

Chapter 1

Integration of Watershed Management and Strategic Asset Management

1-1 Introduction

Municipal managers constantly struggle to balance the conflicting goals of investing in municipality improvements and maximizing future asset value under the restrictions of limited budgets. *How can municipal managers successfully budget to enhance current municipality welfare and increase long-term asset value?* An approach that integrates watershed management with strategic asset management solves the dilemma of concurrently improving public services, enhancing local environmental conditions, and investing in the long-term value of the municipality assets.

Furthermore, municipal managers must achieve these objectives while cost-effectively complying with numerous federal, state, and local environmental laws and regulations. This management role has become increasingly difficult because requirements of major environmental laws have increased exponentially over the past few decades while municipal environmental budgets have remained flat. Specific revisions to the rules promulgating the Clean Water Act (CWA) and Safe Drinking Water Act (SDWA) have the potential to not only result in more stringent limits for existing environmental permits, but to impose operational limits on currently unregulated activities that adversely affect the quality of surface water, groundwater, habitat, or air.

This guide provides a consistent, cost-effective decision-making approach that state and local managers can use to integrate watershed management into their strategic municipal asset management process. It enables them to identify municipal infrastructure assets and activities that can adversely affect the surrounding watershed (reducing asset values) and to find ways to mitigate the effects.

1-2 Overview of Municipal Asset Management and Strategic Asset Management

What is infrastructure?

Long-lived, normally stationary capital assets—such as roads, bridges, tunnels, drainage systems, water and sewer systems, dams, and lighting systems—preserved for significantly more years than most capital assets.

Buildings, which have a shorter service life, are not considered infrastructure, except those that are an ancillary part of an infrastructure facility (such as a wastewater treatment building).

Municipalities share a similar mission: to proactively enhance the health, safety, and welfare of current and future generations through responsible stewardship of municipality infrastructure, development, and maintenance functions. Municipalities endeavor to

- create safe and livable communities,
- fuel economic growth,
- build cohesive communities,
- support human growth and development,
- develop public infrastructure systems that adequately and efficiently serve communities, and
- enhance and protect the environment.

Achieving these goals requires that municipalities simultaneously optimize three independent asset dimensions: condition, functionality, and environmental impact. Few would argue that current management approaches attempt to optimize asset condition and functionality. In fact, most infrastructure investments are made using a purely financial asset management approach. Most current asset management techniques, however, fail to integrate municipal strategic goals, including environmental conditions, in the decision-making process.

Integrating watershed management into strategic asset management enables municipalities to simultaneously optimize condition, functionality, and environmental impact; as a result, they can concurrently optimize financial, environmental, health, community, and service aspects of infrastructure investments. However, before we can show how the watershed assessment approach can be integrated into a strategic asset management approach, we need to review both traditional asset management and strategic asset management approaches.

1-2.1 Municipal Asset Management

Municipalities rely on an extensive infrastructure, consisting of transportation networks, power supply, water supply, drainage, sewerage, solid waste management services, and other assets. These assets represent an immense investment built over many generations, made to fulfill anticipated benefits such as increased productivity and enhanced citizen welfare. Municipalities face the constant challenge of maximizing net public benefit with a limited amount of resources.

The concept of asset management is in its infancy, with varying definitions. The American Public Works Association's (APWA's) asset management task force created a common asset management definition, "to efficiently and equitably allocate resources amongst valid and competing municipal asset goals and objectives,"¹ from its review of various asset management methods. The APWA further defines asset management to include the following:

- **Efficiently allocate funds:** The allocation of funds must be efficient within a particular class of assets (like roads or bridges), and within the entire reservoir of assets being managed (roads versus water networks versus buildings versus parks versus...). The latest engineering and economic principles, like value engineering and life cycle cost analysis or similar concepts are part and parcel of the asset management policy.
- **Equitably allocate funds:** The allocation of funds must be equitable as well as efficient. In this context, equitability refers mostly to constraints, limitations, or orientations that an administration needs to impose on the process in order to avoid being faced with solutions that fail to take in all factors, that are beyond its means, or that are unrealistic or unacceptable. In this context also, equitability allows for the consideration of expressed user needs and of any particular overriding one-time need.
- **Valid and competing needs:** This refers to all the needs of a community. Needs are valid if they are determined by individual management systems or if they are expressed to and accepted by the managers through any recognized approval process. The needs can be past unsatisfied needs (deferred maintenance), current maintenance needs, current capital improvement needs validated by a value engineering analysis, or future maintenance needs as determined in life cycle cost analyses. They are linked directly to the service levels demanded by the community. The needs are competing against one another in each class of assets as well as competing between different classes of assets. Even when funding is not an issue, competition must still exist to ensure that the extra dollars are spent in the most efficient way possible.²

What is asset management?

The APWA's definition of asset management is to efficiently and equitably allocate resources amongst valid and competing municipal asset goals and objectives.

1-2.2 How Municipal Asset Management Relates to Financial Management

Asset management focuses on the evaluation of the cost-effectiveness of infrastructure investments. Optimally, municipalities would have

¹ N. Danylo and Andrew Lemer, *Asset Management for the Public Works Manager: Challenges and Strategies: Findings of the APWA Task Force on Asset Management*, August 31, 1998. Available from www.apwa.net/documents/resourcecenter/ampaper.rtf.

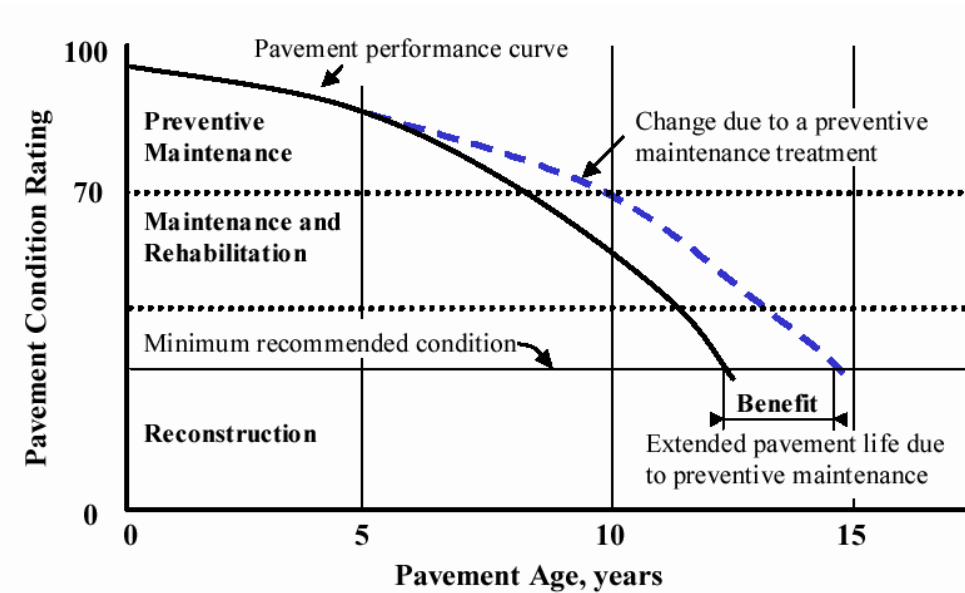
² See note 1.

access to unlimited funds to construct or improve any infrastructure asset that would increase public benefit. However, the reality is that municipalities have limited resources. The challenge is to invest the limited resources to generate the greatest net public benefit (that is, focus on cost-effectiveness).

The optimization of net public benefit is commonly measured by asset valuation expressed in two ways, functionality and condition:

- **Functionality** is the net benefit to the public of the asset's function. Functionality measures the asset's maximum potential value and depends on the public use of the asset. Not all assets within the same class have similar functional value. For example, a critical thoroughfare road has a higher functional value than a rarely used rural road.
- **Condition** is the ability of the asset to provide function over time. Condition measures the percentage of the maximum functional value provided during the asset's life. It can depend on the level of preventive maintenance. The asset performance curve, shown in Exhibit 1-1, graphs the relationship between asset performance, condition, and preventive maintenance, as well as the benefits of preventive maintenance. As the asset ages, its condition deteriorates from requiring preventive maintenance to more costly maintenance and rehabilitation. Once the condition reaches a minimum level, the asset is unusable and requires costly reconstruction. However, if the asset receives preventive maintenance, the rate of deterioration decreases, thereby extending its life.

Exhibit 1-1. Asset Performance Curve and Benefits of Preventive Maintenance



Source: Federation of Canadian Municipalities and National Research Council Canada, National Guide to Sustainable Municipal Infrastructure: Innovations and Best Practices

1-2.3 GASB 34 and Municipal Asset Management Systems

Accurately quantifying the public benefit of infrastructure is a complex task, one of the greatest challenges in asset management. For example, there is no simple financial analysis for placing a value on the net benefit of the presence of a sewer system or road.

In June 1999, the Government Accounting Standards Board (GASB) established GASB Statement 34 (GASB 34) to assist in this effort. The rule requires municipalities to account for the value of major capital assets (including bridges, roads, water systems, and dams) in their financial statements. *GASB 34 serves as the basis for today's municipal asset management systems.*

GASB 34 provides two methods for reporting infrastructure assets, depreciation and the modified approach:

- **Depreciation** involves completing an extensive inventory of assets, including their costs and the dates when they were created or purchased. Each asset's value is then calculated on the basis of depreciation over the estimated useful life. The method does not value assets on the basis of condition.

Depreciation approach

- Reduces asset value over the estimated useful life.
- Does not value assets based on condition.
- Focuses on addressing infrastructure needs through new infrastructure development.
- Often fails to address life-cycle costs of maintaining, operating, and renewing assets.

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- **The modified approach** incorporates condition assessments of infrastructure assets and includes the following requirements:
 - Maintain an up-to-date inventory of eligible infrastructure assets.
 - Assess the condition of the eligible infrastructure assets every 3 years and summarize the results using a measurement scale.
 - Annually estimate the costs to maintain and preserve the eligible infrastructure assets at the condition level established and disclosed by the government entity.

Under the modified approach, the municipality reports the actual costs of maintaining and preserving infrastructure assets at a determined condition level instead of calculating depreciation charges. The depreciation method, the easier of the two approaches to implement, instead focuses on replacing or developing new infrastructure to address infrastructure needs rather than addressing the life-cycle costs of maintaining, operating, and renewing these infrastructure assets. The APWA endorses the modified approach since it enables municipalities to incorporate the benefits of maintenance into municipal asset valuation.³

Exhibit 1-2 outlines the basic flow and components of an asset management system, which are as follows:

1. *Inventory of Infrastructure Assets.* The first stage is to conduct an inventory of infrastructure assets. Data collected include location, construction cost, physical characteristics, usage information, accident history, and maintenance performed.
2. *Infrastructure Asset Valuation.* Next, a municipality must place a value on the asset. Valuation begins by assessing the condition of all infrastructure assets. GASB 34 requires municipalities to do so using a replicable measurement method every 3 years.

The municipality also must estimate the useful asset life. For each year of the infrastructure's life, the net public benefit of the asset is determined from the current predicted condition levels and planned maintenance. Asset value is then calculated as the sum of these annual benefits discounted at the cost of capital.

Asset values are calculated based on functional value and condition. The modified approach uses a productivity-realized asset valuation method in which the asset value is calculated as the "net present value of the benefit stream for

³ American Public Works Association, *APWA Policy Statement—GASB 34*, November 2000.

the remaining service life.”⁴ The net present value captures the functional value over the lifetime of the asset as well as the benefits of maintenance on improving the function of the asset and extending its life (reflected in condition).

3. *List of Potential Infrastructure Improvements.* At the top of any municipality’s wish list is having the resources to complete an infrastructure improvement that has a “return on investment” greater than the capital cost.

However, municipalities, faced with limited resources, must develop a list of potential infrastructure improvements that best allocates their limited funds. The list includes all potential new infrastructure investments as well as asset maintenance, retrofitting, or modifications not currently planned or funded.

4. *Resource Allocation Model.* Employing a resource allocation model enables municipalities to rank potential infrastructure investments and establish funding requirements. The resource allocation model serves as the heart of municipal asset management and incorporates the municipality’s key asset management decision-making method. The primary inputs to the model are infrastructure improvement cost estimates, current and future asset condition estimates, and current and future functional value estimates. The model calculates a net present value of each infrastructure improvement using (1) the annual cost expenses for the improvement, (2) the estimated annual benefits (calculated using the difference of the current and future asset values), and (3) the predicted current and future asset life. The most important output is a ranking of the potential infrastructure improvements based on return on investment and total cost. These variables are the primary input to the infrastructure budgeting process.
5. *Infrastructure Budget.* Though decision-making logic is incorporated in the research allocation model, decisions are ultimately made through infrastructure budgeting. Selecting infrastructure investments for funding is largely a subjective process. Though return on investment and total cost provide decision-making criteria, there is no exact science to developing an infrastructure budget. On the basis of these criteria, we have developed nine primary categories of infrastructure investments. Exhibit 1-3 shows the attractiveness to municipalities for funding infrastructure investments within these categories.

⁴ Sue McNeil, “Asset Management and Asset Valuation: The Implications of the GASB Standards for Reporting Capital Assets,” *Proceedings of the Mid-Continent Transportation Symposium*, 2000.

Exhibit 1-2. Basic Flow of an Asset Management System

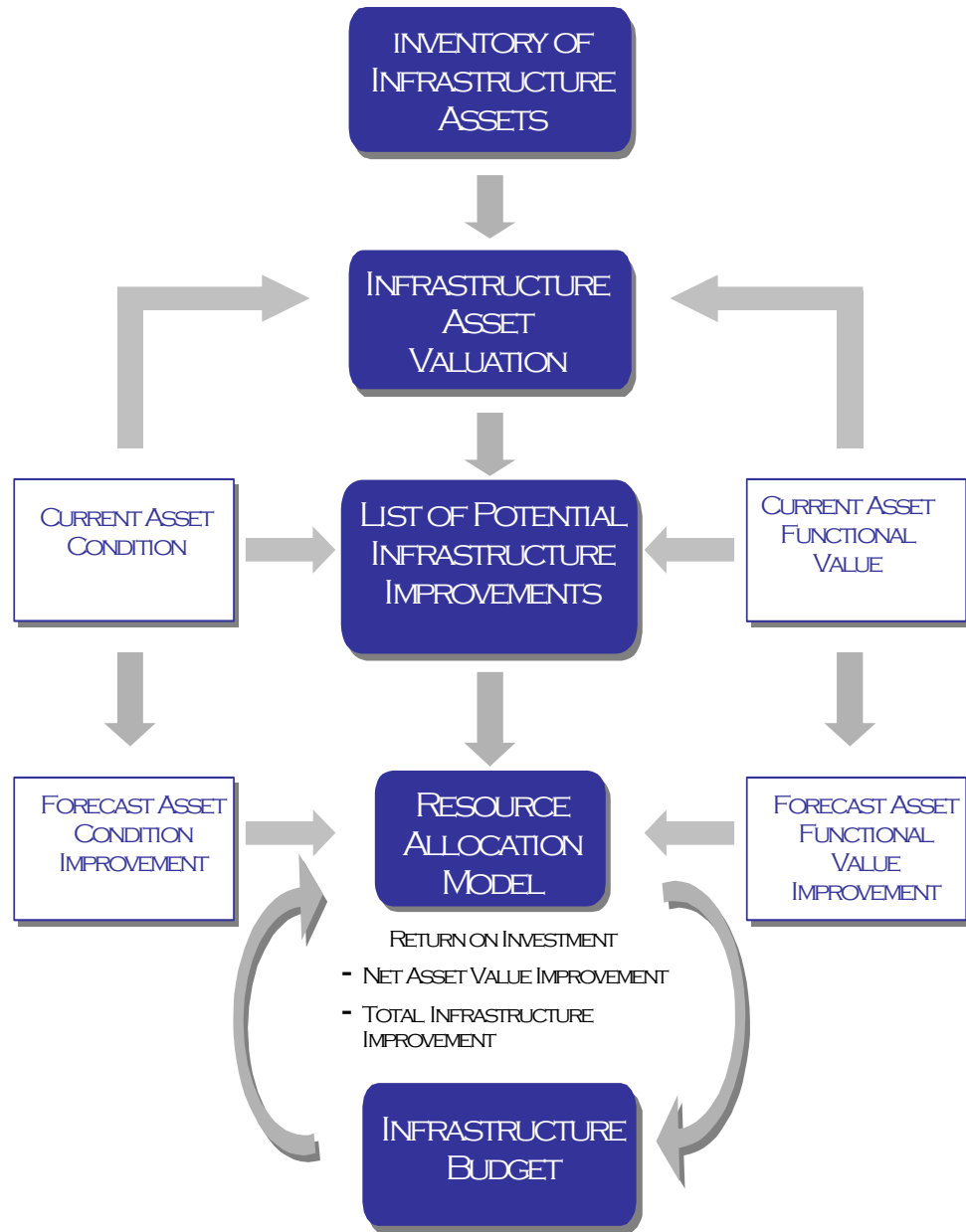


Exhibit 1-3. Assessing Budgeting Attractiveness of Infrastructure Investments

	Return on investment	Total cost	Budgeting attractiveness
1	High	Low	High: Almost always funded; very cost-effective
2	High	Medium	High: Generally funded, except when budgets are very tight
3	High	High	Medium/Low: Although these investments have high returns, limited resources mean only a handful can be funded
4	Medium	Low	High: Generally funded, except when budgets are very tight
5	Medium	Medium	Medium: Most subjective of budgeting decisions; depends on attractiveness of other investments
6	Medium	High	Low: High cost, high return investments are likely funded instead of these
7	Low	Low	Medium/Low: Projects with higher returns are funded
8	Low	Medium	Low: Projects with higher returns are funded
9	Low	High	Low: Projects with higher returns are funded

1-2.4 Preventive Maintenance

Much of the municipal core infrastructure is aging, overused, and lacking investment in maintenance (repair, rehabilitation, and replacement)—all of which severely strain the assets. To add to the problem, citizens demand additional new infrastructure to address growth. Although municipalities attempt to maximize the returns on their infrastructure investments, their asset management practices often hinder meeting these objectives. The primary impediment is budgeting. Few municipalities can split their capital budgets between new projects and renewal/maintenance. As a result, they fuel inefficiency, investing in costly new infrastructure while failing to address asset deterioration.

A solution to the problem, in lieu of additional resources, is to perform preventive maintenance. Preventive maintenance is a best management practice that optimizes the public’s benefit from infrastructure investment.

Preventive maintenance is the most cost-effective approach to increasing asset values. It reduces the rate of asset condition deterioration over time, extends the asset life, and increases functional value. Municipal asset management must shift from a “dire need” maintenance approach to a preventive system of maintenance and renewal.⁵ Preventive maintenance focuses on providing sustained value to citizens at the lowest cost over the asset life cycle.

⁵ CartêGraph Systems, Inc., *Getting Started in Public Works Asset Management*, 2004. Available from www.cartêgraph.com.

Other asset management best practices include

- understanding the requirements of the citizens,
- understanding the cost of sustaining the value of assets for at least 15 years,
- understanding demand for new assets and services,
- constructing new assets and services only with appropriate allocations of real operating costs, and
- selecting an optimal strategy for the municipality, ratepayers, and social community.

1-2.5 Strategic Asset Management

Strategic asset management

Strategic asset management augments the municipal asset management approach by integrating municipality strategic goals into the management of its infrastructure asset portfolio.

Asset management is a financially based approach to infrastructure investment. Although effective at managing the economic health of a municipality, the approach is only loosely linked to serving the municipality goals, that is, optimizing citizen welfare. Thus, the approach cannot achieve strategic goals because municipalities often fail to evaluate infrastructure investments on the basis of their alignment to municipal strategy. They fail to incorporate in funding decisions the ability of the asset to (1) create safe and livable communities, (2) build cohesive communities, (3) support human growth and development, (4) adequately and efficiently serve communities, and (5) enhance and protect the environment.

Strategic asset management augments the municipal asset management approach by integrating municipality strategic goals into the management of its infrastructure asset portfolio. It provides a mechanism for municipalities to integrate long-term strategic planning with capital budgeting and infrastructure management. The focus is on the evaluation of the cost-effectiveness of infrastructure investments.

Exhibit 1-4 presents an evaluation of the financial and strategic performance of municipalities based on different management approaches. Municipalities that focus on achieving strategic goals through a poor or non-existent asset management approach fail to optimize the financial performance of asset investments. Similarly, municipalities that make infrastructure investment decisions solely on the basis of financial returns fail to realize their strategic goals. Only the best performing municipalities employ a strategic asset management approach to align infrastructure management and investment with municipal strategic goals.

Exhibit 1-4. Aligning Strategic Goals and Municipal Asset Management



1-2.6 Steps of Strategic Asset Management

Strategic asset management consists of the following four steps:

1. *Evaluate projects.* The municipality evaluates how the project results align with the municipal goals (mission need).
2. *Perform a cost analysis.* The municipality analyzes the cost of the projects, evaluating the design, implementation, and operating and maintenance costs.
3. *Quantify and qualify the project benefits.* It quantifies and qualifies the benefits of the project in improving municipality asset value (the difference between value before and after the implementation of the project).
4. *Select projects.* The municipality selects projects on the basis of the greatest net financial benefit and associated mission.

1-2.7 Implementing Strategic Asset Management in Municipal Management

Critical to the implementation of strategic asset management is an asset management system that integrates strategic goals into final decisions. Current asset management systems focus on optimizing asset condition and functionality. The goal is to maximize the net present value of the benefit streams from infrastructure investments, rather than to achieve strategic goals.

Municipalities can concurrently manage the financial viability of infrastructure investments and strive to achieve strategic goals. The implementation of strategic asset management requires them to integrate variables that measure the realization of strategic goals into asset management decisions. They can do so by modifying current asset management systems to include additional variables in their evaluation of infrastructure investments. For example, when evaluating the investment in constructing a bridge, the asset management system should provide the project's net economic benefit as well as different measures of its alignment with a number of strategic goals. The manager weighs both variables in making an investment decision.

1-3 Why Watershed Management Should Be Integrated into Strategic Asset Management

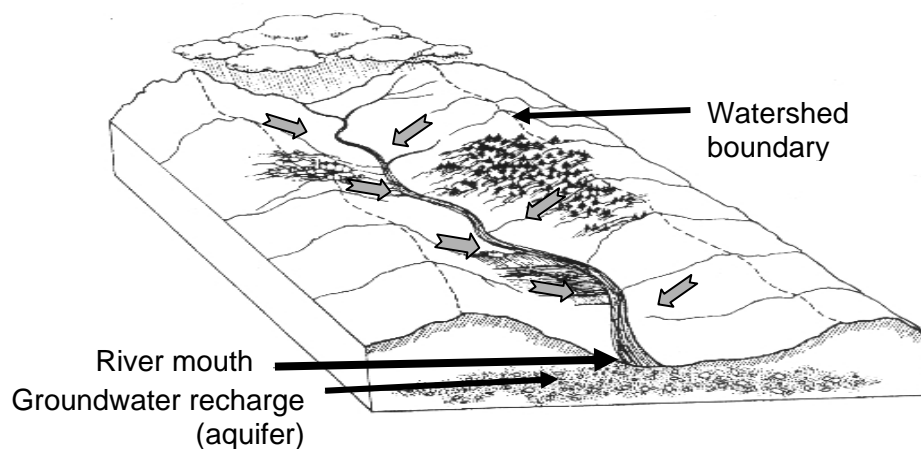
Watershed management is the most comprehensive approach to environmental stewardship. A watershed is simply the land that water flows across or through on its way to a common stream, river, or lake, as shown in Exhibit 1-5. A watershed can be very large (thousands of square miles that drain to a major river, lake, or ocean) or very small (20 acres that drain to a pond). A small watershed that nests inside of a larger watershed is referred to as a subwatershed. Watersheds, geographical areas defined by natural hydrology, are the most logical basis for managing the impacts of human activity on the environment (air, water, and habitat). Focusing on the natural resource, rather than the specific sources of pollution, enables municipalities to evaluate the overall conditions in a geographic area and manage the stressors that affect those conditions.

What is a watershed?

A watershed is simply the land that water flows across or through on its way to a common stream, river, or lake.

Watersheds can be any size, from a few acres to thousands of square miles.

Exhibit 1-5. Example Watershed



Watershed management is a critical dimension of strategic asset management. Minimizing environmental impact (i.e., watershed management) and enhancing local environmental conditions are integral to achieving one of the key municipality strategic goals: enhancing the welfare of future generations by maximizing long-term asset value.

1-3.1 Drivers for Watershed Approach and Assessments

Watershed management approaches are particularly important to municipal managers. Over the past 10 years, municipalities have faced increasingly complex regulations as the U.S. Environmental Protection Agency (EPA) has revised much of its legislation. Working to better integrate watershed approaches, the EPA revised the Clean Water Act, Safe Drinking Water Act, and other regulations concerning water quality, effluent standards, source water protection standards, and stormwater management. These changes, along with the move by regulators to issue permits by watershed, require municipal managers to reevaluate how municipal activities impair water resources and to develop action plans to prevent or correct the identified impairments.

The main compliance drivers behind adopting a watershed approach and completing watershed assessments to manage water issues are as follows:

- *Clean Water Act.* National pollutant discharge elimination system (NPDES), total maximum daily loads (TMDL), spill prevention control and countermeasures (SPCC), wetland 404 permits and mitigation, sludge disposal or reuse, and point and non-point stormwater management programs.
- *Safe Drinking Water Act.* Source water assessment and protection program (which includes wellhead protection), and underground injection control (UIC) program.
- *Coastal Zone Management Act.* Required the 29 states with federally approved Coastal Zone Management Act programs to develop coastal NPS programs.

Exhibit 1-6 shows the relevant federal laws, policies, and plans related to watershed management. Appendix B summarizes the [key federal laws and policies governing water resources](#) that provide the basis for watershed protection activities.

What is watershed management?

A framework to

- assess a waterbody's ability to meet its intended use,
- determine the pollutants and potential sources of impairments,
- incorporate assessment results into a plan aimed at achieving water quality objectives, and
- foster collaboration with all landowners in the watershed

Exhibit 1-6. Federal Laws, Policies, and Plans Related to Watershed Management and Non-Point Source Regulations

Category	Title
Federal laws	Clean Water Act (CWA) and amendments
	Part 130 of Title 40 of the Code of Federal Regulations Water Quality Planning and Management
	Safe Drinking Water Act (SDWA) and amendments
	Coastal Zone Management Act of 1972 (CZMA)
	Clean Air Act (CAA) and amendments
	Comprehensive Environmental Restoration, Compensation and Liability Act (CERCLA)
	Emergency Planning and Community Right-to-Know Act (EPCRA)
	Endangered Species Act (ESA)
	Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
	Resource Conservation and Recovery Act (RCRA)
	Toxic Substances Control Act (TSCA)
Policies and plans	EPA's National Water Program Strategic Plan 2004 -2008 , April 2004
	EPA's Watershed-Based NPDES Permitting Policy , January 2003
	EPA Memo, Committing EPA's Water Program to Advancing the Watershed Approach , December 2002
	EPA's Draft Watershed-Based NPDES Permitting Implementation Guidance , August 2003

1-3.2 Impact of Watershed Regulatory Approaches on Municipal Activities

What is a TMDL?

A written quantitative analysis of an impaired waterbody, which is established to ensure that the waterbody's designated uses are attained and maintained in all seasons.

The CWA's TMDL and stormwater regulations are the primary regulations directing the development of watershed management policies. However, in their efforts to restore an impaired waterbody, regulators are increasingly using the broad scope of these regulations, among others:

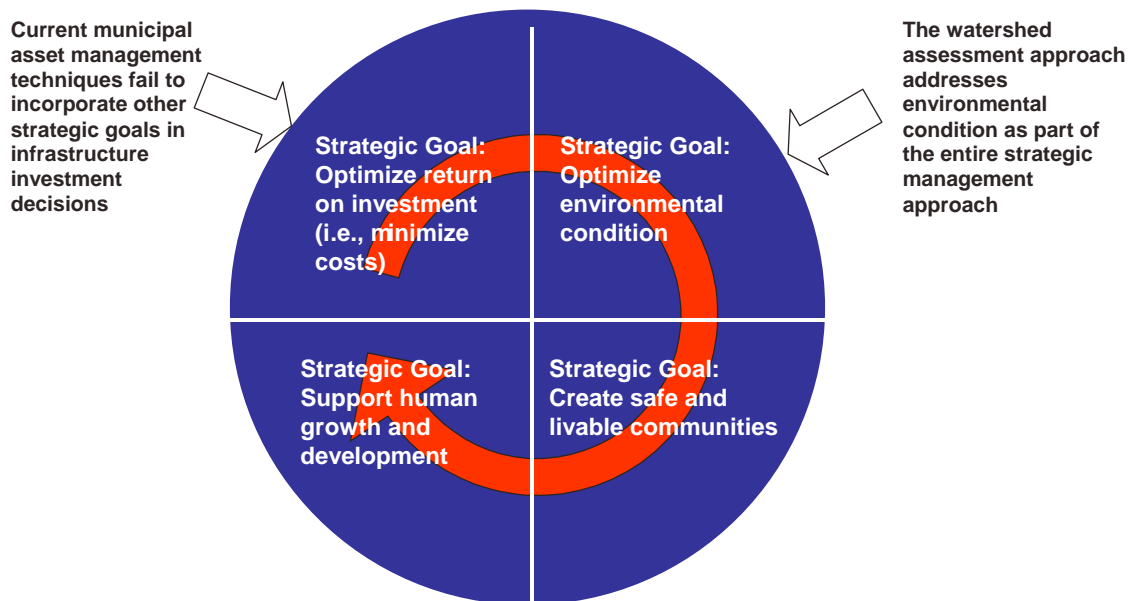
- Modifying a municipality's NPDES, RCRA, or CAA (in the case of CAA, it would be pollutants found in a waterbody that are directly related to air deposition) discharge permits to
 - require monitoring or limits for new pollutants,
 - reduce discharge limits of existing pollutants, or
 - prohibit discharges of particular pollutants
- Requiring stormwater control devices that provide flow control, treatment, or both

- Requiring a permit for or modification of activities that may be generating non-point sources of pollution and are not typically covered under the NPDES program
- Requiring sites to implement best management practices (BMPs) for construction, agriculture, timber operations, and other ground-disturbing activities
- Implementing land use controls or restrictions on activities located on properties surrounding waterbodies
- Requiring development of additional riparian buffer zones, stream bank stabilization, or additional wetlands
- Restricting the site use of surface water and groundwater.

1-3.3 Incorporating Watershed Management into Strategic Assessment Management

Watershed management is a critical dimension of strategic asset management (Exhibit 1-7); it is integral to achieving one of the key municipality strategic goals: enhancing the welfare of future generations by maximizing long-term asset value. Ignoring the environmental impact of an asset decision may only have a minimal impact on the value of the municipality assets in the short term. However, in the long term, a degraded surrounding environment can reduce asset value and impede an asset's functional use.

Exhibit 1-7. How Watershed Management Is Part of Strategic Asset Management Approach



Environmental impact factors into all four strategic asset management steps. First, enhancing and protecting the environment is one of the pillars of the municipality mission. Second, the cost analysis must include quantifying the financial consequences of environmental degradation. Finally, projects that improve environmental conditions improve asset value. Net financial impact would be incomplete without integrating environmental condition.

Current management approaches attempt to optimize asset condition and functionality. They do not address minimizing the environmental impact. Achieving environmental strategic goals requires municipalities to simultaneously optimize three independent asset dimensions: condition, functionality, and environmental burden. By concurrently evaluating the environmental impacts (as measured by environmental burden) and financial performance (as measured by functional value and condition), municipalities can manage infrastructure investments to reach both financial and environmental strategic goals. Environmental burden measures the impact of an infrastructure investment on the receiving environment. Infrastructure investments where the main purpose is not to improve the environment (such as roads and bridges) have a negative environmental burden, and investments designed to improve the receiving environment have a positive environmental burden.

Environmental burden fits nicely within the current asset management system, integrated as a component of asset condition. This technique reduces the value of infrastructure investments that have a negative impact on the receiving environment. This approach also allows municipalities to evaluate funding for projects designed only to improve environmental condition compared with other infrastructure investments (weigh the benefits environmental projects generate from improvements to condition compared with project costs). Exhibit 1-8 shows the impacts of integrating environmental burden on each component of the asset management system.

Exhibit 1-8. Integrating Environmental Burden into Asset Management Systems

Component	Current system	Impact of integrating environmental burden
Inventory of infrastructure assets	List all infrastructure assets and associated data managed by the municipality, including location, construction cost, physical characteristics, and usage	Collect environmental condition (that is, watershed condition) data as part of infrastructure inventory management system
Infrastructure asset valuation	Conduct condition assessments of all infrastructure assets and calculate net present value of asset benefits over useful life	Factor environmental burden into asset condition calculation
List of potential infrastructure improvements	List all infrastructure improvements that have a return on investment greater than the cost of capital	Add environmental condition improvement projects to list
Resource allocation model	Rank the potential infrastructure improvements on the basis of return on investment and total cost	Incorporate environmental burden as a variable in the model to evaluate the effects of environmental condition on investment returns
Infrastructure budget	Select infrastructure investments for funding	Integrate environmental impacts in budgeting decisions

1-3.4 Evaluating Watershed Improvement Projects in Strategic Asset Management

Evaluation of watershed improvement projects begins with a baseline valuation assessment. Municipal managers calculate baseline asset value based on optimal functional value discounted by condition, as measured by both watershed condition (i.e., environmental burden) and ability of the asset to provide functional use.

Municipal managers then evaluate and rank potential watershed improvement projects based on two factors, return on investment and total project cost. Return on investment is calculated using the increase in future asset value (from improved environmental burden) measured against the total project cost.

Finally, municipal managers select watershed improvement projects for funding. Although the process is often subjective, return on investment and total cost are the primary decision-making criteria. Exhibits 1-3 and 1-9 outline the attractiveness for funding projects based on return on investment and total cost.

Exhibit 1-9. Budget Attractiveness of Watershed Improvement Projects

