

Decision Making and Investment Planning



Planning and Defining Municipal Infrastructure Needs

This document is the first in a series of best practices that transform complex and technical material into non-technical principles and guidelines for decision making. For titles of other best practices in this and other series, please refer to www.infraguide.ca.

National Guide to Sustainable Municipal Infrastructure



Planning and Defining Municipal Infrastructure Needs

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INTRODUCTION

InfraGuide – Innovations and Best Practices

Introduction

InfraGuide –
Innovations and
Best Practices

Why Canada Needs InfraGuide

Canadian municipalities spend \$12 to \$15 billion annually on infrastructure but it never seems to be enough. Existing infrastructure is ageing while demand grows for more and better roads, and improved water and sewer systems responding both to higher standards of safety, health and environmental protection as well as population growth. The solution is to change the way we plan, design and manage infrastructure. Only by doing so can municipalities meet new demands within a fiscally responsible and environmentally sustainable framework, while preserving our quality of life.

This is what the National Guide to Sustainable Municipal Infrastructure (InfraGuide) seeks to accomplish.

In 2001, the federal government, through its Infrastructure Canada Program (IC) and the National Research Council (NRC), joined forces with the Federation of Canadian Municipalities (FCM) to create the National Guide to Sustainable Municipal Infrastructure (InfraGuide). InfraGuide is both a new, national network of people and a growing collection of published best practice documents for use by decision makers and technical personnel in the public and private sectors. Based on Canadian experience and research, the reports set out the best practices to support sustainable municipal infrastructure decisions and actions in six key areas: municipal roads and sidewalks, potable water, storm and wastewater decision making and investment planning, environmental protocols, and transit. The best practices are available on-line and in hard copy.

A Knowledge Network of Excellence

InfraGuide's creation is made possible through \$12.5 million from Infrastructure Canada, in-kind contributions from various facets of the industry, technical resources, the collaborative effort of municipal practitioners, researchers and other experts, and a host of volunteers throughout the country. By gathering and synthesizing the best

Canadian experience and knowledge, InfraGuide helps municipalities get the maximum return on every dollar they spend on infrastructure — while

being mindful of the social and environmental implications of their decisions.

Volunteer technical committees and working groups — with the assistance of consultants and other stakeholders — are responsible for the research and publication of the best practices. This is a system of shared knowledge, shared responsibility and shared benefits. We urge you to become a part of the InfraGuide Network of Excellence. Whether you are a municipal plant operator, a planner or a municipal councillor, your input is critical to the quality of our work.

Please join us.

Contact InfraGuide toll-free at **1-866-330-3350** or visit our Web site at **www.infraguide.ca** for more information. We look forward to working with you.



The InfraGuide Best Practices Focus



Decision Making and Investment Planning

Current funding levels are insufficient to meet infrastructure needs. The net effect is that infrastructure is deteriorating rapidly. Elected officials and senior municipal administrators need a framework for articulating the value of infrastructure planning and maintenance, while balancing social, environmental and economic factors. Decision-making and investment planning best practices transform complex and technical material into non-technical principles and guidelines for decision making, and facilitate the realization of adequate funding over the life cycle of the infrastructure. Examples include protocols for determining costs and benefits associated with desired levels of service; and strategic benchmarks, indicators or reference points for investment policy and planning decisions.



Potable Water

Potable water best practices address various approaches to enhance a municipality's or water utility's ability to manage drinking water delivery in a way that ensures public health and safety at best value and on a sustainable basis. Issues such as water accountability, water use and loss, deterioration and inspection of distribution systems, renewal planning and technologies for rehabilitation of potable water systems and water quality in the distribution systems are examined.



Environmental Protocols

Environmental protocols focus on the interaction of natural systems and their effects on human quality of life in relation to municipal infrastructure delivery. Environmental elements and systems include land (including flora), water, air (including noise and light) and soil. Example practices include how to factor in environmental considerations in establishing the desired level of municipal infrastructure service; and definition of local environmental conditions, challenges and opportunities with respect to municipal infrastructure.



Storm and Wastewater

Ageing buried infrastructure, diminishing financial resources, stricter legislation for effluents, increasing public awareness of environmental impacts due to wastewater and contaminated stormwater are challenges that municipalities have to deal with. Storm and wastewater best practices deal with buried linear infrastructure as well as end of pipe treatment and management issues. Examples include ways to control and reduce inflow and infiltration; how to secure relevant and consistent data sets; how to inspect and assess condition and performance of collections systems; treatment plant optimization; and management of biosolids.



Transit

Urbanization places pressure on an eroding, ageing infrastructure, and raises concerns about declining air and water quality. Transit systems contribute to reducing traffic gridlock and improving road safety. Transit best practices address the need to improve supply, influence demand and make operational improvements with the least environmental impact, while meeting social and business needs.



Municipal Roads and Sidewalks

Sound decision making and preventive maintenance are essential to managing municipal pavement infrastructure cost effectively. Municipal roads and sidewalks best practices address two priorities: front-end planning and decision making to identify and manage pavement infrastructures as a component of the infrastructure system; and a preventive approach to slow the deterioration of existing roadways. Example topics include timely preventative maintenance of municipal roads; construction and rehabilitation of utility boxes; and progressive improvement of asphalt and concrete pavement repair practices.

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EXECUTIVE SUMMARY

This best practice focuses on planning and defining municipal infrastructure needs, specifically roads, water, wastewater and sewers. Good planning methods promote efficient and effective municipal spending by providing a framework to focus financial and staff resources where they are most needed. These methods facilitate the sustainability of municipal infrastructure which, in turn, maintains a certain level of provided services.

Planning and defining methods follow an overall corporate vision and are vital in managing municipal infrastructure needs for the long term, especially in communities experiencing population growth, ageing infrastructure or those that aim to have sustainable infrastructure. A capital infrastructure plan integrated with land use and financial plans, and corporate business plans is increasingly seen as key to successful strategic planning. Some of the municipalities surveyed indicated that a lack of cohesion in departmental decision making (and potentially efficient and effective spending) was a result of insufficient links between departmental and strategic or corporate planning activities. High-level goals for levels of service in roads, for example, should be directly correlated to departmental prioritisation targets.

Methods for planning and defining municipal infrastructure needs have been identified as a useful best practice for achieving sustainable infrastructure, because current infrastructure needs are not being addressed in many Canadian municipalities. Planning for, and defining, infrastructure goals can assist in co-ordinating infrastructure needs and municipal finance priorities. Integrated planning can shape and influence the type of growth that occurs and where it occurs. It can also optimize or maximize the use of existing infrastructure (i.e., infill and compact design goals in land use plans with related instruments to target development in certain areas), as well as plan for optimal rehabilitation of infrastructure. Planning and defining methods can also manage the demand on infrastructure through the establishment of good programs to change user behavior (i.e., promoting alternative transportation such as public transit, cycling, or rail to manage road infrastructure demand, or water conservation programs to manage water demand).

There are five methods within this practice of potential interest to municipalities that allow municipalities to develop, analyse, communicate and present the needs for infrastructure, and to incorporate economic, social and environmental issues into the long-term, strategic planning for infrastructure. The key to successful implementation of a strategic planning document is to integrate it within all aspects of municipal decision making. This best practice gives municipalities the basics for developing, analysing, communicating and presenting the needs for infrastructure, and incorporating economic, social and environmental issues into the long-term, strategic planning for infrastructure.

Planning and defining municipal infrastructure best practice methods include:

- Strategic planning: development of integrated vision and strategy
- Information management: asset management systems
- Building public support and acceptance
- Exploring new and innovative methods for continuous improvement
- Prioritization models:
 - weighting and ranking systems
 - linking capital with operations and maintenance (O&M) budgets in planning
 - business case approaches.

1. GENERAL

The National Guide to Sustainable Municipal Infrastructure: Innovations and Best Practices is intended to be a decision-making and investment planning tool as well as a compendium of technical best practices and innovations. The Guide will provide a road map to the best available solutions for addressing infrastructure issues.

The Guide consists of two parts: a decision-making and investment planning tool, and a compendium of technical best practices. The first part is intended for use by municipalities to assess their needs and help both senior management and technical staff, as well as elected officials, manage their infrastructure assets more effectively by using best practices in the selection, development and implementation of infrastructure projects. The second part comprises various sets of technical modules to provide municipal practitioners with best practices for the choice of technologies and methodologies.

1.1 INTRODUCTION

This best practice gives municipalities the basics for developing, analysing, communicating and presenting the needs for infrastructure, and incorporating economic, social and environmental issues into the long-term, strategic planning for infrastructure. The municipalities profiled undertake these practices in a variety of ways that have evolved in response to their infrastructure and community needs.

Planning and defining municipal infrastructure best practice methods outlined below include:

- Strategic planning: development of integrated vision and strategy
- Information management: asset management systems
- Building public support and acceptance
- Exploring new and innovative methods for continuous improvement
- Prioritization models:
 - weighting and ranking systems
 - linking capital with operations and maintenance (O&M) budgets in planning
 - business case approaches

Their intent is not to provide definitive solutions to municipalities, as all municipalities are unique but rather to provide guidance towards local best practices and infrastructure management optimization.

1.2 SCOPE

Planning and defining methods follow an overall corporate vision and are vital in managing municipal infrastructure needs for the long term, especially in communities experiencing population growth, aging infrastructure or those that aim to have sustainable infrastructure. A capital infrastructure plan integrated with land use and financial plans, and corporate business plans is increasingly seen as key to successful strategic planning. Some of the municipalities surveyed indicated that a lack of cohesion in departmental decision making (and potentially efficient and effective spending) was a result of insufficient links between departmental and strategic or corporate planning activities. High-level goals for levels of service in roads, for example, should be directly correlated to departmental prioritisation targets.

Many municipalities have realised the added value in public participation in decision making through committees, workshops, surveys and other avenues of involvement, which leads to increased awareness of municipal responsibilities, support and acceptance of municipal goals. Municipalities are doing this to varying degrees, as demonstrated in the methods profiled in this document. This is partly a response to an identified need by the public for municipal government transparency and accountability in decision making.

The planning and defining methods profiled in this document can provide decision-makers with a view of the successful links between municipal planning and sustainable infrastructure.

1.3 EMERGING ISSUES

Many municipalities in Canada are facing new pressures or increased complexity in infrastructure decision making as a result of several trends over the last decade. Some of these trends have resulted directly in financial pressures; others have had indirect effects as a result of increased public concern or senior government regulatory requirements. The intensity with which the following issues are being realized has increased significantly:

- delegating of responsibility for several services formerly managed by provincial authorities to municipalities, while access to new funding has not increased in proportion to infrastructure needs;
- concern for public health and safety, especially with respect to potable water and emergency services;
- concern for road traffic congestion and speeding;

- concern for aging populations and ease of access to services;
- concern for aging infrastructure supporting municipality;
- concern for air and water quality, watershed integrity, biodiversity decline, species at risk, and maintaining green spaces, natural areas and terrestrial wildlife habitat;
- implications of the growing number of satellite communities and commuters;
- an expectation of transparency and accountability in government spending; and
- regulatory requirements such as senior government requirements for toxics management. Specific issues of interest to municipalities include reporting toxics to the National Pollutant Release Inventory (NPRI), the management of smog (particulate matter and ozone and other smog precursors) and the management of wastewater effluents (ammonia, chlorinated compounds and other substances declared toxic under the *Canadian Environmental Protection Act*, such as road salt).

Public concern and senior orders of government requirements for action to abate climate change have not resulted in significant municipal infrastructure pressures to date, but increased expectations and commitments are likely over the next decade, both for mitigation measures and adaptation needs.

New planning approaches are being developed to prioritise infrastructure needs and find ways to allocate funds most efficiently and effectively. Some new approaches include land-use plans predicated on the limitations on growth, in a given environmental region. New planning methods can shape the fiscal envelope for infrastructure funding.

The integration of environmental, economic and social objectives is emerging in municipal decision making at all levels, to varying degrees. Similarly, municipal infrastructure is related to broader community health and quality of life goals.

1.4 GLOSSARY

Alternative Funding (or Innovative Funding) — Revenue or funds received or generated from sources and methods other than the traditional property tax fund.

Benchmarking — Measuring performance against a standard of quality (industry sector or technical standard).

Best Practices — State-of-the-art methodologies and technologies for municipal infrastructure planning, design, construction, management, assessment,

maintenance and rehabilitation that consider local economic, environmental and social factors.

By-law — Municipal regulation.

Capital — Up-front costs associated with building new infrastructure and investment that extends the life of current infrastructure.

Green Spaces — Natural land, park land or recreational space designated as such within a municipal jurisdiction.

Infrastructure — Refers to those hard infrastructure assets that relate to municipal road, water, wastewater and sewer systems.

Levels of Service — Levels of service reflect social, technical and economic goals of the community and may include any of the following parameters: safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost and availability. The defined levels of service comprise any combination of the above parameters deemed important by the municipality

Life Cycle Asset Management/Total Asset Management — A tool consisting of an inventory of assets, and the ability to track the performance and projected needs of those assets based on life cycle maintenance and care activities and their associated costs during the expected life of an asset, typically computerized.

Long-Term Planning — Ten-to-50-year planning horizon.

Municipality — Jurisdiction that includes both urban and rural areas, and can be both large and small in population size

National Pollutant Release Inventory (NPRI) — An authority granted under *the Canadian Environmental Protection Act* to Environment Canada that requires reporting of pollutants released in Canadian communities by industry and other sectors.

Potable water — Drinking water.

Senior Government — Provincial, state or federal levels of government.

Solid Waste — Municipal garbage.

Species-at-Risk — Biological species in Canada that are at risk of becoming extinct or extirpated.

User Pay — Fees charged specifically to the users of a service, based on the user's consumption of, or reliance on, the service.

Utility — A service that is brought to, or from, individual properties, which operates on a cost-recovery basis to manage capital assets and O&M.

2. RATIONALE

Methods for planning and defining municipal infrastructure needs have been identified as a useful best practice for achieving sustainable infrastructure, because current infrastructure needs are not being addressed in many Canadian municipalities. Planning for, and defining, infrastructure goals can assist in co-ordinating infrastructure needs and municipal finance priorities. Integrated planning can shape and influence the type of growth that occurs and where it occurs. It can also optimize or maximize the use of existing infrastructure (i.e., infill and compact design goals in land use plans with related instruments to target development in certain areas), as well as plan for optimal rehabilitation of infrastructure. Planning and defining methods can also manage the demand on infrastructure through the establishment of good programs to change user behaviour (i.e., promoting alternative transportation such as public transit, cycling or rail to manage road infrastructure demand, or water conservation programs to manage water demand).

Good planning methods promote efficient and effective municipal spending by providing a framework to focus financial and staff resources where they are most needed. These methods, profiled in the next section, facilitate the sustainability of municipal infrastructure which, in turn, maintains a certain level of provided services.

3. GENERAL DESCRIPTION

This best practice is represented by a number of methods that contribute to improved planning and definition in municipal decision making relating to infrastructure. Each method is profiled in the following section, and includes an overview of the following elements:

- description including the approach, context of use, objectives of the practice, mechanics (i.e., how it works, with examples of method application) and cost implications;
- application potential; and
- limitations.

4. STRATEGIC PLANNING: DEVELOPMENT OF INTEGRATED VISION AND STRATEGY

4.1 PROFILE

Planning can be integrated in the form of a strategic vision, official community plan or strategy (vision). This vision leads to an official community plan, an infrastructure plan, an economic plan and a financial plan. It involves consultation with the public to establish a vision of what the municipality should look like in the future, and the goals and objectives to get there. It is usually set for a given planning horizon, subject to periodic review by the municipality. It is best to integrate this vision with defined levels of service objectives. The levels of service, in turn, are balanced with affordability and other factors. The key to successful implementation of the strategic planning document is to integrate it within all aspects of municipal decision making. The strategic plan subsequently drives all development and operational plans for the municipality, including departmental prioritizing processes. Departmental plans should reflect the objectives of the strategic plan, and show how their planning priorities are linked with a strategic outcome of the vision. This ensures the municipality develops and operates (or limits development, as the case may be) within an established framework of well-defined priorities, and within its capacity to service infrastructure, often considering the environmental carrying capacities of its location.

4.2 EXAMPLES

Surrey, British Columbia has an official community plan (OCP) based on its established vision. The plan will guide land use and infrastructure development for the next five to twenty years. It was developed because Council is intending to achieve orderly growth in a high-growth region (the municipality of Surrey represents six distinct communities), and Council members want Surrey to be environmentally sustainable in its growth patterns. The OCP is a guiding document for the municipality, and will be reviewed every five years; however, Council will only consider changes to it if the changes would bring significant benefit to the municipality. Each department in the municipality prioritizes its needs based on the goals set in the OCP. Stemming from the OCP is an economic plan to increase the commercial base in each town centre as a demand management strategy intended to decrease the volume of commuter employment in Vancouver.

Okotoks, Alberta has a guiding vision from which its municipal development plan (MDP) was established. This vision was based on public consultation and grounded in the recognition that there are environmental limits to growth within the watershed. As a result, the MDP has established a cap on growth, based on the maximum carrying capacity of the watershed. Okotoks established this vision in the context of its experience as a high-growth municipality. There is an action

plan to implement related elements of the vision into decision making at all levels, including infrastructure development. The goals include environmental stewardship, social conscience, economic opportunities and fiscal responsibility. The goals specifically relating to infrastructure planning include environmental protection, sustainability and sizing infrastructure developments in line with carrying capacity. Departmental priority setting is grounded in the MDP and vision, with public health, safety and environmental considerations as priorities.

Winnipeg's strategic plan sets out a series of three-to-five-year goals for each department. Overarching goals are translated into corporate programs, and the city experienced a boost in solid departmental goal setting in the last four years. Each department has a business plan that allows managers to track progress with regards to finances. An extensive public consultation process accompanies this, and takes place in the form of an annual public survey of satisfaction levels with municipal service delivery. This information leads to priority setting for the city. Within the plan, there are goals pertaining to sustainable development and land-use planning (encouraging compact urban development). The goals for achieving sustainable development relate to downtown design (infill), economic development, an integrated transportation plan, safe communities, public health, and environmental image and amenities (reducing greenhouse gases, increasing heritage buildings and increasing park space). The plan is reviewed every five years. The city has also established a green agenda, relating to the above commitments.

Calgary, Alberta has a municipal development plan with a comprehensive land-use planning strategy that is tied in with a sustainability strategy. Goals include land-use balance, public transportation and multiple housing. The city uses indicators and targets to achieve higher-level goals, such as air quality and wastewater treatment. These targets are integrated into the overall planning cycle for the municipality, and connected to the MDP and the sustainability strategy.

Annapolis County, Nova Scotia has a strategic plan with the following key goals: environmental protection, social health, fiscal stability, economic/community development and good governance. This plan is reflected in yearly action plans.

Brisbane, Australia has a corporate plan that guides the budget-setting process and a community strategic plan. Outcome areas of the corporate plan are linked to focus areas of the community strategic plan. These plans provide a framework for program prioritization and goal setting; each department must justify project priorities relative to the goals outlined in the strategic and corporate plans.

Cardiff, United Kingdom has a strategic community plan (SCP), which is updated annually and outlines 50 high-level strategic objectives for the municipality. Stemming from this plan is a sustainability strategy, a unitary development plan and the Ambitions for Cardiff Plan. The SCP provides the overall context for departmental prioritization. Priority setting is heavily based on

social priorities outlined in the SCP. The project appraisal system used by departments is based on social and environmental goals.

Toronto, Ontario has strategic directives for Council, which prioritize municipal goals in the following order: health and safety, legislation, state of good repair, service improvement and enhancement, and growth.

4.3 ASSESSMENT

Other (although not all) municipalities interviewed had strategic plans. Shortfalls included that most plans did not appear to incorporate a balance of social, economic and environmental priorities, plus, it was not clear whether or how the strategic plan was integrated with decision making at all levels.

The approach of developing a vision or overall strategy for a community with a balance of social, economic and environmental goals has been around for some time. However, municipalities are finding new imaginative ways to make it work: more practical and meaningful methods, more clearly linked to planning and decision-making processes.

The idea is applicable for large and small, urban and rural, and high-growth and slow-growth municipalities. Although it may be a time-consuming process to develop the vision or strategy, there are no intensive costs. Most municipalities interviewed indicated it was well worth the time and effort to consult with the public and prepare iterative plans that led to a solid final document to guide the decision-making process. Municipalities indicated the intrinsic benefits to having such guiding plans are fundamental: a framework in which to operate that incorporates social, environmental and economic objectives is vital to the successful operation of any municipality.

5. INFORMATION MANAGEMENT: ASSET MANAGEMENT SYSTEMS

5.1 PROFILE

Information management refers to the use of information systems as inventory programs that feed into planning needs, since good planning requires a sound information system. This usually involves software/database systems that facilitate decision making for long-range infrastructure plans. These systems can be developed in a variety of ways, with varying levels of detail, depending on the municipality's needs and available resources. Some municipalities purchase packaged systems to help them get started (Australian systems are commonly cited), while other municipalities generate their own system in-house using commonly available spreadsheet software. Generally, the concept is to include an inventory assessment of infrastructure components (or groups of components) as baseline data. From here, systems can include annual data on condition assessment, demand, usage, risk assessments, condition prediction, etc. Such a system allows municipalities to plan their needs and investment priorities for the long term, plus it allows them to have on-demand information on detailed systems. Most systems would use the inventory as a baseline and input parameters (e.g., usage, risk weightings) on an annual basis. Then, the program would prioritize infrastructure needs based on established criteria, and forecast them for the next planning cycle and beyond. Many municipalities find such information systems extremely beneficial, because they did not have a comprehensive inventory of all assets. In addition, the systems usually include asset monitoring, ongoing condition/degradation analysis, performance assessment, determination of the most economic and efficient replacement time, and calculation of financial projections for project repair.

5.2 EXAMPLES

Portland, Oregon uses a life-cycle costing approach to long-term investment planning; it is captured in a new asset management system. This tool helped them decide to build three new fire stations with "green roofs" to reduce energy costs and manage storm water in the long term. Council requires a full life-cycle costing package presentation for all capital project proposals. The city also uses a monthly project tracking function, so all capital projects under way are regularly tracked. If there appears to be greater than 20 percent deviance from the proposed budget, the project is discussed again by council before proceeding further.

Caledon, Ontario, uses an asset management program to help prioritize capital spending. The program uses a life-cycle analysis and cost-benefit analysis approach. The city indicates this has been in use for two years and is an objective management tool. The program can also prioritize operations and maintenance (O&M) needs, with designated levels of service for primary and secondary assets.

New Glasgow, Nova Scotia uses an asset management system that is in a geographical information system (GIS) form. Hand-held palm pilot global positioning systems are used to quantify and qualify the condition of assets in the field and determine an asset's repair or replacement value. This is done on a yearly basis. It does not profile all assets, at this point in time.

Winnipeg, Manitoba is developing a sustainable asset management tool, which uses a life-cycle costing approach to planning infrastructure investments over the long term.

Hamilton, Ontario is implementing a life-cycle asset management system that will forecast needs and sustainable financing requirements for 100 years. The city has been using it for water and wastewater planning, and plans on incorporating all other aspects of infrastructure into it. Halifax, Nova Scotia is also implementing a life-cycle asset management system.

Yellowknife, Northwest Territories does not have a total asset management system. However, it does have an asset management program for roads, which prioritizes road projects according to a set of criteria. Like many smaller municipalities that do not have a total asset management system, Yellowknife does however rely on their road asset management program.

Cardiff, United Kingdom uses asset management plans (AMPs) because they are nationally required for local authorities. They are seen as a long-term strategy to achieve better value for money from capital assets. The National Assembly of Wales outlined AMP guidelines with a deadline for implementation, that engages all cabinet members in the decision-making process and allows target funding to increase according to community need. To accomplish these goals, Cardiff formed an asset management sub-group.

Brisbane, Australia has been using a total asset management framework to link departmental information together in assessing infrastructure priorities for 25 to 30 years.

5.3 ASSESSMENT

The use of asset information and management systems appears to be more prevalent among medium to large municipalities in Canada, although it's still not in mainstream use. It has been in use for quite some time around the world and, as such, is not very "new"; however, the newest versions of these systems have only been in use in Canada for a few years. Information systems are valuable for all types of municipalities, but are extremely useful for large municipalities with extensive assets and increasing demand on those assets. Information systems are time consuming to establish because of the extensive inventory system that is necessary to get them up and running. While it is normal to take a few years of time and effort for full system implementation, the benefits of having the system

are great. The system essentially provides full justification for project prioritization using established criteria, thus facilitating the information exchange with decision makers, plus it allows the municipality to be aware of risks and liabilities associated with infrastructure conditions; this knowledge is quite valuable to municipalities.

Notwithstanding the many benefits of asset management systems, it must be recognized that their success is predicated on many factors not least of which are:

1. asset understanding in the context of life cycle, and
2. integration within a strategic framework which allows for consistent decisions for individual asset components.

6. BUILDING PUBLIC SUPPORT AND ACCEPTANCE

6.1 PROFILE

Since the public is the primary stakeholder in planning and prioritization, the public is a major influence in decision making for infrastructure. While not all projects require consultation, there should be sensitivity to those projects where consultations are essential or could be beneficial. The public uses, owns and pays for infrastructure and, in this sense, public involvement in decision making is important. Public consultations use varying mechanisms for gaining feedback including polls, mail or phone surveys, open houses and focus groups. As regular participants in planning processes, members of the public could have seats on steering committees and other issue committees, and they could be encouraged to attend council meetings. In addition, the public could be consulted to gauge acceptance or willingness to pay for certain programs. An annual survey is a very valuable way to determine levels of satisfaction with infrastructure services being received, or to get reaction to proposed infrastructure budget priorities.

The survey could be a general survey or it might relate to a specific project or decision. The consultation could take place at all planning levels including implementation, at all stages of the decision-making process. For example, consultation could take place before the annual budget is set or as input to the process, or it could take place after an infrastructure prioritization plan is developed, to solicit feedback. It could also involve consultations as input into a strategic plan, or for other plans that stem from the strategic plan, such as a municipal development plan, environmental strategy or similar comprehensive policy mechanisms. Consultations as input to strategic planning usually take place at the start of the decision-making process, and can be used to gather input into the community vision, or as a feedback mechanism for developed strategies. They could also be in the form of committees that engage the public with municipal managers on issues or decisions. The mandate, scope and reason for public involvement must be defined to have focussed input that is effective.

A consultative approach can do a variety of things for a municipality, such as:

- allow managers to gain insight as to the public's level of satisfaction on specific infrastructure issues;
- give managers insight as to what the public considers the municipality's strategy should include;
- provide a vehicle for the public to channel views;
- establish a mechanism for the municipality to refine its vision, strategy or policies;

- provide an opportunity for municipal managers to inform the public of their plans and the reasons for them;
- assist municipal managers in identifying areas of specific service that need to be improved;
- gauge specific reactions for potential rate or tax increases;
- provide an open, transparent decision-making process, which will increase public support for the municipality's decision makers; and
- help establish levels of service.

6.2 EXAMPLES

Grand Falls-Windsor, Newfoundland consulted the public on the need to increase rates to cover some of the costs for a new water and sewer treatment plant. The town conducted information sessions and demonstrated the value of paying for these projects through federal grants and dedicated revenue from taxes, highlighting the increased quality of life that would result. It was able to gain considerable public support for the rate increase. The town also had a unique approach to gaining public input on municipal priorities. In establishing its next strategic plan, the town conducted a series of workshops that invited members to discuss departmental priorities in the five-year strategic plan. They used an external facilitator to run the consultations. (There were no municipal representatives present.) This approach was seen as highly successful because it encouraged the public to provide honest views. (In a small town, the direct involvement of municipal officials can discourage honest debate.)

Similarly, New Glasgow, Nova Scotia conducted surveys on a proposed eight percent increase in water rates needed to pay for a new sewage treatment plant. The municipality demonstrated the health and environmental issues associated with the older sewage lagoon system, and the public was supportive of the rate increase.

Okotoks, Alberta completes a general household survey (every household) once per term of Council and selected service-specific surveys every year. Responses guide Council members in their determination of municipal service priorities and direction.

Halifax, Nova Scotia conducts bi-annual surveys before beginning the budget process to gain feedback and assist Council in setting priorities. The aim is to set priorities based on the public's perception of the city's goals.

Winnipeg, Manitoba conducts an annual public survey to assess the level of satisfaction with municipal service delivery. This information feeds into the priority setting for the municipality.

Calgary, Alberta conducts annual surveys on satisfaction with levels of service.

Charlottetown, Prince Edward Island has a committee for sustainable development.

Annapolis County, Nova Scotia uses a municipal area advisory committee as a “bottom-up” source of views on overall fund prioritization for the municipality.

Iqaluit, Nunavut undertook a public consultation program to develop its strategic vision. Council places a high priority on the public consultation process to get input on proposals before making decisions.

The Greater Vancouver Regional District, British Columbia has found great benefits in using a citizen’s advisory committee in a controversial dam project. The committee was made up of municipal representatives, Greater Vancouver officials and neighbourhood stakeholders. The project was delayed for one year so this committee could work with the public and gain support. This process was considered successful and was integral to the decision to proceed. Vancouver has neighbourhood teams for police, parks and other planning exercises that require cross-departmental co-ordination and discussion.

Yellowknife, Northwest Territories conducts an annual citizen survey, which is part of its budgetary policy. In the annual survey, the public is asked what their “willingness to pay” is, for certain proposed program ideas, including road upgrades. This helps the city gauge acceptance of potential rate or tax increases.

Brisbane, Australia produces a corporate and community plan every year that looks four years ahead. These plans are rolled over and prioritized each year as part of the planning and budgeting cycle. Brisbane also conducts annual community satisfaction surveys on levels of service. Brisbane has a process called “Your City Your Say” involving a core group of 600 citizens/families who are regularly surveyed on a range of projects and issues.

Winnipeg Manitoba conducted “public tolerability surveys” that involved a pilot project conducted by a task group on tolerability, formed in 1999. The objective was to enable the city to determine the level of service the public will tolerate with respect to road surface conditions. The task group designed a process for collecting public input on this matter, and prepared an action plan for identifying and recruiting volunteer participants, developing a questionnaire, and identifying routes and the procedure used during the survey. The task group then executed the survey, analyzed the results, documented issues and prepared a report. Road conditions were assessed on the basis of pavement cracking, the quality of ride and aesthetics. If respondents indicated a condition for any of the three indicators was “very poor,” then a rating of “intolerable” was assigned. Results indicated that participants tolerated a lower standard of roadway condition than was

previously thought. The pilot project sample was small, and results would have to be replicated in future studies to confirm findings. The report recommends that the concept of using public input to determine public tolerability and levels of service should continue to be developed.

Charlottetown, Prince Edward Island has established a committee to look at how the city manages sustainability. It is called the Environmental Initiatives Sub-Committee and is composed of representatives from the various departments (e.g., public works, parks/recreation, planning and development, utilities and the environment), as well as a chairperson from Council. The goals are to establish multi-disciplinary and multi-departmental participation in decision making, to include representatives of the public and to develop/review/achieve environmental and sustainable goals.

6.3 ASSESSMENT

Public consultation is valuable because municipalities need effective ways to gain public input for decision making. Not many interviewees reported routine public consultations as input to the strategic planning process, so it appears consultations are not as prevalent as they could be. The approach of using stakeholder/citizen committees to gain public input into the strategic decision-making process is not new, but the methods and applications are being constantly refined. The approach can be used in every type of municipality, and would have significant value for community members and municipal managers. It may take time and require personnel resources to manage, to strike new committees and establish associated processes. Most municipalities find there is great value in public involvement in strategic planning, both in terms of improving the plans and in building community consensus. The reader may wish to consult the “Developing Levels of Service” best practice for additional gauges by which a community may conceive of and aspire to sustainable infrastructure.

7. EXPLORING NEW AND INNOVATIVE METHODS FOR CONTINUOUS IMPROVEMENT

7.1 PROFILE

This proactive approach provides a mechanism for corporate objectives to be addressed. It refers to a diverse range of management approaches to provide capacity for innovative infrastructure management. It could be a decision to allocate staff or resources (e.g., funds for external consultants) strategically to improve the analysis of infrastructure options, or it could be to demonstrate an ability to explore new innovative infrastructure solutions in the form of pilot projects that represent a municipal objective. Innovative approaches can be used at any particular stage of the decision-making process, depending on the area of focus preferred by the municipality, and could also involve private or public partners. Some municipalities have used innovative approaches to focus on risk management or self-assessment, to research pilot projects to assess options for infrastructure solutions or for special project committees. The key is that these approaches create a corporate perspective and include corporate priorities into decision making at the departmental level.

By building capacity through staff resources or pilot projects, a municipality demonstrates its commitment to strategic issues within the organization. Pilot projects promote the multi-disciplinary development of skills and organizational learning; and assist in resource estimation. There is a greater chance of cross-training staff inter-departmentally on a municipal strategic objective when a municipality focuses on capacity building through strategic allocations of staff.

7.2 EXAMPLES

Winnipeg, Manitoba has established an internal risk management team to consider all aspects of risk when evaluating priorities for infrastructure programs. The objectives are to look at worst case/best case scenarios for project plans, and account for financial and liability risks. In addition, the city has benefited from the use of a project advancement committee that was used to co-ordinate all public consultation and communication activities.

St. John's, Newfoundland employs an interdepartmental risk assessment manager to advise department managers and project officers on risks (public, health, safety, financial) associated with proposed projects on a rotating and as-needed basis.

Surrey, British Columbia uses a capital ranking committee to score projects and consolidate overall infrastructure objectives before presenting information to Council. The committee has interdepartmental representation and is chaired by a finance representative.

Portland, Oregon has established an office of sustainable development to integrate environmental, social and economic goals throughout the city's departments.

Cardiff, United Kingdom uses an audit commission to scrutinize results of internal best-value audits with a goal of continuous improvement in service delivery.

Portland, Oregon has built three new fire stations with "green roofs" that are managing storm water more effectively and reducing municipal use of energy. The city is using the three facilities as a model, and strategically promoting them to the construction industry as a pilot project example of more efficient infrastructure sustainability and reduced financial costs in building operation.

Iqaluit, Nunavut has a strategic goal to become a "green community." As such, it has conducted a feasibility study that incorporates environmental objectives into an infrastructure solution. The city has recently undertaken the APEX Healthy Homes Project, a grey water recycling pilot project that reuses all drain water in the home for flushing and other secondary water needs. There is interest in applying the concept to a large portion of the community currently on a trucked water/sewer system (one third of the city). The feasibility study for the project was funded by the Federation of Canadian Municipalities. The municipality has also identified the importance of building internal capacity to make better decisions pertaining to infrastructure.

7.3 ASSESSMENT

All municipalities make decisions about how to organize themselves; however, not all municipalities are prepared to allocate staff time and resources to pursue strategic infrastructure goals or to implement higher risk pilot projects. There is nothing new about this type of approach, but the nature of the assignments and the pilot projects are new, and reflect an evolving understanding of the nature of infrastructure issues. In return for a relatively modest investment of human and financial resources, municipalities can enhance their long-term ability to make sound decisions and increase their options for infrastructure investments.

8. PRIORITIZATION MODEL: WEIGHTING AND RANKING SYSTEMS

8.1 PROFILE

Weighting and ranking refers to corporate prioritization processes and reflects the micro-level of decision making that often takes place at the departmental level, following a technical assessment or the macro level of decision making at a corporate level. It is more of a qualitative assessment and, although it can take place within the overall framework of an asset management system, weighting and ranking usually involves many other factors that can be termed multi-criteria considerations. Regardless of whether a municipality has an asset management system or not, all departments need to prioritize their planned projects using a combination of technical and qualitative information, and judgment. The method typically includes weighting factors in a prioritization system and, often, public input is of assistance in developing weighting factors. This is usually necessary before presenting proposals to Council. Qualitative criteria can include social, economic and environmental goals, since the criteria are often linked to corporate strategic objectives. Some municipalities choose to formalize the method used to conduct this prioritization.

8.2 EXAMPLES

In Portland, Oregon, departments refer to a manual to set priorities using filtering criteria such as:

- Is the project mandated?
- Are there health and safety issues?
- Will it decrease operating costs?
- Is it a sustainable practice?
- Is there economic support for it?
- Is it a community plan priority?
- Will it decrease liability?

Their prioritized list is then presented to Council.

Caledon, Ontario uses a priority model in which department managers calculate the best areas in which to spend money (best value for money) by reviewing the technical priorities and the status of service delivery (the effectiveness and efficiency of service). Environmental goals are considered as well as whether

there is increased value to taxpayers in changing the level of service. Essentially, the city uses a results-based management approach to infrastructure prioritization.

Surrey, British Columbia has developed a capital ranking model (CRM) as a formal method of rating/weighting projects and for fund allocation. The model assigns an overall project feasibility rating, and creates funding models for each program area. The funding models are ranked in order of priority and allow for a collective decision-making process on top of individual departmental plans. (Traditionally, departmental plans were not consolidated into a corporate perspective.) Social, economic and environmental goals are taken into consideration in the CRM.

Grande Prairie, Alberta uses a capital project evaluation and weighting system that considers criteria such as legal and safety issues, level of service, community enforcement, business priorities, life of the asset, urgency of need and cost benefit analysis. This is done at the departmental level. The model requires an assigned score of one to five in all the detailed criteria areas. Then, at a second stage, a score is assigned for emergency rating. A third stage involving a cost assessment is conducted. This model prioritizes projects whose costs are recovered within the year of the project's conception, and the lowest score is assigned to projects that will not have recovered costs within five years. The last stage involves a qualitative rating by experts, and includes a balance of social, economic and environmental goals.

New Glasgow, Nova Scotia uses a technical merit system, which is a formal weighting system that prioritizes projects and funding allocations according to feasibility and technical merit.

The Greater Vancouver Regional District, British Columbia uses a long-range utility planning program called a criteria ranking system for all aspects of infrastructure planning. It includes a comprehensive risk assessment, regulatory analysis, health and safety evaluation, and impact assessment for property and the environment. The program also assesses the risks of not meeting a basic level of service. Departments use it to prioritize projects before presenting them to Council.

Toronto, Ontario indicated it also uses a prioritization tool at the department level that reflects Council's strategic directives.

8.3 ASSESSMENT

Not all municipalities have a prioritization tool. Some of those that do not indicated they realized it would be helpful to use one. In the absence of prioritization tools, the budget allocation system usually consists of departments presenting a long list of proposals to Council, and Council deciding what will be funded. Decisions may also be made on the basis of historical allocation. There is

inherent value in a prioritization tool, because both departmental and Council decisions are based on rational, defensible, transparent criteria. While various weighting and prioritization approaches have been in use for many years, more recent applications appear to be more practical than some that were used in the past. Municipalities today have to deal with more complex issues, they have less funding from senior levels of government, and they need tools to assist them in making sound prioritizations for the funding they do have. The prioritization tool approach is generally applicable to every type of municipality, but the criteria used or weightings assigned may vary depending on the priorities in each municipality's strategic plan or vision. The weighting factors could be problematic, and sensitivity analysis is needed within the system used. This approach is not necessarily costly or difficult to apply. There would be a time investment to develop criteria, ranking or weighting systems in an appropriate tool form. There may also be a need for an external consultant to develop an appropriate tool, and the public may be needed to define priorities and criteria.

The benefits of a prioritization tool are very significant, and the small investment made to get such a system in place would most likely save the municipality time and expense in decision making each year. Such a tool can allow for flexibility for Council's decision making (e.g., fast growth versus aging infrastructure). There might be legal obligations or provincial government requirements to meet in designing asset allocation systems, especially with regard to public-private partnerships or other contractual obligations.

9. PRIORITIZATION MODEL: LINKING CAPITAL WITH O&M BUDGETS IN PLANNING

9.1 PROFILE

This is an analytical process that takes place in the project planning phase. The full life-cycle cost of a capital investment is reviewed, and any estimated increases or decreases in the operation and maintenance budget are considered. Full costs are identified as part of the project proposal, for replacement and for new infrastructure. This allows the municipality to plan more accurately for future operating and capital budget allocations, and avoid chronic O&M budget shortfalls. In effect, the municipality is able to make better decisions regarding capital project planning, if projects are only allowed to go ahead once the entire projected cost package, including O&M, is reviewed. This method includes accounting for depreciation, reliability and maintenance schedules, and results in optimizing asset performance and life cycle considerations. This method can apply to all capital infrastructure decisions.

As the following examples indicate, this approach can be applied in both slow- and fast-growing municipalities, large and small, rural and urban.

9.2 EXAMPLES

In Okotoks, Alberta, the linkage of capital expenditures to operating budgets actually forms the basis of decision making for the town. The operational budget must be able to sustain the increased costs of new infrastructure in order for a capital project to be approved.

Vancouver, British Columbia has linked the operating budget with capital expenditures for the past three to four years. Debt charges to borrow are added to O&M bulk rates.

Caledon, Ontario links operating budget allocations with capital project planning through asset management software. It also considers any predicted changes in the nature of the asset. The town indicated it distinguishes between operating costs to provide a service and the value of the asset being used to provide that service.

Winnipeg, Manitoba links operating budget allocations to capital projects. The utility rates charged account for O&M costs. Winnipeg also linked O&M to capital costs as part of a public-private partnership agreement for a new transportation bridge.

Toronto, Ontario indicates that the net operating impacts, work-force requirements and debt servicing needs are all evaluated when considering capital projects.

New Glasgow, Nova Scotia indicated that operating budget allocations are linked to capital project planning through the project business plans for new developments. It cited a recent example of building a marina where both the O&M and capital costs were considered as a package before project approval was given.

Grande Prairie, Alberta links the operating budget to capital project planning for all new infrastructure investments, to assess the capacity to maintain the new facility.

Iqaluit, Nunavut indicated that it links capital project planning with the operating budget as a standard practice to allow for more realistic funding allocations.

St. John's, Newfoundland links operating budgets with capital project planning. In the recent decision to build a new water filtration plant, the O&M costs were built into the total cost.

Cardiff, United Kingdom always links operating budget allocations with capital project investments, as the proposals must include O&M estimates.

Portland, Oregon, links operation budget allocations with capital project planning in all instances. Projects for which operating funds are not available, are not approved by Council. Funds identified as operating needs are identified in the budget.

Brisbane, Australia started linking O&M and capital budgets three years ago.

Annapolis County, Nova Scotia considers O&M budget linkages by using a break-even analysis incorporated in its community impact model.

9.3 ASSESSMENT

Linking capital with O&M budgets is being done, to some degree, by about two thirds of the municipalities interviewed. Some municipalities reported they are not doing it at all (including both large and small municipalities). In most cases, the linkage is a recent event. Linking capital with O&M budgets is applicable to all types of communities, since it promotes better decision making and more accurate budget planning. It may be that fast-growing municipalities stand to gain the most by implementing this linkage, since they are most at risk of adding future liabilities. The municipalities that have adopted this approach ensure they have a funding strategy in place before a project is approved. This tool is not costly or difficult to apply, and would involve strategic thinking, forecasting demand and projecting O&M costs. While the use of the tool itself is not costly, its application can significantly affect costs allocated to O&M budgets or approvals for capital expenditures. Finally, and most importantly, the linkage of capital with O&M budgets in the planning phase promotes improved initial investment decisions, since a full life cycle approach to infrastructure asset management is explicitly acknowledged.

10. PRIORITIZATION MODEL: BUSINESS CASE APPROACHES

10.1 PROFILE

The business case is used in departmental prioritization and budgetary planning exercises. Departments prepare a business case for a project or budget proposal, which would generally include:

- proposal background;
- current level of service to meet the need;
- requirements for the proposal;
- options to achieve the requirements (including the do nothing option);
- financial analysis;
- assumptions made;
- risk assessment;
- analysis of non-financial factors (e.g., technology changes, regulatory, policy, procedural changes);
- strategic context;
- implementation plan (e.g., schedules, projections, feasibility); and
- conclusions (i.e., recommended option = best value for money).

A business case approach is traditionally a private sector or corporate common sense approach to planning, which is being adopted into many levels of government, including federal, provincial and municipal investment planning. Municipalities would have departments prepare business cases and present them to senior departmental staff or directly to Council. The method provides Council with a comprehensive picture of the department's proposal, including a detailed analysis of all relevant factors. It enables Council to make more sound decisions, by comparing a series of options including doing nothing, and evaluating the resulting scenario for each. A business case approach traditionally recommends the best technological option at the best price, or best value for money approach, which is a goal for many municipalities facing dwindling funding resources. The business case can be used as a communication or marketing tool for presentation to Council and the public.

10.2 EXAMPLES

Annapolis County, Nova Scotia uses a community impact model (CIM) to assist the municipality in prioritizing infrastructure needs in the 100 communities within its jurisdiction. It characterizes the amount of change occurring in a community, identifies the fiscal and environmental impacts of change, the implications of doing nothing and assists in the development of a business case for any financial, policy and regulatory involvement by the County. The CIM is not fully institutionalized into the decision-making framework and has only been in use for two years.

Winnipeg, Manitoba is using a business case approach within its departmental planning, which the city sees as key to success for long-term financial management. Each department prepares a business plan that feeds into a corporate plan. Departments must present their business case to Council, where decisions are made on the level of service to be provided, based on the business cases presented.

10.3 ASSESSMENT

The business case is not very prevalent among the municipalities interviewed, and appears to be a fairly new way of presenting prioritized needs. A corporate business case perspective must be financially sound and can encourage departments to examine ways of funding projects, or operating programs within budget. This approach would be applicable to all types of municipalities but is of particular interest to those managing large debt loads. The approach would not be very difficult to apply, but training may be required. The benefits would be more indirect: strategic thinking, better decision making and time saved by Council in debate through a sound departmental proposal process.