New Jersey A∙I∙M∙S4

Advanced *and* Integrated Menu of Strategies

for Sustainable Sewer *and* Stormwater Systems

Appendix A:

Strategy Checklist

The New Jersey A∙I∙M∙S4 Strategy Checklist is a management tool for municipalities and utilities that own, maintain and operate sewer and stormwater infrastructure to plan and track their progress in employing actions selected from the Strategy Guide.

* *Status*: where the municipality or utility can note each selected action or method as complete, in progress, not started, or not applicable

*Note: certain actions or methods may not be applicable depending on a specific infrastructure system or community*

* *Explanation:* where the municipality or utility can provide an explanation, comments or evidence to document how each selected action or method was met
* *Steps to completion*: where the municipality or utility can outline the steps necessary to meet each selected action or method
* *Person(s) accountable:* where the municipality or utility can identify who within or outside the organization assisted or led the steps to completion
* *Deadline*: where the municipality or utility can note the date on which the selected method or action was met, or the anticipated date of completion

Information that can be tracked in the A∙I∙M∙S4

Strategy Checklist

Each of the six strategies has several **actions** and **methods** to achieve those actions, with **resources** to facilitate achievement. The ***A∙I∙M∙S4 Strategy Checklist*** provides a tool todocument progress in employing selected actions. Please refer to the ***Strategy Guide*** and resources for more information.

The A∙I∙M∙S4Strategy Checklist can be used to indicate which relevant actions are being actively pursued or are flagged for future consideration. For actions that are being pursued, the Strategy Checklist can be used as a work plan to outline the necessary steps to achieve each action and method.

Completing the New Jersey A∙I∙M∙S4 Strategy Checklist

Assigning one Project Manager, the “keeper of the checklist” will identify who is responsible for facilitating collaboration among different persons within and outside the organization to complete the selected actions and methods.

The Checklist is designed to allow each municipality or utility to plan as follows:

The status box can be used to indicate whether each selected action and method is complete or in progress. For actions that are not selected, the status box can indicate not selected.

For selected actions and methods that have been met, the explanation box provides space for documentation, comments, references, milestones, and other notes that record progress.

For selected actions and methods that have yet not been met, the Strategy Checklist can be used to assign tasks (steps to completion), responsibilities (persons accountable), and scheduled dates for completion (deadlines). The project manager can use the Checklist as a tracking tool to notify all persons accountable of their responsibility and deadlines to complete specific tasks.

*Note: Completion of the Strategy Checklist does not guarantee permit approval or other compliance.*

New Jersey A∙I∙M∙S4 Collaboration

The Strategy Checklist can be completed with input from all entities involved in sewer and stormwater management, such as the municipality (local officials and staff), utility (board and staff), community groups, and public-at-large.

# STRATEGY 1: Planning and Understanding Gray and Green Infrastructure Systems

**Municipality/Utility Name:** Click here to enter text. **Primary Contact:** Click here to enter text. **Date Completed:** Click here to enter a date.

| ***Actions*** | ***Methods*** | ***Status*** | ***Explanation***  | ***Step(s) to Completion*** | ***Person(s) Accountable*** | ***Deadline*** |
| --- | --- | --- | --- | --- | --- | --- |
| **1.1** | The municipality/utility maintains a *digital* **map and inventory** of green and gray stormwater and sewer infrastructure. | * The secure GIS map and inventory characterizes existing and proposed wastewater, combined, and stormwater system gray and green infrastructure, including the following assets (and their features):
	+ collection areas, such as sewersheds and watersheds (direction of flows)
	+ catch basins (with or without water quality hoods)
	+ manholes (diameter, depth, rim and invert elevations, material type, date built)
	+ collection system pipes including trunk and interceptor sewers (diameter, length, direction of flow, material type, slope, invert elevations date built),or regulators,
	+ pump stations (number of pumps, capacities, performance curves, make and model , link to drawings if available), emergency generators, and force mains (diameter, material type, length, locations of air release, and vacuum valves)
	+ treatment systems (plants)
	+ outfalls (CSO and MS4)
	+ structural and non-structural stormwater BMPs
	+ green infrastructure facilities
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The secure GIS map and inventory is updated regularly to incorporate new and rehabilitated infrastructure through project as-built drawings and specifications.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The secure GIS map and inventory is made available to appropriate government agencies and is not available to the public. Permission may be granted to entities concerned or involved with developing green or gray solutions for sewer systems/CSOs, such as technical consultants and universities. It provides a unique identifier, location description, construction information (i.e., age, size, materials and maintenance history to the extent known), condition, and criticality for every mapped feature.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The public GIS map and inventory includes mapping (of all components that do not raise security issues) and generalized descriptions and is provided through an open source web platform such as ArcGIS.com.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The public GIS map interfaces with a public notification system alerting the public to real-time CSOs, SSOs, and water quality advisories (see 5.1).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **1.2** | The municipality/utility has adopted a *comprehensive* ***electronic* operations and maintenance (O&M)** program for green and gray stormwater and sewer infrastructure systems. | * The O&M program describes existing and planned programs for prioritizing sewer and stormwater infrastructure preventive maintenance, and any plans for improving the system, as needed, to maintain the integrity of the system.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The O&M program addresses criteria and results for short-term and long-term prioritization of corrective actions based on structural or other deficiencies identified during preventive maintenance activities.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The O&M program provides for periodic objective calculation of the degree of I/I to determine its level of excessiveness and, where excessive I/I is identified, provide for the means of eliminating that excessive I/I.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The O&M program provides for comprehensive real-time surveillance/monitoring of the sewer system to allow the operator/owner to quickly identify and respond to system blockages and other causes of dry weather overflows, sanitary sewer overflows and basement backups.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The O&M program determines whether a fats, oils and grease (fog) control program is needed, if applicable. if so, the program includes a FOG control program as an appendix, which identifies sections of the sewer system subject to grease blockages based on blockage history, line investigation and inspection of FOG dischargers (such as restaurants), and establishes a cleaning maintenance schedule for each section.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The O&M program outlines an implementation agenda with an annual capital budget, funding, responsible parties, as well as short- and long-term outlook.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The O&M program includes an O&M manual as an appendix, which details standard operating procedures for completing scheduled preventive maintenance of sewer and stormwater infrastructure in accordance with the manufacturer’s recommendations, corrective maintenance procedures and system improvement measures outlined in the O&M program. The O&M manual also identifies operational protocols for routine and emergency conditions that address energy and materials conservation, employee and public safety, and continued operations.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The O&M program includes key performance indicators and discusses how implementation will be monitored, and performance indicators will be tracked.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The O&M program provides a framework for collecting information that can subsequently be used to optimize operations.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The O&M program is updated as new assets are placed into operation.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The O&M program establishes policies to ensure proper functionality and O&M of gray and green infrastructure systems on private property (see 2.1, 4.2, 4.4).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **1.3** | The municipality/utility has adopted a *system-wide* **asset management** plan for green and gray stormwater and sewer infrastructure.  | * The asset management plan includes an inventory of system assets (see 1.1), each asset’s condition and criticality to the overall system.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The asset management plan outlines a formal condition assessment process that performs periodic condition assessments based on asset criticality, likelihood of failure, and consequences of failure for each system asset, at minimum inspecting 10-15% the collection system annually, to determine the location and extent of problem areas and prioritizes preventive maintenance and capital investments.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The asset management plan identifies structural deficiencies, and recommends a system renewal and replacement planning program of prioritized short-term and long-term actions to address them.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The asset management plan defines performance indicators, and discusses how implementation will be monitored and performance indicators will be tracked.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The asset management plan outlines an implementation agenda with funding, responsible parties, and timeframes for phased implementation.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The asset management plan evaluates staffing needs, training requirements, and succession planning (see 6.1).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **1.4** | The asset management plan identifies a *system-wide* **optimization** **strategy** of green and gray stormwater and sewer infrastructure.  | * For wastewater systems that include CSOs or SSOs, a thorough characterization of the existing sewer collection and treatment systems is performed to obtain a comprehensive understanding of existing system limitations and causes of CSOs and SSOs, inflow and infiltration and cross-connections in its sewer system. This includes the development of a list of the most to least critical system needs in order to prioritize the action plan for improvements and updates.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The system-wide optimization strategy assesses the system’s water balance, water footprint and carbon footprint (see 2.7).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The system-wide optimization strategy identifies opportunities for modifying existing system assets to gain efficiency, maximize flood mitigation and pollution reduction, minimize net water and energy demands, and recommends a program of prioritized short-term and long-term actions to achieve them (see 2.3, 2.7).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * For wastewater systems, a system evaluation has been conducted to identify hydraulic restriction(s) that could be removed to reduce sewer backup and overflow events, as applicable (CSOs or SSOs).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * For stormwater systems, a hydrologic and hydraulic analysis has been conducted to identify system capacity or flow restriction(s), and the recommendations of the plans above (see 1.2, 1.3) are modeled in relation to impacts on flows in rivers and tributary streams.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The optimization strategy clearly identifies roles for responsible parties, including public entities and private developers.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The optimization strategy includes performance indicators and discusses how implementation will be monitored, and performance indicators will be tracked.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **1.5** | The municipality/utility regularly **projects demands** for future sewer and stormwater service, potential growth and future demand risks; and has adopted a **system evaluation** and **capacity evaluation analysis** to address these needs, if applicable.  | * A process to regularly assess the current and future capacity requirements for infrastructure systems has been established.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A system evaluation has been completed to determine current and future capacity needs and risks (e.g., structural, systemic, revenue, natural hazard, altered demand projections) for infrastructure systems.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The system evaluation aggregates baseline data required to estimate future demand and system capacity requirements, including demographic forecasts, projected changes in per capita residential water demand, land use plans, redevelopment plans, and major site plans or developments; and projects future system demand estimates at several intervals through 2040 (2050 if demographic forecasts are available).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The capacity management plan accounts for increases in demand, ensuring that adequate capacity exists in all portions of the collection system, the system can handle peak flows, and downstream areas that will receive stormwater or wastewater from new connections can handle the additional flow. The plan also accounts for offsetting decreases in demand, resulting from standards and incentives driving the use of more water-efficient fixtures and appliances and other water conservation practices.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The capacity management plan outlines an implementation agenda with funding, responsible parties, and timeframes for phased implementation.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The capacity management plan includes performance indicators and discusses how implementation will be monitored, and performance indicators will be tracked.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A routine system evaluation and capacity assessment process has been established to re-evaluate capacity needs and risks for infrastructure systems every two years, and update the capacity management plan accordingly.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **1.6** | The municipality/utility has adopted a *system-wide***hazard mitigation resiliency, and response plan** for green and gray stormwater and sewer infrastructure. | * The hazard mitigation, resiliency and response plan has been adopted that assesses the risk to infrastructure systems by determining the exposure and vulnerability of system assets to all future hazards, as applicable.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The risk assessment defines hazards consistently with adopted multi-jurisdictional hazard mitigation plans or local resiliency efforts, as applicable; all relevant plans are cross-referenced.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The risk assessment evaluates system-wide risk at five-year intervals for a specified timeframe such as 35 years, considering potential impacts from climate change, including coastal flooding, increased precipitation or storm severity, wind, and heat. Where capital projects or assets have a lifetime exceeding the chosen timeframe a longer planning horizon should be used for those system components as feasible (i.e., 50 year climate projections).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The hazard mitigation, resiliency and response plan prioritizes short and long term capital improvements required to mitigate risk to critical infrastructure assets and system-wide through at least 2050 in the most cost-effective manner based on lifecycle costs and key performance indicators.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The plan outlines equipment to handle emergencies, stand-by power, and spare/replacement parts intended to minimize interruptions in service, including power outages.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The hazard mitigation, resiliency and response plan outlines an implementation agenda with funding, responsible parties, and timeframes for phased implementation.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * An appendix outlines how the most critical spare parts are either kept in inventory or have a clear and quick path to procurement.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The plan includes an overflow emergency response plan as an appendix, which outlines notification procedures, response, reporting and impact mitigation.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The hazard mitigation, resiliency and response plan includes performance indicators and discusses how implementation will be monitored, and performance indicators will be tracked.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **1.7** | The municipality/utility regularly adopts a **capital improvement plan** (CIP) and **budget** that integrate and budget for all relevant capital project recommendations for green and gray stormwater and sewer systems. | * The CIP integrates all recommended green and gray sewer and stormwater infrastructure projects, capital investments, operations, budgets, and cost-benefit analyses included in the O&M program (see 1.2), asset management plan and optimization strategy (see 1.3, 1.4), system evaluation and capacity management plan (see 1.5), hazard mitigation resiliency, and response plan (see 1.6), integrated plan (see strategy 3), green infrastructure plan (strategy 4), and CSO long term control plan, if applicable.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * For municipalities, the CIP refers to the CIP for the municipality as a whole, such that green and gray sewer and stormwater improvements are incorporated into other municipal projects, routinely and cost-effectively.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The CIP outlines the ongoing funding for all rehabilitation or replacement of infrastructure systems, and upgrading of systems to meet regulatory requirements and system needs.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The CIP describes and budgets for capital improvements anticipated in the next 1-5 years, 5-10 years, and 10-20 years.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The CIP identifies other funding sources to be leveraged for implementation (see 6.3).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Costs in the CIP account for planning, design, construction, initial inspection, and operations & maintenance of new or rehabilitated facilities.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The CIP is regularly updated as implementation occurs and priorities change.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |

# STRATEGY 2: Implementation and Optimization of Gray and Green Infrastructure Systems

**Municipality/Utility Name:** Click here to enter text. **Primary Contact:** Click here to enter text. **Date Completed:** Click here to enter a date.

| ***Actions*** | ***Methods*** | ***Status*** | ***Explanation***  | ***Step(s) to Completion*** | ***Person(s) Accountable*** | ***Deadline*** |
| --- | --- | --- | --- | --- | --- | --- |
| **2.1** | The municipality/utility ensures that its sewer and stormwater systems are in a *state of good repair* by implementing its comprehensive **O&M program**(s) for gray and green infrastructure, and has established preventive maintenance programs to enhance the O&M of these systems (see 1.2). | * Per the O&M program, the following high priority and cost-effective preventive maintenance activities are conducted regularly, in accordance with the manufacturer’s recommendations, as applicable:
	+ Scheduled cleaning of collection system infrastructure including (catch basins) with a higher frequency in those areas with a history of collection system blockages
	+ Root control in areas that are known to suffer damage due to root intrusion
	+ Investigation and resolution of sewer back-ups in residences and businesses, collection system overflows due to blockages, and odor complaints from customers
	+ Routine testing, exercising and maintenance of pumps, emergency generators, air release and vacuum valves, regulators and other equipment with moving parts
	+ Routine inspection and maintenance of all green infrastructure assets and systems, in coordination with other agencies or private property owners as applicable (see 4.2)
	+ Odor control including the maintenance of chemical injection systems, carbon filters, etc.
	+ Digital tracking systems for maintenance activity records to support appropriate analysis and reporting
	+ GIS based data management systems to gather information on blockages, operational problems
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Information gathered in maintenance tracking and data management systems is reviewed regularly by system managers for re-evaluation of prioritization.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Implementation is actively monitored and performance indicators are routinely tracked and met per the O&M program, as applicable:
	+ Positive ratio of scheduled collection system cleaning to unplanned collection system cleaning
	+ Percentage reduction in sewer back-ups in residences and businesses, collection system overflows due to blockages, and odor complaints from customers
	+ Response time to address maintenance requests
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * No backlog of repair, rehabilitation, and replacement projects; or significant reduction in backlog toward a five-year goal of no backlog (from the date of the initial O&M program).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Per the O&M program, compliance with policies to ensure proper O&M of gray and green infrastructure systems on private property is enforced (see 1.2, 4.2, 4.4).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **2.2** | The municipality/utility ensures that its sewer and stormwater systems are *functioning properly* by implementing its system-wide**asset management plan**(s) for gray and green infrastructure (see 1.3). | * Per the asset management plan, high priority and cost effective measures to understand system performance, improve and maintain system function are implemented, as applicable:
	+ Routine inspections and condition assessments of all assets with a process to address defects, damage, or other identified problems
	+ Routine flow monitoring for capacity analysis
	+ Smoke testing, dye testing, and exfiltration testing to monitor/reduce inflow and infiltration (I/I)
	+ Uniform condition assessment based on inspection data
	+ Maintenance of records to support appropriate analysis and reporting
	+ Rehabilitation actions to address each deficiency
	+ FOG Control Program addresses blockage “hot spots” through more frequent cleaning, targeted outreach, and additional regulation of FOG dischargers
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Implementation is actively monitored and performance indicators are routinely tracked and met per the asset management plan, as applicable:
	+ Reduction in localized flood events
	+ Reduction in number of overflow events (volume, frequency, and duration)
	+ Avoided emergency repair costs
	+ Avoided costs of extended service disruptions due to a catastrophic failure
	+ Avoided business losses, neighborhood disruption and restoration costs due to environmental and property damage from a catastrophic failure, sewer backups, etc.
	+ Avoided public health costs (i.e. injury, death, disease transmission) from catastrophic failure, sewer backups, etc.
	+ Improved planning and prioritization of rehabilitation and replacement projects due to condition assessment information and improved estimates of service life
	+ Avoided costs of premature replacement or rehabilitation of pipes, pumps and other system components
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **2.3** | The municipality/utility improves the efficiency of its sewer and stormwater systems by implementing its system-wide **optimization strategy(ies)** for gray and green infrastructure (see 1.4). | * Per the optimization strategy, high priority and cost effective measures to optimize system efficiency are implemented, as applicable:
	+ Removing extraneous flows through effective inflow and infiltration (I&I) controls such as pipe lining, pipe repairs, pipe replacement, watertight manhole covers, manhole lining, tide gate repair/replacement, and identification and elimination of cross connections between storm and sanitary sewers
		- *For a CSO municipality/utility, identify the I&I reductions with the biggest impact on CSO flow reductions at the lowest cost, such as I&I reductions in upstream communities to increase treatment capacity for CSO flows.*
	+ Reducing flow volumes in combined sewer systems through water conservation programs, as applicable.
	+ Eliminating illegal discharges to sewers and stormwater systems (e.g. sump pump connections to collection systems), which identifies illegal or unapproved system connections, notifies property owners with illegal connections, requires, requests or provides a financial incentive for the correction, and establishes and employs protocols and legal mechanisms for enforcement
	+ Industrial pretreatment program to control metals and toxic parameters that may upset treatment plant and/or reduce viability of beneficial reuse of biosolids
	+ Controlling FOG from restaurants and hotels
	+ Reducing energy demand of stormwater and wastewater processes through energy conservation and efficiency measures
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Implementation is actively monitored and performance indicators are routinely tracked and met per the optimization strategy, using annual, seasonal and trend data as appropriate.
	+ Percentage reduction in energy demand or utility costs
	+ Percentage reduction in the number or volume of overflow events, as applicable, (CSO and SSO), distinguishing between dry weather overflows and wet weather overflows
	+ Percentage reduction in pollutants released
	+ Percentage reduction in the number or volume of localized flooding events
	+ Reduction in impacts to beach closures and shellfishing
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **2.4** | The municipality/utility *ensures adequate capacity* for future demand and accounts for future demand risks by implementing its **system evaluation and capacity management plan**, if applicable (see 1.5). | * Per the capacity management plan, high priority and cost effective measures to ensure sufficient system capacity are implemented, as applicable:
	+ Capacity is available for additional flows due to development, redevelopment and population increases in developed areas
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Implementation is actively monitored and performance indicators are routinely tracked and met per the system evaluation and capacity management plan.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **2.5** | The municipality/utility *reduces system vulnerability* and *mitigates the risk to critical infrastructure* associated with hazards and climate change by implementing its system-wide **hazard mitigation, resiliency, and response plan** (see 1.6). | * Per the hazard mitigation, resiliency and response plan, high priority and cost effective measures to reduce system vulnerability and mitigate risk to critical infrastructure are implemented, as applicable:
	+ Municipality/utility has auxiliary power equipment to ensure continued, effective operation of systems to maintain service for the duration of any power outage
	+ Contingency equipment (e.g. portable pumps, generators) is available to support an effective response to emergency conditions
	+ Spare/replacement parts are kept in inventory to minimize equipment/facility interruption in the event of an unplanned failure
	+ System assets are protected from submersion during flood events
	+ Utility personnel have safe operating conditions during natural hazard events
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Implementation is actively monitored and performance indicators are routinely tracked and met per the hazard mitigation, resiliency, and response plan, as applicable
	+ Average time to respond to an overflow event
	+ Days or hours per year of (partial or entire) system outages
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **2.6** | The municipality/utility routinely funds its *capital improvement budget* to implement gray and green infrastructure improvements in its **capital improvement plan** (see 1.7) and also its **integrated plan**, if applicable (see 3.6). | * A capital improvement budget is adopted annually to provide appropriate funding to address the priority needs for each year.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The capital improvement budget demonstrates that the resources provided will be adequate for an acceptable delivery of services to the public, including capital replacement.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A public summary of the CIP is routinely updated and provided through the municipality/utility website.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A public CIP inventory is developed which characterizes projects in the CIP, and is linked to the public and secure GIS map and inventory of system assets (see 1.1).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The secure CIP GIS map and inventory provides a unique identifier, location description, project status, project funding, responsible parties, and timeframe for implementation for every mapped feature (see 1.1).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The condition and criticality of system assets are updated in the secure GIS Map and Inventory following implementation of CIP projects.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Implementation is actively monitored and performance indicators are routinely tracked and met per the Integrated Plan, if applicable.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Procurement issued for projects under the CIP places emphasis on the selection of professionals that will develop innovative approaches for providing an effective CSO elimination program that minimizes costs to local government, wastewater utilities and ratepayers while achieving the best solutions for each community that also achieve water quality improvements.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **2.7** | The municipality/utility has implemented **redundant energy systems**, and/or **renewable energy measures**, if applicable.  | * Water conservation and internal reuse programs are implemented at treatment plant(s) and other system assets (see 1.4).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Energy conservation measures are implemented at treatment plant(s), pumping stations and other system assets (see 1.4), such as:
	+ Biogas conversion to electricity via anaerobic digestion
	+ Energy efficient HVAC systems at treatment plants and large scale pump stations
	+ Usage of energy efficient motors, such as variable frequency drives on pumps and blowers
	+ Usage of energy efficient lighting fixtures, windows, doors, and insulation
	+ Participation in utility load shedding and/or smart grid programs
	+ Installation of alternative energy solar panels or wind turbines
	+ Bioenergy or use of plasma gasification
	+ Usage of sewer lines as heat exchangers
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Stand by power is available for critical operations to prevent service disruption during hazard events.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * System assets are energy efficient.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * System energy assets are protected from severe weather events.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Additional measures are undertaken, as applicable, to minimize the system’s water footprint and carbon footprint (see 1.4).
 |  |  |  |  |  |
| * Performance indicators are routinely tracked and met, such as:
	+ Energy usage (gas and electric) per MGD rates equivalent to benchmark utilities
	+ Response times for power outages
	+ Disruption of service due to power outages
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |

# STRATEGY 3: Integrated Sewer and Stormwater Management

**Municipality/Utility Name:** Click here to enter text. **Primary Contact:** Click here to enter text. **Date Completed:** Click here to enter a date.

| ***Actions*** | ***Methods*** | ***Status*** | ***Explanation***  | ***Step(s) to Completion*** | ***Person(s) Accountable*** | ***Deadline*** |
| --- | --- | --- | --- | --- | --- | --- |
| **3.1** | The municipality has conducted an **assessment of needs, opportunities and constraints** for integrated water management. | * Local needs for integrated water management are identified and mapped, including:
	+ Impaired water bodies (parameters, impacts)
	+ Areas of localized flooding (“hot spots”) that require mitigation
	+ Areas of basement flooding
	+ Areas or populations that experience public health impacts from localized flooding
	+ Areas of repetitive flood losses that require mitigation or structure removal
	+ Historic stream systems that have been channelized or diverted to storm sewers
	+ Areas with inadequate flow capacity for water or sewage
	+ Quality of life concerns related to water management issues
	+ Beach closures, fish/shellfish consumption bans and other losses of recreational opportunities
	+ Physical degradation of stream channel integrity due to high stormwater volumes and velocities
	+ Air quality and air pollution reduction
	+ Urban heat island effect
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Local opportunities for integrated water management are identified and mapped, including:
	+ Community facilities, parks, natural resources, public rights-of-way, fishing access and public property where potential projects could occur
	+ Hydraulic connectivity of these locations to areas of localized flooding or water pollutant sources, and existing infrastructure
	+ Stream restoration through riparian restoration or stream “daylighting”
	+ Related municipal objectives
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Constraints for integrated water management are identified and mapped, including:
	+ Subsurface geology, such as soil permeability and composition, depth to bedrock and groundwater, and slopes
	+ Land use context
	+ Impervious surfaces and topography
	+ Bridge and culvert structures
	+ Encroachment into floodplains, open channels, and lack of preserved riparian corridors
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * All mapped features above are added to both the public and secure GIS map and inventory.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The public GIS map and inventory with these features is provided through an open source web platform such as ArcGIS.com.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipality’s goals for water quality are identified and understood.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The sewer system planning process actively involves the public and considers the impacts of the sewer system upon water quality and waterbody goals and objectives.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Water supply and/or wastewater systems are evaluated to identify valuable and viable opportunities to reduce overall water, carbon and energy footprints (see 1.4, 2.7), as a means of reducing stress on natural resources, creating cost savings, and providing community benefits (e.g. the ability to operate during power outages), such as the following:
	+ Energy conservation, wastewater to energy systems, renewable energy options, etc.
	+ Internal and external beneficial water reuse systems and other approaches to reduce water demands associated with the utilities, reduce the need for treatment plant capacity expansions, augment water supplies or restore freshwater resources
	+ Resource extraction (e.g., nutrients, minerals, saleable by-products) from effluent and sludge associated with water supply and wastewater treatment facilities
	+ Reduced wastewater production from water supply treatment facilities (e.g., backwash water)
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **3.2** | The municipality/utility adopts and implements an effective **water** **conservation program**. | * Water conservation goals and objectives are established to reduce net costs for both water supply and sewer system management, and to reduce stresses on water supply sources.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The water conservation program includes a water conservation ordinance that requires new development, rehabilitation and retrofit projects to employ low-flow fixtures consistent with the U.S. EPA WaterSmart certified water saving fixtures, as applicable.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The water conservation program includes retrofits of public facilities with U.S. EPA WaterSmart certified water saving fixtures, as applicable.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The water conservation program employs effective alerts, “give aways,” rebates or other incentives such as:
	+ Drinking water conservation rate structure with inclining block rates (i.e., escalates charges after minimum amounts for necessary uses)
	+ Sewer rates are volumetric (i.e., with metered drinking water usage as surrogate for wastewater usage), and are based on a rate structure that encourages conservation
	+ Upgraded water meters that assess data daily for leak identification
	+ Monthly drinking water and wastewater billing (rather than yearly or quarterly) to provide for more accurate usage charges and greater knowledge by users to reinforce price signals for water
	+ Monthly customer notifications for major increases in water consumption, indicating leaks or excessive use, with requirements for leak repair for customer laterals
	+ Real-time customer notifications through social media or email for increases in water consumption beyond the hourly average
	+ Soil moisture or precipitation-based control devices for lawn irrigation systems
	+ Cash rebates, utility bill credits, or subsidized costs to purchase and install U.S. EPA Water Smart certified water saving fixtures -per individual fixture, household, business etc. (i.e., $50 off a low-flow toilet, 50% of the installed cost of a low-flow sprinkler system) Technical assistance to install U.S. EPA Water Smart certified water saving fixtures
	+ Providing rain barrels for rainwater harvesting
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The water conservation program includes policies and/or programs to promote harvesting of stormwater to use for non-potable purposes (e.g., landscape irrigation) in place of municipal drinking water.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Implementation is actively monitored and performance indicators for water conservation are routinely tracked and met:
	+ Reductions in residential and commercial water consumption toward levels equivalent to utility benchmarks within a five year period from initial implementation
	+ Reduction in residential and commercial ratio of growing season to non-growing season water consumption toward levels equivalent to benchmark systems within a five year period from initial implementation
	+ Annual water loss audits of the drinking water system are conducted using AWWA’s “M-36” methodology, in order to reduce water needs and identify cost-effective opportunities to reduce leakage from drinking water delivery pipes (as undetected subsurface leakage from aging pipes can contribute to infiltration into wastewater collection systems)
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **3.3** | The municipality/utility **collaborates regionally on water management** issues and projects with other municipalities or utilities in shared sewersheds or watersheds, if applicable. | * Stormwater and sewer flows are effectively addressed through cooperation and regional coordination between utilities and their hydraulically connected municipalities.
	+ Cooperate in the development and implementation of a regional long term control plan
	+ Identify ways to maximize utilizing the existing sewage treatment plant capacity, which might include I&I reductions in upstream municipalities
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A regional framework for managing wastewater or stormwater has been established among hydraulically connected communities, such as a task force, board, network, or other coordination platform that:
	+ Outlines opportunities and protocols for regular coordination and communication
	+ Has common goals and objectives for flood mitigation and water quality in shared watershed
	+ Prioritizes collective short-term and long-term regional actions to address shared water management issues
	+ Outlines an implementation agenda with funding, responsible parties, and timeframes for phased implementation
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Cooperate on a regional basis to identify cost-effective shared services, such as:
	+ Stormwater and Sewer collection system inspection
	+ Water Sampling and Monitoring
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **3.4** | The municipality **integrates water management** issues and projects with quality of life **and** **other community objectives**. | * The municipality incorporates green and gray infrastructure improvements into other municipal projects, routinely and cost-effectively.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Water management issues are addressed in efforts, programs, and actions with other related community objectives to address quality of life issues, such as:
	+ Public health
	+ Equity
	+ Environmental justice
	+ Neighborhood character and aesthetics
	+ Open space, parks and recreation
	+ Parking and transportation
	+ Land use planning and urban design
	+ Waterfront spaces
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Stakeholder groups are identified that address other related community objectives.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Opportunities for collaboration among other related community objectives are identified and implemented, as applicable, such as:
	+ Groundwater recharge and water balance
	+ Water conservation
	+ Energy conservation and renewable energy production
	+ Reduction in greenhouse gas emissions and carbon footprint
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The implementation agenda for the regional framework is incorporated into applicable municipal and utility plans and budgets, as applicable.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **3.5** | The municipality/utility has adopted **design and construction standards and specifications** for public and private water infrastructure.  | * Design standards are adopted for the installation of new sewer systems or rehabilitation and repair of existing sewer systems that meet and exceed the [10 State Standards](http://www.state.nj.us/dca/divisions/codes/offices/rsis.html) for wastewater, to the extent feasible within the requirements of the Residential Site Improvement Standards (RSIS, N.J.A.C. 5:21).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Design standards are adopted for the installation of new stormwater infrastructure or rehabilitation and repair of existing systems that meet and exceed criteria set in the New Jersey Stormwater Best Management Practices Manual, such as design standards for low impact development and green infrastructure measures (see 4.4).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Design standards encourage and facilitate the use of green infrastructure for stormwater management whenever feasible (see 4.4).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Design standards include procedures and requirements for inspecting and quality control and quality assurance testing the installation of new infrastructure.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Design standards are ecologically sensitive, maximizing the habitat, water, and air quality benefits of new infrastructure.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Design criteria include specifications such as pipe materials, minimum diameter, design capacity, minimum cover, strength, minimum slope, trench and backfill, structure standards, treatment of water quality volume, and minimum groundwater recharge.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **3.6** | The municipality has developed an **integrated plan** for combined sewer infrastructure to prioritize water quality improvements, if applicable. (See also 3.7) | * The integrated plan has been approved by the NJDEP (and, as applicable, U.S. EPA).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipality uses the integrated plan to prioritize regulatory compliance efforts in a manner that prioritizes water infrastructure improvements that provide high environmental and public health benefits and clean water at a low cost (i.e., “bang for the buck”).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipality uses the integrated plan to maximize the effectiveness of infrastructure dollars through a comprehensive approach that employs innovative technologies, an analysis of alternatives and the selection and sequencing of actions.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The integrated plan includes performance indicators or benchmarks, discusses how implementation will be monitored, performance indicators will be tracked, and adaptive management will be employed throughout implementation.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |

# STRATEGY 4: Green Infrastructure

**Municipality/Utility Name:** Click here to enter text. **Primary Contact:** Click here to enter text. **Date Completed:** Click here to enter a date.

| ***Actions*** | ***Methods*** | ***Status*** | ***Explanation***  | ***Step(s) to Completion*** | ***Person(s) Accountable*** | ***Deadline*** |
| --- | --- | --- | --- | --- | --- | --- |
| **4.1** | The municipality has adopted a community-driven **strategic plan for green infrastructure** implementation. | * The strategic plan for green infrastructure identifies goals and objectives related to flooding, MS4 pollution, combined sewer overflows (if applicable), and community objectives developed through a process of public outreach and stakeholder engagement.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Hydrologic and hydraulic modeling have been utilized to assess the runoff volume and water quality benefits of implementing green infrastructure, inform site selection and evaluate locations to identify optimal sites for green infrastructure interventions, as well as establish performance metrics (recognizing that site-specific engineering feasibility analysis and design would be required for each project).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The strategic plan for green infrastructure identifies green infrastructure siting opportunities and constraints, based on factors such as parcel ownership (including public property such as parks, buildings, parking areas, roads, and vacant lots; as well as private property), slope, parcel size, soil type, groundwater contamination, land use and community input. Evaluation of constraints should incorporate a combination of available data with selective field evaluations, especially for major sites.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The strategic plan for green infrastructure identifies the green infrastructure measures that provide high obtainable benefits at low possible lifecycle costs at various scales, for specific project sites, areas, watersheds or sewersheds. Benefits and costs are assessed in a manner that addresses financial and non-financial issues.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The strategic plan for green infrastructure identifies the potential for reduction of CSOs and MS4 pollution by sewershed utilizing the optimum green infrastructure measures.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The strategic plan for green infrastructure prioritizes the optimum short and long term green infrastructure projects that achieve program objectives.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The strategic plan for green infrastructure outlines an Implementation agenda with incentives, funding or financing mechanisms, responsible parties, and timeframes for phased implementation.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The strategic plan for green infrastructure includes performance benchmarks for stormwater capture and/or impervious acres retrofitted, flow modifications, pollution reduction and neighborhood benefits; and discusses how implementation will be monitored.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Per the strategic plan for green infrastructure, high priority and cost effective measures to optimize system efficiency are implemented, as applicable, and performance benchmarks are met.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The Green Infrastructure Strategic Plan identifies maintenance requirements including frequency and responsible parties (see 1.2, 2.1, 4.4).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **4.2** | The municipality **integrates green infrastructure into other** plans **and capital projects** across municipal departments and agencies. | * Green infrastructure has been integrated into ongoing and proposed master plans and redevelopment plans, land use and development ordinances (see 4.4), public development projects, resurfacing programs and inter-agency capital improvement programs.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Projects use good models and data sources to determine the optimum green infrastructure measures to address areas of public concern.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Cooperative funding arrangements have been established with other departments and agencies for budget efficiencies and cost savings. For example, municipal capital projects leverage green infrastructure with conventional infrastructure investments by integrating the optimum green infrastructure measures into new, rehabilitated or retrofitted community facilities such as:
	+ Green streets, roadways and highways
	+ Streetscape and parking facilities
	+ Parks and other dedicated open space
	+ Public buildings, facilities and schools
	+ Vacant lots
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * O&M of green infrastructure systems is coordinated across agencies, with defined responsibilities for maintenance of each capital project that incorporates green infrastructure (see 2.1).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **4.3** | The municipality has an **effective program for building public understanding of green infrastructure** benefits and support for green infrastructure implementation (see 5.3). | * The municipal education program builds public understanding of green infrastructure benefits through a website, print and social media presence, public education and student education.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipal education program includes targeted outreach to the private development and real estate community.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipal education program builds public understanding of the types of green infrastructure measures through publicly visible Demonstration Projects that are selected, sited, and installed in partnership with community organizations and their members and contain educational signage.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipal education program builds public understanding of the water quality and retention benefits of green infrastructure measures through monitoring mechanisms of Demonstration Projects to evaluate performance over a 5-year period.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipal education program builds public understanding of green infrastructure maintenance practices and the need for routine maintenance by regularly maintaining Demonstration Projects (i.e., weeding, trash removal, and excess sediment removal).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipal education program builds understanding of the multiple benefits of green infrastructure that accrue to the public and to private property owners.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **4.4** | Property owners and developers are **required and/or encouraged to manage stormwater on-site** and employ green infrastructure. | * A campaign for green infrastructure builds public understanding of residential and commercial site-level green infrastructure measures, and their benefits to property owners, including practices such as:
	+ Minimizing impervious surfaces, clustering, and low-impact development
	+ Planted “islands” in parking lots and around the perimeter of parking lots; and reductions in on-site parking requirements
	+ Downspout disconnections
	+ Rain gardens
	+ Green roofs
	+ Permeable pavement
	+ Tree planting
	+ Bioswales
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipality has adopted stormwater management regulations that encourage (or require) green infrastructure on private property but do not conflict with state, city, or local stormwater regulations. These include, as applicable (see 3.5):
	+ A stormwater ordinance that applies to redevelopment or new development projects that exceed 5,000 square feet of impervious surface or land disturbance, while ensuring that the ordinance and other local codes do not restrict the use of GI (e.g. EPA’s Water Quality Scorecard can assist municipal agencies in evaluating local regulations).
	+ A stormwater management ordinance that establishes an on-site stormwater retention standard requiring a Surface Water Quality Design Volume (SWQDv) equal to the runoff from the 1.25-inch, 2-hour rainfall event for major developments. Where it is technically infeasible to retain the full SWQDv, the major development shall use bioretention with an underdrain, constructed wetlands, or other practice that relies on vegetation and soil for water quality treatment, to treat 1.5 times the volume of the SWQDv that is not retained on-site
	+ A stormwater management ordinance that applies to establishes tiered performance requirements for different land uses or classes of development, with most stringent requirements on major (5,000 square feet and larger) land-disturbing activities
	+ A stormwater management ordinance that allows for the use of off-site retention through in-lieu fees
	+ A stormwater management ordinance that stipulates routine inspection and maintenance requirements, including frequency and responsible parties
	+ A stormwater management ordinance that encourages monitoring of individual green infrastructure installations to measure performance
	+ A master plan that recommends green infrastructure, low-impact development and preservation of open space, riparian corridors and floodplains
	+ Incentive zoning that offers increased floor-to-area (FAR) ratios, special use permits, or area variances for construction of public green infrastructure projects
	+ Performance zoning that offers increased floor-to-area (FAR) ratios for on-site retention through green infrastructure that exceeds the local stormwater management regulations set forth above
	+ Special zoning “stormwater retention districts” that stipulate geographic areas with on-site retention standards or regulations through green infrastructure that exceed the local stormwater management regulations set forth above
	+ Stormwater fees based on area of impervious coverage on-site (potentially using tiered rate structures or average area of impervious coverage fees for residential properties) with dedicated revenues toward public green infrastructure projects
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipality provides an incentive program to encourage (or require) green infrastructure installation on private properties that includes, as applicable:
	+ Grant awards and matching funding programs that subsidize the cost of implementing green infrastructure for private property owners
	+ Offer percentage discounts off utility fees for volumes of stormwater treated or retained through green infrastructure
	+ Offer credits for volumes of stormwater treated or retained through green infrastructure that can be traded in an open market to others who use them to meet regulatory requirements, with dedicated revenues toward public green infrastructure projects
	+ Offer rebates for green infrastructure implementation, tree planting, and low-impact design improvements
	+ Provide technical assistance in the form stormwater reduction audits to identify changes that private property owners can make to treat or retain stormwater
	+ Site plan and subdivision review processes that offer expedited reviews for developments that exceed the local stormwater management regulations set forth above
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipality establishes policies and monitoring systems that require O&M of gray and green infrastructure systems on private property to ensure proper functionality (see 1.2, 2.1, 4.2).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **4.5** | The municipality/utility **offers green jobs and job training** to local workers for green infrastructure installation and maintenance. | * A green jobs training program has been established in partnership with local educational institutions, community groups and/or nonprofit organizations.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The green infrastructure program employs local workers in constructing and maintaining green infrastructure projects.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **4.6** | The municipality/utility employs **adaptive management** to assess green infrastructure progress. | * The municipality/utility conducts routine performance assessments of green infrastructure progress every five years to monitor benefits on a neighborhood, sewershed or watershed scale.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * In response to the findings of the performance assessment, the municipality/utility adjusts the targets, goals and objectives in its green infrastructure plan to achieve an optimal balance between green and gray infrastructure (see 4.1).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |

# STRATEGY 5: Public Participation and Partnerships

**Municipality/Utility Name:** Click here to enter text. **Primary Contact:** Click here to enter text. **Date Completed:** Click here to enter a date.

| ***Actions*** | ***Methods*** | ***Status*** | ***Explanation***  | ***Step(s) to Completion*** | ***Person(s) Accountable*** | ***Deadline*** |
| --- | --- | --- | --- | --- | --- | --- |
| **5.1** | The municipality/utility has a **comprehensive public awareness campaign** for educating and empowering a diverse set of stakeholders in sewer and stormwater management issues. | * A public education campaign for sewer and stormwater management has been developed and is implemented with targeted measures for residential water management, addressing issues such as:
	+ Water conservation practices (see 3.2)
	+ Design standards (see 3.5)
	+ Residential Green Infrastructure Measures and their benefits (see 4.3)
	+ On-site retention of stormwater and reduction in impervious cover (see 4.4)
	+ CSO causes and impacts on basement flooding and residential sewer backups as applicable
	+ Water quality impacts of household items, lawn chemicals, street litter, illegal dumping, and pet waste
	+ Control of kitchen grease and impacts of flushable wipes
	+ Native plants
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A public education campaign for water management has been developed and is implemented with targeted measures for nonresidential, to encompass commercial, industrial, recreational users, water management tailored for local businesses, addressing issues such as:
	+ Water conservation practices in landscaping, restaurant, hospitality and industrial processes (see 3.2)
	+ Design standards (see 3.5)
	+ Large scale Green Infrastructure Measures and their benefits (see 4.3)
	+ On-site retention of stormwater, groundwater recharge, and reducing in impervious cover (see 4.4)
	+ Green jobs training (see 4.5)
	+ Programs that encourage actions by property owners, such as River Friendly Programs
	+ CSO causes and impacts on receiving water bodies and the environment as applicable
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Curricula for sewer and stormwater management, focusing on water conservation and green infrastructure, has been developed and implemented at public schools, private schools, higher education, job placement/education programs, childcare facilities, parks, etc.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipality and health agencies are made aware (preferably through real-time monitoring and use of web based mapping systems/social media) of the locations and times of sanitary or combined sewer overflows and possible impaired water conditions (see 1.1).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Materials and resources included in the public education campaign above are provided in multiple languages, as appropriate for the municipality.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **5.2** | The municipality/utility has a **robust public participation plan for stakeholder partnership** and regularly provides for **meaningful ratepayer and stakeholder input** **and** **engagement in decision-making** regarding sewer and stormwater management projects. | * Stakeholders are actively engaged as partners in the development of the public participation plan that ensures they are proactively engaged in the decision-making process in a meaningful way.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Stakeholders are actively engaged as partners in decision-making for water management projects and efforts, beginning early in the planning process and continuing throughout, using interactive feedback mechanisms such as:
	+ Surveys
	+ Social Media
	+ Websites
	+ Real-time customer (i.e., ratepayer) notifications
	+ Interactive customer relations platforms for ratepayers.
	+ Public meetings that utilize a variety of formats, including interactive design charrettes
	+ Formal advisory committees
	+ Ongoing engagement with community-based organizations
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Interviews or focus groups are regularly conducted with key stakeholders, such as the municipal council, residents, businesses, and nonprofit or community groups, including environmental commissions and Green Teams, as applicable.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Stakeholders have opportunities to actively engage in the development of plans, projects and programs, through existing venues and additional means as appropriate. This includes engagement in both the setting of goals and the methods for achieving those goals.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Proposed plans are explained clearly to non-technical audience and are made available online for review and comment, on a timeline that provides an opportunity for public feedback to influence final decisions (i.e., not after decisions have been made and it is too late to make substantive changes).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Decision-makers are transparent in explaining, in detail, how public comments and concerns have been addressed in final decisions.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The community engagement methods above are provided in multiple languages, as appropriate for the municipality.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **5.3** | The municipality/utility **empowers community organizations** to achieve a combination of improvements to sewer and stormwater management systems and community needs through locally directed programs. | * Water management issues have been integrated into other related ongoing public outreach efforts and planning processes and vice versa
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Partnerships have been established with stakeholder community organizations to collaborate throughout the water management project lifecycle: planning, design, construction, maintenance.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Direction, guidance or training has been provided to community organizations for how to site, design, implement, and maintain green infrastructure or other water management investments.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Community organizations are engaged in understanding and addressing needs, opportunities and constraints for program improvement.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **5.4** | The municipality/utility has **developed a recognized local "brand"** for sewer and stormwater management efforts. | * A "brand" has been developed to build public awareness around water management issues. A regional brand may be used where integrated sewer and stormwater management is being conducted at a larger scale, such as a watershed.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The water management brand has been marketed through strategies such as a logo, website, and social media.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A public website provides opportunities for engagement such as free mapping tools, FAQ, comment forms, mechanism for reporting issues and obtaining feedback on response (feedback from rate payers on responses to issues, or blockages, flooding, etc.), as well as educational information.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The “brand” and all materials or resources are provided in multiple languages, as appropriate for the municipality.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |

# STRATEGY 6: Financial and Institutional Capacity

**Municipality/Utility Name:** Click here to enter text. **Primary Contact:** Click here to enter text. **Date Completed:** Click here to enter a date.

| ***Actions*** | ***Methods*** | ***Status*** | ***Explanation***  | ***Step(s) to Completion*** | ***Person(s) Accountable*** | ***Deadline*** |
| --- | --- | --- | --- | --- | --- | --- |
| **6.1** | The municipality/utility has an organizational structure, management systems and personnel resources that ensures its **institutional capacity** to implement integrated sewer and stormwater management projects. | * The organizational structure, resources, and management have been evaluated to identify staff resource needs, management system improvements, and opportunities for human resource efficiency; this evaluation is reflected in the Asset Management Plan (see 1.3).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The organization has a sufficient and trained staff, a forward-looking transition plan, and efficient management systems.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A training program has been established and is implemented that provides regular training for its staff to advance the skills necessary to perform proper operations and maintenance, to provide timely and effective emergency response, and to incorporate recognized safety practices.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The training program is routinely adapted as system components are upgraded or new best practices are available, and ranges from special classes or seminars in innovative practices, certification programs, and informal training.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The governing body of the municipality/utility has a sound understanding of the wastewater or stormwater system, as relevant, including the primary finding of all plans and major implications for budgeting and management.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **6.2** | The municipality/utility prioritizes projects by **considering all costs and benefits over** the **project life cycle**. | * A life cycle cost analysis is employed for all capital investments that considers upfront planning, engineering and design, capital construction costs, operational and maintenance (O&M) and any renewal and replacement costs over time.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Cost effectiveness analysis (CEA) is applied to identify the least cost preferred investment alternatives that are subject to a full cost benefit analysis (CBA).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A triple bottom line, or another comparable multi-variable cost-benefit analysis is employed for all capital investments, that considers co-benefits such as:
	+ Energy savings
	+ Air quality improvements (criteria air pollutants, NOX, SOX, PM2.5),
	+ Greenhouse gas reductions (CO2, CH4)
	+ Environmental benefits (ecosystem services , e.g., treatment wetlands for tertiary treatment providing wetland habitat)
	+ Health benefits (reductions in pathogens or asthma, disease vectors, prescription meds in treatment trains, avoided cost of illness, heat island effect reductions, mental health improvements)
	+ Water quality benefits (e.g., nutrient removal (surface water), salt water intrusion management to aquifers/groundwater
	+ Increased property values
	+ Fiscal impact management savings to agency (e.g., reduced rates, O&M, taxes), providing stable revenue stream
	+ Social benefits to keep rates affordable while providing quality services, and equitable rate structures
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A comprehensive evaluation of the cost/benefits of a variety of CSO controls (source reduction, collection system, storage, treatment) has been performed in order to reduce or eliminate CSOs.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Post construction monitoring programs are developed and implemented to measure progress in improving water quality and to assess the effectiveness of CSO and other sewer system controls.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **6.3** | The municipality/utility **leverages public and private resources through collaboration** with other funding interests or partners such as private, public and nonprofit entities, where appropriate. | * Partnerships have been established to implement innovative sewer and stormwater management projects that employ mutually beneficial means to achieve effective water management, such as:
	+ Public-Nonprofit Partnership (i.e., Camden SMART)
	+ Public-Private Partnership (i.e., Prince George’s County Urban Retrofit Project, Philadelphia’s Greened Acres Retrofit Project)
	+ Public Financing Partnership (i.e., NJEIFP Projects)
	+ Community based Public-Private Partnerships (CBP3s)
	+ Crowd-sourced funding mechanisms
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Incentive programs have been established for private investment in water management, such as:
	+ Payment-in-lieu programs
	+ Options for developers pay into regional stormwater facilities
	+ Enhanced infrastructure financing districts
	+ Financial incentives for green infrastructure retrofits on private property, such as grants, rebates, property tax credits
	+ Where a stormwater fee has been established (see 6.4), credits are available to property owners who install stormwater retrofits to reduce runoff into the sewer system
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **6.4** | The municipality/utility has sound, reliable finances and **ensures fiscal responsibility** to consumers. | * Reliable, consistent, and sufficient funding sources are provided for both the operating budget and capital replacement plan.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipality/utility sets pricing to cover infrastructure costs over the full life-cycle of system assets.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Sewer and stormwater departments/utilities have taken measures to ensure fiscal responsibility, such as:
	+ Adopting a formal operating budget and expenditure plan that details the annual cost of running the collection system and/while maintaining fiscal solvency
	+ Maintaining transparent and reliable utility finances
	+ Establishing a user-supported rate-paying structure, commonly known as an enterprise fund or utility fund (which for a municipal utility is separate from general fund revenue sources)
	+ Imposing capital facilities charges for regional facilities constructed to serve specific service areas
	+ Preventing diversion of funds to the municipal general budget
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A stormwater fee has been established based on a measure of stormwater generation such as impervious coverage (with credits available for properties installing green infrastructure retrofits), as applicable.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipality/utility evaluates the use of shared-services for sewer system operation and maintenance.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| **6.5** | Sewer and stormwater **rates are affordable**. | * The municipality/utility evaluates the impact of rates on ratepayers, with attention to low-moderate income populations.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * A ratepayer assistance mechanism is provided so that low income families are able to pay sewer rates.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Rate structures are based on full-cost pricing over the full life cycle of utility assets, including projects in the Capital Improvement Plan (see 1.8).
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * Sewer rates are volumetric (i.e., with metered drinking water usage as surrogate for wastewater usage), and based on a rate structure that encourages conservation.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |
| * The municipality/utility has used all other applicable actions included in Strategies 1-5 to improve efficiency, reduce costs, and leverage additional resources.
 | Choose an item. | Click here to enter text. | Click here to enter text. | Click here to enter text. | Click here to enter a date. |