WATER QUALITY STRATEGIC PLAN

December 2017
The Northeast Ohio Areawide Coordinating Agency (NOACA) is a public organization serving the counties of and municipalities and townships within Cuyahoga, Geauga, Lake, Lorain and Medina (covering an area with 2.1 million people). NOACA is the agency designated or recognized to perform the following functions:

- Serve as the Metropolitan Planning Organization (MPO), with responsibility for comprehensive, cooperative and continuous planning for highways, public transit, and bikeways, as defined in the current transportation law.
- Perform continuous water quality, transportation-related air quality and other environmental planning functions.
- Administer the area clearinghouse function, which includes providing local government with the opportunity to review a wide variety of local or state applications for federal funds.
- Conduct transportation and environmental planning and related demographic, economic and land use research.
- Serve as an information center for transportation and environmental and related planning.
- As directed by the Board, provide transportation and environmental planning assistance to the 172 units of local, general purpose government.

NOACA’s Board of Directors is composed of 45 local public officials. The Board convenes quarterly to provide a forum for members to present, discuss and develop solutions to local and areawide issues and make recommendations regarding implementation strategies. As the area clearinghouse for the region, the Board makes comments and recommendations on applications for state and federal grants, with the purpose of enhancing the region’s social, physical, environmental and land use/transportation fabric. NOACA invites you to take part in its planning process. Feel free to participate, to ask questions and to learn more about areawide planning.

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# The Northeast Ohio Areawide Coordinating Agency's (NOACA's) Water Quality Strategic Plan (WQSP)

The Northeast Ohio Areawide Coordinating Agency's (NOACA's) Water Quality Strategic Plan (WQSP) establishes a consensus-driven mission, goals, objectives and strategies to guide the staff-supported work of the agency. The WQSP builds on current land-use and employment trends that affect water resources and infrastructure in both rural and urban communities.
Water Quality Strategic Plan

December 2017

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EXECUTIVE SUMMARY

The Northeast Ohio Areawide Coordinating Agency’s (NOACA’s) Water Quality Strategic Plan (WQSP) establishes a consensus-driven mission, goals, objectives and strategies to guide the staff-supported work of the agency. The WQSP builds on current land-use and employment trends that affect water resources and infrastructure in both rural and urban communities.

NOACA is the designated “Areawide” agency responsible for water quality and wastewater planning in Northeast Ohio. Subsequently, NOACA prepares plans, such as its Clean Water 2000 Plan (208 Plan) to support federal, state and local government solutions to regional water quality issues. NOACA was designated by the Governor of Ohio under Section 208 of the federal Clean Water Act (CWA) to perform areawide planning. Together with local public officials throughout the region, NOACA updates and maintains the region’s 208 Plan to address both municipal wastewater treatment issues and nonpoint source pollution management and control. The first 208 plan for Northeast Ohio, completed in 1979, focused considerable attention on public investments in wastewater treatment facilities and point sources of water pollution. These investments produced a remarkable recovery in the region’s water quality. However, there remains a widespread threat to water quality in Northeast Ohio from nonpoint source pollution generated by storm water runoff from paved surfaces, rooftops, lawns and farms.

In response to the water quality threats that persist, NOACA staff collaborated with stakeholders and the public to develop the following goals of the Water Quality Strategic Plan (discussed more fully in Chapter 2):

1. Support Work to Restore and Protect Lake Erie and the Region’s Freshwater Assets
2. Promote Water’s Value as a Regional Driver of Economic Competitiveness
3. Identify and Inform Communities & Organizations about Regional Impacts of Local Water Infrastructure Decisions
4. Advance the Philosophy of “One Water” through NOACA’s 208 Planning Process
5. Within NOACA’s Internal Structure, Consider and Address Potential Water Quality Impacts of Transportation Projects

The goals of the WQSP support the agency’s vision, the bedrock of its Regional Strategic Plan:

NOACA will STRENGTHEN regional cohesion, PRESERVE existing infrastructure, and BUILD a sustainable multimodal transportation system to SUPPORT economic development and ENHANCE quality of life in Northeast Ohio.

NOACA’s Board of Directors adopted its Regional Strategic Plan, Going Forward, Together, on January 23, 2015. The Plan is a comprehensive approach to propel the agency forward in an era of changing demographics and employment needs and competing funding constraints. An overarching goal of the plan is to ensure that Northeast Ohio is competitive in a global economy and that people and freight move efficiently. The WQSP and Regional Strategic Plan are complementary, not competitive. Both will guide the agency’s important work to improve quality of life for the residents, business owners and stakeholders of Northeast Ohio.
CHAPTER 1: EXISTING CONDITIONS IN THE NOACA REGION

Background
According to the American Planning Association (APA), water resource issues should be integrated into the comprehensive land-use planning process. Urbanization increases runoff from impervious surfaces, which leads to storm water flooding and nonpoint source pollution problems. Planners use population and employment trends to understand the impacts of urbanization, which includes changes in land use and development patterns. Land use and development pattern changes often determine water quality impacts, which in turn drive water infrastructure investment decisions. This chapter provides a brief overview of recent population and employment trends in Northeast Ohio, as well as the regional water quality conditions affected by such trends (see Appendix A for more details). These conditions and trends informed the development of the mission statement, goals, objectives, and strategies of the WQSP (see Chapter 2).

Regional Population & Employment Trends
Since World War II, Northeast Ohio has experienced four distinct periods of population and employment change. From the end of the war (1945) until 1970, the region increased in population largely due to the second phase of the Great Migration of blacks from the rural south to northern industrial cities and the dramatic increase in birth rates following the end of the war (The Baby Boom). Although Cleveland’s population declined during this period, rapidly growing suburbs yielded net growth for the region prior to 1970. After 1970, the entire region’s population and employment declined, while the decline in Cleveland accelerated further. While there was a brief period of modest growth across the region during the 1990s and early 2000s, this ended with the onset of the Great Recession in the mid-2000s. Since then, the regional population and employment numbers have resumed their decline, albeit at a slower rate. Though the overall region has resumed a gradual population and employment decline, there has been pockets of growth in certain areas. During the 60 years between World War II and the Great Recession, the pattern was largely one of urban decline and suburban growth. However, since the Great Recession (approximately the past decade), the pattern has become more complex. Pockets of growth now exist in certain urban areas and pockets of decline now affect certain suburban areas. This shift in trends also affects water and wastewater infrastructure. Decline in urban and suburban areas mean those communities struggle with disinvestment and aging infrastructure; systems are very expensive to repair and replace. Areas of growth in urban and suburban areas put pressure on aging systems to perform with higher capacity and create demand for new infrastructure where there currently isn’t any. Maintenance and expansion are costly investments. The financial burdens challenge officials in both new and aging communities as they struggle to cope with the demands imposed by changing populations. These same challenges exist for transportation infrastructure and, for that reason, many stakeholders urge stronger integration of water and transportation planning within the framework of asset management.

Population
As briefly described in the preceding paragraphs, the population of the five NOACA counties remained relatively stable between 1990 and 2015. Modest growth experienced in the 1990s and early 2000s was countered by modest decline since the mid-2000s. Within the region,

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however, there have been pockets of simultaneous growth and decline in urban, suburban and rural communities. Future patterns of population change in Northeast Ohio are expected to follow these new trends. The simple population paradigm of urban decline versus suburban growth has become more complex. There will be nodes of growth along with pockets of decline in both the City of Cleveland and its suburbs through 2020 and beyond. This pattern of population change presents unique water quality impacts. In urban areas, growth increases the need for maintenance on aging systems (both drinking water and wastewater), but additional customers help shore up utility budgets. In exurban and rural areas, growth increases demand on less developed systems and increases costs from the need to build new pipes and pump stations. Exurban and rural areas may also mean an increase in home sewage treatment (i.e. septic) systems and replacement of old systems. These treatments may potentially harm both surface and groundwater sources if they are not properly designed, maintained and regularly replaced.

Employment
Similar to population, the employment numbers within the five NOACA counties remained relatively stable between 1990 and 2015. The 1990s and early 2000s witnessed modest employment growth within the region; all counties experienced an increase during this period. However, the onset of the Great Recession in the mid-2000s brought a regional decline in employment. During that same period, there has been movement of employers and employees between urban and suburban locations. Of the six largest job hubs in the region, two are urban (Downtown and University Circle) and four are suburban (Chagrin Highlands, Hopkins Airport, Rockside Road and Solon/Cochran). As with population, the region will likely experience nodes of employment growth (both urban and suburban) along with nodes of employment decline (also both urban and suburban) in the coming years. Just as with residential change, commercial and industrial change present special opportunities and challenges for aging systems in urban areas and the need for new systems in exurban and rural areas. Poor planning of new commercial and industrial development may contribute to excess pavement (rooftops, parking lots, roadways) that creates more rainfall runoff than a storm water treatment system can handle. If the system is supposed to treat both storm water and wastewater (a combined system), excess runoff may cause sewage to back up and enter streams and lakes untreated (Combined Sewer Overflow (CSO) event).

Water Quality Conditions
For watersheds, most impairment is related to modification of the landscape by agriculture and urban development. Impairments have the most impact on smaller streams (i.e., the larger the drainage area, the larger the stream and the more likely the stream will be healthy). Hence, unhealthy fish and aquatic insect populations are more common in small streams. The Ohio Environmental Protection Agency (Ohio EPA) uses the fish and aquatic insects that live in streams to assess the health of Ohio’s flowing waters because aquatic animals are generally the most sensitive indicators of pollution; they inhabit the water all the time. A healthy stream community is also associated with high-quality recreational opportunities, such as fishing and boating. There are instances when stream degradation may be due to natural phenomena, but most impairment stems from human activity.

Once Ohio EPA determines impairment, the state must take action (required by the CWA). Typical actions include restoration plans known as Total Maximum Daily Loads (TMDLs), water quality based permits, and nonpoint source pollution control measures. For each impaired waterbody, Ohio EPA typically prepares a TMDL analysis: a written, quantitative assessment of water quality problems; and contributing sources of pollution. It specifies the amount a pollutant
must be reduced to meet water quality standards; allocates pollutant load reductions; and provides the basis for restorative actions.

The top five causes of impairment are 1) total suspended solids/siltation/sedimentation, 2) nutrient enrichment and pathogens, 3) habitat modification, 4) hydromodification, and 5) organic enrichment/dissolved oxygen. Most impaired watersheds in Northeast Ohio have at least one of the top five causes; many have two. It is noteworthy that many larger rivers and watersheds are impaired by organic enrichment/dissolved oxygen, primarily from sewage. Adequate treatment and disposal of waste are critical for watershed health. Please see Appendix A for full definitions of each of the top five causes of impairment and further discussion.

**Conclusion**

Northeast Ohio has undergone significant population and employment changes that have implications for regional water quality. People and jobs, once concentrated in central cities such as Akron and Cleveland, are now more dispersed throughout the region. Earnings, tax revenues, and demands for new infrastructure have accompanied people and jobs in their migratory pattern. The region now faces the challenge to manage threats to water quality posed by both aging infrastructure in declining areas and new infrastructure in growing areas. Infrastructure is expensive and strains tight local budgets. Poorly maintained and inadequate infrastructure threatens the integrity of our region’s rivers and streams.

What do these trends and conditions signify for regional water quality? The next 25 years may bring a variety of concerns due to a more complex pattern of growth and decline across Northeast Ohio: infrastructure (How are we going to pay for it? What about abandoned neighborhoods?); drinking water protection (How do we mitigate the impacts of agricultural runoff into Lake Erie outside Northeast Ohio? What about emergency supplies?); green treatment (How can we replace some of the pipes and culverts in our old system with rain gardens and bioswales and open spaces to treat water more naturally and reduce the amount we treat with chemicals?); and the integrated of water quality and transportation planning (How do road, bridge and transit projects impact our water resources? How do we correct past mistakes and capitalize on opportunities to make things better?). This complex collection of challenges will require regional collaboration and strategic planning to support the agency’s vision and goals.

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CHAPTER 2: NOACA WATER QUALITY MISSION STATEMENT, GOALS, OBJECTIVES, AND IMPLEMENTATION STRATEGIES

Without a regional and strategic context to address transportation and water infrastructure, Northeast Ohio communities will continue to compete with one another for maintenance and new infrastructure dollars, and fail to leverage the region’s size and economic importance to influence state and federal decisions regarding funding priorities. Lack of a regional and strategic context will further degrade the region’s future as a global economic competitor. To establish such context, NOACA’s Board of Directors and its Senior Management Team invested nearly three years in the development of a Regional Strategic Plan.

NOACA’s Board of Directors adopted its Regional Strategic Plan, Going Forward, Together, on January 23, 2015. The Regional Strategic Plan is a comprehensive approach to propel the agency forward in an era of changing demographics and employment needs and competing funding constraints. An overarching goal of the plan is to ensure that Northeast Ohio is competitive in a global economy and that people and freight move sustainably and efficiently. The WQSP and Regional Strategic Plan are complementary, not competitive. Both will guide the agency’s important work to improve quality of life for the residents, business owners and stakeholders of Northeast Ohio (see Appendix B for more details). The remainder of this chapter will focus on the Water Quality Strategic Plan’s development, including mission, goals, objectives and strategies.

Water Quality Strategic Plan Development Process

While the NOACA Regional Strategic Plan guides the organizational development of staff and agency activities, a strategic plan for water quality is also needed. NOACA is continuously challenged to balance the competing interests of a diverse region, ranging from compact urban neighborhoods to sprawling suburbs to exurban/rural development to productive farms. The region also faces many challenges related to its environmental health and water quality. While the water quality in the region has shown much improvement since 1969 (the year of the infamous Cuyahoga River fire), there are many threats to the region’s water resources, including Lake Erie. These challenges include the degradation of area streams (many Lake Erie tributaries); aging infrastructure for wastewater, storm water, and drinking water; lack of appreciation for water’s value due to its abundance; and disjointed efforts in planning for both transportation and water infrastructure. The WQSP will guide the agency’s efforts, supported by NOACA staff, to inform the work of member communities and watershed organizations within Northeast Ohio. The WQSP will promote tools and best management practices, particularly those learned from local member communities in urban and rural areas, to foster a stronger regional focus on the health and value of local water resources.

NOACA staff identified regional technical stakeholders who plan for and manage water (natural) resources and water infrastructure. Staff enlisted stakeholders from natural resource management organizations (regional park districts, soil and water conservation districts); watershed planning organizations; communities within the Lake Erie and Ohio River watersheds; drinking water, storm water (county engineers), and wastewater management agencies; local health departments; regional and state agencies (Ohio Department of Natural Resources, Coastal Office, Ohio EPA, etc.); nonprofit organizations; and elected officials. Staff
ensured the approximately 20 to 25 stakeholders were regionally balanced, with representation from each of NOACA’s five counties.

Staff held four stakeholder meetings to identify regional stressors that affect water quality. The stakeholders participated in facilitated discussions to identify regional strengths, weaknesses, opportunities, and threats. NOACA staff used this information to draft a mission statement, goals, and objectives for the WQSP, and then sought feedback on them from the same stakeholders. Staff incorporated the feedback and then developed implementation strategies and created a draft WQSP document. Staff sought public comment through four public engagement sessions; staff also conducted an online survey. NOACA staff then incorporated feedback from public engagement activities (nearly 250 individuals contributed comments) to refine the WQSP.

Mission Statement
NOACA’s WQSP technical stakeholders helped NOACA staff develop the following mission statement to guide the agency’s focus through the next five years (through 2021):

“As a designated areawide planning agency, NOACA will prepare, approve and maintain a Water Quality Management (208) Plan. The 208 Plan will promote the sustainable use of water and both the management and reduction of pollution from point and nonpoint sources. NOACA will also provide leadership, planning and technical work to help communities and watershed organizations align, coordinate and collaborate efforts to protect drinking water resources; plan for wastewater treatment; and mitigate storm water impacts. NOACA will inform regional decision making to enhance Northeast Ohio’s quality of life through the management of water as a valuable resource.”

Water Quality Goals, Objectives and Strategies
The goals in the WQSP are intended to help the agency fulfill its mission. The objectives provide the agency with concrete, attainable and measurable outcomes that support agency goals. NOACA staff will implement strategies to help the agency accomplish its objectives. Please note there is some overlap since the objectives and strategies for each goal are not mutually exclusive. NOACA staff will implement strategies through the agency’s designated status and responsibilities as an areawide water quality management agency (e.g. a comprehensive update of the region’s 208 Plan) and their assigned work (e.g. NOACA’s annual Overall Work Program). Chapter 3 provides more details about implementation.

Goal 1: Support Work to Restore and Protect Lake Erie and the Region’s Freshwater Assets

**Objective:** Collaborate and coordinate with stakeholders to promote a sustainably based Northeast Ohio water “brand” to foster regional identity and opportunities

**Objective:** Provide planning and technical assistance to organizations upon request (e.g. drinking water utilities, major watersheds (e.g. Cuyahoga, Rocky, Grand) and minor sub-watersheds (e.g. Tinkers Creek, Euclid Creek))

**Objective:** Identify areas, including transportation infrastructure, potentially susceptible to water resource impacts (e.g. flooding from new precipitation patterns and land use changes; freeze/thaw cycles)
**Objective:** Provide planning and technical assistance to address regional water quality impacts from Combined Sewer Overflows (CSOs) and other water infrastructure failures (particularly in urban/suburban areas versus rural areas)

**Implementation: Priorities**
The first objective is NOACA’s highest priority for this goal; the other objectives represent NOACA’s ongoing commitment to supplement the existing excellent work by local watershed groups and jurisdictions in the region. NOACA has the potential role to provide a regional forum for different stakeholders to focus collectively on Lake Erie and its importance in Northeast Ohio. Although NOACA is not a marketing firm, NOACA could invite groups together and facilitate collaboration with a marketing expert through branding exercises. A regional brand focused on Lake Erie is important to help individual jurisdictions and groups realize their shared future in Lake Erie’s health. NOACA can encourage and facilitate cohesion around the region’s greatest freshwater asset.

**Implementation: Potential Strategies**

- **Lake Erie Brand:** Support a regional sustainable water “branding” effort in partnership with technical stakeholders, infrastructure decision makers, regional institutions, and NOACA member constituents to promote the value of water in Northeast Ohio and encourage protection and restoration of Lake Erie and freshwater assets (also supports Goal 2).
  - Identify and advance a Lake Erie Brand; incorporate “From Rust Belt to Blue Belt” concept.
  - Seek potential stakeholder partners to explore a branding/marketing effort that reflects regional cohesion and sustainable stewardship of Lake Erie.
  - Have NOACA’s Executive Director actively participate on the Ohio Lake Erie Commission (OLEC).

- **Planning and Technical Assistance:** Provide technical and planning assistance to Lake Erie drinking water utilities in the development of Source Water Protection Plans (SWPPs) and watershed groups as needed (given available resources and staffing)
  - Identify and support drinking water interconnections and redundancy planning to mitigate impacts of water emergencies and supply shortages.
  - Encourage and support improved regional communications efforts regarding potential drinking water emergencies.
  - Educate decision makers about storm water effects on sources of drinking water.
  - Advance understanding that “protection is always cheaper than remediation.”

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3 Communities can adopt management strategies to protect drinking water sources. This involves: (1) Assessing the contaminant threats in the protection area; (2) Identifying and prioritizing management measures for the threats; (3) Implementing the management measures (retrieved 8.17.2017 from [https://www.epa.gov/sourcewaterprotection/local-source-water-protection-planning](https://www.epa.gov/sourcewaterprotection/local-source-water-protection-planning)).

4 A critical step for planning is to identify the existing condition of system infrastructure and to reduce outage risk through system redundancy and repair capabilities. Redundant pipe connections and strategically placed valves may make it possible to isolate damaged pipes and minimize the area(s) of lost service. For example, New York City and Cleveland both rely on system redundancy for their emergency water supply plan, while Seattle has means for establishing temporary connections between pressure zones to allow by-passing of certain areas and improve the provision of service (Ohio EPA, 2011, Planning for an Emergency Drinking Water Supply. Retrieved 8.17.2017 from [https://www.epa.gov/sites/production/files/2015-03/documents/planning_for_an_emergency_drinking_water_supply.pdf](https://www.epa.gov/sites/production/files/2015-03/documents/planning_for_an_emergency_drinking_water_supply.pdf)).
- Participate in large watershed Areas of Concern (AOC), including the Black and Cuyahoga Rivers, as staff resources allow.\(^5\)
- Track water quality legislation significant to the region and inform stakeholders.

- **Impacts from water resources:** Incorporate in NOACA’s Long-Range Transportation Plan (LRTP) the potential impacts from current and future precipitation and temperature patterns (e.g., map potential roads and bridges susceptible to flooding from heavy rainfall events or land use changes; identify roads and bridges vulnerable to increased frequency of freeze/thaw cycles, etc.). Recognize that effects may differ and merit different support in rural versus urban communities; communities adjacent or in close proximity to Lake Erie, a river, lake or other body of water versus inland communities or communities where surface water bodies are not immediately present; and communities where storm water runoff is an issue versus those where it is not.

- **Combined Sewer Overflows (CSOs):**
  - Collaborate with the Northeast Ohio Regional Sewer District (NEORSD) and other wastewater management entities to map CSO events across the Northeast Ohio region. This is primarily an urban issue and may not be applicable in rural areas without sewer service.
  - Provide forums and educational training for local government officials on how to apply for and receive financial assistance from the Ohio Department of Environmental and Financial Assistance (DEFA).

**Goal 2: Promote Water’s Value as a Regional Driver of Economic Competitiveness**

**Objective:** Collaborate and coordinate with stakeholders to promote a sustainably based Northeast Ohio water “brand” to foster regional identity and opportunities

**Objective:** Collaborate and coordinate with stakeholders to educate the region, state, and nation about the value of water to Northeast Ohio

**Objective:** Collaborate and coordinate with stakeholders to identify sustainable economic uses of water that balance environmental, economic, and social equity benefits and impacts

**Implementation: Priorities**

The second objective of this goal is the most important: NOACA should embrace the opportunity to disseminate information about the value of water to local stakeholders. NOACA is not an expert on water’s value, but it can collaborate with organizations such as the Cleveland Water Alliance to better understand water’s true value in numerous aspects of Northeast Ohioans’ lives. More importantly, NOACA can convey information about water’s numerous benefits through public education and outreach. NOACA may host meetings and workshops at its offices or in various locations throughout Northeast Ohio, with speakers and literature to communicate information about the value of water and its implications for potential economic growth in the region.

\(^5\) The U.S.-Canada Great Lakes Water Quality Agreement (Annex 1 of the 2012 Protocol) defines AOCs as "geographic areas designated by the Parties where significant impairment of beneficial uses has occurred as a result of human activities at the local level." An AOC is a location that has experienced environmental degradation (Retrieved 8.17.2017 from [https://www.epa.gov/great-lakes-aocs](https://www.epa.gov/great-lakes-aocs)).
**Implementation: Potential Strategies**

- **Lake Erie Brand:** Support a regional sustainable water “branding” effort in partnership with technical stakeholders, infrastructure decision makers, regional institutions, and NOACA member constituents to promote the value of water in Northeast Ohio and encourage protection and restoration of Lake Erie and freshwater assets (also supports Goal 2).
  - Identify and advance a Lake Erie Brand; incorporate “From Rust Belt to Blue Belt” concept.
  - Seek potential stakeholder partners to explore a branding/marketing effort that reflects regional cohesion and sustainable stewardship of Lake Erie.
  - Have NOACA’s Executive Director actively participate on the Ohio Lake Erie Commission (OLEC).6

- **The Value of Water (Blue Economy and One Water):**
  - Participate actively in and support the Cleveland Water Alliance’s (CWA) “Blue Economy” economic development efforts.7 Recognize and promote different efforts in agricultural communities versus urban/suburban communities.
  - Incorporate a “One Water” focus into NOACA planning efforts. The United States Water Alliance (USWA) drives a “One Water” movement.8 This movement envisions a future where all water is valued: water from the tap; irrigation on a farm; storm water; water flowing toward a treatment plant. Strive to understand and apply different values systems for water within the region, such as those in rural versus urban areas, those in waterfront versus inland communities and those in communities with significant storm water issues versus those that do not experience such problems. The “One Water” Movement has six focus areas:
    - Reliable and Resilient Water Utilities
    - Thriving Cities
    - Competitive Business and Industry
    - Sustainable Agricultural Systems
    - Social and Economic Inclusion
    - Healthy Waterways
  - Educate NOACA’s Planning and Programming Subcommittees (Transportation, Air Quality, and Water Quality) about “One Water” through the Cleveland Water Alliance; highlight significant parallels between NOACA’s Regional Strategic Plan and One Water Roadmap to support the agency’s work.
  - Invite Cleveland Water Alliance Director to present at a future Designated Management Agency (DMA) workshop; map potential collaboration through brainstorming exercises.

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6 The role of the Ohio Lake Erie Commission (OLEC) is to preserve Lake Erie’s natural resources, to protect the quality of its waters and ecosystem, and to promote economic development of the region by ensuring the coordination of policies and programs of state government pertaining to water quality, toxic substances, and coastal resource management. The Commission also oversees the management of the Lake Erie Protection Fund. Authority for the Commission is contained in ORC Sections 1506.21-1506.24 (Retrieved 8.18.2017 from http://lakeerie.ohio.gov/).


• **Sustainable Economic Uses of Water:**
  o Leverage NOACA’s technical, planning, and funding resources to support local initiatives on water valuation and freshwater asset restoration and protection to ensure the highest and best use of existing regional infrastructure. Tailor support efforts to different parts of the NOACA region that may have different needs (farming and small town communities in outlying areas versus growing suburban areas versus core urban areas struggling with both gentrification and disinvestment).
  o Participate actively in and support longer-term bonding opportunities for water infrastructure.
  o Engage the Corporate Roundtable (CRT) at Cleveland State University (http://www.csuohio.edu/business/sustainability/crt-corporate-roundtable), whose mission is to unite social, environmental and financial assets for innovative change. The CRT is a group of business leaders that meets monthly for peer learning about best practices and innovation in corporate and community sustainability. CRT serves as a neutral, “honest broker,” offering knowledge resources to assist in participants’ exploration of sustainability and what it means for their businesses. NOACA staff can both learn about business efforts to incorporate sustainability into practices, products and technology and educate business leaders about impacts of business location, employee commuter behavior and production on regional water resources.

**Goal 3: Identify and Inform Communities & Organizations about the Regional Effects of Local Water Infrastructure Decisions**

**Objective:** Identify and assess the positive and negative regional effects of local drinking water, wastewater, and storm water infrastructure decisions

**Objective:** Facilitate a regional forum on implementation and how to leverage resources efficiently (i.e., funding, etc.).

**Objective:** Provide planning and technical assistance to Municipal Separate Storm Sewer System (MS4) communities to update their Storm Water Management Plans (SWMPs) so they meet Ohio EPA’s new MS4 National Pollutant Discharge Elimination System (NPDES) permit requirements

**Objective:** Maintain and routinely update NOACA’s 208 Plan to address regional water quality and water infrastructure needs; mediate potential conflicts between competing interests of Designated Management Agencies and municipalities

**Objective:** Act as a regional data clearinghouse to track the progress of community investments (i.e. map sewer and water investments within NOACA region)

**Objective:** Facilitate the integration of Ohio Department of Natural Resources’ (ODNR’s) Office of Coastal Management Program into local and regional planning efforts, including the 208 plan
Implementation: Priorities
The first, second and fifth objectives under this goal speak to how NOACA can help local governments understand how local infrastructure decisions impact the entire region through education, a significant priority for the organization. The third, fourth and sixth objectives represent technical support that NOACA can provide communities; these are important but the impact of local decisions on the region provides an educational opportunity that NOACA is uniquely positioned to fill. As the Areawide Agency for Northeast Ohio, NOACA should strive to inform local infrastructure decision-making throughout the region, both in urban and rural areas. NOACA does not have the authority to make decisions for local communities, nor implement those decisions, but it can certainly inform communities about potential impacts of those decisions; provide resources that local communities may leverage for support; and share data about investments across Northeast Ohio communities. The resources provided and the methods used to provide them will vary based on the community served (rural versus urban/suburban, agricultural versus industrial, waterfront versus inland, flood-prone versus not flood-prone). Furthermore, this is an opportunity for NOACA to learn lessons from its member communities and realize that many smaller communities have developed very creative and worthy solutions that NOACA could share with others.

Implementation: Potential Strategies

- **Identify and Assess Regional Effects of Proposed Infrastructure Projects through Intergovernmental Review (IGR):** Expand NOACA’s IGR to assess regional impacts of water infrastructure (drinking, storm water, and wastewater) projects proposed for federal and state funding.
  - Work with Ohio EPA’s Division of Environmental and Financial Assistance (DEFA) to reinstitute IGRs of all funded water infrastructure projects in Ohio.
  - Provide NOACA’s Water Quality Subcommittee and technical stakeholders of staff reviews and comments to support the agency’s decision-making process.
  - Provide planning and technical support to applicants who make funding requests and ensure review comments reach applicable funders.

- **Host Regional Implementation Forum:**
  - Facilitate a regional forum on implementation and how to leverage resources efficiently (i.e., funding).
  - Further advance the regional and local understanding that “protection is always cheaper than remediation.”
  - Educate communities, developers, elected officials, etc. about building codes, transportation infrastructure, economic development, drinking water services, and sewage treatment practices that could potentially harm Lake Erie.
  - Educate others on the implications of potential decisions and trends of the future to ensure use of existing infrastructure before the addition of new infrastructure.

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9 Ohio EPA’s Drinking Water Assistance Fund (DWAF), Water Pollution Control Loan Fund (WPCLF); and Drinking Water Emergency Loan Fund (D Wells); Ohio Water Development Authority’s (OWDA’s) Revolving Loan Fund; Unsewered Area Assistance Program, and Security Assistance Program for Emergency Preparedness; United States Department of Agriculture’s (USDA’s) Rural Development Water/Waste Disposal Program; Ohio Public Works Commission’s (OPWC’s) Grant/Loan programs; Ohio’s Rural Community Assistance Program (RCAP), Ohio’s Economic Development Association (EDA) Public Works Program; Ohio Capital Asset Financing Program (Ohio CAF); USEPA Green Infrastructure Technical Assistance Program. NOACA staff acknowledge there are numerous funders and programs listed here that may not be familiar to all readers. However, their purpose in this section of the WQSP is to illustrate the breadth and variety of funding resources that may be available to local communities.
Generate information about the cost to taxpayers of not managing storm water and demonstrate the potential savings to the public and elected officials if storm water is managed properly.

Coordinate a speakers’ series and educational programs on water quality and quantity planning topics for staff, WQS members, and NOACA constituent communities.

**Planning and Technical Assistance through Northeast Ohio Storm Water Training Council (NEOSWTC):**

- Educate urbanized communities how they can meet their MS4 NPDES permit requirements.
- Partner with the NEOSWTC to offer in-person training sessions and workshops to engineers, planners, and storm water professionals on SWMPs and the new MS4 NPDES permits.
- Support “undevelopment” and restoration best management practices (e.g., “depave” program: replace excessive or abandoned surface parking with trees to create a storm water management area).

**NOACA’s 208 Plan:**

- Include a focus on drinking water (chapter) and capital improvement planning coordination in the 208 Plan.
- Maintain the region’s Clean Water 208 Plan to address regional water quality and incorporate planning for water infrastructure needs.

**Regional Data Clearinghouse:**

- Create a regional data clearinghouse to track the progress of community investments and mediate potential conflicts between competing interests in drinking water, wastewater, and storm water.
- Collect and share a comprehensive set of regulatory codes (e.g., planning, zoning, building, etc.) available for implementation across communities. Identify code solutions that may be appropriate for some types of communities and different code solutions for other types of communities. This is a prime opportunity to learn about what has worked and what has not worked in various locations and develop a compendium of best practices across the region.
- Identify and assess the positive and negative regional effects of local drinking water, wastewater, and storm water infrastructure decisions. Different criteria may be used to assess “positive” versus “negative” in different types of communities.
- Identify cost savings associated with integrating storm water management into capital improvement plans. Recognize that storm water management needs may differ between communities and cost savings solutions may vary as well.

**ODNR Coastal Management Program:**

- Host a workshop for local and regional planning officials to learn about ODNR’s Coastal Management Program, particularly key connections with NOACA’s 208 Plan.
- Incorporate critical elements of ODNR’s Coastal Management Program into the comprehensive update of NOACA’s 208 Plan.
- Establish a technical support network between NOACA and ODNR staff to provide resources to help local community officials understand how they might update their plans to reflect the tenets of the Coastal Management Program.

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Goal 4: Advance the Philosophy of “One Water” through NOACA’s 208 Planning Process

Objective: Advance a regional understanding of the “one water” movement, which is an approach to water stewardship that values water and proactively advances policies and programs to manage water resources to advance a better quality of life for everyone. Utilize NOACA’s quarterly DMA Roundtables and update its GIS products to support this objective.

Objective: Maintain and update NOACA’s 208 Plan to encourage holistic water infrastructure planning and engage regional stakeholders about current water quality issues

Objective: Utilize the 208 Plan to support drinking water resilience and redundancy planning

Implementation: Priorities
A comprehensive update of the 208 Plan and its ongoing updates (“maintenance”) are critical for NOACA; this is required by the Clean Water Act. The 208 Plan essentially fleshes out many of the goals, objectives and strategies outlined in the Water Quality Strategic Plan; the two documents support one another and collectively guide the agency’s work and service focus to public stakeholders.

Implementation: Potential Strategies:
- Advance Regional Understanding of “One Water” Movement:
  - Join the U.S. Water Alliance through the Cleveland Water Alliance and actively engage members through local, regional, and national “one water” events (e.g., educational campaigns that illustrate the interconnectedness of drinking water and infrastructure)
  - Develop a primer on “One Water” to inform the NOACA Board of Directors and its Committees and Subcommittees.
  - Invite the Cleveland Water Alliance Director to present at a future Designated Management Agency (DMA) meeting; map potential collaboration through brainstorming exercises.
  - Conduct educational workshops for both DMA and wastewater/storm water professionals to identify opportunities for comprehensive infrastructure planning
  - Request DMAs provide copies of wastewater, storm water, and land-use master plans as part of any facility planning area (FPA) boundary or prescription change process.
  - Further NOACA’s GIS capabilities to facilitate data sharing and act as a source of information for the region.
    - Expand the agency’s GIS mapping to incorporate current wastewater treatment plant capacities, trunk conveyance capacity, gravity drainage directions, combined sewer overflows (CSOs), etc.
    - Develop GIS technical and planning skills further to support underserved communities in planning for infrastructure.

- NOACA’s 208 Plan:
  - Engage NOACA’s Water Quality Subcommittee (WQS) and WQSP technical stakeholders in a comprehensive update of the region’s 208 Plan to reflect
current water quality conditions and land-use development patterns associated with population and employment changes.

- Review and update FPA boundaries and prescriptions of NOACA’s designated management agencies (DMAs) per application.
- Include language in the 208 Plan that would document that DMAs demonstrate capacity to treat wastewater, analyze the current state of their system, and provide a long-term maintenance plan.
- Summarize current water quality conditions in Northeast Ohio with Ohio EPA data.
- Track current trends and project future conditions for population and employment in Northeast Ohio.

- Continue reviewing and commenting on Permit-to-Install (PTI) applications to ensure consistency with NOACA’s 208 Plan.
- Leverage NOACA’s technical, planning, and funding resources to support local initiatives on water valuation and freshwater asset restoration and protection to ensure the highest and best use of existing regional infrastructure.
- Evaluate the long-term perpetual costs of projects that require a 208 Plan FPA modification.
- Improve consistency between the 208 Plan and local service agreements; help communities understand how the service agreements relate to the 208 Plan.
- Identify areas within the 208 Plan that have been designated “to be served by on-site systems” and work with county health departments to address water quality issues associated with failing home sewage treatment systems (HSTS).

- Drinking Water (Resiliency and Redundancy Planning):
  - Plan with and provide technical support to Lake Erie drinking water utilities so they can develop Source Water Protection Plans (SWPPs).
  - Partner with local watershed organizations to connect storm water management with the protection of Lake Erie drinking water.
  - Facilitate regional cooperation among various drinking water systems to face shared challenges, but also recognize differences and create opportunities to learn from different experiences.
  - Identify opportunities and encourage the installation of interconnections between the City of Cleveland Division of Water and shallower Lake Erie intakes.
  - Improve regional communications about potential water emergencies and supply shortages.
  - Assess and communicate the relationship between storm water and drinking water (e.g., effects on the surface water and groundwater used for drinking).
  - Provide planning and technical assistance to underserved communities to become financially stable with respect to managing infrastructure costs. Identify different needs of different communities and learn cost savings solutions from different communities to share with their Northeast Ohio neighbors.

Goal 5: Within NOACA’s Internal Structure, Consider and Address Potential Water Quality Impacts of Transportation Projects

Objective: Evaluate water quality impacts of transportation projects through Project Plan Review (PPR), Transportation for Livable Communities Initiative (TLCI), Long-Range Transportation Plan (LRTP), etc.
Objective: Develop a Best Management Practices (BMPs) Program for transportation projects (e.g., stream crossing, complete and green streets, etc.)

Objective: Update and expand all of NOACA’s transportation project application processes to include water resource impacts and water infrastructure considerations

Objective: Incorporate water quality issues associated with transportation into NOACA’s annual Overall Work Program (OWP)

Objective: Present potential water resource impacts of transportation projects to NOACA Board, Committee, Subcommittee, and Advisory Council members

Implementation: Priorities
NOACA needs to fully integrate water quality planning and transportation planning efforts within its programs, processes and plans. The work of the agency as a Metropolitan Planning Organization and as an Areawide Agency must be truly comprehensive; you can’t focus on one without the other. Although NOACA has made some strides in this regard, there are many opportunities for NOACA staff to improve its interdisciplinary approach to transportation planning programs. Water resource impacts on transportation infrastructure projects merit full consideration and disclosure, particularly if the agency wishes to emphasize asset management.

Implementation: Potential Strategies:
- **Project Evaluation for Potential Water Quality Effects:**
  - Expand NOACA’s Project Planning Review (PPR) process to assess water quality impacts of transportation projects proposed for federal and state funding.
  - Transportation for Livable Communities Initiative (TLCI): Incorporate a “green and complete streets” priority that addresses storm water runoff.
  - Work to coordinate transportation projects with water projects within local capital improvement plans (CIPs).
  - Assess water quality impacts of transportation projects within the Environmental Planning chapter of the LRTP.

- **Develop water quality BMPs for transportation project review:**
  - Develop a stream crossing BMP program for transportation projects.
  - Provide technical and planning assistance to local communities with regard to sizing, designing, removal/replacement, etc. (e.g., develop a watershed drainage hydrology modeling tool/GIS layer that reflects current storm event magnitude and frequency). Realize different approaches might be appropriate and/or necessary (i.e. rural or urban communities; contiguous to Lake Erie, a river, lake or other body of water and where surface water bodies are not immediately present; where storm water runoff is an issue or where it is not).
  - Require that ODOT’s Red Flag Summary be completed earlier in the application for funding.\(^\text{11}\)

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\(^\text{11}\) The Red Flag Summary is a snapshot of potential issues that will be studied and evaluated later in the project development process to determine their magnitude of impact. The Red Flag Summary allows locations and descriptions of potential issues to be presented to someone unfamiliar with the project. It is to be a simple, brief, informative resource for a project. Red Flag Summary activities are required for all projects. A written Red Flag Summary is required for Major and Minor Projects and is strongly suggested for Minimal Projects. Design and
Promote the adoption of installation and maintenance BMPs as a component of funding priorities.

Promote innovative BMPs such as floodplain relief culverts and other bridge designs that create better pass flow, within context of its location (BMPs may vary between communities; some BMPs may come out of local community solutions shared with NOACA).

Provide additional scoring points that encourage:

- sponsors to identify, consider, and plan for water quality/quantity.
- the adoption/installation and maintenance of innovative BMPs such as floodplain relief culverts and other bridge designs that create better pass flow.

- **NOACA Transportation Project Applications:**
  - Update and expand NOACA’s transportation project application process to facilitate holistic planning with water resources and water infrastructure.
    - Revise the project sponsor application form to include questions about the status of existing below-grade infrastructure, existing flooding issues, and capital improvement plans to address existing and future water-related impacts of transportation and influence on land development,
    - Integrate water resource protection, green infrastructure, and best management practice (BMP) criteria into the evaluation of Transportation for Livable Communities Initiative (TLCI) grants,
    - Quantify the effect of transportation infrastructure on storm water (how much storm water the transportation network creates),
  - Work to encourage holistic water and transportation infrastructure planning by funding project applicants; work to coordinate transportation projects with water projects within local capital improvement plans (CIPs).
  - Support longer-term bonding opportunities for water infrastructure.

- **Overall Work Program (OWP):**
  - Propose interdisciplinary projects that consider water quality issues associated with transportation projects.
  - Integrate water quality considerations into transportation project tasks, particularly through the methodology.
  - Include non-Environmental NOACA staff to assess water quality impacts of transportation planning and programming projects
  - Emphasize the importance of water quality and transportation planning integration in the project descriptions and introduction to the OWP.

- **NOACA Board, Committee, Subcommittee, and Advisory Councils:**
  - Solicit NOACA’s Board and Committee members to provide insight on regional water and infrastructure issues.
  - Support NOACA Board and Committee members’ current efforts to update NOACA plans and processes to consider the effects of transportation projects on water quality.
  - Inventory, assess, and educate NOACA Board and Committee members about the region’s transportation infrastructure assets that may be affected by climate change and changes in precipitation (frequency, intensity, freezing rain, etc.).

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CHAPTER 3: PLAN IMPLEMENTATION

Introduction
Successful implementation of NOACA’s WQSP will depend on the availability of funding and staffing resources; the incorporation of the WQSP goals and objectives throughout NOACA’s work; and the optimization of NOACA’s existing planning processes and supportive regional partnerships. NOACA will need to enhance its current funding support from federal, state, and local sources to identify, prioritize, and implement WQSP strategies; periodic updates of Local Water Quality annual dues are also necessary. The agency has options to implement the WQSP strategies through different vehicles: The Wastewater Management Plan (208 Plan); Overall Work Program (OWP); collaboration with the Ohio EPA (both District and Central Offices); and other Ohio areawide agencies through the OARC Areawide/Water Quality Subcommittee. These implementation opportunities are described in greater detail below, with the staffing and cost implications for the NOACA Board should they choose to pursue them.

The Wastewater Management Plan (208 Plan): NOACA’s Role as a Designated Areawide Water Quality Management Agency:
NOACA’s 208 Plan provides the agency with a key opportunity to implement the strategies outlined in Chapter 2. Goals 3 and 4 specifically cite the 208 Plan, as do their objectives and proposed strategies. This section provides a brief description of the 208 Plan, its purpose and how the agency could utilize this tool to improve water quality planning and water resource protection.

Description
In 1975, NOACA was designated as an areawide water quality management agency by the Governor of Ohio under provisions of the federal Clean Water Act to perform the areawide planning required under Clean Water Act (CWA) Section 208 (208 plans) for five river basins (Black, Chagrin, Cuyahoga, Grand, Rocky) in seven counties (Cuyahoga, Geauga, Lake, Lorain, Medina, Portage (Lake Erie drainage only) and Summit (Lake Erie drainage only). In 1980, Summit and Portage Counties were redesignated to the Northeast Ohio Four Counties Regional Planning and Development Organization (NEFCO).

208 Plans describe and promote efficient and comprehensive programs to control water pollution from point and nonpoint sources in a defined geographic area that may include both urban and rural communities. Ohio EPA reviews and updates, as necessary, the state’s 208 Plan. The Governor then certifies the entire 208 Plan via submission to the U.S. EPA for approval. The State of Ohio prepares and maintains the 208 Plan for 64 (mostly rural) counties. Areawide agencies act as the lead planning agencies and approve the 208 Plan in the other 24 Ohio counties (typically within metropolitan regions with urban, suburban and rural populations). NOACA’s 208 Plan addresses both municipal wastewater treatment issues and nonpoint source pollution management and control for its five counties in collaboration with local public officials.

Opportunities to Implement WQSP Strategies
The mission, goals, objectives, and strategies in NOACA’s WQSP can guide future updates to NOACA’s 208 Plan, particularly Goal 3 (Identify and Inform Communities & Organizations about the Regional Effects of Local Water Infrastructure Decisions) and Goal 4 (Advance the Philosophy of “One Water” through NOACA’s 208 Planning Process). The NOACA Board bears the responsibility, with staff support, to update and approve the 208 Plan to ensure that it
reflects current best management practices to protect water quality and up-to-date wastewater management.

The NOACA Board can support Goal 3 through maintenance and routine updates of NOACA’s 208 Plan to address regional water quality and water infrastructure needs. Mediation of potential conflicts between competing interests of Management Agencies (MAs)\(^\text{12}\) and municipalities also supports this goal. These objectives are achievable if the agency includes a focus on drinking water and capital improvement planning coordination in the 208 Plan and maintains the 208 Plan through comprehensive updates to its chapters. NOACA recently completed an audit of all 13 chapters in its 208 plan and has now begun a comprehensive update of all chapters with the support of a technical working group. This process began in Fall 2016 and will take approximately three years to complete, with Board review and approval anticipated by Spring 2019. These activities are supported by current staff and current local, state and federal funding sources; no need for additional staff and funding.

The NOACA Board can also support Goal 3 through ODNR’s Office of Coastal Management Program. This effort could likely be accomplished through the current comprehensive 208 Plan update, but also a workshop to educate local and regional planning officials about the Coastal Management Program. This workshop merits the establishment of a technical support network between NOACA and ODNR staff to provide local officials with resources so they can update their own plans to support the elements of the Coastal Management Program. These activities could be supported by current staff and funding sources, although there may be an opportunity for partnership with ODNR or another state agency.

The NOACA Board can also support Goal 4 through its 208 Plan, but a more active role in the promotion of the “One Water Movement” would likely require partnership with the Cleveland Water Alliance. The 208 Plan could certainly serve as a foundation for NOACA to advance the “One Water Movement” in Northeast Ohio, but additional staff support would enable NOACA to pursue not only opportunities to educate more local officials about “One Water,” but also actively pursue branding/marketing efforts to develop a Lake Erie Brand that captures the value of water for the region and its stakeholders (Goals 1 and 2).

NOACA has already supported drinking water resiliency and redundancy planning through its work with the City of Painesville, but there is great need for additional support for other drinking water utilities with Lake Erie intakes to advance the region towards Goal 4. While current staff and funding may support periodic help toward a drinking water utility that wants to develop a Source Water Protection Plan (SWPP), NOACA has the potential to advance more widespread adoption and implementation of SWPPs among drinking water utilities in the Central Lake Erie Basin.

\(^\text{12}\) An existing or newly created local, regional, or state agency, political subdivision or other entity that has been given specific water pollution abatement or control responsibilities under the 208 plan. As stipulated in the Clean Water Act, MAs must have the legal authority, managerial capacity and financial resources to carry out assigned responsibilities, and MAs agree to implement the abatement or control measures contained in the 208 plan (retrieved 8.23.2017 from http://epa.ohio.gov/dsw/mgmtplans/208index.aspx#157704654-glossary).
Overall Work Program (OWP)
The OWP describes in detail the work of NOACA’s four divisions, including the Planning Division, which is responsible for transportation and environmental planning (air and water quality planning). The OWP includes three project areas under water quality: Local Water Quality Planning, 604b Water Quality Planning, and the Ohio EPA Biennium Water Quality Program. Each project area (described below) has its own section in the OWP, including previous accomplishments, proposed tasks, methodologies for task completion, and budget. Subsequent paragraphs provide a brief description of each water quality project area, followed by a discussion of how the agency could utilize the OWP to attain its WQSP objectives.

Description
Local Water Quality Planning efforts focus on NOACA member communities and their stakeholder populations. Regional water resources and water quality management are primary aspects of these efforts. NOACA staff provides support to the Board of Directors on water quality planning issues through the Water Quality Subcommittee. NOACA staff also engage local stakeholders through outreach efforts and collaborate with water infrastructure managers to ensure effective and efficient planning for the region’s water resources.

604b Water Quality Planning includes activities associated with contract work for the Ohio EPA. Under the CWA, water quality management agencies for Ohio EPA receive Section 604(b) funds to carry out water quality management planning. Work includes point and non-point source planning activities, water quality assessments, and watershed restoration plans. Ohio EPA passes funding through to local areawide water quality management agencies, including NOACA, to support this work.

The Ohio EPA Biennium Water Quality Program includes activities associated with a contract between NOACA and Ohio EPA (TIPBUD/Biennium contract). The contract provides funding toward continuing planning activities associated with maintaining and improving the 208 Plan for Northeast Ohio (as described in the previous section).

Opportunities to Implement WQSP Strategies
All of the work conducted by NOACA staff to support the agency’s WQSP goals would be detailed in the OWP, updated each year to reflect the agency’s priorities. Each of the three water quality project areas described above could include strategies that would help the agency achieve its objectives. Some of the strategies, such as those that directly relate to the maintenance and update of the 208 Plan, have direct funding sources from the Ohio EPA (TIPBUD/Biennium). Others may be included under Local Water Quality Planning Efforts, with funding provided by local dues from NOACA’s members. However, current staff is not sufficient to carry out all of the strategies provided. Rather, these proposed strategies serve as a menu of options for the Board to select and will depend on the funding and staffing priorities of the Board. Examples of such projects would be the development of a “Lake Erie Brand” (Goal 1); creation and implementation of a regional data forum, possibly in conjunction with the Cleveland Water Alliance or the Corporate Roundtable of Cleveland State University to advance the “One Water Movement” (Goals 2, 3 and 4); and development of a Regional Data Clearinghouse (Goal 3).
One objective that specifically cites the OWP as a prime opportunity for strategic implementation (Goal 5: Consider and Address Water Quality Impacts of Transportation Projects) is to incorporate water quality issues associated with transportation into NOACA’s annual Overall Work Program (OWP). NOACA staff can support the agency’s objective if the Transportation Planning, Programming and Environmental Planning divisions collaborate to encourage interdisciplinary projects that consider water quality issues associated with transportation projects. Staff can integrate water quality considerations into transportation project tasks of the OWP, particularly through project task methodology. Environmental Planning staff can solicit non-Environmental NOACA staff to assess water quality impacts of transportation planning program areas and project tasks. Finally, OWP authors can emphasize the importance of water quality and transportation planning integration in the introduction to the OWP and in project descriptions.

**Strategic Collaboration with Ohio EPA**

As mentioned in the previous section, NOACA (like all Ohio areawide agencies) currently receives funding through Ohio EPA from two sources: 1) U.S. EPA’s CWA Section 604b federal pass-through allocations; and 2) The State of Ohio’s biennium budget. These funds can support 208 Plan maintenance and updates, nutrient reduction, drinking water protection, storm water management, impervious surface analysis, wastewater management and other regional water quality issues. Subsequent paragraphs provide a brief description of NOACA’s collaborative relationship with Ohio EPA, followed by a discussion of how the agency could utilize the OWP to attain its WQSP objectives.

**Description**

Each spring, NOACA staff collaborates with Ohio EPA Northeast District Office staff to develop new annual contracts for each of the two funding sources. Once staff and the District Office come to agreement on the scopes of work for the upcoming fiscal year, the contracts are signed by the executive directors of both NOACA and the Ohio EPA. The federal funding has been earmarked for water quality planning work that addresses nutrient pollution reduction strategies. The state funding targets the 208 Plan and related activities (see previous section on 208 Plans). NOACA, along with the other five areawide agencies in Ohio, developed a scope of services focused on nutrient pollution reduction through storm water runoff mitigation and failing home sewage treatment systems (HSTS).

**Opportunities to Implement WQSP Strategies**

Ohio EPA has identified nutrient reduction as a state-wide agency priority; they consider this theme a priority common to the majority of supplemental work plan activities funded through 604b contracts. The Ohio EPA Division of Surface Water has suggested Ohio’s areawide agencies focus on two preferred work activity areas: storm water and home sewage treatment systems (HSTS). Areawide agencies can propose specific projects in other areas of work if this work will promote the goal of improved nutrient management and the reduction of nutrients that reach surface or ground waters. Four alternative work activity areas that might easily contain strong nutrient reduction elements are: Great Lakes Water Quality Agreement (GLWQA) annex 413; drinking water protection; inland lake management; and water quality characterization (if it relates to storm water or HSTS issues).

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13 Through the Nutrients Annex of the 2012 Great Lakes Water Quality Agreement, Canada and the United States have committed to: 1) By 2016, develop binational substance objectives for phosphorus concentrations, loading targets, and loading allocations for Lake Erie; 2) By 2018, develop binational phosphorus reduction strategies and
The WQSP references “storm water” throughout its five goals with supporting objectives and implementation strategies. In particular, NOACA has identified opportunities to provide technical assistance to drinking water utilities, watershed groups and local municipalities to help them plan for and mitigate the impacts of storm water from both agricultural and urban land uses. Ohio EPA has identified Areawides’ experience with local communities on storm water issues. Given this background, Ohio EPA has suggested the following specific examples of technical support to both Ohio EPA and local stakeholders to directly assist Ohio EPA’s efforts to better characterize the urban storm water contribution to nutrient loadings:

- Ohio EPA and Areawides can collaborate to estimate pollutant loading (amount of nutrients) discharging from urban areas through storm water collection systems.
- Areawides could pull together GIS information that identifies impervious and open spaces within their planning areas in a way that Ohio EPA can also integrate into its assessments. (i.e., with compatible GIS platforms)
- Areawides could work with local MS4 permit holders, Ohio EPA and potentially a contractor to design and implement a network of storm water outfalls through which flow data and flow-weighted water quality samples are collected to characterize pollutant loads.

Home Sewage Treatment Systems (HSTS) are addressed in a chapter of the current 208 Plan, but this chapter requires significant revision as part of the 208 Plan Comprehensive Update. This effort supports objectives toward Goal 4 (Advance the Philosophy of “One Water” through NOACA’s 208 Planning Process). Ohio EPA has suggested the following specific examples of technical and educational support Ohio’s areawides can provide to inform local stakeholders, property owners and Ohio EPA staff about the impact of HSTS and their proper installation and maintenance:

- Ohio EPA and Areawides can collaborate on estimating pollutant loads (amount of nutrients) from areas with discharging home treatment systems. Ohio EPA already calculates an overall estimate of the state loading. It would be helpful if Areawides could identify and evaluate smaller sample areas that could be used to confirm that Ohio EPA estimates are accurate.
- Areawides can educate stakeholders about Division of Environmental and Financial Assistance (DEFA) programs to fund HSTS repairs through local health departments.
- Areawides can share past projects with one another in which they identified and prioritized unsewered areas, which need centralized treatment solutions or connection to nearby Publicly-Owned Treatment Works (POTWs).
- Areawides can engage local health departments and POTWs to find solutions.

domestic action plans to meet the objectives for phosphorus concentrations and loading targets in Lake Erie; 3) Assess, develop, and implement programs to reduce phosphorus loadings from urban, rural, industrial and agricultural sources. This will include proven best management practices, along with new approaches and technologies; 4) Identify priority watersheds that contribute significantly to local algae development, and develop and implement management plans to achieve phosphorus load reduction targets and controls; and 5) Undertake and share research, monitoring and modeling necessary to establish, report on and assess the management of phosphorus and other nutrients and improve the understanding of relevant issues associated with nutrients and excessive algal blooms (retrieved 3.13.2017 from https://binational.net/annexes/a4/).
• Areawides can map Geographic Information System (GIS) data on sewered vs. unsewered areas. This would include estimates on total population on discharging systems.

It is important to note that Ohio EPA has not promised additional funding to expand the role of the areawide agencies in these efforts, yet there are conversations between Ohio EPA and the areawide agencies to that end. Initially, however, Ohio EPA expects the areawide agencies to pursue these priorities under the current funding agreements.

**Ohio Association of Regional Councils (OARC) Areawide/Water Quality Subcommittee**

In addition to its requests for areawide agency prioritization as part of the new funding contracts, Ohio EPA also requested that areawide agencies collaborative more on matters of mutual interest. NOACA staff took initiative and proposed the creation of a formal subcommittee of the Ohio Association of Regional Councils (OARC) that would focus on water quality planning and water resource protection issues. The following paragraphs describe the new subcommittee and its anticipated role to promote collaboration among areawide agencies to support Ohio EPA priorities.

**Description**

The Areawide/Water Quality Subcommittee was approved by the OARC Executive Directors Committee on June 22, 2016. Members include representatives of all Ohio Regional Councils; particularly the water quality planning staff from each organization. Meetings are held quarterly, to which Ohio EPA Central Office and District Office staff are invited. The first meeting, chaired by Kurt Erichsen, Vice-President of Water Quality Planning for the Toledo Metropolitan Area Council of Governments (TMACOG), was held on December 20, 2016, in Columbus. The areawide agency and Ohio EPA representatives used this meeting to establish future meeting protocol; strategies to petition for increased funding, and future collaborative efforts on impervious surface analysis; GIS mapping; and nutrient reduction.

**Opportunities to Implement WQSP Strategies**

The two preferred Ohio EPA work activity areas (storm water and HSTS) most closely fit the Ohio EPA’s statewide nutrient reduction strategy. As described in the previous section, areawide agencies can support the State’s nutrient strategy by helping the Agency fill in data gaps to improve future load estimates. In addition, the Areawide agencies collectively put forth the following list of candidate collaborative opportunities. Ohio EPA concurred these would be productive pursuits:

- Data sharing (platform for Areawide/Ohio EPA sharing) (BaseCamp, Dropbox, etc.)
- Create a Water Quality Subcommittee of the Ohio Association of Regional Councils (OARC), including representatives of Ohio EPA Central and District offices. Schedule quarterly meetings (described above).
- Coordinate Areawide Permits-to-Install (PTI) Consistency review process with Ohio EPA Central and District offices.
- Link Areawide 208 Plans with Water Pollution Control Loan Funds (WPCLF) for HSTS replacements.
• GIS technology coordination – explore ArcGIS Online – one location to upload Areawide 208 Plan and supplemental data
• Areawides coordinate learning of impervious surface mapping techniques to provide storm water assistance; learn from Ohio-Kentucky-Indiana Regional Council of Government’s (OKI’s) project, methodology, etc.

These types of collaborative efforts support all five WQSP goals and build a stronger network of professionals focused on water quality planning and water resource protection throughout Ohio. The six areawide agencies have much to learn from one another and can make significant strides together versus forging paths in isolation. Furthermore, the collective voice stands a better chance in the call for increased funding to support more ambitious initiatives. Discussions about contract work and future funding among all Ohio areawide agencies and Ohio EPA will continue through the new OARC Areawide/Water Quality Subcommittee.

**Conclusion**

While the implementation opportunities described above will help NOACA staff realize WQSP strategies and meet objectives, the WQSP itself requires evaluation and update every five years. Northeast Ohio is a dynamic region, and shifting patterns in population, employment, development, land use, water quality, and policy merit reconsideration of the WQSP content by the agency. There is a critical need to engage stakeholders and the public during the update process to ensure the contents of this plan best serve the interests of the region and help decision makers guide communities and watersheds in the right direction. The WQSP is a road map for NOACA to help the people who call Northeast Ohio home chart their preferred course toward a cleaner future where water is planned, protected and valued.
Regional Population & Employment Trends

Since the 1990s, an increasingly complex pattern of population and employment change within the region has significantly impacted water quality in Northeast Ohio. This change has evolved from a pattern of population and employment dispersal away from the central city to a more intricate, multi-nodal pattern of growth and decline in the central city, inner suburbs, and exurbs. Such shifts affect people, businesses, and the environment in complex ways.

Population Change

Urban population dispersal in the absence of population growth defined Northeast Ohio between 1970 and 1990, similar to other regions in the Northeast and Midwest United States. Northeast Ohio’s largest city, Cleveland, peaked in population in 1950, while Cuyahoga County’s (and NOACA’s) population peaked in 1970. Between 1990 and 2015, however, the population in NOACA’s five counties has remained relatively stable. Instead of growth, there has been significant churn, characterized by simultaneous growth and decline in both the central city and suburbs. Only Cuyahoga County experienced a net population decline between 1990 and 2015 (See Table 1). Its population dropped by more than 156,000 (-11.1%). The other four counties, however, collectively grew by nearly 115,000 during that period, leading to a net regional loss of over 41,000 (-2.0%).

Figure 1. Northeast Ohio Population Change (%): 1990-2010
Figures 1 and 2 illustrate patterns of population and population density change in the NOACA region between 1990 and 2010. Even though Cuyahoga County has declined in population as a whole, there are areas of growth within the county and especially in the urban core of Cleveland. Likewise, there are areas of decline in suburban counties, despite an overall pattern of growth. Population decline has been noticeable in more urban areas of Lorain County, but also older suburbs of Lake County and some rural communities in Geauga and Medina counties. These details, along with a shift in population change trends since 2010, suggest that future patterns of population change may be increasingly complex in Northeast Ohio. The simple paradigm of urban decline versus suburban growth may not hold true through 2020 and beyond. Rather, there may be multiple nodes of growth interspersed with stagnant or declining areas.

Employment Change

Between 1990 and 2015, the employment in NOACA’s five counties increased over 9% (see Table 2). Cuyahoga County was the slowest growing employment center in the region, adding just 12,000 jobs (1.3%). The remaining four counties added nearly 100,000 jobs during the same period (32.4%). Essentially, the region experienced urban employment dispersal as Cuyahoga County’s share of regional employment dropped from more than 75% to less than 70%.

A closer inspection of the data in Table 2, however, reveals a more complex story than one of urban employment dispersal. First, the employment growth of the region largely occurred in the 1990s, when all counties experienced an increase in total employment and the region’s employment growth was over 11%. The next decade reflected the onset of the Great Recession in 2007, a nearly 8% decline in employment. It is worth noting that the 2015 NOACA employment totals are still lower than the 2000 NOACA employment totals; the region as a whole has not recovered all the jobs lost in the Great Recession.

Although Cuyahoga County was hit the hardest between 2000 and 2010 (more than a 10% decline), other counties in the region also experienced employment decline: Lorain (-7.2%) and
Lake (-4.6%). Since 2010, the region has added more than 78,000 jobs (6.3% growth) and the growth has been spread among all counties. Somewhat surprisingly, though, is that Cuyahoga County’s growth rate (6.0%), which had lagged the other four counties in the region between 1990 and 2010, has actually been stronger than suburban Medina County (5.0%) and just below that of Lake County (6.4%). Also, it is worth noting that Cuyahoga County added approximately twice as many jobs (52,000) as the other four counties combined (26,000) between 2010 and 2015. There has been a mixed movement of employers to newer spaces in suburban markets, as well as employers relocating from suburban areas to Downtown Cleveland and University Circle.

In summary, Northeast Ohio has undergone significant changes in a generation. People and jobs, once centered in central cities such as Akron and Cleveland, are now more scattered throughout the region. The region has shifted from a manufacturing-based economy, characterized by heavy industry, to a service-based economy. Earnings, tax revenues, and demands for new infrastructure have accompanied people and jobs in their migratory pattern.
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</tr>
</thead>
<tbody>
<tr>
<td>Cuyahoga County</td>
<td>1,412,140</td>
<td>67.2%</td>
<td>1,393,978</td>
<td>1,280,122</td>
<td>1,255,921</td>
<td>60.9%</td>
<td>-1.3%</td>
<td>-8.2%</td>
<td>-1.9%</td>
<td>-11.1%</td>
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<tr>
<td>Geauga County</td>
<td>81,129</td>
<td>3.9%</td>
<td>90,895</td>
<td>93,389</td>
<td>94,102</td>
<td>4.6%</td>
<td>12.0%</td>
<td>2.7%</td>
<td>0.8%</td>
<td>16.0%</td>
</tr>
<tr>
<td>Lake County</td>
<td>215,499</td>
<td>10.3%</td>
<td>227,511</td>
<td>230,041</td>
<td>229,245</td>
<td>11.1%</td>
<td>5.6%</td>
<td>1.1%</td>
<td>-0.3%</td>
<td>6.4%</td>
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<tr>
<td>Lorain County</td>
<td>271,126</td>
<td>12.9%</td>
<td>284,664</td>
<td>301,356</td>
<td>305,147</td>
<td>14.8%</td>
<td>5.0%</td>
<td>5.9%</td>
<td>1.3%</td>
<td>12.5%</td>
</tr>
<tr>
<td>Medina County</td>
<td>122,354</td>
<td>5.8%</td>
<td>151,095</td>
<td>172,332</td>
<td>176,395</td>
<td>8.6%</td>
<td>23.5%</td>
<td>14.1%</td>
<td>2.1%</td>
<td>44.2%</td>
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<tr>
<td>REGION</td>
<td>2,102,248</td>
<td>100.0%</td>
<td>2,148,143</td>
<td>2,077,240</td>
<td>2,060,810</td>
<td>100.0%</td>
<td>2.2%</td>
<td>-3.3%</td>
<td>-0.8%</td>
<td>-2.0%</td>
</tr>
</tbody>
</table>

Table 2. Northeast Ohio Employment: 1990-2015

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<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuyahoga County</td>
<td>907,255</td>
<td>75.2%</td>
<td>965,267</td>
<td>867,323</td>
<td>919,421</td>
<td>69.9%</td>
<td>6.4%</td>
<td>-10.1%</td>
<td>6.0%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Geauga County</td>
<td>34,894</td>
<td>2.9%</td>
<td>47,806</td>
<td>49,634</td>
<td>55,002</td>
<td>4.2%</td>
<td>37.0%</td>
<td>3.8%</td>
<td>10.8%</td>
<td>57.6%</td>
</tr>
<tr>
<td>Lake County</td>
<td>103,370</td>
<td>8.6%</td>
<td>122,666</td>
<td>117,028</td>
<td>124,509</td>
<td>9.5%</td>
<td>18.7%</td>
<td>-4.6%</td>
<td>6.4%</td>
<td>20.4%</td>
</tr>
<tr>
<td>Lorain County</td>
<td>111,800</td>
<td>9.3%</td>
<td>131,467</td>
<td>122,056</td>
<td>131,062</td>
<td>10.0%</td>
<td>17.6%</td>
<td>-7.2%</td>
<td>7.4%</td>
<td>17.2%</td>
</tr>
<tr>
<td>Medina County</td>
<td>49,279</td>
<td>4.1%</td>
<td>72,809</td>
<td>81,791</td>
<td>85,904</td>
<td>6.5%</td>
<td>47.7%</td>
<td>12.3%</td>
<td>5.0%</td>
<td>74.3%</td>
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<tr>
<td>REGION</td>
<td>1,206,598</td>
<td>100.0%</td>
<td>1,340,015</td>
<td>1,237,832</td>
<td>1,315,898</td>
<td>100.0%</td>
<td>11.1%</td>
<td>-7.6%</td>
<td>6.3%</td>
<td>9.1%</td>
</tr>
</tbody>
</table>

Future Changes in Regional Population and Employment

Future Regional Population Distribution
Regional population change is expected to qualify as “slow growth” in Northeast Ohio through 2040. Population growth is expected to continue in communities on the outer fringes of the urban areas, as well as in Downtown Cleveland and reviving urban neighborhoods adjacent to downtown and around University Circle. Figure 3 illustrates a more complex pattern of projected growth in the areas just described, along with continued declined in certain urban neighborhoods, inner-ring suburbs, and exurban/rural areas.

Figure 3. Northeast Ohio Projected Population Change (%): 2010-2040
Future Regional Employment Distribution

Regional employment trends will follow population trends with more complex patterns of growth and decline. Recent shifts back toward parts of Cuyahoga County (particularly Downtown and University Circle) will continue (see Figure 4), particularly with new infrastructure development (Opportunity Corridor, Innerbelt Project, redeveloped RTA transit stations and new transit-oriented development). There will be continued decline in other urban and suburban areas, however. Exurban and rural areas will generally experience employment growth, but not as strong as in the past. There is a paradigm shift in Northeast Ohio employers’ location decisions since the Great Recession. A steady stream of employers consider millennials’ preferences for walkable, mixed-use, transit-accessible neighborhoods. The combination of Baby Boomers retiring and Millennials coming into the job market has meant a shift in preference from suburban housing developments and office parks to more urban, walkable environments, particularly among local tech, health, arts, and food economies.

Water Quality Conditions

Summary of Water Quality Conditions in Ohio

Since the early 1970s, Ohio EPA has been required by the Clean Water Act to measure the quality of Ohio’s water resources and prepare a biennial report that summarizes current water conditions. Ohio’s Integrated Water Quality Monitoring and Assessment Report (also called the Integrated Report) indicates the general condition of Ohio’s waters and identifies waters that are not meeting water quality goals. This report satisfies the Clean Water Act’s requirements for both Section 305(b) for biennial reports on the condition of the state’s waters and Section 303(d) for a prioritized list of impaired waters. Under the Clean Water Act, the state must take action to improve identified impaired waters. Typically, the actions include developing Total Maximum

Daily Loads (TMDLs), water quality based permits, and nonpoint source pollution control measures. A TMDL is a written, quantitative assessment of water quality problems in a waterbody and contributing sources of pollution. It specifies the amount a pollutant needs to be reduced to meet water quality standards (WQS), allocates pollutant load reductions, and provides the basis for taking actions needed to restore a body of water. Information about TMDLs and water quality monitoring are organized by large watershed (See Figure 5).
Figure 5. NOACA's Major Watersheds
The following table summarizes current water quality conditions as identified by Ohio EPA’s Total Maximum Daily Load (TMDL) program. The TMDL program is established under Section 303(d) of the Clean Water Act and focuses on identifying and restoring polluted rivers, streams, lakes, and other surface bodies of water. TMDLs are prepared for waters identified as impaired on the 303(d) list in the biennial Integrated Report.

A TMDL is a written, quantitative assessment of water quality problems in a body of water and contributing sources of pollution. It specifies the amount a pollutant needs to be reduced to meet water quality standards (WQS), allocates pollutant load reductions, and provides the basis for taking actions needed to restore a body of water.

Table 3. Summary of Total Maximum Daily Load (TMDL) Pollution by Watershed

<table>
<thead>
<tr>
<th>Waterbody</th>
<th>TMDL Pollutant Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Erie Tributaries, West</td>
<td>TMDL not started</td>
</tr>
<tr>
<td>Lake Erie Tributaries, East</td>
<td>TMDL not started</td>
</tr>
<tr>
<td>Black River, West</td>
<td>Phosphorus, Nitrogen, Bacteria, Total Suspended Solids, Dissolved Oxygen/Organic Enrichment</td>
</tr>
<tr>
<td>Black River, Main</td>
<td>Bacteria, Dissolved Oxygen</td>
</tr>
<tr>
<td>Black River, East</td>
<td>Phosphorus, Nitrogen, Bacteria, Total Suspended Solids, Dissolved Oxygen/Organic Enrichment</td>
</tr>
<tr>
<td>Rocky River</td>
<td>TMDL in progress</td>
</tr>
<tr>
<td>Rocky River, Plum Creek</td>
<td>Phosphorus, Nitrogen</td>
</tr>
<tr>
<td>Cuyahoga River, Lower</td>
<td>Phosphorus, Nitrogen, Habitat, Bacteria, Dissolved Oxygen</td>
</tr>
<tr>
<td>Cuyahoga River, Middle</td>
<td>Phosphorus, Ammonia, Total Suspended Solids, Dissolved Oxygen, Flow</td>
</tr>
<tr>
<td>Cuyahoga River, Upper</td>
<td>Phosphorus, Habitat</td>
</tr>
<tr>
<td>Euclid Creek</td>
<td>Phosphorus, Habitat, Total Suspended Solids</td>
</tr>
<tr>
<td>Chagrin River</td>
<td>Phosphorus, Nitrogen, Habitat, Bacteria, Total Suspended Solids</td>
</tr>
<tr>
<td>Grand River, Lower</td>
<td>Phosphorus Bacteria, Flow</td>
</tr>
<tr>
<td>Grand River, Upper</td>
<td>Phosphorus, Nitrogen, Ammonia, Habitat, Bacteria, Total Suspended Solids</td>
</tr>
</tbody>
</table>

The top five aquatic life impairment causes for the period 2003-2012 were 1) total suspended solids/siltation/sedimentation, 2) nutrient enrichment and pathogens, 3) habitat modification, 4) hydromodification, and 5) organic enrichment/dissolved oxygen (DO). Additionally, unhealthy fish and aquatic insect populations are more common in small streams (i.e., the larger the drainage area and usually the larger the stream, the more likely the stream is to be healthy). Figure 6 provides a snapshot of the streams and their aquatic life use designation status.

For watersheds, most impairment is related to modification of the landscape by agriculture and urban development. These types of impairments have the greatest effect on smaller streams. Most of the impaired watershed units for which current data exists had at least one of the top five causes contributing to impairment; many had at least two. Of note is the prevalence of watersheds and large rivers that are impaired by organic enrichment/DO, due primarily to “sewage”-related impairments, including high biochemical oxygen demand, elevated ammonia concentrations, and in-stream sewage solids deposition. Such results suggest that adequate treatment and disposal of human and animal wastes remain critical water quality issues in many watersheds. The major causes and sources of water quality problems are described below.
Figure 6. Northeast Ohio Watersheds: Map of Aquatic Life Use Attainment
Causes of Impairment

Total Suspended Solids/Siltation/Sedimentation
Total Suspended Solids (TSS) are solids in water that can be trapped by a filter. TSS can include a wide variety of material such as silt, decaying plant and animal matter, industrial wastes, and sewage. TSS should not be confused with the term “total solids,” which refers to the amount of matter suspended and dissolved in water or wastewater, and includes both TSS and total dissolved solids, the portion that passes through a filter.

High concentrations of suspended solids causes many problems for stream health and aquatic life. High TSS can block light from reaching submerged vegetation. As the amount of light that passes through the water decreases, photosynthesis slows. A slower rate of photosynthesis causes less dissolved oxygen (DO) to be released into the water by plants. If light is completely blocked from bottom-dwelling plants, the plants will cease to produce oxygen and die. Bacteria use up most of the remaining oxygen during plant decomposition, causing fish kills. High TSS can also cause an increase in surface water temperature, because suspended particles absorb heat from sunlight. This can reduce water’s dissolved oxygen holding capability and ultimately harm aquatic life in many other ways.

Decreases in water clarity caused by TSS can affect the ability of fish to see and catch food. Suspended sediment can also clog fish gills, reduce growth rates, decrease resistance to disease, and prevent egg and larval development. When suspended solids settle, they can smother the eggs of fish and aquatic insects, as well as suffocate newly hatched insect larvae. Settling sediments can fill spaces between rocks, eliminating potential homes for aquatic organisms.

High TSS in bodies of water can often mean higher concentrations of bacteria, nutrients, pesticides, and metals. These pollutants may attach to sediment particles on the land and be carried into bodies of water with storm water. In the water, the pollutants may be released from the sediment or travel farther downstream. Furthermore, high TSS can cause problems for industrial use, because the solids may clog or scour pipes and machinery.

Nutrient Enrichment (Phosphorus, Nitrogen, and Ammonia) and Pathogens (Bacteria, E. coli, etc.)
Nutrient enrichment describes the excess contribution of materials such as nitrogen and phosphorus used for plant growth. Excess nutrients are not toxic to aquatic life, but can have an indirect effect because algae flourish where excess nutrients exist. The algae die, and their decay consumes the dissolved oxygen other organisms require. The aquatic community is stressed on both a daily basis and over the long term.

Contamination by pathogens occurs when human or animal waste reaches the stream. Pathogenic organisms include bacteria, viruses, and protozoa. Contamination by pathogens is a human health issue, as skin contact or accidental ingestion can lead to various conditions such as skin irritation, gastroenteritis, or other more serious illnesses. Excessive nutrients lead to excessive algae growth.

Habitat Modification
Habitat modification is the straightening, widening, or deepening of a stream’s natural channel. It can also include the degrading or complete removal of vegetation from stream banks; such vegetation is essential to a healthy stream. These activities can effectively transform a stream from a functioning ecosystem to a simple drainage conveyance. Some aquatic life will lose
protection from predators and experience stressful flows and temperatures. The stream also often loses its ability to process water pollutants naturally.

*Hydromodification (Flow)*
Hydromodification, or flow alteration, describes any disruption to the natural hydrology of a stream system. Flow alteration includes stream impoundment, increased peak flows associated with the urbanization of watersheds, and water-table regulation through subsurface drainage. Such changes can cause extended periods without stream flow, more extreme or frequent floods, and loss of fast-current habitat in dam pool areas.

*Organic Enrichment/Dissolved Oxygen*
Organic enrichment is the addition of carbon-based materials from living organisms beyond natural rates and amounts. Natural decomposition of these materials can deplete oxygen supplies in surface waters. Dissolved oxygen is vital to fish and other aquatic life and for the prevention of odors associated with the decomposition process.
APPENDIX B: REGIONAL STRATEGIC PLAN

Overview of NOACA Strategic Planning
Without a regional and strategic context to address transportation and water infrastructure, Northeast Ohio communities will continue to spread, compete with one another for maintenance and new infrastructure dollars, and fail to leverage the region’s size and economic importance to influence state and federal decisions regarding funding priorities. Lack of a regional and strategic context will further degrade the region’s future as a global economic player. To establish such context, NOACA’s Board of Directors and its Senior Management Team invested nearly three years in the development of a Regional Strategic Plan.

The NOACA Regional Strategic Plan is an organizational development document. It is less concerned with the state of the transportation system and environmental conditions, and more concerned with the demographic, economic, and environmental trends that will shape the region over the next 20 to 30 years. Documents such as the LRTP, TIP, and 208 Plan are tools NOACA uses to carry out its mission—to undertake transportation and environmental planning under local direction and in accordance with federal, state, and local mandates. A strategic plan, however, captures and documents the ultimate reasons that justify the agency’s planning efforts from those who lead, operate and are served by the organization. Strategic plans identify the agency’s vision, goals, and strategies to allocate resources—money, staffing, and Board and stakeholder activities—in pursuit of those goals.

Summary of Key Steps in NOACA’s Strategic Planning Process

- **June 2012:** New Executive Director Grace Gallucci is appointed and identifies development of strategic plan as goal for the agency.
- **July 2012:** Executive Director announces development of a strategic plan for the agency at first Board meeting.
- **July-December 2012:** Executive Director meets one-on-one with Board members. The need for, and thoughts, ideas and opinions about, a strategic plan is among the topics of these meetings.
- **November 2012:** NOACA conducts a staff retreat, with a strategic plan among the topics discussed.
- **December 2012:** NOACA conducts a Principles and Goals Workshop with Board members.
- **January 2013:** NOACA Staff and Board members draft a mission statement based on input from the Principles and Goals Workshop in December. The draft mission statement reads as follows: “NOACA will foster the success of communities with regard to quality of life and economic strength through targeted transportation investments that create a multimodal regional transportation system in the counties of Cuyahoga, Geauga, Lake, Lorain, and Medina.” Using polling devices, Board members give the proposed mission statement a 70% rate of approval.
- **February 2013:** NOACA holds a Board Retreat to kick off the Regional Strategic Planning effort. With the assistance of Cleveland State University, Input is collected that is later used to develop initial vision statement, goals and objectives.
- **March 2013:** BVU is brought in to assist with evaluation of the board committee structure.
April-June 2013: Board receives results of polling exercise related to the vision statement elements from the retreat and the results of a Board survey related to the Code of Regulations.

July 2013: The consultant team of Parsons Brinckerhoff (PB) and Organizational Effectiveness (OE) Strategies is selected to assist NOACA in the development of the Strategic Plan.

October 2013: NOACA staff and the consultant team hold a Board Visioning Workshop in which Board members provide input on elements of a potential vision statement.

December 2013: Board members select and make minor wording modifications to a proposed vision statement from among three potential vision statements proposed by NOACA staff and the consultant team.

January 2014: Board approves the vision statement identified and developed in the December meeting. NOACA staff and the consultant team hold a Goals and Objectives Development Workshop to identify potential elements of a set of goals and objectives for the Strategic Plan.

February 2014: NOACA Staff, PB and OE Strategies engage in a series of strategies discussions with Board committees.

February-June 2014: NOACA staff and the consultant team, with the addition of Civic Commons at Ideastream, solicit public input on the plan vision statement, goals, objectives and strategies at a series of online and in-person forums around Northeast Ohio, culminating in a community forum held at the Idea Center at Public Square on June 4.

July – October 2014: Board review and refining of goals and objectives and preliminary drafting of Strategic Plan Document.

October – December 2014: Final drafting of Strategic Plan Document

January 2015: Board approval of final NOACA Regional Strategic Plan

NOACA Strategic Plan Vision Statement, Goals, Objectives and Strategies
NOACA’s Board of Directors adopted the Regional Strategic Plan, Going Forward, Together, on January 23, 2015. The Regional Strategic Plan is a comprehensive approach to propel the region forward in an era of changing demographics, job climate, and funding constraints. An overarching goal of the plan is to keep northeast Ohio sustainable and competitive in a global economy and effective at moving people and freight.

The plan embraces a vision statement, five goals, and strategies to support its goals. Goals and strategies are intended to allocate the region’s resources effectively.

NOACA’s Vision Statement
NOACA will STRENGTHEN regional cohesion, PRESERVE existing infrastructure, and BUILD a sustainable multimodal transportation system to SUPPORT economic development and ENHANCE quality of life in Northeast Ohio.

NOACA’s Goals
1. STRENGTHEN regional cohesion
2. PRESERVE existing infrastructure
3. BUILD a sustainable, multimodal transportation system
4. SUPPORT economic development
5. ENHANCE quality of life in Northeast Ohio
NOACA’s Objectives

1. **Goal: Strengthen Regional Cohesion**
   1.1. Foster collaboration on issues of transportation, air and water quality that will lead to greater regional cohesion and cooperation on other issues of regional concern.
   1.2. Work with governments in the region as well as state and federal authorities to remove barriers to joint development or maintenance of infrastructure by multiple governmental entities and by governmental and private entities.
   1.3. Work with governments in the region as well as state and federal authorities to promote cost sharing, purchasing coordination and consolidation of services to improve the efficiency and reduce the costs of developing and maintaining transportation and water infrastructure.
   1.4. Facilitate and promote the sharing of best practices for regional collaboration and cost sharing.
   1.5. Ensure infrastructure investments are planned and implemented to maximize transportation benefits across all impacted communities.
   1.6. Promote infrastructure investments that enhance the inter-relationships of communities within the region.

2. **Goal: Preserve Existing Infrastructure**
   2.1. Provide funding and other priority and other preferences to infrastructure projects that:
      2.1.1. preserve or maintain existing infrastructure that serves currently developed areas of the region
      2.1.2. facilitate improvements that connect existing activity centers and reinvigorate existing communities
      2.1.3. facilitate development in higher density areas
      2.1.4. promote environmental sustainability
   2.2. Create mechanisms to monitor the condition of existing regional transportation assets and evaluate the social equity/environmental justice impacts of infrastructure investments.
   2.3. Conduct benefit-cost analyses of all projects to insure that life-cycle costs and regional fiscal sustainability are considered.
   2.4. Devote approximately 90% of the region’s transportation and infrastructure funding to maintain and preserve existing transportation investments.

3. **Goal: Build a Sustainable Multimodal Transportation System**
   3.1. Provide funding priority and other preferences with scoring criteria to projects that:
      3.1.1. enhance and improve coordination for public transit, rail, pedestrian and bicycle transportation
      3.1.2. improve access to regional job centers, employment opportunities, and city centers
      3.1.3. facilitate intermodal transportation connections
      3.1.4. reduce energy use and improve air quality
      3.1.5. reduce greenhouse gas emissions
      3.1.6. reduce reliance on auto travel
      3.1.7. demonstrate an adequate long-term funding stream for operation and maintenance
      3.1.8. integrate the control of storm water, protection and improvement of water quality, and control of development in floodplains
      3.1.9. ensure and/or enhance safety
   3.2. Assure that the Regional Transportation Plan and TIP reflect a coherent commitment to a balanced multi-modal transportation system and to NOACA’s strategic vision.
3.3. Encourage transit-oriented development in higher density urban corridors and other higher density areas of the region and retrofitting transit oriented elements in appropriate lower density areas.

3.4. Consider strategic abandonment or alternative provision of service for infrastructure elements that are underutilized or whose maintenance or reconstruction costs may exceed their benefit.

3.5. Achieve levels of infrastructure investment that do not exceed the region’s financial capacity.

4. **Goal: Support Economic Development**
   4.1. Provide funding priority and other preferences with scoring criteria to projects that:
      4.1.1. provide for the movement of goods essential to the economic viability of the region
      4.1.2. are consistent with state, regional and local economic development priorities, policies and strategies
      4.1.3. support the retention and expansion of Northeast Ohio area businesses in areas served by existing infrastructure and the attraction of new businesses to Northeast Ohio
      4.1.4. support the development of the region’s manufacturing base, health care system, and other areas of regional economic strength and economic development focus

4.2. Ensure that NOACA’s Board of Directors includes the expertise of representatives of the business, medical, higher education and non-profit sectors through their participation in the Community Advisory Council and Business Advisory Council.

4.3. Conduct focused studies that identify ways in which NOACA can direct investments and actions to create realistic opportunities for job retention and economic development.

4.4. Promote regional cooperation in the areas of economic development and job retention.

4.5. Direct investments and actions to create realistic opportunities for job retention and economic development.

5. **Goal: Enhance Quality of Life**
   5.1. Provide funding priority and other preferences with scoring criteria to projects that:
      5.1.1. promote the redevelopment of declining and abandoned areas
      5.1.2. provide improved access to primary and secondary schools, colleges, universities and other educational opportunities
      5.1.3. enhance the public’s access to and enjoyment of the region’s parks, cultural assets and recreational activities
      5.1.4. preserve agricultural lands, open space and important habitat areas, woodlands, and wetlands
      5.1.5. promote healthy and active living

5.2. Make prudent and necessary infrastructure improvements to minimize the economic burden of transportation investments on the region’s taxpayers.

5.3. Ensure that safety factors are considered in the development of regional infrastructure.

**NOACA’s Strategies**

Strategies identify specific ways that NOACA can reach its objectives, and ultimately, its goals. They connect the vision, goals and objectives to the way NOACA does business day-to-day. Vision leads directly to the goals, which are supported by broad strategies. These strategies lead to tools and objectives that will guide the Board’s and the leadership team’s strategic focus, decision making and actions over the next five years. A series of strategies were initially developed by NOACA and consultant staff, then modified and further defined in committee workgroups of NOACA Board members between February and April 2014. The strategies that were proposed include the following:
1. Develop and implement performance criteria systems to most effectively achieve NOACA's vision.
2. Further develop and leverage strong relationships with community, economic development and business partners.
3. Act as a regional facilitator of knowledge sharing, integrated needs assessment, and other collaborative efforts.
4. Develop fiscal policies to insure the highest and best use of available resources; focus on maintaining existing regional infrastructure.
5. Align NOACA’s priorities and projects to other federal, state and regional initiatives.

The five broad strategies overlap and support the five goals and vision statement, serving as the mechanisms by which the goals and objectives will be achieved by NOACA staff.