

Working Paper: Infrastructure Table

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Working Paper of the Infrastructure Table

Provincial-Municipal Fiscal and Service Delivery Review

June 2008

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Executive summary

Ontario's municipal infrastructure systems, including roads, bridges, water systems, and other critical assets, are in a state of steady decline. Modelling done for the infrastructure table, one of the joint provincial-municipal tables involved in the Provincial-Municipal Fiscal and Service Delivery Review, shows that future fiscal requirements for infrastructure are much larger than the resources available to meet them. To close the estimated gap between actual infrastructure spending in recent years and what is needed would cost at least \$5.9 billion a year over the next 10 years.

All orders of government need to be involved in finding a solution because deteriorating infrastructure reduces quality of life in Ontario and threatens economic competitiveness.

This report provides guidance to the coordinating and political tables on how the growing infrastructure gap can be addressed and sets out options for consideration.

Our goal was to find ways of ensuring that Ontario's municipal infrastructure systems are best-in-class, providing reliable, safe, and environmentally responsible services throughout the province on an efficient, sustainable basis.

The following principles support that goal and informed our proposed options:

- System owners and operators, funders, and regulators must constantly seek out innovative approaches to improving service, reducing costs and managing risk. All of these parties must show that they achieve value for money.
- Where appropriate and feasible, users and producers must pay the infrastructure costs attributable to them.
- Given shared interests in infrastructure, all orders of government must be prepared to share funding responsibilities where circumstances warrant.
- Decisions by all orders of government must be based on long-term financial plans and solid information about asset condition, and should aim to reduce overall risks, be integrated with the management of growth and population change throughout Ontario, protect public health and the environment, take into account regional differences, and give appropriate weight to the interests of all participants.
- When infrastructure can be provided at lower cost or higher quality by involving more than one community, options to do so should be pursued.
- The costs of regulation must not outweigh its benefits.

- Growth must pay for growth.

These principles gave rise to the following proposed options:

- Municipal asset management plans should be a requirement for infrastructure funding programs.
- Municipalities should continue to work toward implementing full cost recovery fees for garbage, water, and wastewater.
- The provincial and/or federal government should target producers that burden the solid waste stream.
- The considerable scope to expand the application of user pay mechanisms in such other sectors as transportation should be explored.
- A process to review the *Development Charges Act* should be launched on a priority basis.
- An outcome of the review process could be an agreement by municipalities to invest more in infrastructure.
- Create a new Infrastructure Investment Fund to provide predictable levels of support over a sustained period of time to municipalities with an infrastructure affordability problem.
- Reform of the water sector that includes a transition to full cost recovery, broader organizational improvements, and provincial support is needed.
- Launch a joint review of responsibilities and funding arrangements for roads and bridges based on established technical and functional criteria, grounded in sound asset management principles.
- Provide greater provincial support for Conservation Authority infrastructure, due to the aging of dams and other high-cost infrastructure.
- Consideration should be given to addressing local cost pressures in the hospital sector through a revised development charges regime, in line with the option set out above.
- The Province could commit that a new regulation would be reviewed with the municipal sector before adoption to identify and disclose its costs and benefits.

In addition to these specific options, the table commented on other aspects of municipal infrastructure:

- We acknowledge a continuing provincial role in funding public transit through the gas-tax allocation and other programs such as MoveOntario 2020. The unique transit demands of the GTA and Hamilton area were noted, as were the growing public transit needs of other centres. Members agreed with a regional approach to public transit where beneficial.
- On social housing, the policy background, including the link to service delivery and the need for better information are so important that we felt it more appropriate as an issue for the coordinating and political tables. As well, this area has important linkages to a new provincial affordable housing strategy under development and the Province's poverty agenda.

We concluded that Ontario must see a sustained increase in municipal infrastructure investment and a continuing partnership on infrastructure issues between the Province and municipalities. Recognizing that some of the options proposed represent fundamental shifts from the way the Province and municipalities do things today, we acknowledge the challenge of implementing significant changes. The length of time involved in some proposed options may appear daunting, but that is all the more reason to set the wheels of change in motion quickly. Ontario cannot afford delay.

1. Introduction

The massive public systems on which people in Ontario depend for their health, safety and economic well-being – our highways, bridges, water systems, and other critical assets – are in a state of steady decline. Impacts are being felt already, with major disruptions from sinkholes, snarled traffic, shattered pavement and potholes, damage to vehicles, sewage back-ups and flooding. Without significant investment to catch up on needed repairs and replacements, these costs can only mount.

This report was prepared for the infrastructure table, one of the joint provincial-municipal tables involved in the Provincial-Municipal Fiscal and Service Delivery Review. It sets out the results of the most extensive modelling done to date on municipal infrastructure needs in Ontario. Appendix A provides details of the table's mandate and membership and how its work was carried out.

The conclusions are alarming and the need for action clear. Future fiscal requirements for infrastructure are much larger than the resources available to meet them. To close the estimated gap between actual infrastructure spending in recent years and what is needed would cost at least \$5.9 billion a year over the next 10 years. This amounts to just over \$1,200 a year in additional taxes for every Ontario household, or an average increase of almost 50% to current residential property tax bills.

Ontario's municipalities clearly do not have the collective fiscal capacity to fix the problem. All orders of government need to be involved.

Governments must work together because deteriorating infrastructure is reducing quality of life in all Ontario communities, putting public health and safety at risk, and threatening this province's ability to compete successfully for jobs and investment.

The modelling confirms that much of the problem arises from the age of the massive stock of infrastructure built through the 1950s as part of the post-war boom. These assets are reaching the end of their useful life. In addition, many municipalities have not had the money for proper upkeep of their infrastructure, and have put maintenance off. The unmet maintenance bill alone amounts to more than \$22 billion.

For many types of infrastructure, letting upkeep slip increases the rate at which further deterioration occurs. As a result, the cost of fixing the situation also climbs. Across Ontario, the infrastructure bill is not just high, it is growing increasingly quickly. Reversing this downward spiral will take swift,

Putting off upkeep can multiply costs and harm other assets and services. Leaking water mains are a major cause of sinkholes in roads, for example, which can in turn damage cars and buses, and increase traffic congestion.

concerted, and decisive action.

The content of this report

This report provides guidance to the coordinating table and political table on how the growing infrastructure gap can be addressed. While our discussion was largely shaped by the focus of the overall review on provincial-municipal fiscal relations, we have also looked at other considerations where appropriate, including the role of the federal government.

- Chapter 2 provides background on municipal infrastructure, including a description of public infrastructure; the challenges in making infrastructure investment decisions; and how the interests of different orders of government lead inevitably to entwined roles and responsibilities that must be managed effectively.
- Chapter 3 explains why better information on infrastructure is needed; provides background on how the models used for the estimates in this report were developed; sets out the results of the modelling work; and explains why financial reporting fails to reveal the size of the infrastructure need.
- Chapter 4 outlines a vision for infrastructure in Ontario and principles guiding decisions on how to achieve the vision.
- Chapter 5 provides a range of options, both general and sector-specific, for the coordinating table to consider.
- Chapter 6 summarizes the table's broad conclusions and underlines the need for swift, decisive action by all levels of government.
- The appendices:
 - A. The table's mandate and membership
 - B. More details on asset management plans
 - C. The detailed methodology of the modelling
 - D. The technical submission of the development charges sub-group
 - E. The technical submission of the road and bridge sub-group

A collaborative effort

The infrastructure table served as an excellent forum for discussing a wide range of provincial and municipal infrastructure issues. Throughout our proceedings, we

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worked in a spirit of open and respectful dialogue and collaboration, with the goal of providing helpful and objective guidance. Although there may continue to be different perspectives on how best to move forward, this report represents a consensus among the members of the table.

We thank the Ministry of Energy and Infrastructure for excellent support in modelling, analysis, and other elements of our work, and the Provincial-Municipal Fiscal and Service Delivery Review Secretariat of the Ministry of Municipal Affairs and Housing for their help coordinating our activities with those of the other tables.

2. Background

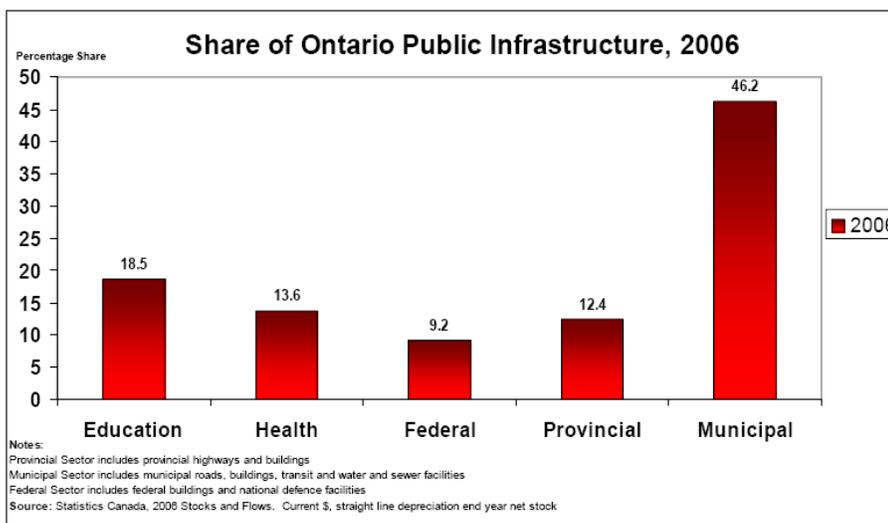
Defining municipal infrastructure

Infrastructure consists of long-lived, major physical assets that provide key services to the public. Our discussions touched upon the following types of infrastructure:

- Transportation (including streets, roads, highways and bridges);
- Municipal transit (including public transit and transit service for the disabled);
- Water systems, wastewater systems, and stormwater systems;
- Solid waste facilities;
- Parks, conservation areas and street trees; and
- Municipal buildings, community centres, long-term care facilities, cultural and recreational facilities, including libraries, social housing and hospitals.

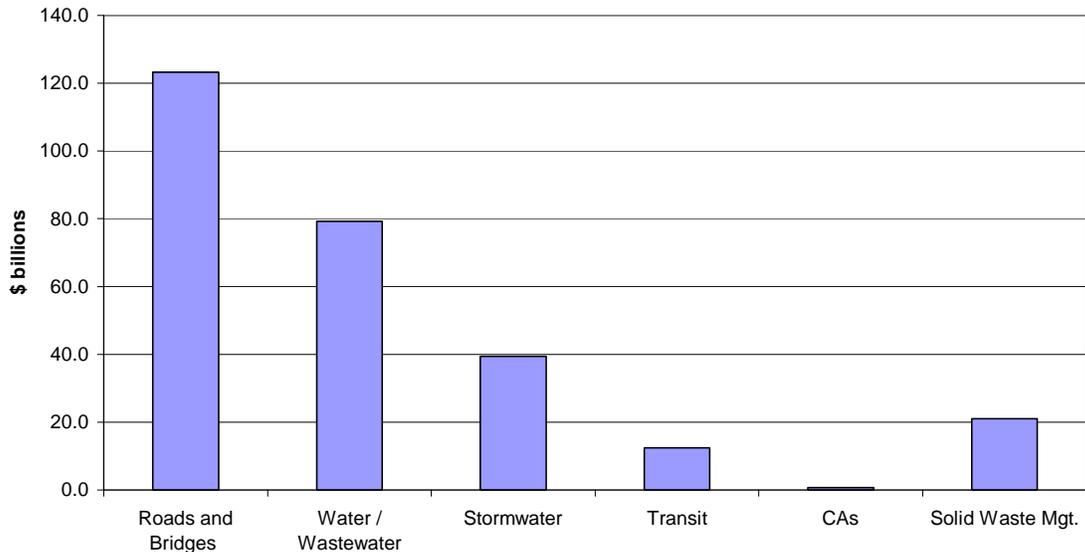
Not every municipality owns all of the above types of infrastructure. Some types of infrastructure make sense only for municipalities above a certain size. In two-tier systems, the infrastructure may be the responsibility of only one tier of government. Or another order of government may have responsibility for the infrastructure, as in the case of hospitals. Finally, a municipality may purchase services from another municipality or other party rather than owning the related infrastructure itself.

Together, Ontario's municipalities own almost half of all public infrastructure in this province:



MEI developed estimates of the replacement costs of each of the major municipal infrastructure sectors:

Replacement value of municipal infrastructure by system type



Total estimated replacement value \$276.0 billion

Source: Ontario Ministry of Energy and Infrastructure

Ownership arrangements have evolved over the years. In the late 1990s, in one instance particularly relevant to the current review, several major infrastructure portfolios were transferred from the Province to municipalities. These comprised:

- Roughly 5,000 kilometres of highways and the related bridges;
- 230 water treatment plants previously owned by the Ontario Clean Water Agency (OCWA), a provincial agency; and
- Roughly 250,000 social housing units.

These transfers were part of an initiative that resulted in other changes in the provincial-municipal fiscal framework, including new funding arrangements for social programs and education. The role of the current fiscal review is to re-examine the provincial-municipal fiscal framework and the delivery of related services.

Understanding the challenge

Making the right decisions about infrastructure investment involves balancing two questions:

- What quantity and quality of infrastructure can we afford as a community? Affordability depends mainly on the current and future revenue base of the community, but other sources of funding are sometimes available.
- What quantity and quality of infrastructure do we need? Need is driven by regulation and public expectations, as well as current and future population and consumption patterns.

Municipalities ask these questions when dealing with all competing demands on their resources, but factors unique to infrastructure make it particularly hard to come up with the “right” answer.

Infrastructure decisions have a profound effect on how and where communities grow over time. Building systems requires large and “lumpy” investments, not a smooth series of annual outlays. Once built, infrastructure has a very long-term impact on a community’s financial resources, as some types can last a century or more.

Despite the long-lasting impact of infrastructure decisions on communities, however, planning periods in municipal official plans do not align with infrastructure life expectancy. As well, infrastructure decisions should be based on what is called lifecycle costing. However, this is hard to calculate at the outset, as future operating costs can only be estimated.

How large a system to build also requires estimation. Many types of infrastructure exhibit economies of scale: that is, adding more capacity at the outset is relatively inexpensive. However, these decisions require being realistic about the current and future population to be served, otherwise the costs of operating the infrastructure can become too high for the population served.

Municipalities use a number of funding and financing techniques to pay for their infrastructure, complicating matters further. Many types of infrastructure have clearly identified users who can be charged for their consumption (for example, metering for water use). But not all services have these characteristics, legislation to permit

Life-cycle costing

The full cost of infrastructure consists of capital plus operating and maintenance costs.

A capital investment is the cost to build infrastructure, extend its expected service life, or upgrade it to meet new standards for its operation.

Operating and maintenance costs, which are incurred every year, include such items as repairs and maintenance, power, staff and materials.

To get the full picture of the costs to the municipality of an infrastructure investment, an analysis of a particular type of infrastructure should consider its purchase price and the costs through its life and for disposal or decommissioning.

Where revenue (such as development charges and user fees) is available, an estimate of this should offset the costs to determine the net funding need, if any.

municipal user fees is not in place for every type of infrastructure, and not all municipalities charge users even where it is possible. As well, the design of programs offered by other orders of government to help pay for infrastructure has an impact on the size and timing of municipal investments.

Even the best initial decision, based on accurate life-cycle costing, and a realistic population base and growth estimates, needs to be backed up by a proper asset management plan through the infrastructure's life. Appendix B provides more details on asset management plans.

Finally, some factors are simply beyond the municipality's control.

Many parties are involved in providing infrastructure systems. Municipal streets and roads, for example, are not only part of the transportation system themselves, but have other infrastructure networks located above, below and alongside them. Municipal systems that are co-extensive with streets and roads include water mains, fire hydrants, wastewater and storm water collectors, street trees, sidewalks, traffic lights, and street lights. For cities with public transit, streets and roads may have to accommodate bus lanes, streetcar or LRT tracks and even subway tunnels. Corporate infrastructure using the same arteries includes gas mains and electrical, cable, and telephone lines. All of this makes coordination – which is important for minimizing life-cycle costs – very difficult, and introduces perverse incentives and disincentives for certain activities.

As well, there are regulatory authorities for infrastructure within the municipal, provincial, and federal orders of government. Even within one order of government, several different departments or ministries can be involved. Compliance can be complex and costly. Moreover, the impacts of changes in regulatory standards can shorten an asset's service life, raise operating costs, or both – and crowd out other investment needs.

3. Modelling the infrastructure gap

The need for better data

Discussions about infrastructure are often clouded by lack of information about what stock of infrastructure exists and the related financial needs. This is understandable: huge investments were made over the past century or more by various orders of government, owners had limited ability to accurately track asset condition over time, and in many instances ownership changed hands, sometimes more than once.

While many municipalities are currently gathering much more complete information and analyzing it to determine spending needs, there is no comprehensive, province-wide data on the value, size, age and condition of all infrastructure. For this reason, the Ministry of Energy and Infrastructure (MEI) developed a series of financial models to estimate infrastructure needs for this element of the review.

This modelling did not include all municipal infrastructure. In particular, MEI did not model social housing needs, in large part because of work by the Social Housing Services Corporation to develop information on asset condition and needs in that sector. Preliminary work done for the City of Toronto indicated that immediate capital repair needs for housing owned by the Toronto Community Housing Corporation (TCHC) alone were more than \$300 million in 2006. Including lifecycle and growth needs would add significantly to the total needs of the TCHC, which owns only about two-thirds of the social housing stock in Toronto.

The other major categories of assets not included in the modelling were cultural and recreational facilities, “green” infrastructure such as parks and street trees, municipal buildings and long-term care facilities.

How the models were built

MEI first estimated the stock and age of infrastructure by category for each census division in Ontario. (A census division is the general term used by Statistics Canada for counties, regions, and other population centres defined by a province.) In carrying out the modelling, MEI:

- Started with best available data
 - Road, bridge and highway information came from the Ontario Road Network Geospatial Database maintained by the Ministry of Natural Resources;
 - The Ministry of the Environment provided data on water and wastewater plants;

- The Canadian Urban Transit Authority provided information on buses, while the Toronto Transit Commission capital plan was the source of data on the City of Toronto's light and heavy rail transit systems;
 - Statistics Canada data were used for solid waste facilities;
 - A central database maintained by the Grand River Conservation Authority on behalf of all conservation authorities in Ontario was used for information on flood and erosion control structures.
- Refined this information, where required, to model specific systems
 - Using Statistics Canada population density data, roads were subdivided into urban and rural, with differing assumptions for each type about curbs, sidewalks, surfacing material, and so on;
 - Road data and the urban/rural split were also used to estimate the extent of water main, wastewater collector, storm sewer, and drainage ditch networks;
 - Statistics Canada data on the age of local housing were used as proxy for the age of the networks serving that area.

MEI then developed estimates of lifecycle needs, which are the normal “going forward” costs of keeping existing stock in good repair, assuming no infrastructure deficit. These were based on such predictable events as sealing road cracks and resurfacing. It also projected growth needs by applying current costs to expected growth, using the demographic projections of the Ministry of Finance.

These estimates were developed as follows:

- **Lifecycle costs** were calculated based on an inventory of assets in each municipality, and a model of the rehabilitation and replacement events over the life of an asset, including the timing and cost of each event for a typical municipality.
- For the cost of adapting to **growth**, regression analysis was used to estimate the relationship between population growth and infrastructure stock along with other relevant factors.
- Infrastructure condition data was not available to estimate the **infrastructure deficit**. So:
 - MEI used the age of long-lived assets (those with a life expectancy of 50 years and upward) as a proxy for asset condition. If the estimated

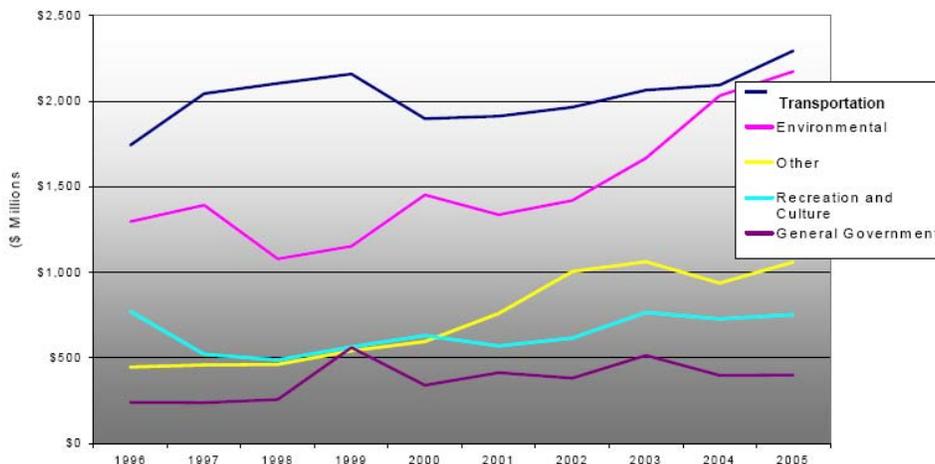
- For all assets with an estimated replacement date in the future, MEI included the replacement cost of the asset as an expense in the year it is expected.

Finally, MEI normalized the required outflows of funds over the 40-year period covered by its model. This means that outflows were smoothed so that an equal amount was attributed to each year.

For the spending that might be applied to these needs, the model used the average annual capital expenditures by all Ontario municipalities on various types of infrastructure over the past five years as reported to the Ministry of Municipal Affairs and Housing. This includes all sources of funds, including development charges and provincial or federal grants. Information on capital spending by Conservation Authorities is not available from this source; however, so the model results assume no historical spending in this sector. Since the need is small compared to other sectors, it is MEI's view that the impact of this assumption is not significant.

It should be noted that using actual spending over a five-year period does not speak to the ongoing ability of a municipality to invest in infrastructure, because the spending may have come from such sources as borrowing and grants that are not necessarily sustainable.

This graph shows the investment trend in various sectors over the period used for the modelling:



MEI partnered with the Regional and Single Tier Treasurers to create a working group that included municipal infrastructure experts and MEI modellers to review and revise the details of the investment-needs model.

The working group met monthly starting in September 2007 to review the model on a sector by sector basis. Working group members reviewed and were able to improve the assumptions around lifecycle events, timing and costs, and commented on the infrastructure deficit and growth methodology and estimates, including sector trends.

Work continues on improving the investment-needs model to develop the most accurate estimates possible and add other sectors.

Appendix C provides more background on the methodology used to develop the infrastructure models.

Ontario's municipal infrastructure gap

Analyzing the results of the modelling, MEI provided a table that showed the need for each sector and the total for all infrastructure systems. The table assumes that municipalities would eliminate the outstanding infrastructure deficit over a 10-year period:

Infrastructure gap estimates for Ontario municipalities

	Investment needs			Total need	Average spending, past 5 yrs	Gap (need less spending)
	Lifecycle	Eliminate deficit	Growth			
Roads and bridges	\$2,671.1	\$935.8	\$651.6	\$4,258.5	\$1,460.2	\$2,798.3
Water and wastewater	\$844.3	\$1,277.7	\$661.3	\$2,783.3	\$1,520.5	\$1,262.8
Stormwater	\$525.3	\$27.8	\$234.7	\$787.8	\$106.7	\$681.1
Transit	\$899.8	\$0.0	\$730.1	\$1,629.9	\$563.7	\$1,066.2
CAs	\$4.4	\$3.2	\$0.0	\$7.6	NA	\$7.6
Solid waste mgt.	\$316.5	NA	\$77.4	\$393.9	\$291.1	\$102.8
Totals	\$5,261.4	\$2,244.5	\$2,355.1	\$9,861.0	\$3,942.2	\$5,918.8

Source: Ministry of Energy and Infrastructure

Note: Amounts are in \$ millions

What the table shows is that eliminating the entire infrastructure deficit over 10 years while meeting the ongoing lifecycle and growth needs would require an additional investment of \$5.9 billion a year for each of the next 10 years. That is the equivalent of adding an extra \$1,203 onto the tax bill of every household in Ontario every year.

MEI believes that these estimates are conservative and most likely underestimate the infrastructure deficit, for the following reasons:

- The model does not directly estimate the timing of investment need for existing assets with expected service lives of less than 50 years.
- Although the growth model captures population changes, it does not fully estimate the impact of other changes such as policy shifts and new standards (for example, the growing importance of green infrastructure).
- Some key municipal infrastructure sectors such as social housing and sport and recreation infrastructure are not yet added to the model.

Including these factors would very likely increase the investment gap.

How the need varies by municipal size

The investment needs and resulting gap from current investment levels vary significantly across the province.

Investment needs are greater on a per-household basis in smaller places (in the definition used for modelling, a smaller place is a census division that does not include a centre with a population of at least 100,000).

In smaller places, each household's contribution would need to be \$1,705 a year for the next ten years to eliminate the infrastructure deficit and meet normal needs. The equivalent figure for large municipalities is \$1,053.

This disparity reflects the likelihood that a smaller community has a large stock of infrastructure, particularly in certain categories, relative to the number of households who can pay for it.

Where the population density is low, for example, more kilometres of road and more bridges are needed per household than in more densely populated areas. The roads and bridges support economic activity, but usually not as much as in larger centres. When traffic from outside the municipality uses the network, as is often the case, the municipality may not even benefit from the related economic activity, but does have to pay the increased costs.

Another example is water and wastewater: because of scattered populations and difficult terrain, a treatment plant typically serves a small customer base and cannot achieve economies of scale.

On an absolute basis, however, the large centres collectively own the biggest share of infrastructure – about 70% of the \$276 billion total. They also have the greatest spending needs in straight dollar terms, at almost \$4 billion a year to close the infrastructure gap over 10 years. This is about two-thirds of the entire provincial requirement.

Larger centres spend slightly more per household on infrastructure than smaller ones. Over the five-year period used in the modelling, the larger centres spent \$333 a year on average per household, while the comparable figure for smaller places was \$299 a year. The profile of needs for larger centres differs from that of smaller places, because they are better able to achieve economies of scale in such sectors as roads, bridges, water, wastewater and storm water. Public transit and solid waste management, however, tend to be greater concerns in larger communities.

And by sector

Looking at the results more closely by sector:

- Annual investments in roads and bridges would have to roughly triple from the recent average of about \$1.5 billion a year to meet the total need in the sector. This sector accounts for almost half of the total investment gap.
- The water and wastewater sector represents about one-fifth of the total gap, at roughly \$1.3 billion a year. This sector has the largest current infrastructure deficit, at \$12.7 billion, but on average the sector would be sustainable at current investment levels if that deficit were gone. Some centres, however, especially smaller ones, would have difficulty achieving sustainability over the long term even without a deficit.
- Municipalities would have to increase their annual investment in stormwater systems by a factor of more than seven from the recent average of about \$107 million a year to meet needs over the next 10 years.
- Projected capital spending on public transit would also be considerably higher than in recent years, but this reflects to some extent provincial commitments and plans to invest significantly in this sector.

How infrastructure gaps grow

Numerous studies by various authorities across Canada have come to conclusions similar to those of the modelling exercise about the investment needed in our public infrastructure. Understanding the origins of the infrastructure need is a step toward closing the existing gap in Ontario's municipal sector and preventing future ones from appearing.

Initial decisions not always the best

Life-cycle costing was not used consistently during major infrastructure investment periods in the past. Planners were not always able to create larger service areas upfront to use economies of scale and make infrastructure more sustainable over the long run.

Governance models, both provincial and municipal, tended to encourage the expansion of infrastructure networks to meet growth needs. Expansion diverted available funding, very often at the expense of properly maintaining what was already in place. Where other orders of government funded capital cost this may also have contributed to a “disconnect” between the initial investment and long-term financial sustainability.

Once the more extensive infrastructure networks were in place, governments generally lacked the ability, political will, or both, to recoup the added costs of urban sprawl through taxes or user fees. Development charges are supposed to ensure that “growth pays for growth,” but this is not true today and was probably not true for the bulk of past investments.

Uncertain funding for operations

Once infrastructure systems were built, getting the revenue to maintain them properly was hard. Given the complexities inherent in pricing the services of very long-lived assets and the lack of revenue tools for some systems, it was difficult to collect the right (or any) revenue from users. As a result, most municipal infrastructure was funded out of general taxation revenues.

Governments undertook major infrastructure investments in the 1950s, largely to respond to widespread need after the Second World War diverted significant resources to the military front (and before that, the Depression dampened ability to invest).

Those huge investments and ones from earlier periods started to show their age by the 1980s, triggering significant upkeep costs. But by then the focus of government spending had shifted to social programs. Shifting enough resources back from social programs to cover the full infrastructure need would be difficult if not impossible. Moreover, starting in the early 1990s, all orders of government encountered strong resistance to tax increases, making it equally difficult to raise taxes to cover infrastructure needs.

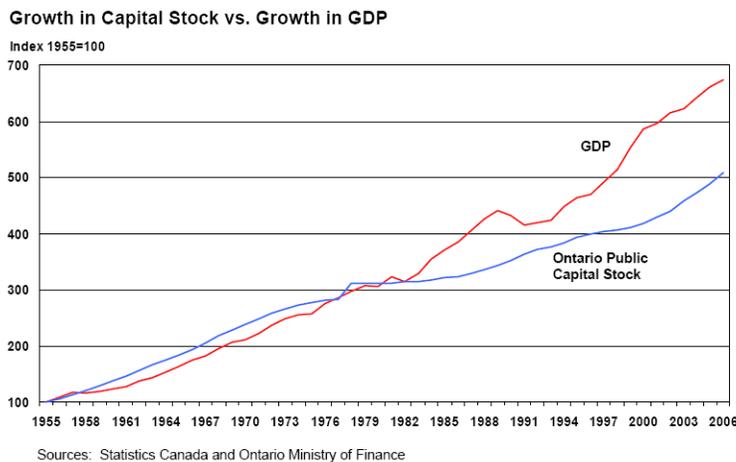
Higher service standards

Service standards have changed over time. Increasing standards in some areas such as water and wastewater have increased costs and appear to have diverted investment from other types of infrastructure, although the higher standards have conferred other benefits. Given cost and revenue pressures, communities have chosen in some cases to accept lower service standards for their infrastructure.

Repairs, upgrades and maintenance put off

When the needed revenues are not available, managers are forced to put off needed upkeep. The location of much municipal infrastructure, under the ground or on the margins of the community, adds to the problem by creating an “out of sight, out of mind” attitude. As revenues started to seriously lag costs over the past several decades, some upgrades and replacements were also deferred.

This graph shows how spending on public infrastructure has lagged behind growth of Ontario’s Gross Domestic Product (GDP) for close to three decades now.



Why the picture isn’t clearer

The results of the modelling exercise paint a disheartening picture. Collectively, municipalities own a very large stock of infrastructure assets. The size of this asset base calls for significant ongoing spending to maintain it in good condition. That clearly is not happening.

Looking at the available financial information, however, this problem isn’t readily visible. When operating expenses, including those related to infrastructure, are deducted from the ongoing revenues of Ontario municipalities, the picture is relatively rosy. Most municipalities seem to be collecting more than enough to pay their operating costs as currently recorded.

This is in part because current accounting and budgeting practices do not formally recognize that infrastructure incurs a “cost” each year as its service life gets one year shorter (and the need to replace it gets one year closer).

When MEI subtracted this cost (called amortization in accounting terms) from the seemingly safe margin reported above, the picture flipped over completely: very few municipalities are able to cover the full costs of their infrastructure – in fact, most can cover only a very small percentage, based on current ongoing revenues. Here is how the picture changed:

- Subtracting operating expenses only from ongoing revenue for 2005, less than one per cent of municipalities were in deficit (that is, the total was less than zero);
- But when operating expenses *and* infrastructure life-cycle costs were subtracted from ongoing revenue, 80 per cent of municipalities were in deficit. Looking at municipalities with population of less than 20,000, that number jumped to 90 per cent.

New accounting standards to record amortization will help, especially as new assets are added. But they will not provide a complete or accurate picture of the existing situation. Even if a correct “book value” could be calculated for every asset – which is unlikely, given the lack of good information – the actual capital costs to a municipality are driven by the age and physical condition of assets, not by their book value.

The knowledge at a local level that the full costs of infrastructure aren’t being covered – even though financial reporting doesn’t currently show this – may be one reason why smaller municipalities, in particular, are hesitant to take on debt and its related servicing costs to finance infrastructure.

The need for new approaches

The work done to identify Ontario’s municipal infrastructure gap underlines the seriousness of the problem. The challenge is finding realistic, workable ways to start closing that gap.

4. Towards a better approach

To address the complexity of the issues and the potential options for dealing with them, we first asked what a realistic end-state for Ontario's infrastructure would be. We then set out principles that should guide decisions about how to reach it.

Vision

Given the essential role of infrastructure in enhancing quality of life and economic competitiveness, Ontario's municipal infrastructure systems should be best-in-class, providing reliable, safe and environmentally responsible services throughout the province on an efficient, sustainable basis.

How do we get there?

We weighted the public-policy considerations around infrastructure to develop the following guiding principles:

- System owners and operators, funders and regulators must constantly seek out innovative approaches to improving service, reducing costs and managing risk. All of these parties must show that they achieve value for money.
- Where appropriate and feasible, users and producers must pay the infrastructure costs attributable to them.
- Given shared interests in infrastructure, all orders of government must be prepared to share funding responsibilities where circumstances warrant.
- Decisions by all orders of government must be based on long-term financial plans and solid information about asset condition, and should:
 - Aim to reduce overall risks;
 - Be integrated with the management of growth and population change throughout Ontario;
 - Protect public health and the environment;
 - Take into account regional differences; and
 - Give appropriate weight to the interests of all participants.
- When infrastructure can be provided at lower cost or higher quality by involving more than one community, options to do so should be pursued.
- The costs of regulation must not outweigh its benefits.

- Growth must pay for growth.

It is worth looking in more detail at two of these principles, which are to some extent linked: user fees and shared funding based on shared interests.

A fair share from users and producers

It is standard for municipalities to charge for the use of many types of infrastructure, whether through a water bill, parking meter, or entrance fee to a city's art gallery.

These charges help to offset the costs of the infrastructure and, often, to allocate demand for limited availability of service.

User fees also play a role in stewardship. Water and wastewater systems, and solid waste disposal can degrade the environment. Road congestion creates pollution as well as slowing economic activity. Charging users in these cases can minimize negative impacts by preventing overuse.

Charging a fee is also a fair approach when not all residents can use the service the infrastructure provides. In rural areas, for example, some residents must provide their own drinking water and sewage disposal. The fairest approach in that situation is to recover the costs of municipal water in the community through fees levied on the actual users. Otherwise, some residents end up paying twice – directly for their own wells and septic systems, and through property taxes for municipally-owned water and wastewater systems.

But what is “fair”?

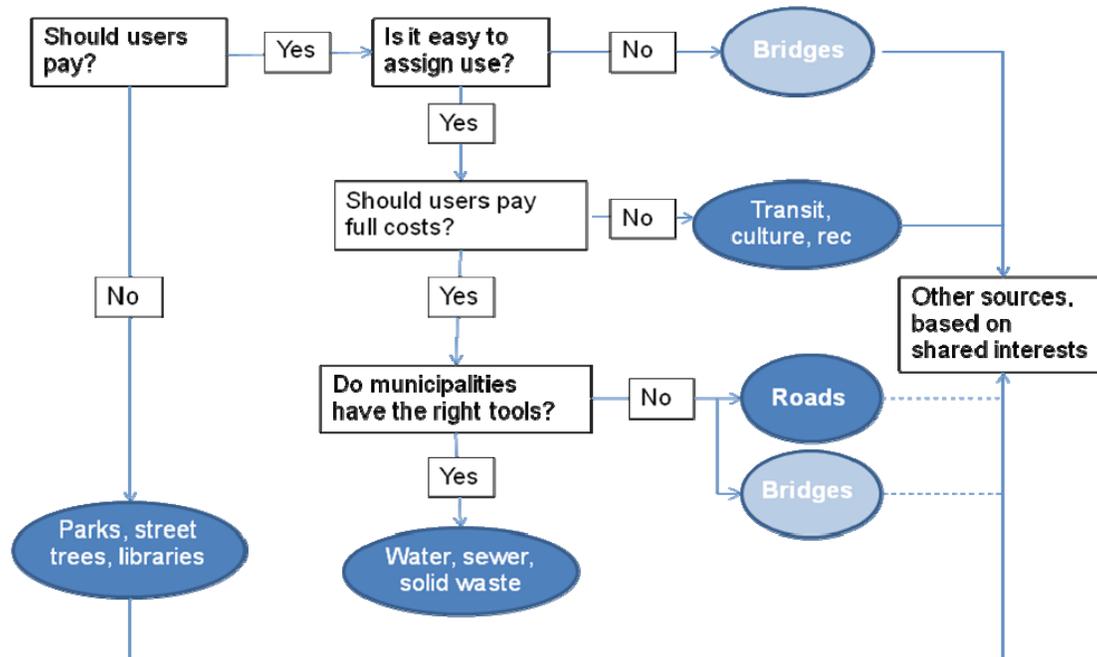
Who should pay the cost of building an infrastructure system? This touches on the issue of “intergenerational equity.” Given that it will last for generations, today's users and taxpayers might argue that they should pay only their share, not the entire amount.

To do that, municipalities would borrow money up-front that would be paid off gradually over the life of the assets – much like the way homeowners pay down their mortgage gradually.

However, as noted in the previous chapter, many municipalities do not use debt to pay for infrastructure, for a variety of reasons.

This becomes especially problematic when, as is the case right now, there is a large unpaid maintenance bill that has been growing for decades. Eliminating it through charges to current property owners raises questions about whether they are bearing an unfair share of the costs.

The table grappled with the question of when user fees are appropriate, as well as whether user fees should be expected to pay the full costs of the service. This flow chart shows how a municipality might consider these questions:



Certain infrastructure systems are felt to confer such large net public benefits that access to them is normally universal and free of fees. Examples include parks and libraries.

For the balance of systems, the questions revolve around the feasibility of collecting fees and what share of costs should be collected. The options in the next chapter address these questions.

Finally, the diagram necessarily deals in generalities. One important issue it fails to address is the affordability of services.

Individual affordability is a valid concern when considering user fees. But addressing it through a widespread subsidy for all users causes more problems than it solves, by reducing the ability to manage demand and reduce environmental harm through pricing. Solutions are better directed at the individual, not the system – making this a question to address in the wider context of income supports and social services.

The issue of affordability for an entire municipality leads to the question of the role to be played by other orders of government.

Shared interests, shared roles

Public infrastructure is one of the areas in which the three orders of government in Canada together serve the public interest by promoting economic growth, protecting individuals, acting as stewards and providing other social goods.

The roles and responsibilities that follow from that sharing of interests are far from static; however, they inevitably shift over time in response to changing views as to how best to serve the public interest, as well as public needs and the availability of resources.

In the current landscape, municipal interests in infrastructure are reflected in their owning much of the infrastructure that serves their community, funding most of the costs of this infrastructure, managing operations (including complying with regulation), and being closely involved in governance, usually directly through a municipal department.

The Province's interests are reflected in its roles of regulating and funding infrastructure, and legislating governance options. It also has an ownership role, but generally not where municipal infrastructure is concerned. The federal government's roles are similar, but tend to be lower-profile than those of the Province where municipal infrastructure is concerned.

With three orders of government involved, tension is almost inevitable. Municipal interests focus (mainly) on the municipality's residents, while the provincial and federal governments have much broader populations to consider.

We recognize, however, that it may be neither possible nor appropriate to assign each order of government a discrete set of roles that fully reflect its own interests without overlapping in any way with the roles of another order. Shared interests will always give rise to the sharing of roles and responsibilities to some degree. Our focus has been on recognizing shared interests, understanding the implications and managing the impact on roles and responsibilities with the aim of providing the greatest good to the greatest number of people in Ontario.

This means having open, predictable, and consultative approaches to the funding, regulation, operation, and management of our infrastructure. The alternative – an inaccessible, unpredictable system driven by unilateral actions – has no place in the future that this process envisions.

In the area of funding in particular, the federal and provincial orders – with access to broader revenue bases, both in size and scope, than municipalities – have greater ability to allocate resources to help meet important social goals. One such goal is

helping to pay for infrastructure when a municipality cannot or should not meet the full costs itself. The next chapter discusses these instances in more detail.

A strong foundation on which to build

Fortunately, addressing the infrastructure investment need does not mean starting from scratch. Ontario has a good foundation of policies and programs. In particular:

- The provincial gas tax transfer of two cents a litre for public transit should remain in place.
- Build on the federal gas tax, which the federal government announced would be made permanent in the 2008 budget.
- Funding initiatives such as MoveOntario 2020, and regional approaches to public transit, such as Metrolinx, should continue to be developed to support public transit.
- Municipalities will continue to use a portion of their property tax and other revenues to support investments in municipal infrastructure.
- Places to Grow is the Ontario government's initiative to manage growth and development in Ontario in a way that supports economic prosperity, protects the environment, and helps communities achieve a high quality of life. Under the *Places to Grow Act*, regional growth plans, such as the Growth Plan for the Greater Golden Horseshoe, 2006, are developed to guide coordinated land use and infrastructure planning.
- The Province also strongly supports compact patterns of growth, which make more efficient use of infrastructure and reduce the costs per household.
- The federal government provides significant support for municipal infrastructure in Ontario, and the province and Ontario's municipalities should continue to work together to ensure that these federal funds address Ontario's needs, including the Building Canada Plan over the next seven years.

The options ultimately endorsed through the PMFSDR process should build and expand on this foundation.

5. The options

Constructing options

Reaching the desired state for municipal infrastructure described in the previous chapter involves two elements: eliminating the existing deficit and ensuring that systems are financially sustainable over the long term.

Several options could be used to pursue these goals. The impact of each on users, owners and funders of infrastructure would vary according to individual circumstances. Certain options could be put in place relatively quickly, while others would require legislation or other long-term changes. Major changes might require phasing in.

In developing options, we were mindful first of what would be most equitable to people in Ontario. They are by far the largest funders of infrastructure, whether through taxes or user fees. We also considered the distinctly different needs of urban and rural centres across Ontario that the modelling revealed. Finally, we looked to the differences between systems, the benefits they provide, and the public interests they serve.

All of our deliberations were guided by the principles and public policy considerations set out in the previous chapter.

The options

We propose options in the following areas for the coordinating table to consider:

- Municipal Asset Management Plans
- User pay mechanisms
- Reforms to the *Development Charges Act*
- Increased municipal investment in infrastructure
- An Infrastructure Investment Fund
- Reform of the water sector
- Realignment of road and bridge responsibilities
- Sustainable transit funding
- Options for other sectors
- Regulatory review guarantee

The balance of this chapter provides more details and examples for each of the options and highlights some of the key considerations for the evaluation process.

Municipal asset management plans

Asset management plans are essential to better planning because they report on the physical extent, age, and condition of infrastructure. Having better information about a municipality's capital assets helps elected officials understand the diversity and relative urgency of different types of capital investment needs.

Some Ontario municipalities have already demonstrated significant leadership in this area, and there are good precedents and models for other communities to follow.

Asset management plans should also be linked to financial management plans and risk management strategies. These plans should be combined with an assessment of revenue tools and other financing sources. This would be a logical follow-on to the PSAB capital accounting standards that municipalities will have to comply with beginning in 2009.

Rolling all of this information up across the municipality is the basis of preparing a long-term financial management plan that links asset management, resources and risk management. The goal should be to maximize value for money in infrastructure investment, including effective procurement and delivery models.

Sharing asset management and financial plan information with the Province will help to reduce the "moral hazard" problem, in that it will identify genuine and serious affordability problems. This benefits all municipalities by ensuring a more equitable distribution of funding. The provincial gas tax program, which requires a municipal asset management plan for transit before funding is released, established a precedent for linking plans to funding.

Option:

- Make municipal asset management plans a requirement for infrastructure funding programs.

User-pay mechanisms

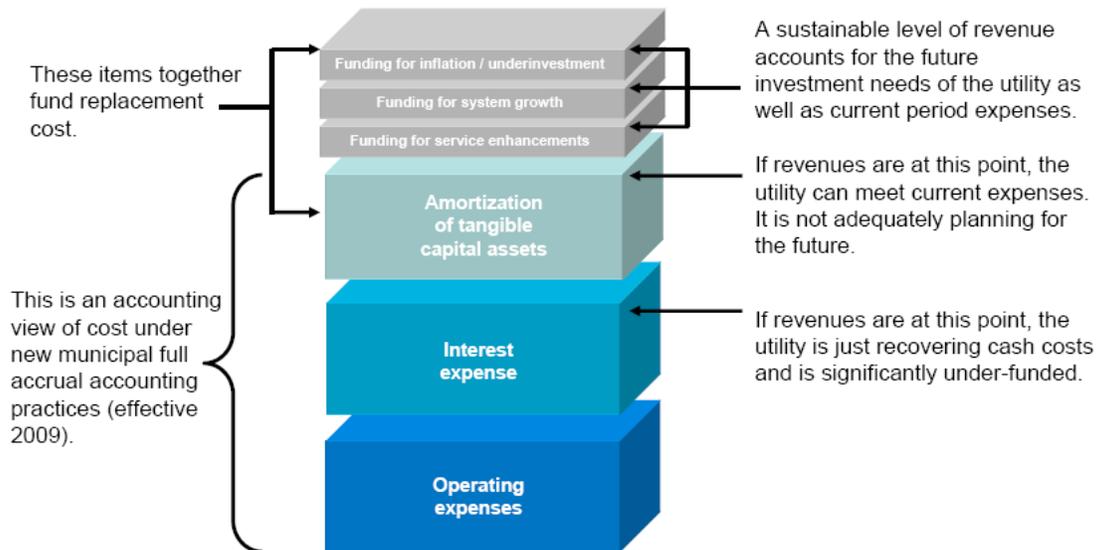
The analysis of the previous chapter outlined why user fees are not appropriate for such services as green spaces and libraries. Another exception to using fees, based on feasibility, would be bridges in locations where assigning use would be difficult.

Among other types of municipal infrastructure, user fees to recover some or all costs can be appropriate.

Recreational and cultural facilities, as well as transit, offer strong net social benefits. In these cases, a user fee doesn't necessarily seek to recover full costs. Its purpose

may be to limit demand, or simply to ensure that users pay some of the cost of providing a service instead of covering it fully from the tax base.

It is also important to be aware of what “full cost” entails, as this chart illustrates:



With some infrastructure, however, good stewardship requires full cost recovery. This is the case where overuse of systems cuts significantly into the public benefits – water and wastewater, stormwater, solid waste disposal, and roads. Many municipalities have the tools now to collect full costs from users of these systems, with the critical exception of roads.

Water and wastewater

Moving to full cost recovery is a central element of water sector reform, which includes other measures to help ensure affordability. Sectoral reform for water and wastewater is discussed in more detail later in this chapter.

Stormwater

Dealing with stormwater problems over the next several years is projected to involve costs that are much greater than current spending would support. The MEI models estimate the going-forward costs of stormwater management, including eliminating the infrastructure deficit for this sector, to be almost \$800 million a year – compared to average annual spending of roughly \$100 million over the past five years. A large part of the reason is that many storm sewers in the province are nearing the end of their estimated 100-year service life.

The user pay model for wastewater is generally based on the volume of municipal water a customer uses. The burden on stormwater management infrastructure,

however, is not related to municipal water consumption. Instead, it reflects such factors as the surface area and surfacing materials of a property and whether run-off from roofs is diverted from sewers. Taking these factors into account is important in designing a user-fee structure for stormwater needs.

Solid waste management

Solid waste management is a combination of activities that includes collecting waste, sorting it into recyclable, non-recyclable and possibly compostable streams, and delivering the non-recyclable stream to its final destination, which is usually municipal landfill.

While all of these activities have some environmental impact, landfills and other disposal options pose by far the greatest threat. For this reason, municipalities are starting to apply user fees to reduce the non-recyclable waste stream. The City of Toronto, for example, recently approved annual fees of up to \$190 a year for residential garbage collection, based on size of the household's trash container.

Producer fees are an important concept in solid waste management, one that is widely used in other countries. These fees require the makers of products that are a particular burden to the solid waste stream, such as disposable batteries, to cover the additional costs. Adding these costs to the costs of production also provides a price signal that might encourage consumers to switch to other, less harmful products.

Considerations around user and producer fees include the need to apply resources to communicating and enforcing the fees. The fact that residential versus commercial waste is managed and paid for differently presents a further complexity. As well, it can be difficult to differentiate between capital and operating costs for solid waste management services, especially when private contractors are involved.

Transportation / transit

A wide range of potential user-pay mechanisms, many of which are already in use in parts of the province, could be considered. For example, the City of Toronto now levies a personal vehicle tax.

It is important to note, however, that while public transit riders already pay for transit services through the fare box, this revenue does not fully cover costs, nor should it be expected to.

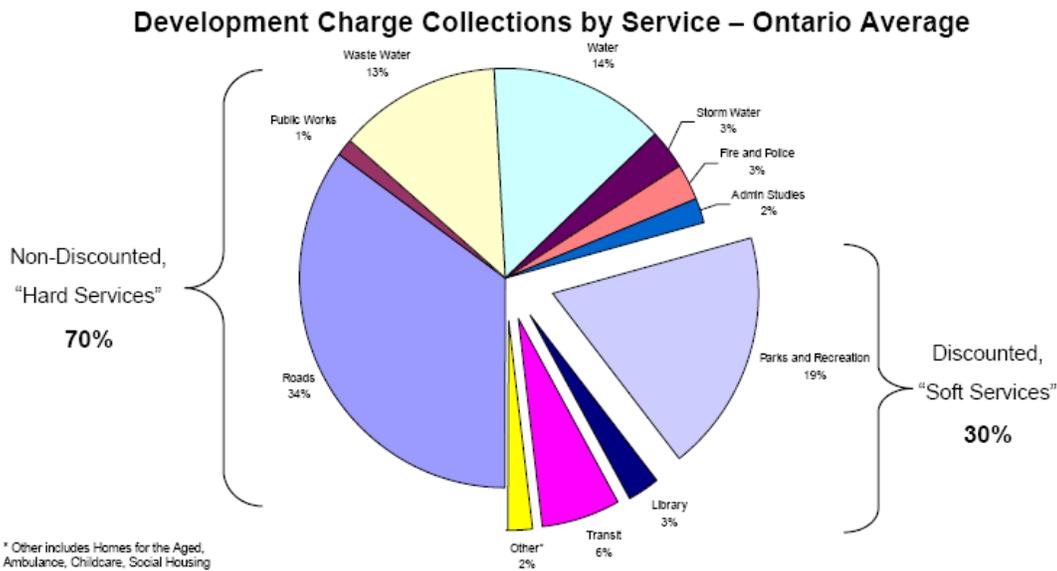
Table members agreed that the existing provincial gas tax allocation of two cents a litre for public transit should remain in place and should remain dedicated to public transit. There is merit in the flexibility and program design objectives of the existing federal gas tax transfer. Increasing the provincial gas tax allocation could be considered as a way of responding to Ontario's infrastructure investment need.

Options:

- Municipalities should continue to work toward implementing full cost recovery fees for garbage, water and wastewater.
- The provincial and/or federal government should target producers that burden the solid waste stream.
- There is considerable scope to expand the application of user-pay mechanisms in such other sectors as transportation.

Reforms to the *Development Charges Act*

Development charges are fees levied on new development to help pay for the infrastructure required to service the new growth. They serve a function similar to user fees, in that they are intended to collect, through developers, the up-front costs of growth from those who will enjoy its benefits – in other words, they are the mechanism to ensure that “growth pays for growth,” a key principle in funding municipal infrastructure.



The chart above shows how development charges currently help to offset the costs of serving growth.

In response to concerns about how development charges are set and applied, a sub-group examined the issues in detail and brought back a number of specific recommendations (see Appendix D). The major one was to launch on a priority basis a review of the *Development Charges Act*. The process should involve extensive consultation, particularly with the development industry, and should lead ultimately to legislative changes.

The sub-group's report noted that the current *Development Charges Act, 1997* introduced a number of restrictions and requirements that were not in the act it replaced. It identified four priority areas that appear to be most inconsistent with the "growth pays for growth" principle:

- **Ineligible Services.** Certain types of infrastructure, including acquisition of land for parks, solid waste management, municipal administrative buildings, and cultural, entertainment or tourism facilities, cannot currently be financed through development charges.
- **10% Discount.** A municipality must apply a mandatory 10% reduction to certain growth-related capital costs before calculating the development charge. This discount applies to all eligible services except such "hard services" as roads, water and wastewater, storm water management, police and fire services. The result is underfunding of "soft services." In addition, creating two classes of infrastructure complicates financial management where the two types share physical space and can create perverse outcomes. Roads, for example, are fully covered, while public transit is discounted.
- **Service level calculation.** Development charges cannot be used to pay for the portion of any new infrastructure that would lead to a service level higher than the average over the previous 10-year period. This makes it impossible to use development charges to pay for a municipality's first investment in a particular category (such as building a first home for the aged or adding light rail to transit services). It complicates matters where service levels are hard to calculate over the required period because of amalgamations, transfers of responsibility, and so on.
- **Treatment of other funding support.** The growth-benefiting portion of all grants, subsidies and other contributions must be deducted from the eligible capital costs, unless the funder specifies that a greater portion should benefit existing development (up to 100%). Some sub-group members felt this approach had the effect of subsidizing new development.

The subgroup also reviewed and provided options for other areas, including transit, growth management, calculation methodology, transparency and accountability, and dispute resolution.

We recognize that re-examining the *Development Charges Act* would call for a rigorous consultation process including the development community and would require legislative change. On the other hand, the issues are already well understood, providing an opportunity for quick action. Speed is important, given the point municipalities are at the development charge cycle and the fact that many are currently reviewing and updating by-laws in this area.

Option:

- A process to review the Development Charges Act should be launched on a priority basis.

Increased municipal investment in infrastructure

Room in the budgets of many municipalities is becoming available for infrastructure needs as new fiscal arrangements reduce other demands on their revenues. Municipalities have access to other funding sources as well, including development charges, the existing property tax base, user fees, and municipal debt for those municipalities with debt servicing capacity. (Debt can be a way of better matching the costs of infrastructure to the benefits provided over its useful life, which helps to deal with the fairness question raised on page 21.) The mix of funding sources that pays for infrastructure is at the discretion of individual municipalities.

The ability of municipalities to invest more in infrastructure on their own is tied, of course, to having the sustainable fiscal capacity to do so. As such, this is related to the future of the Ontario Municipal Partnership Fund (OMPF) and the proposed Infrastructure Investment Fund discussed below, both of which are elements of the broader review.

Our preferred outcome, however, would be that municipalities take infrastructure needs into account in their decisions around how to allocate municipal resources. In line with that, the Province and municipalities should continue to work together on estimating infrastructure needs and tracking municipal investments, especially through the asset management plans that we see as a priority.

Option:

- An outcome of the review process could be an agreement by municipalities to invest more in infrastructure.

An Infrastructure Investment Fund

The MEI modelling and analysis highlighted large disparities among Ontario municipalities in their ability to pay for their infrastructure. In particular, some municipalities have an affordability problem: they cannot independently sustain the level of investment that their infrastructure systems require. The reasons include low population density, low revenues, high costs, or very often some combination of these factors.

A new infrastructure investment fund could be created as a kind of “equalization” program to target the infrastructure needs of such municipalities, which were characterized by the infrastructure table as being “asset rich and revenue poor.”

Such an initiative would involve several important considerations:

- A rigorous process would be needed to determine which municipalities were eligible and how funds would be allocated. Among other things, this would involve defining more precisely the concept of “asset rich and revenue poor.”
- To help mitigate the risk that ineligible municipalities might question its fairness, the fund could be designed cooperatively with municipalities.
- Regardless of the program design details, however, a minimum criterion should be that the fund provides predictable levels of support over a multi-year period.

Option:

- Create a new Infrastructure Investment Fund that would provide predictable levels of support over a sustained period of time to municipalities with an infrastructure affordability problem.

Reform of the water sector

Water and wastewater services are the most “utility-like” of all municipal infrastructure services. Users in most municipalities are metered and billed separately, not through their tax bill, for consumption.

Since the Walkerton crisis and the subsequent inquiry, as well as with rising concerns about environmental damage, municipalities and the Province have become more aware of the need to upgrade water and wastewater systems and use fees to encourage conservation and recover costs.

To a large extent, users have also accepted this direction. Anecdotally, communities have not encountered strong resistance to the relatively large increases to water rates needed to move toward full cost recovery. For example, the town of Perth in Eastern Ontario substantially increased its water rates in 2003 to move immediately to full cost recovery. As other municipalities phase in full-cost recovery rates, planned annual

Higher rates but lower revenues?

It may seem that raising water rates both to cover full costs and encourage conservation might be at odds. Higher rates, after all, might reduce consumption to the point where total revenues fell.

In fact, some communities have gone through a series of increases to ensure they reach the point where revenues and costs balance properly. As more municipalities move to full cost recovery, more information becomes available about how demand changes in response to prices, allowing for better design of rates.

The most important aspect of using full-cost recovery rates, however, is that by lowering consumption they help to defer the need for a new or expanded treatment plant. This long-term benefit may not be immediately apparent.

increases in the 10 to 15% range over several years are not uncommon. Municipalities have generally carried out public education programs in concert with the changes so that consumers understand the environmental and other benefits.

In parallel with the rise in rates, as well as with significant provincial grant programs, investments in municipal water and wastewater systems have increased sharply in recent years. As the chart on page 13 shows, municipal investments in environmental services, which are dominated by water and wastewater systems, have risen at the fastest rate among the sectors included in the graph. The upward trend has been particularly strong since 2001.

As a result, this sector may be on its way to sustainability in most communities. There is still work to be done, however. The results of the modelling done by MEI show that on a global basis, water and wastewater is the only sector in Ontario for which the average spending over the past five years would cover life-cycle and growth costs going forward. Nonetheless, few municipalities are currently recovering the full costs of water and wastewater – that is, covering future investment requirements and working off the infrastructure deficit.

The need to move to full cost recovery through rates was discussed earlier in this chapter. To support that transition, larger water service areas need to be created to make infrastructure investments more efficient and enhance management capacity. Cross-subsidizing high-cost systems by blending rates with lower-cost systems, however, should not be the driver for consolidation.

Much of the groundwork for reform in this sector was provided by the Water Strategy Expert Panel, whose work should be updated and built upon. In particular, the differing needs of large and small systems, and the related issue of staff capacity and skills must be taken into account. A related consideration is the set of unique factors that apply to managing water systems and setting prices on the rural margins of urban communities.

While it may be necessary to analyze in more detail the extent to which municipal debt is tied into water-related investments, the issues in this sector go beyond the strictly fiscal. There are significant regulatory and operational aspects as well, and reforming the sector would call for legislative and regulatory as well as funding changes. It would take several years and might involve different timelines in different parts of the province.

Even with reform, some municipalities or systems are unlikely ever to achieve full cost recovery because of affordability problems. These municipalities would be candidates for the Infrastructure Investment Fund discussed above, or other kinds of targeted provincial support.

Option:

- Reform of the water sector that includes a transition to full cost recovery, broader organizational improvements, and provincial support.

Realignment of road and bridge responsibilities

Roads and bridges are particularly important because they comprise the largest category of municipal infrastructure – at \$123 billion, they make up 45% of the estimated replacement value of entire infrastructure portfolio. While they are crucial to communities and the Province, they are expensive to build and maintain. The current estimated infrastructure deficit for this sector is about \$9 billion, and the annual needs for lifecycle and growth amount to \$3.3 billion a year on top of that.

Given the concern at the Infrastructure Table that the current alignment of road and bridge responsibilities between the province and municipalities was not appropriate, particularly given the transfer of road and bridge responsibilities of the late 1990s, we struck a sub-group to examine roads and bridges in detail. The sub-group's technical submission appears as Appendix E.

Its fundamental recommendation was to launch a joint review of responsibilities and funding arrangements for roads and bridges based on established technical and functional criteria.

The sub-group noted that in order to be successful, such a review would require more and better-quality information on roads and bridges (including traffic volumes and other characteristics) than is available today. Therefore, the process would need to build in the capacity to collect that data.

The review could differentiate between road needs and bridge needs, given that their respective maintenance requirements and costs are different. The results of the review process could lead to new funding, ownership and/or management arrangements, depending on the circumstances.

The review could also help to more clearly establish what the federal role in supporting roads and bridges in Ontario should be, particularly with respect to the National Highway System.

We believe the review process should be repeated periodically (for example, every three years) to ensure the alignment of road and bridge responsibilities remains optimal as conditions change.

As well, the Province and municipalities could work together to develop a centre of excellence or a shared service corporation to provide expertise on asset management, maintenance best practices, procurement, and inspections, particularly

for bridges. This could be particularly helpful for smaller municipalities with large road and bridge networks, but limited resources to manage them.

Because of the limited staff capacity in some municipalities, managing transportation systems effectively can be difficult. As with the water sector, the merits of consolidating responsibilities for infrastructure like bridges could be considered.

Efforts in this area would need to be linked to the proposed Infrastructure Investment Fund to ensure that funding was being provided appropriately for realigned responsibilities.

It is worth noting that the investment gap for roads and bridges is so large that no single option will be sufficient to address the need completely. Realignments would be only a small part of the solution.

Moving forward, the Province needs to monitor and measure progress to ensure that the problems are clearly understood and that the overall condition of Ontario's road and bridge network is improving.

Option:

- Launch a joint review of responsibilities and funding arrangements for roads and bridges based on established technical and functional criteria, grounded in sound asset management principles.

Sustainable transit funding

Where a municipality has public transit, it needs to be considered as part of a transportation network that also includes roads and bridges. As a substitute for personal vehicles, public transit has the potential to improve the environment, particularly air quality, and allow people and goods to move more quickly, supporting economic activity.

Close to 90 municipalities in Ontario receive provincial support for transit services. The largest communities in the province, together comprising more than 7 million residents, have their own public transit systems. They also provide specialized transit for residents with limited mobility, as do many smaller communities. The provincially-owned GO Transit system also provides public transit throughout the Greater Toronto Area (GTA).

The cluster of communities making up the GTA and the City of Hamilton require a special approach to public transit because of high population density, the many municipalities involved, greater capacity needs and the high economic, social and environmental costs of congestion. Through Metrolinx, the Province is implementing a

regional approach to transit and transportation planning. We support new, integrated fare structures under this approach.

MoveOntario 2020 funding also addresses the special needs of the GTA and Hamilton and, when coupled with an alternative financing and procurement approach, provides the fiscal flexibility necessary for long-term sustainability.

The City of Ottawa operates the second-largest public transit system in Ontario. It has a long and very successful history of taking a regional approach to public transit, including interprovincial linkages with the municipality of Gatineau in Quebec.

We concluded that, at present, gas tax allocations are sufficient in addressing the transit needs of smaller municipalities. As transit planning in other large cities matures, however, a regional approach similar to that used in Ottawa and being developed in the GTA may be appropriate.

Options for other sectors

Conservation authorities

Conservation areas are the responsibility of conservation authorities, but municipalities are closely involved in their governance and funding. Conservation authorities were created by the Province mainly to deal with flood control and environmental protection. The conservation areas they govern are based on watersheds, generally covering several municipalities, which their board composition reflects. Their major infrastructure is flood control structures such as dams.

Some municipalities are concerned that the assets of the conservation authorities in which they are involved are becoming – like other infrastructure – increasingly costly to replace and rehabilitate. One difference, however, is that including them in municipal planning is difficult because of the governance arrangements. Some conservation authorities do charge fees for recreational users of their land, but these do not cover their full costs and could not reasonably be expected to do so. The Province provides funding through an existing program, but there is a concern is that the funding level is too low.

Option:

- Greater provincial support, due to the aging of dams and other high-cost infrastructure.

Hospitals

Municipalities face challenges in meeting the demands of local-share provisions. This is an instance, like roads, where users of the infrastructure do not necessarily live in the municipality that has funding responsibility.

Option:

- Consideration should be given to addressing pressures through a revised development charges regime, in line with the option set out above.

Social housing

Ontario's social housing portfolio has grown from an important social goal: providing housing for those who could not otherwise afford adequate shelter. As such, it is an aspect of general shelter policy, which covers a spectrum from homelessness to affordable home ownership.

Shelter needs involve many factors, including income, employment status and disabilities, and linkages between shelter needs and other needs that are best met through social programs. As a result, this is a particularly complex policy area. The provincial government, for example, delivers some 28 programs through four ministries that touch in some way on social housing. Many other parties are involved in delivering shelter and related programs.

Even to look at social housing as an infrastructure issue alone is clouded by lack of information about the asset stock and the future spending needs. Fortunately, work is currently under way within the social housing sector to collect this information, which will be valuable in developing and assessing options. Existing information on the social housing in the City of Toronto, whose 90,000 units represent the largest concentration of social housing in the province, shows that significant investment needs are looming.

At the same time, federal support for social housing is scheduled to be fully phased out by 2029, a move that will have an impact of \$175 million on the City of Toronto alone. In recognition of needs in this sector, the Province invested \$100 million in social housing rehabilitation in the 2008 Budget.

The social policy backdrop to this issue and the need for better information are so important that options must be considered in the context of the broader review, which is looking at service delivery arrangements as well as infrastructure. Each social housing service manager has a different set of capital and operating needs, suggesting the need for flexibility. As well, this area has important linkages to a new provincial affordable housing strategy under development and the Province's poverty agenda.

Regulatory review guarantee

Regulation is an important public good. Provincial involvement in oversight and regulation is necessary in many areas to protect the public interest, achieve public policy goals, ensure public health and safety, and provide consistency in service delivery across the province. Table members also recognize, however, that regulations can drive up the cost of providing and maintaining municipal infrastructure.

To ensure regulation is efficient and its benefits outweigh its costs, the Province should conduct a review and consultation before new regulations are adopted. The goal would not be to carry out a mechanical cost/benefit analysis for every new regulation, but to consider the issues as part of the due diligence in the planning phase and ensure potential costs inform the decision-making process. This option could be implemented by building on the existing consultation protocols under the Ontario-AMO and Ontario-Toronto memoranda of understanding.

It can be difficult to quantify the costs and benefits of regulations, particularly before they are adopted. The parties might have to agree, therefore, on a template or protocol to set the appropriate scope of any review, with the level of detail varying on a case-by-case basis.

Option:

- The Province could commit that a new regulation would be reviewed with the municipal sector before adoption to identify and disclose its costs and benefits.

Conclusions

Our analysis shows that fiscal realignment between the Provinces and municipalities will help to close the infrastructure investment gap to some degree, but much more is needed. Both the Province and municipalities have a role to play, and must work in partnership to increase the overall investment effort in this area. A combination of several measures will be required.

Our most important conclusion is that, in the future, Ontario must see a sustained increase in municipal infrastructure investment. We see this as the most important outcome from this process. One-time infusions of money, while helpful to address the infrastructure deficit, are insufficient to address the ongoing imbalance between infrastructure needs and spending.

Other key outcomes from the infrastructure discussion should be:

- Better asset management as an essential component of a sound infrastructure strategy; and
- Better integration of infrastructure planning and investment with growth management and encouragement of more compact and efficient growth patterns.

By working together towards these key outcomes, the Infrastructure Table believes that we will go a long way towards achieving our vision, helping to ensure the quality of life, economic competitiveness and overall sustainability of communities throughout Ontario.

6. Time to act

Ontario's municipal infrastructure gap is clearly a significant problem and will grow more serious the longer it's not dealt with, as will the potential for severe impacts on economic activity and even human life.

Putting in place the tools required to address Ontario's infrastructure investment need will require bold action, tough decisions, and sustained effort over a number of years.

Next steps and setting priorities

It is important to convey to elected officials the gravity of the infrastructure problem and to provide them with comprehensive information about how to respond to it.

Some of the options outlined in the previous chapter represent fundamental shifts from the way the Province and municipalities do things today, and we acknowledge the challenge of implementing significant changes. We see the following steps as priorities:

- Drawing up municipal asset management plans
- Encouraging greater application of user fees
- Reforming the *Development Charges Act*
- Encouraging greater municipal investment in infrastructure
- Creating an ongoing Infrastructure Investment Fund
- Doing further work on the road and bridge sector, with a view to expanding municipal user-pay mechanisms, realigning funding/ownership responsibilities between the provincial and municipal orders of government, or both

The "roadmap" that comes out of the consensus report of the provincial-municipal review could be an ideal framework to plan for the implementation of all options presented in this report.

Timing

Most of the options require some amount of lead time before they could be fully implemented. In some cases, a process that could start within the next year has been recommended to the Coordinating Table of the review.

Other options – such as reform in the water sector – will require significant structural transformations over a number of years. However, the framework to allow those transformations to unfold could be put in place in a relatively short period of time.

In many cases, a process of stakeholder engagement including more than just the Province and the municipal sector should be followed before the options are implemented.

The length of time involved in some proposed options may appear daunting, but that is all the more reason to set the wheels of change in motion quickly. Delay will lead only to a greater problem.

Appendix A. - Mandate

The mandate of the infrastructure working table was to provide research and analytical support to the Coordinating Table of the Provincial-Municipal Fiscal and Service Delivery Review and provide options on the design and implementation of future infrastructure programs.

The mandate required the table to look at the funding of municipal infrastructure, including discussing respective roles and responsibilities. It was also to consider the linkages between municipal infrastructure and shared federal, provincial and municipal priorities, including:

- safe drinking water and the protection of water resources;
- effective transportation and transit systems that provide a foundation for competitiveness and reduce green house gas and other emissions;
- sustainable waste management systems; and
- cultural and recreational facilities that support healthy, vibrant, active communities.

Other topics considered include the role of reserve funds, debt, user fees, development charges and the issue of intergenerational equity.

The table was directed to take into account the differing circumstances of various types of municipalities dictated by their size, location and other factors.

The members of the table and their affiliations:

Infrastructure Table	
Vic Cote	London
Dan Cowin	Municipal Finance Officers Association
Peter Dance	Orillia
Steven Davidson	Ministry of Culture
Joe Fratesi	Sault Ste. Marie
Mike Garrett	York Region
Bill Hughes*	Ministry of Energy and Infrastructure
Larry Keech	Lennox and Addington
Andy Koopmans	Association of Municipal Managers, Clerks and Treasurers of Ontario
John Lieou	Ministry of Environment
Pat Moyle	Halton Region
David O'Toole	Ministry of Transportation
Joe Pennachetti	City of Toronto
Dana Richardson	Ministry of Municipal Affairs and Housing
Brian Rosborough	Association of Municipalities of Ontario (AMO) Staff
Nancy Schepers and Marian Simulik	Ottawa
Sriram Subrahmanyam	Ministry of Finance
Joe Tiernay	Ontario Good Roads Association
Gerry Wolting	Chatham-Kent
* Denotes administrative chair	

How the table conducted its work

- Members of the table met 20 times between April 2007 and April 2008.

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- In addition, two sub-groups looked in more detail at (1) development charges and (2) roles and responsibilities for roads and bridges
- The Ministry of Energy and Infrastructure (MEI) provided support, particularly in creating and refining the models used to estimate Ontario's municipal infrastructure gap
- An MEI working group on modelling met monthly, starting in September 2007

Appendix B. - Sample Asset Management Plan

Section 1 - Purpose of the Plan

This section provides an overview of key highlights of the AMP.

In this section, please address the following questions:

- a) Why is the plan being prepared? Is this the annual plan or mid-year review?
- b) What is the plan expected to deliver?
- c) How is the plan aligned with the organization's strategic goals?
- d) How did the organization perform against the previous year's targets (see Sections 8 & 9)?
- e) Does the plan introduce any new improvement actions from those in the previous AMP?
- f) Are there specific issues that the plan is intended to highlight?
- g) How does the AMP align or link with other organizational documents?

Section 2 - Asset Description and Valuation

The asset inventory is the foundation on which asset management processes are based. Informed investment decisions rely on ministries having both accurate and current descriptions of their assets, both physically and in financial terms.

- Asset Type – buildings, land, transportation, and other;
- Asset Sub Type – logical business categories (i.e., freeways, bridges, office space facilities, special purpose facilities, etc.);
- Ownership – organization owned, transfer partner owned, leased; and
- Region – geographical area in which the asset resides.

Applying this hierarchy, the total quantities (lane-km, #, m², sq. ft, depending upon asset type) and financial valuation (historical cost, accumulated amortization, net book value) and replacement cost valuation (replacement cost, depreciated replacement cost, annual depreciation) are recorded.

Please address the following questions:

A spreadsheet template has been prepared to assist organizations in compiling their asset inventory information for the purposes of the AMP submission. The AMP inventory section should contain this table along with the following supporting information:

- a) How complete is the inventory data in terms of coverage (percentage)?
- b) How current is the inventory data (date or year)?

- c) How is the data updated and validated?
- d) What is the confidence level in the quality of data (i.e. excellent – seldom incorrect, very good – correct most of the time, good – normally correct half the time or poor – sometimes correct)?

A discussion on key aspects of the inventory should follow after the above “factual” items have been documented. This may include items such as higher priority assets, asset valuation and risk management with respect to critical assets. Additional information (including maps) may be included as an appendix.

Section 3 - Asset Management Practices

This section briefly outlines the asset management systems and main business processes that are currently being used by the organization for managing the assets and making investment decisions. The purpose of this section is to document how asset management practices are currently undertaken in order to assist in identifying possible areas for change and improvement in the future.

The following are the key considerations to include in this section:

- a) The organization staff structure (organizational chart), with brief supporting notes on which departments perform which aspects of the asset management cycle.
- b) Description of asset management software in place for each major asset type, when the software was implemented and the completeness of required data entry. Are there any known deficiencies with the system? Table 1 is a suggested format.

Table 1: Asset Management Software

Asset Type	Software Used	When Implemented	% of Data Entry Completed	Known Deficiencies

- c) Asset condition assessments completed - types of performance data collected for the assets, procedures, completed by who, how often and most recent. Table 2 is a suggested format.

Table 2: Asset Condition Assessments

Asset Type	Data Collected	Procedures	Who Completes	How Regular (years)	Last Collected

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- d) Are separate more detailed, life cycle plans in place for individual assets describing how the asset is managed, identification of needs and strategies employed for addressing operational maintenance and capital (renewal or new) works? If so, then provide a short summary of each.
- e) Processes used for predicting future condition and demand of the assets. Methodologies for identifying maintenance or capital treatment options including evaluation and ranking, life cycle costing, optimization and multi-criteria analyses.
- f) Documented standards or guidelines that are used in the management of the assets (i.e. asset condition rating manuals, asset maintenance/ capital program guidelines, etc.).

If available, supporting information related to the above can be included as reference material to the AMP.

Section 4 - Levels of Service

Levels of service describe the quality of service provided by the asset for the benefit of end users against which performance can be measured. They are generally linked to an organization's strategic goals, integrated within the needs analysis and used to assess the effects of investment decisions. Levels of service are either based on:

- Condition – preservation of the physical integrity of the asset; or
- Demand – service delivered by the asset in terms of its use.

In this section of the AMP, please address the following:

- a) What are the strategic goals and objectives related to asset management?
- b) Are there key legislative requirements that need to be considered?
- c) What are the specific goals and service level objectives for each major asset type?
- d) What clearly defined performance measures are used to monitor whether these objectives are being achieved? Table 3 is a suggested format.

Table 3: Performance Measures

Performance Measure	Purpose of Performance Measure	Data Source	Target Value	Last Years Value	Current Value

- e) What key factors may influence future demand for the assets and what strategies are applied to manage this demand?
- f) What 10 year (or longer) demand forecasts have been developed to assist in managing growth for each type of asset including the impact of changes in demand.

Section 5 - Risk Management

Risk management has been widely applied in many fields to assist with the identification of events that can adversely affect the delivery of a service or project. Within the context of developing an AMP, it is important to first establish which assets are critical, identify and evaluate the risks and put in place risk management strategies.

Please address the following questions:

- a) Which assets are critical to the delivery of services?
- b) For the critical assets, to what risks are they exposed?
- c) How does the organization incorporate risk management within its asset management planning process?
- d) Are factors such as user safety, natural events (i.e. snow/ice, flooding, etc.), physical risk (i.e. failure), economic (i.e. rising world oil prices), legislative (i.e. provincial or federal policy) taken into consideration and if so how?
- e) Is risk management considered when assessing maintenance/capital (renewal or new) options and investments needs?

Section 6 - Needs Analysis and Life Cycle Analysis

This section documents the results from the evaluation of the gap between current asset performance and the required levels of service defined in Section 4.0, followed by the development of options for addressing the gap.

Please provide the following information:

- a) A comparison outlining the difference between the current service capability and required levels of service by asset type. This may just cross-reference to Table 3.
- b) Documentation as to the reason(s) for the performance gap.
- c) Discussion of the options available to close the performance gap if in deficit or potential cost savings if over performing.
- d) Description of the life cycle and optimization analyses completed for each major asset type, based on the results from the needs assessment contributing to the desired program of works.

The section should separate out (to the extent possible) the needs associated with the maintenance/renewal of the existing infrastructure, from that of the need for new infrastructure. In the case of the latter (new infrastructure) there should be a clear discussion as to what the drivers of the need are (i.e. is it general population growth, a change in policy or legislation).

This section should exclude any price escalation component. Price escalation is covered in the next section.

Section 7 - Requested Program Financial Summary

The requested program financial summary documents the financial requirements resulting from the previous section and considers alternative funding scenarios. This section aims to clearly summarize:

- a) The level of funding requested for the portfolio (not project by project); and

- b) The impact of receiving more/less funding than requested.

While the overall AMP provides the confidence in the predictions, it is this section that will ultimately be used by the Ontario Government when determining the appropriate funding levels for an organization.

Based on the needs analysis, the following information is to be provided:

- a) Financial forecasts for the next five years required for (1) operational maintenance of existing assets, (2) capital renewal of existing assets and (3) capital enhancement (new infrastructure) as per the format of the table below.

Five alternative funding scenarios should be analyzed to provide an indication as to the degree of sensitivity of the requested program.

- Funding Scenario 1 – continuation of currently approved five year funding levels
- Funding Scenario 2 - 20% increase in current budget allocation (Note: While 10% might be a more realistic increase or decrease in capital budget allocation, the intent is to understand the sensitivity of performance to funding)
- Funding Scenario 3 - 20% reduction in current budget allocation
- Funding Scenario 4 – maintain the existing performance levels
- Funding Scenario 5 – meet all performance targets at end of five years

The same information requested above should be provided for each funding scenario, preferably in the form of a table or chart.

Table 4: Funding Scenarios

Funding Scenario	Component	Year 1	Year 2	Year 3	Year 4	Year 5
		2008-09	2009-10	2010-11	2011-12	2012-13
1	Operational					
	Capital Renewals					
	Capital New					
	<i>Total</i>					
	Escalation	\$0				

	Total Funding Required					
2	As per above etc					

- b) Forecast of future value of the assets (as per Table 5);
- c) Forecast of future level of service performance measures (as per Table 5);

Table 5: Valuation and Performance Measure Predictions

Funding Scenario	Component	Current Value	End Year 1	End Year 2	End Year 3	End Year 4	End Year 5
			2008-09	2009-10	2010-11	2011-12	2012-13
1	Depreciated Replacement Cost						
	Performance Measure 1						
	Performance Measure 2						
	Performance Measure ...						
2	As per above etc						

- d) Listing of key assumptions (including price escalation over the 5 year period) made in the financial forecasts and performance predictions, including rational for allocating between existing and new assets.

Section 8 - Approved Budgets and Agreed Targets

This section of the AMP is initially included as a place holder and should not to be completed until the final iteration of the works program and expected achievements have been defined based on the final budget allocation.

The section will include:

- a) Approved final budgets for operational maintenance of existing assets, capital renewal of existing assets and capital enhancement; and
- b) Agreed level of service performance measure targets based on the allocated funding.

Next year's review of performance will be based on this section.

Note that the budget approval will be for an amount including price escalation. You will need to account for this when determining the quantum of work that can be completed.

Section 9 –Improvement Plan

The asset management business framework is structured to support a process of continuous improvement. Through the asset management process there is likely to be a series of desirable improvements to advance asset management practice.

This section should include:

An Action Plan that lists the planned short term (< 3yrs) improvements and corresponding timetable for implementing. The table below should be used to clearly define actions against each of the components of asset management (note that there may be several actions against some components and none against others).

Table 6: Sample Improvement Action Plan

Component	Actions	Target	Progress (to be completed in next annual update)
Purpose of the plan	Develop linkage to other organizational documents for inclusion into AMP	2009/10	
Inventory data	Audit 10% of inventory	On going	

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	data per year Complete inventory data collection		
Asset management practices	Acquire an AMIS	2010/11	
Condition data	No improvements required	NA	
Asset valuation	Complete a replacement cost valuation of buildings and transport assets Complete a replacement cost valuation of other infrastructure assets	2009/10 2011/12	
Levels of service	Document levels of service	2009/10	
Risk management	Identify critical assets to service delivery Complete risk assessment of critical assets	2009/10 2010/11	
Needs analysis	Develop asset performance model Identify new assets required	2012/13 2012/13	

	Identify surplus assets for disposal	2012/13	
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Section 10 – Plan Preparation and Adoption

AMP Prepared By: _____ Business Unit _____

AMP Approved By: _____ Date: _____

Appendix C. - The Investment Needs Model

The modelling methodology paper, The Investment Needs Model, is available at www.amo.on.ca.

Appendix D. - Technical submission of the development charges sub-group

The technical submission of the development charges sub-group is available at www.amo.on.ca.

Appendix E. - Technical Submission of the road and bridge sub-group

The technical submission of the roads and bridges sub-group is available at www.amo.on.ca.