

**Municipal Capital Works Projects:
An Analysis of Scheduling Delays and Cost Escalations**

MPA Research Report

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**MUNICIPAL CAPITAL WORKS PROJECTS:
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EXECUTIVE SUMMARY

Municipal capital works projects in Ontario are becoming increasingly difficult to deliver due to the accumulative affect of internal bureaucratic controls and external legislative restrictions. In comparison to decades earlier, there have been substantial changes in the methods followed to construct municipal infrastructure. There is very little research in the area of municipal capital works projects and this research report presents a discussion on the changes that have adversely affected the ability of municipalities in Ontario from constructing roads and bridges.

Requiring permits to work near water or areas of natural habitat was unheard of 30 years ago, as there was little consideration for the environment. Public consultation was not considered until community advocacy groups became involved to protect their community from planned roads and freeways. In response to increased stakeholder involvement and environmental concerns, the Environmental Assessment Act, introduced in 1979, was the singular piece of legislation that resulted in municipal projects taking longer than a year to design and construct.

The current process of delivering capital works projects is one of extensive restrictions and controls, both internal to local government to ensure accountability, and external to protect the environment and engage stakeholders. Over time, the process has become increasingly complicated with additional restrictions and requirements. Coincidentally, the municipal infrastructure network is failing due to age and substantial investment is required to replace what the public has entrusted its local government to provide.

Municipalities cannot assume that the process will become simpler. Rather, learning from experience and good planning is required in order to accurately schedule projects and budget

accordingly. Recognition of excessive demands is necessary and municipalities must be prepared to question the process and unreasonable requirements when necessary. Stakeholder consultation can greatly benefit a project, but also severely hinder budgetary and scheduling targets. Thus, the consultation program should be reflective of the expected contentiousness of the project.

Regardless of the project or its impacts, all issues must be addressed early, quickly and directly.

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1. INTRODUCTION

The Romans and Egyptians constructed monuments, roads, and aqueducts that have lasted for thousands of years. Historians marvel at the ingenuity and hypothesize as to how these structures were built without the benefit of modern technology. Although these ancient ruins were built without computers or today's construction equipment, it is highly unlikely that formal approvals or permits were required before the commencement of construction. Over the last several decades, Ontario's municipalities have been subject to a variety of legislative and bureaucratic initiatives introduced for the purpose of protecting the environment, supporting the democratic process, and controlling financial expenditures. Unfortunately, these new regulatory encumbrances have added to the burden of delivering capital works projects, thus resulting in scheduling delays and cost overruns.

The purpose of this research report is to analyze why modern municipal capital works projects now take years to plan and construct and inevitably go over budget, placing even greater demands on the already constrained municipal revenue stream. Many of today's capital works projects take in excess of five years to complete, from planning to construction, often due to the associated work required to obtain the approvals and permits, many of which have been introduced in the last 20 to 30 years.

The transition has been gradual, but there is no recorded evidence of project delivery methodology prior to the introduction of the mandatory processes. There is also no substantial academic research in the field of project delivery and why numerous steps have been added.

This report will not only identify the primary reasons for project delays and cost overruns, but record the progression of project delivery from when there were no restrictions to the current

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lengthy process. Based on the research conducted, there are remedies to both improve the delivery of capital projects and make municipalities better prepared before embarking on the next project.

1.1 Methodology

Senior staff will often talk of how much simpler it was constructing roads and bridges in the “old days”. There were no approvals or permits required, funding was received from the Province and the municipality constructed the roadway. Often the planning, designing and constructing process occurred in less than a year.

To gain an historical perspective on project delivery methods and to gather opinions on the current state of the approval and permit process, interviews were initially arranged with experts with 30 to 40 years of experience, which is the period of greatest transition in the field of delivering municipal infrastructure projects. Attached to the interview invitation was the draft questionnaire (see **Appendix A**), provided in order to assist the interviewee in preparing for the interview. The original concept was to interview only representatives of the municipal sector, but following the initial set of interviews it became apparent that additional interviews were required from representatives of approval and permitting agencies to provide a contrasting perspective. Conference calls or personal meetings were held with representatives of the Province of Ontario, agencies and municipalities during April and May of 2007. In all, 11 senior professionals were interviewed, six of whom are retired civil servants. The other five are currently working in a local government setting with various years of experience. The final complement of interviewees consisted of:

- Seven (7) from the municipal sector
- Two (2) from the Ministry of the Environment

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- One (1) from a conservation authority
- One (1) from the Ministry of Transportation

The results of the interviews are summarized as follows.

- In the “early years”, MTO was the only approval agency, as the primary funding source for municipal projects was the province (50% for roads and 80% for bridges).
- Before the Environmental Assessment Act (the EA) no permits were required.
- The defining turning point was the introduction of the EA Act and the associated EA process. City of Toronto staff would also recognize amalgamation and the resultant confusion as a turning point.
- Nine of the 11 stated that project delivery is now either “more difficult” or “far more difficult” when compared to early in their career.
- The two who said that project delivery is “the same” began their working careers in 1989/90 – following the introduction of the EA process.

The quotes provided throughout this report are taken from the summaries of these interviews. To ensure accuracy, each interviewee reviewed and signed off on the transcript of their interview.

The information given is based on the interviewees’ recollection and may be subject to bias due to selective memory, therefore misrepresentation may be possible.

1.2 Scope of Research Report

There are many facets to delivering a municipal capital works project and this research report does not address all of the issues. Based on the literature review and the interviews, this research report will focus on the primary areas that appear to have affected the delivery of infrastructure projects to the greatest degree. The barriers to be discussed include those that have been constant,

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such as financing, property acquisition and utility relocation, and those that have been introduced more recently, such as the Environmental Assessment Act. Other factors that have impacted project delivery include the Occupational Health and Safety Act, the Employment Standards Act, and the various funding sources, such as development charges. These factors were not present in the “early days”, but now restrict the scheduling of projects. The point being made is that there are many other additional barriers affecting municipal projects other than those discussed in this report. As such, this report attempts to highlight the most significant barriers and possible remedies.

2 BACKGROUND

The public works departments in Ontario's municipalities deliver projects in a much different manner than they did in the past. The following quote¹ summarizes the transition from a personal perspective:

Early in my career, I considered the pendulum was far to one side, maybe too far in terms of what we could do. We didn't consult to the extent we do today. We'd cut down trees and didn't take inventory for what we may have been affecting. Today, the pendulum has swung completely the other way and the hands of municipalities are tied with significant restrictions.

The current process is defined by permits, approvals, and consultation. On the technical side, not much has changed. The ingredients in road, bridge, and sewer construction are essentially the same: aggregate, concrete, asphalt and steel. What has changed is the level of involvement of approval agencies and the public. There was a time when a municipality could construct a road in a single year if land was available. The current environment is one where mandatory processes, approvals, and public consultation affect the scheduling leading to increased costs: "the process is becoming far more complex".

The extent of how severely the change in the process has affected municipalities is unknown. There is no suitable inventory of Ontario's municipal assets. There is also no accurate database of the total annual expenditure of capital works projects. The Ontario Good Roads Association recently published survey results, with 35 of Ontario's 445 municipalities responding, which revealed that \$255 million is being spent on road construction, but \$700 million was required.² A report of the Municipal Performance Measurement Program (MPMP) and the Ontario Centre for

¹ This is the first of many quotes throughout this report, which are taken from a series of interviews with senior municipal and provincial representatives. To ensure anonymity and confidentiality, the quotes are provided without attribution.

² Source: Canadian Automobile Association's Worst Municipal Road Campaign 2006, www.worstroads.ca

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Municipal Best Practices (OCMBP) revealed that the total operating and capital roads budget for municipalities responding to another survey was over \$1.3 billion in 2005. Although these numbers are not accurate and do not reveal the actual expenditure of transportation infrastructure in Ontario, an order of magnitude is provided regarding what is required to rebuild, rehabilitate and maintain Ontario's municipal transportation network.

The Federation of Canadian Municipalities estimates that there is a \$60 billion municipal fiscal imbalance. In terms of infrastructure, new investment grew by 4.8% annually between 1955 and 1977. Until 2000 this investment decreased to 0.1% per year. Since 2001 the investment in new infrastructure has grown to 7.5% per year, but very little funding had been directed to the replacement of existing infrastructure. Hence, there is an infrastructure deficit, the difference between the growing range of municipal responsibilities and the deferral of investment in infrastructure.³

The Ontario Auditor General⁴ has estimated the life of a road and the costs associated with its construction. With ongoing maintenance a road can last for up to 15-17 years. The structure of the road (underneath the asphalt) can last up to 50 years. The cost of preventative maintenance is estimated to be \$1000 per year per lane kilometre of road surface. The cost to resurface a road is approximately \$80,000 per lane kilometre. If preventative maintenance is avoided, the reconstruction of the road, including the structure, can be \$250,000 per lane per kilometre. The importance of road maintenance can ensure its maximum life expectancy.

³ Federation of Canadian Municipalities, www.fcm.ca

⁴ Source: Canadian Automobile Association's Worst Municipal Road Campaign 2006, www.worstroads.ca

2.1 Literature Review

Municipal projects attract little attention in the form of research. There is considerable research and data analysis on “mega projects”, those projects that cost in the order of several hundred million to multiple billions. Clearly these types of projects are not common in most of Ontario’s municipalities; only the major metropolitan areas such as Toronto, Hamilton and Ottawa have a need to consider mega projects.

The problems and missed opportunities of mega projects have been well documented. Projects such as the tunnel linking England and France was double the original estimate and one year behind schedule; the Sydney Opera House cost 15 times more than expected and was nine years delayed; and the cost of the Boston Big Dig has increased by almost four times and was completed five years later than expected. There are many examples of mega projects that have experienced cost overruns and significant delays: Toronto’s Skydome (Rogers Centre), the Pickering Nuclear Generating Station, Montreal’s Olympic Stadium, London’s Millennium Dome, and the Denver Airport. However, some major construction projects were built on budget, including the Sheppard Subway.

Large projects can get out of control but with proper planning and project/program management it is possible to build large projects on budget. Project control and oversight systems have now been advanced to the point that it is possible to detect early warning signs of potential cost overruns and then take early and effective corrective action.

Mega projects are often heralded as landmarks and engineering marvels. As such, the cost to construct a world renowned feature, such as the Sydney Opera House, which is synonymous with opera, Sydney, and Australia, can be considered secondary. The benefit to the municipality can be incalculable, resulting in increased tourism and many other tertiary benefits. There are other projects, such as Boston’s Big Dig, which are constructed for utilitarian reasons with no other

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benefit except infrastructure modification. However, the cost associated with any municipal project relies on funding, the source of which is usually taxes.

Research of mega projects has identified four factors that contribute to cost overruns: technical, psychological, economic and political (Flyvbjerg 2002). The research references problems associated with construction delays, but is primarily focused on the root causes of why the final costs exceed initial estimates. In addition, the research concludes the following:

- For road projects, actual costs are on average 20% higher than the estimated cost
- Nine out of 10 mega projects are over budget
- Cost underestimation has not decreased over the past 70 years
- Errors in cost estimation do not appear to be a factor, but instead a form of strategic misrepresentation
- There is a need for institutional accountability at the municipal level

Further exploration is required to determine whether typical municipal projects, such as a road widening, an intersection improvement, bridge reconstruction, or the construction of water and sewer mains, are subject to these same factors. The primary difference between mega projects and municipal projects is the characteristic of the undertaking. In addition to their cost, mega projects tend to be one-of-a-kind civil engineering marvels with unknown technical requirements. Municipal projects are typically not defined by these qualities. Most municipal works projects are common civil engineering ventures that are added to an annual capital works program on an as-required basis.

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The purpose of this research report is to study the reasons why municipal capital works projects are increasing in cost and taking longer to complete. The research on mega-projects can be related to municipal projects to a limited degree, as it helps to provide an understanding of the potential problems and barriers.

2.2 Infrastructure Defined and Public Opinion

The Gage Canadian Dictionary defines infrastructure as the “essential elements of a system or structure.” Municipal infrastructure are the elements that the public, business and industry rely on for their everyday existence. Roads, water treatment systems, watermains, sewers, water pollution control plants, and storm drainage systems are all examples of municipal infrastructure elements. Without municipal infrastructure, the health and welfare of the community could not be maintained.

During the post-war boom of the 1950s and 1960s, Ontario’s municipalities grew significantly. As an example, the City of Toronto’s population was 676,000 in 1951; upon amalgamation on January 1, 1998 its population was 2.8 million⁵. In response to the rapid growth, a significant portion of the infrastructure was constructed during the 1950s and 1960s. There were few barriers to road construction in this era and citizens were not opposed.

There were different pressures 40 plus years ago and people thought road construction was beneficial for the city and the community. Nobody complained or was worried about the environment. Growth and development were signs of progress.

⁵ City of Toronto Archives, www.toronto.ca

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A recent public opinion survey⁶ indicates that the development and maintenance of public infrastructure is a key concern to Canadians. Nearly three quarters of Canadians think that the roads and highways in their province are in either declining or in desperate need of a complete overhaul. Ontario residents' opinion of roads and highways was very similar to the national average. Interestingly, Quebec residents considered their roads and highways particularly poor, and the survey was conducted prior to the September 2006 bridge collapse in Laval.

The survey covered a number of areas related to municipal infrastructure. Insofar as other municipal services, Ontario residents considered water treatment facilities a priority, more so than the rest of the country, likely due in part to the Walkerton tragedy and water problems in Kashechewan in 2006.

In terms of the public's view on municipal government, the majority of Canadians think that their municipality has performed poorly in managing roads and highways. Transportation in general seems to be a weakness as public transportation is also rated poorly.

In summary, Canadians, and in particular Ontario residents, say roads and highways are a concern and that municipalities could be doing better in terms of managing the transportation infrastructure.

The infrastructure is aging and signs of failure are evident, especially during the winter months when the number of watermain breaks are higher and pot holes appear in roads. With every passing year, the likelihood of failure rises and the public recognize this failing infrastructure.

⁶ Ipsos Reid, Public Opinion on Infrastructure, September 2006. This is a frequently cited survey, discussed in journals such as *Municipal World* and the Ontario Good Roads Association's *Milestones* monthly magazine. In addition, I have obtained a copy of a presentation from Ipsos Reid providing additional detail of the survey.

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However, as will be discussed in the following sections, the ability of Ontario's municipalities to improve the infrastructure has become an increasingly difficult process, with higher associated costs and longer schedules.

2.3 Project Delivery Options

Municipal capital works projects involve the construction of infrastructure and there are several methods by which it can be delivered. A municipality can program work as part of its capital budget, a developer can include it in the construction of a subdivision or new commercial or industrial site, or, for larger projects, a municipality can enter into public-private partnerships, among other methods. Work associated with land development is for the purpose of servicing the site and is not constructed for future use, unless the municipality contributes to the developer's contract and the infrastructure is increased in size to accommodate future considerations (typically applies to water and sewer projects).

The difference between developer and municipal projects is one of business. Land development is about the conversion of land to usable space. Brownfield development refers to the redevelopment of an existing occupied parcel, usually associated with contaminated soil or other environmental concern. Greenfield development is the conversion of farmland or other open space. Land development is a business and as such is profit driven. Therefore, once approval is given to the redevelopment of lands, the construction activity appears to occur relatively quickly. This is partially due to the business aspect of land development, but also that the approval process for land development is different in comparison to municipal infrastructure projects.

There is a difference between the requirements for public agencies (municipalities) and the private sector. It is far more difficult for municipalities to obtain the necessary approvals and permits. This is mainly due to the greater political and public involvement in the process. Private developments require public contact, but these meetings are often grouped as part of several through the local municipality, whereas there is often

significant focus on the public sector initiative. Often the private developments get through the process without objection, or even acknowledgement by the public.

Investigating land development issues is beyond the scope of this research paper, but it is important to note there are real differences in the approval process when comparing municipal projects and development related projects.

2.4 Project and Construction Costs

The terms project cost and construction cost are often used interchangeably. Although the cost of construction is relatively straight-forward to understand, as it is the actual cost of the construction activity, the project cost may not be so easily understood. Project cost is the cost to complete the project in its entirety. Costs associated with a project include the construction cost, but also include municipal staff time and consulting fees related to the planning stage or design stage. The costs associated with obtaining additional right of way (property) and utility relocation are also included. Often the project costs can be almost double the cost of the construction contract⁷.

The estimating of project costs becomes more complicated the longer the project schedule and the greater the number of stakeholders involved. However, there is an inherent flaw when it comes to project cost estimating. Engineers, project managers and senior bureaucrats develop budgets and schedules for their projects before the design stage has begun. Thus, the project is added to the annual capital works budget based on the best estimating techniques: primarily the cost of recently completed similar projects. Once a project enters the design phase, budgets are refined as more detail is provided and if possible, the overall budget is adjusted accordingly. At this point, costs will include not only the construction costs, but costs to acquire property and relocate utilities. Upon completion of the design, a pre-tender budget is established based on historical

⁷ Region of Durham Works Department project cost estimates

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unit costs for materials, equipment and labour. The pre-tender budget is the estimated cost the municipality anticipates a contractor will bid the project. At this point the project may be placed on hold if any necessary property has not been purchased or utilities relocated. Several months will often pass before the project is tendered and depending upon changes in the marketplace and various other factors, the bids may be substantially higher than anticipated.

Municipalities are bound by purchasing by-laws and the legislation as outlined in the Municipal Act, leading to the acceptance of the lowest bidder, regardless of experience or reputation.

Before the tender price is considered, the bidder must meet the municipality's mandatory requirements, such as bonding and insurance. Once the project is awarded to the successful bidder, its completion is left to the contractor, often with little recourse if the contractor chooses to direct equipment and labour elsewhere; this is especially prevalent in periods of economic growth. Currently, there appears to be few penalty and bonus clauses included in municipal contracts, perhaps the value of such are not substantial enough to motivate a contractor to complete the project on schedule and within the bounds of the contract.

There are numerous areas where the cost of a project can escalate. Delays during any phase of the project can have an effect on the cost of the project, including the design phase. The construction phase is particularly susceptible to cost increases, as construction change orders or "extras" are issued (unforeseen changes to the contract). Unfortunately the tendering process can aid in the opportunity for extras. Since the low bidder will be awarded the contract, the contractor may attempt to increase the profitability of the project, as the tender price must be marginal to ensure award. There is resistance on the part of the contractor to make adjustments in the field; rather, a change order will be issued.

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Another factor associated with extras during the construction phase is whether the project site is free of all encumbrances. If a contract is tendered before property is acquired or utilities have been relocated, the project will inevitably increase in price, as penalties will be imposed on the proponent. The contractor will have allocated resources to the project and if the schedule cannot be maintained by the proponent, the contractor will claim damages. Unfortunately there can be situations that arise whereby contracts must be let before all the issues have been addressed.

Factors during the construction phase may impact the schedule and cost of capital works projects. Since infrastructure projects are deemed core services delivered by local governments, their importance cannot be underestimated. Not only do capital works projects typically comprise one of the largest components of a municipality's annual budget, they can be subject to public and political concerns. It is during the construction phase that the tangible result of the project begins to be realized. It is also during this phase that the public is most inconvenienced due to detours, dust, construction equipment and noise.

3 THE “EARLY DAYS” OF MUNICIPAL CAPITAL WORKS PROJECTS

It is important to recognize how the actual construction activity of a typical municipal project has evolved over time. By recording stories and anecdotes of experiences from the 1950s and 1960s, a baseline can be defined from which point we can compare and contrast the issues of the current process and hurdles faced by Ontario’s municipalities. The following three accounts lend credence to the ease of project delivery in the “early days”.

Early in my career I visited a bridge reconstruction project on the boundary road. The workers saw me as the young guy at 27 and asked me to blow up the old bridge with dynamite, which I proceeded to do. I took the fuse line, cleared the area, and detonated the dynamite. The bridge blew up. We didn’t need a permit for explosives or clearances from everybody and anybody. As a county engineer I could purchase dynamite from the local hardware store.

In the early 50’s, MTO staff would meet on site with a contractor to discuss a relatively simple project. The contractor would be asked for a price and with approval given the project would commence.

Long before the EA Act and the other approvals that are now necessary, I remember stories of projects that are quite amazing and unbelievable by today’s standards. One story involved the construction of a highway in British Columbia. The surveyors were no more than two miles ahead of the construction crew.

The above stories are from retired municipal commissioners and directors who experienced the transition of project delivery. From the 1950s, exemplified in the above examples, to today’s difficult regime, the process for delivering municipal projects has evolved into a complex undertaking. “It was far easier early in my career, no comparison. The pressures and bureaucracy of today’s business are astounding. There are definitely more requirements delivering a project today.”

There are several reasons for the increased complexity of today’s municipal works projects. Everything from internal bureaucracy, to environmental awareness, to additional provincial and

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federal legislation, has contributed to the lengthening of the process, from planning to implementation. Unfortunately, scheduling delays usually result in cost overruns. Similarly, the estimated cost of a project is likely to rise the further into the future construction is scheduled to begin.

3.1 Finance

Before 1995 in Ontario, the Ministry of Transportation (MTO) provided funding for infrastructure improvements and maintenance. Key documents that helped municipalities budget for capital works projects, and to justify the conditional grants, were the road and bridge appraisals. Every year, municipalities evaluated the condition of their transportation infrastructure. Working with the MTO, municipalities would schedule various rehabilitation and reconstruction projects. The province would provide conditional grants to municipalities for road construction (50% towards construction), bridge construction (80%), and road maintenance (50%). “You really only had to deal with the MTO.”

During the design stage, MTO would be involved to confirm what was to be constructed and to protect against wasteful construction. “Everybody followed the Ministry design standards, so there were no surprises in terms of how something should be designed and how it should be constructed.” Although municipal staff applied the standard, there was little opportunity to change the design from beyond the standards, or risk losing the grant.

MTO conditional grants would be built into the financing of capital works projects. The budget document would specify total expenditures and the subsidy amount. “You had a good idea of the amount you were going to receive,” since the amount did not vary greatly from year to year. An example of a budget summary is provided in **Appendix B**.

3.2 Property Acquisition

The purchase of land is a primary example of the simplicity of project delivery 30 to 40 years ago, where municipalities would offer to build a fence in exchange for a road widening.

Concession roads were originally surveyed with a public right of way (ROW) of 66 feet. In a rural community, the municipality would request a widening from the adjacent property owner of 17 feet. By obtaining 17 feet from both sides of the road, the municipality could properly construct a major road with 100 feet of ROW. A sample agreement from 1972 is provided in **Appendix C**.

3.3 Utilities

Utilities typically include gas, electricity and telephone companies, the infrastructure for which is located within the municipal right of way. Before deregulation, utility companies would work cooperatively with municipalities in identifying the location of buried telephone lines, gas mains and power cables. Utility searches consisted of municipalities sending drawings of proposed road improvements to the utility companies for infrastructure identification. This information would be included on the final construction drawings; there was a certain level of confidence in the information. This service was provided by the utility companies to ensure identification and thus, protection of the utility infrastructure, which reflected the monopoly or franchise agreements of the time.

3.4 Resources

If the land was available, municipalities would initiate construction. This process led to the successful completion of most projects within a very short timeframe. The schedule was aided by municipal labourers performing the work. Also, municipalities sometimes had their own source of material. “The Town and County had their own gravel pits, so we could hedge against

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commodity prices. With our own forces, we could also manage the project better. It was a stable environment and we had few over-expenditure reports to council.”

It was a much different environment. We did everything and the project was typically constructed by County workers, as there was a construction labour force. The length of a project differed depending on the type of project. If a bridge required construction, it typically took two years as a tender was required, but no more than two years.

3.5 Approvals and Permits

The research suggests that there were virtually no requirements for permits or approvals in the “early days” of delivering capital works projects. Since provincial conditional grants were directly related to the approval of projects, the only agency a municipality had to work with was the MTO. “In some cases you had to deal with the Feds if navigable waters were affected, or CN / CP if a railway was impacted, and, of course, utilities.”

The Conservation Authorities Act was acted following Hurricane Hazel, but in the “early days”, the conservation authorities were “were finding their way and developing policies”. They were also growing and “primarily concerned with flooding, sediment and erosion control, and recreational trails. Their mandate has expanded considerably in recent years.”

4 MUNICIPAL CAPITAL WORKS PROJECTS: THE CURRENT PROCESS

The previous section provided an historical perspective of municipal capital works projects in the 1950s, 60s and 70s. At the end of the 1970s, approvals and permits were becoming necessary before a municipality could initiate a construction project. Over the course of approximately 15 years, between 1980 and 1995, there were further changes in the funding structure and approval process of projects. The following section attempts to document these changes and the impact on Ontario's municipalities.

4.1 Financing

Prior to 1995, Ontario's municipalities could predict with some accuracy the level of funding to be received from the province in the coming budget year. The province provided conditional grants to municipalities for the specific purpose of constructing or maintaining certain roads and bridges. Once the funding program was cancelled and municipalities were left to manage their transportation networks, MTO ceased administering municipal affairs. With this also came the change to design standards as municipalities now had the flexibility to design roads and bridges without the highly regulated controls of MTO standards. Unfortunately, the removal of the funding program also occurred at the same time as the downloading of many provincial highways and various other services.

To ease the burden, many of the smaller municipalities have cancelled their road inventory programs, leading to the inability to accurately predict the life remaining in a road. With proper maintenance, roads can last 15 years without resurfacing and bridges are built to last between 60 and 80 years. Without suitable funding the transportation system is deteriorating faster than municipalities can maintain or replace the infrastructure. Because one quarter of municipal

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expenditures are directed to social services (McMillan 2004), municipalities must balance rehabilitation and maintenance against reconstruction among many of the other services provided.

4.2 Property

There would be little possibility of obtaining land today in exchange for a fence. Although the Expropriations Act is in place to protect property owners from the unreasonable acquisition of land for public use, property owners typically consider the value of their land much higher than market value. Since some municipalities may proceed with land acquisition as if Section 32 of the Expropriations Act has been invoked, all legal fees are paid for by the municipality substantially increasing the cost of a project. As such, this process provides no incentive to come to an agreement in a timely fashion and thus, could result in legal costs far exceeding the purchase price of the land. If these costs were the responsibility of the land owner until an agreement is reached, the process could be shortened. Until such time, the acquisition of land will continue to take a considerable amount of time. Therefore, a municipality will formally expropriate land only when absolutely necessary.

Property acquisition has always been a difficult task. Since the lawyers have gotten involved and advised clients of the potential financial windfall, the process has become very onerous. It takes a minimum of one year to obtain property and if expropriation is required, this process easily lasts two to three years.

Property acquisition typically is the last barrier to a project going to construction as scheduled. In the 2007 construction year, the Region of Durham will not meet the construction schedule of six projects with a combined cost of \$18 million of a \$28 million road improvement program. Four projects are being delayed due to property acquisition issues and the other two due to utility relocation problems.

4.3 Utilities

In many organizations, municipal capital works projects will not be tendered until the necessary property has been acquired and conflicting utilities relocated. Typically if issues involving property and utilities are not resolved prior to construction, the schedule will be delayed and penalties will be imposed by the contractor.

Utility companies have a right to locate their infrastructure within public (municipal) rights of way, as per the Public Utilities Act, R.S.O. 1990. In Ontario, if not the rest of Canada, there was a virtual monopoly on telephone, television cable, natural gas, and electrical services. In the case of television cable and natural gas distribution, the service was regulated by way of franchise agreements, which set boundaries within which the individual utility company operated (the Canadian Radio-Television and Telecommunications Commission regulates television cable providers and the National Energy Board is the overseer of gas distribution companies). In the 1990s, the CRTC enacted the Telecommunications Act, which deregulated the telecommunications industry.

In an effort to become more competitive, services were eliminated or their levels reduced. One of the core services provided to road authorities by utility companies was searches, whereby municipalities provided draft design drawings to the various utility companies for identification of their infrastructure. This information was included on tender drawings and provided to contractors. Municipalities are now responsible for locating utilities within the municipal right-of-way before construction commences, as utility companies no longer provide locating services during the design phase. Also, there are now more telecommunication providers and the information on existing utilities is weak, requiring greater effort on the part of the designer to confirm what utilities may be in conflict with the proposed project.

The design component of utility identification adds to the burden, but the cost to relocate conflicting infrastructure is shared. The Public Service Works on Highway Act, R.S.O. 1990 ensures that the cost of labour and labour-saving devices associated with the relocation of utilities due to a municipal works project is equally shared between the municipality and the utility company. As such, “apart from property, dealing with utilities is probably the most technically challenging part of project delivery.”

4.4 Resources

The research has shown that in the “early days” municipalities would often use their own forces to complete capital works projects. The research effort did not conclude if day labourers continue to be employed by Ontario municipalities. Observations and interpretations of the data provide evidence that contracting of capital projects is prevalent today and that only small projects may be completed by municipal forces, as most respond to operational issues only. A 2005 benchmarking report⁸ on Ontario municipal services combined operating and capital work. Participating municipalities of the survey indicate that almost 55% of operating and capital work is completed by own forces.

4.5 Approvals and Permits

Over time, provincial legislation was introduced and new municipal policies implemented. With additional steps being added, costs and project schedules increase. This transition was gradual, as many approvals and permits were not originally mandatory or forced onto the municipalities. Agencies were developing their own policies based on the new legislation. However, permits and approvals were eventually made mandatory and penalties were enforced. Although project schedules have increased to account for the necessary approvals and permits, the pressure to

⁸ Ontario’s Municipal Roads 2005: Benchmarking Ontario’s Municipal Road System. A report of the MPMP / OCMBP Roads Working Group.

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tender and construct has maintained constant. As such, capital projects can be politicized and their progress is closely followed by local councillors. “Some councillors become very involved in the process and become project managers. They will often walk the job site, make suggestions, and direct work.” This is a relatively new phenomenon in urban municipalities, as this may have been commonplace in rural communities when there was not the municipal staff compliment available to manage such projects and therefore elected officials assisted.

4.5.1 Municipal Bureaucracy and Other Internal Factors

Denhardt (2003) defines governance as the tradition, institutions and processes that determine how decisions are made of public concern and how citizens participate in these decisions. In making these decisions, regardless of the subject, local governments in Ontario are giving a strong voice to its citizens and showing greater awareness of social and environmental considerations (Tindal 2004). With increased public awareness of local government activities, policies and procedures have been introduced to not only support the goals and objectives of the municipality, but ensure openness of decision making and increase financial accountability.

Municipal leaders are accountable for local government revenue and expenditures. In Ontario, 48% of a municipality’s revenue is generated by property taxes (McMillan 2006), a highly regressive form of taxation. Therefore, municipalities should have sound fiscal policies and long range financial planning that balance expenditures for delivery of services with available funding.

The increased transparency and financial management in local government is evolutionary and some municipalities in Ontario have introduced policies to provide a guideline for the expenditure of funds, which also set an accountability framework.⁹ When compared to the methods followed

⁹ Budget Management Policy, Regional Municipality of Durham

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in previous generations, and considering the expectations of the public were different in the “early days”, more trust was given to senior management.

In the early days, the Commissioner had the responsibility of issuing and awarding tenders. There was no limit to the tender value. Far more trust was given to the responsible individuals. Today it seems that municipalities are too risk adverse. The cost of administrative controls has resulted in government becoming very expensive.

In many cases, budget control policies are implemented as a result of errors in contract administration. This is especially true at the City of Toronto, where recommendations from the Toronto Computer Leasing Inquiry include the hiring of an ethics commissioner, a complaints process (to the ethics commissioner), a policy on the acceptance of gifts, and procurement limits by staff, among many others. As a result of these recommendations, Toronto has, among others, introduced:

- Auditor General office
- Detailed procurement and procedures manual
- Fraud and waste hotline

Before the computer leasing scandal, Toronto went through a period of considerable distress, and some would say that the problems of amalgamation are still apparent.

At the City of Toronto, there is no doubt that amalgamation was the turning point. On January 1st, 1998, the system fell apart and new policies and procedures were adopted, but they were a combination of seven previous policies. The internal bureaucracy is huge. Finance drives project delivery.

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The formation of the City of Toronto through amalgamation is a well researched and documented subject matter. It would be an oversight to not mention the effects of amalgamation in a paper that discusses the internal factors that have contributed to municipal capital works projects exceeding budgets and schedules. In the case of Toronto, amalgamation appears to have had a much greater impact than any other provincial legislation.

Policies introduced at one municipality are often adopted by other agencies as a preventative measure. These policies attempt to ensure public accountability is upheld and that staff act in an unbiased manner, and are seen to be unbiased. As such, policies have been introduced at Ontario municipalities that restrict relationship building ventures and set purchasing limits and travel. Policies restricting lobbying have also been introduced and are often the result of mistakes and errors of judgement in other organizations. The ripple effect of such scandals at the City of Toronto¹⁰ and the Royal Canadian Mounted Police¹¹ has been felt at many municipalities. Attendance at events such as golf tournaments, which are commonplace in the private sector, is forbidden by some municipalities. When former municipal leaders are questioned, a common response is:

Surprisingly, there were no big scandals early in my career. The work got done, decisions were made, and there was trust. Now, with all the internal processes in place, we have scandals, some of which are headline news, for example, the MFP scandal. These events have led to an increase in internal controls, thus adding layers of bureaucracy. In the old days, it was a team approach, now each department seems to be vying for power.

Policies common in municipalities include those relating to purchasing / procurement and monitoring / controlling the budget. At most municipal governments, council approval is

¹⁰ Toronto Computer Leasing Inquiry (MFP Computer Leasing Scandal), Justice Denise Bellemy

¹¹ RCMP Pension Scandal (2006)

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required for the purchase of goods or services over a certain value, even if council previously approved the budget for the purchase. The treasurer or commissioner of finance is often accountable for the purchase and therefore has final approval of a major purchase, regardless of whether the funding was previously approved by municipal council.

Internal challenges included more aggressive budget analysis and audits by centralized departments. These would typically target works departments since that was where most of the money was being spent. Central procurement departments and processes have also added substantial delay to the process.

Internal checks and balances do provide increased transparency and accountability, but it can add to a project's schedule. If council approval is required before a contractor can begin, sometimes several months are required depending upon the time of year and whether council is in session.

Forms of practice, not necessarily policy, often dictates the approach used by a municipality in problem solving or decision making. Municipalities approach governance differently, depending upon the desires of the mayor or elected officials, or the expectations of the public. Public consultation is one area that is becoming prevalent in Ontario's municipalities, regardless of the issue. Denhardt (2003) states "public servants do not deliver customer service but democracy". This statement reflects the concept of the new public service in which many municipalities approach governance. The City of Toronto is an example of a municipality that consults with the public on many issues. By way of example, Toronto and several other municipalities in Ontario will hold a public meeting for transportation engineering projects when the project is, by definition, pre-approved by provincial legislation. Toronto has gone as far as publishing a public consultation guideline and creating a department to assist in public meeting facilitation. Public consultation is endorsed by Peters (2001), as "consultation and citizen involvement in policy making have become components of Canadian government". Depending upon the municipality

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and the strategy followed, the level of public participation will vary. These internal procedures are sometimes an extrapolation of provincial legislation and other external factors.

In the next section, the aspect of stakeholder consultation will be discussed. However, this is an internal factor as well when a municipality has a policy requiring consultation with numerous commenting groups within the organization. At the City of Toronto, the internal circulation and contact list can be as lengthy as the external agency list.

The project delivery process has become far more difficult with the number of stakeholders involved. Internally, we gather comments from 40 different stakeholders / commenting groups, each having a specific mandate.

4.5.2 The Environmental Assessment Process and Stakeholder Consultation

In the last 30 years several major approval requirements were introduced that have made project delivery much more complicated. In the opinion of transportation experts, the Environmental Assessment Act is the most significant hurdle to affect the delivery of municipal capital works projects.

The Environmental Assessment Act was the turning point in efficient project delivery. I clearly remember hearing that it 'won't be a hurdle' and that it won't cost any more than 'one percent of the project cost'. The EA resulted in projects becoming much more difficult to deliver. The EA added at least another year to the project schedule.

Before 1979 there was no Environmental Assessment Act (the EA). Times were different and the public was not generally engaged or opposed to road construction. During those early years, municipalities, in general, expanded the infrastructure with little regard to the environment or the community. There were exceptions, for example, the Spadina Expressway in Toronto. This project became highly contentious in the late 1960s and early 1970s and was ultimately cancelled

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due to public opposition. The debate over this freeway expansion may have been the catalyst to develop a provincially mandated process to consider both the environment and the public. The introduction of the EA Act has added to the project schedule and cost, but has also offered the opportunity for the public and agencies to play a much greater role in the planning of municipal works projects. Since the introduction of the EA Act and the approval process, “we have gone from virtually no control to over control.”

The EA was introduced to be mindful of the environment and the community, and it applied to any improvement or modification in the public realm. Municipalities follow the Municipal Class EA¹² process for road, bridge, water and wastewater projects. The Class EA process is an approved, consistent and streamlined methodology for planning and implementing projects, as municipalities in Ontario generally address similar types of problems and opportunities. The Class EA process is provided in flow-chart form in **Appendix D**. By following this process, municipalities can ensure that the requirements of the EA Act are being adhered to. Attempts to follow provincial legislation without guidelines are difficult, time consuming and costly; “this approved planning process saves municipalities a tremendous amount of time and money.”

Within the Municipal Class EA, different processes are followed depending upon the type of project and the estimated construction cost. Construction cost is used to distinguish the potential impact of a project; the theory is the more a project will cost, the greater the potential impact.

The three classifications of projects within the Class EA are:

- Schedule ‘A’: projects that are limited in scale, have minimal adverse environmental effects and include the majority of municipal road maintenance and operational activities.

¹² Municipal Class Environmental Assessment, Municipal Engineers Association, June 2000.

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These projects are pre-approved and may proceed to implementation without following the Class EA planning process.

- Example projects: pavement resurfacing, streetscaping, and the installation of left turn lanes at an intersection

- Schedule 'B': projects that have the potential for some adverse environmental effects. These projects are subject to a screening process, which includes contacting directly affected public and relevant review agencies.
 - Projects typically less than \$1.5 million
 - Example projects: bridge reconstruction, road widening

- Schedule 'C': projects that have the potential for significant environmental effects. These projects must proceed under the full planning and documentation procedures specified in the Class EA document.
 - Construction costs of more than \$1.5 million
 - Example projects: new bridge construction, major road widening

What differentiates a Schedule B and C project is the \$1.5 million estimated construction cost. If the cost is estimated to be greater than this amount, the project is classified as a Schedule C. The proponent municipality does have the ability to elevate any project to a higher level if the project is deemed contentious and requires additional consultation. Unfortunately, the \$1.5 million benchmark is referenced in the June 2000 Class EA document and does not reflect the inflationary impact or construction costs. With rising oil prices, the cost of asphalt has risen. The

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price of asphalt cement, an ingredient of asphalt, has almost doubled since 2001.¹³ The impact on the cost to pave roads has resulted in an annual increase of 10-15%.

Environmental Assessments do increase the cost of the project. The original expectation that the cost to follow the EA Act would cost “less than 1% of the project” has been exceeded. Whether a municipality conducts a Class EA in-house or with the assistance of a consultant, there is a cost. For a simple road project, the cost of an EA could be as little as \$40,000. However, the cost for some projects could be between \$100,000 and \$300,000 depending upon the level of consultation required or the complexity of the undertaking. The cost of the EA translates to 6-8% of the project cost for a bridge replacement and 3-5% for a road widening, which are typical municipal road projects.¹⁴

No one would dispute the environment is worth protecting, but the cost to mitigate concerns is sometimes too great to make the project feasible (Munoz-Raskin 2006). The amount of environmental protection is subjective, but it must be taken into account during planning. That is, there are varying degrees as to the necessary mitigating measures required to protect the feature in question. New protection measures are continually being introduced, such as migratory bird policies and wildlife passage culverts. The conservation authorities are now heavily involved in the approval process and the issuance of permits, and are now concerned with more than erosion and sediment control. Such organizations may ask for what at times appear to be unreasonable requirements. Municipalities must be prepared to include these design features in their project or risk the denial of a permit. As such, municipalities must become knowledgeable in areas of

¹³ Ontario Hot Mix Producers Association, www.ohmpa.org

¹⁴ The costs and percentages are based on a selection of recent Region of Durham Works Department projects. The scope of work for Class EAs varies on a project by project basis and may include the preliminary design of the preferred solution.

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natural habitat and learn from experience. Municipalities must also understand the process and articulate an argument against requirements that are deemed unnecessary or excessive.

Sometimes agencies request additional information through their review process to address broader environmental objectives. This is good, but sometimes it can be unrealistic. Agencies have mandates and policy guidelines that guide them in their review and decision making process. Any information requests should be consistent with their mandate and project under review.

By way of an example, a conservation authority requested that a municipality consider the 100-year meander belt in the planning of a bridge replacement. An existing crossing was a 60-year old 20-metre span bridge and the municipality budgeted for a 30-metre replacement bridge, but the conservation authority requested a 100-metre bridge to accommodate the future meander of the watercourse.¹⁵ The cost of such a bridge had the potential to direct all financial resources from the municipality's works department to this single endeavour. In cases such as this, the municipality challenged the request based on:

1. The meander-belt analysis is an analytical exercise
2. Bridges do not last 100 years
3. Property owners whose land is adjacent to the watercourse will do everything possible to restrict the meander potential, especially if these lands have been developed
4. The cost implications for such a bridge are crippling

Although the above example resulted in a compromise, it is representative of the differences of opinion between agencies and municipalities. Conservation authorities have the mandate to protect the environment, but municipalities are the custodian of mobility and must be considerate

¹⁵ Taunton Road Reconstruction, Town of Ajax

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of the public dollars being spent and rationalize project costs. Conservations authorities do have boards that are comprised of elected officials (municipal councillors), to which a proponent can appeal a decision. If the proponent is denied at the board, the case can be made to the Mining and Lands Commissioner for a final decision.

As discussed previously, some municipalities consult with the public on many issues. Although the Municipal Class EA deems Schedule A projects pre-approved, some municipalities will hold a public meeting to garner consensus. In some cases, public meetings are used to promote the project or allow an opportunity for public engagement. Many scholars recognize the benefits of public participation and “that an engaged and enlightened citizenship is critical to democratic governance” (Denhardt 2003). To what extent public engagement is necessary is an issue that requires further exploration.

It is argued that public participation is a worthy exercise for some municipal matters. However, it is a wasteful effort to hold public meetings to engage the public for necessary improvements or modifications to the transportation infrastructure where there are no alternatives. Proponents of public engagement would counter that “participation is reflective of quality of governance” (Sharp 2003), but municipal staff can provide examples of public meetings in which few, if any, members of the public attended. All forms of public consultation are time consuming and expensive. In this era of good governance, municipalities must be mindful of wasteful spending on unnecessary meetings. In relation to the EA “it answers the question if the preferred solution is the best solution. But in some cases it is redundant when a project clearly needs to proceed.”

The public consultation component of the EA has many benefits that contribute towards a beneficial municipal capital works project. By engaging the public on those projects that have

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significant impacts, a municipality can plan a project that has addressed all concerns. However, there is a shortcoming to this approach that must be noted:

The process encourages influence in the extreme by vocal minorities. In other words, a very small percentage of the population may take exception to your project, but the majority who see no problem are silent. The system caters to those who have a recognized or perceived problem. Generally, people don't participate or comment if they don't have any concerns.

When confronted with opinionated views from stakeholders, it is often difficult to continue the engagement. Municipal employees typically do not attempt to deal with the issue or argument, but only collect comments from the public and respond in non-confrontational means. In some cases, it is difficult to meet with the public on certain issues, especially when people become passionate or stakeholders use the forum as a means to promote their issue or complaint.

In terms of working with the public, council and staff can't deal effectively with the often minority views and positions of the public. Some councillors want the exposure that the EA process provides. Council and staff should address vexatious and frivolous requests immediately before a project spirals out of control by focusing too much on the concerns of a few.

Opposition to infrastructure has become too easy. "Municipalities have become too accommodating to individuals too eager to exercise their rights but without taking responsibility. Municipalities have difficulty in reconciling the view of the individual against the view of the silent majority. This is illustrated with the EA process." A small group may voice their concern and affect the project, but the voice of thousands of daily infrastructure users is quiet. This problem can be reflected as the NIMBY (Not In My Back Yard) culture, but municipalities are facing the BANANA factor as well (Build Absolutely Nothing Anywhere Near Anything). "The

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current political climate is one of anti-car. Some councillors want streets to be points of recreation and destination, even minor arterial roads.”

Mass stakeholder consultation is becoming the norm. This is typical not to only Ontario, but is a fundamental concern throughout North America. The term “utopian consensus” (Munoz-Raskin 2006) is now synonymous with the planning process. The extent to which municipalities will go to balance conflicting concerns is, in many ways, excessive and the resulting documentation extreme. For example, the Environment Impact Study for a planning study in New York City is now close to 8,000 pages in length.¹⁶

Stakeholder consultation has benefited municipal projects in many ways. Early consultation can result in an improved design and facilitate the construction phase. There have been planned projects that became highly controversial and ultimately were cancelled due to public pressure. Upon further examination, it is unfortunate that opportunities were missed as a result. Perhaps earlier and improved consultation could have benefited the process and supported the proposed project.

After the cancellation of the Spadina Expressway on 1971, the province offered to fund transit expansion at a 75% subsidy. The Eglinton subway was proposed as a key element of a subway expansion plan. It would have converted the radial system into a network configuration and provide the opportunity for significant redevelopment in the former City of York and City of Scarborough that would have supported the transit investment. However, due to local politics and concerns over increased density, the proposal was not pursued. Have you seen the area of Eglinton Avenue east of Victoria Park Avenue? It has become a big-box retail outlet area and not transit friendly at all, which in my view flies in the face of the current sustainability objectives if municipal planning. It’s unfortunate that we couldn’t have taken advantage of the funding that was available at the time.

¹⁶ Ramon Munoz-Raskin and Floyd Lapp, *Mega-obstacles to Mega-projects? Barriers and Remedies to Large Transportation Project Implementation*. Case Study: The New York Metropolitan Area. TRB 2007.

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Missed opportunities such as the Eglinton subway in Toronto can be considered, at least, unfortunate. The planning process for a subway today would be excessive, and the construction cost unwieldy without financial support from the province or federal government, especially following the recently completed Sheppard subway.

Today, a municipality's efforts to engage the public and practice democracy have given way to excessive consultation. If the municipality eventually completes an EA, the opportunities for opposition do not end. Opponents of the project have the ability to request a Part II Order of the EA Act, in which the Ministry of the Environment (MOE) decides whether the project should be reviewed directly by the MOE as an Individual EA. The ability to request a Part II Order is simple: a letter is written to the Minister of the Environment requesting the Part II Order.

Generally the Ministry is only concerned with whether the process was followed. The MOE may decide to accept the project as an Individual EA, deny the request, or direct the proponent and stakeholder to come to an agreement. The problem with the opportunity to request a Part II Order is that it will inevitably add further delay to the schedule. The request may be on the basis of unrelated reasoning, but the opponent uses the EA process as a vehicle of opposition for the purposes of frustrating the project schedule.

The MOE will accept and evaluate all requests and will not consider any as frivolous or vexatious. The Ministry will not, however, consider requests outside the Ministry's mandate or scope of the project. Regardless of the nature of the request, the project schedule will be delayed for months if not years, depending upon the complexity of the project and the workload of the Ministry. In summary, the EA added a minimum of one year to a project schedule. If a request

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for a Part II Order is received, an additional year could be added. From a time when a project could be completed in a year, the process has potentially added multiple years to the schedule.

The legislation in place today stymies modifications or improvements to the transportation infrastructure. In essence, the vocal minority can easily stall a project, but the silent majority suffers.

Exemption from the EA process is an option, but unless the project is defined as a Schedule A, it is rarely accomplished. There have been exceptions for certain projects, such as the construction of Highway 407 between Burlington and former Highway 48 (Markham Road), the route for which was defined as part of the “Parkway Belt System” of 1959. Avoidance of the mandated planning process can result in penalties if found guilty for acting in contravention of the EA Act. This aspect lends to another flaw in the Municipal Class EA. Schedule definition of a project is based on the estimated construction value, assuming the higher the cost the greater the impact. There are, however, projects that far exceed the \$1.5 million threshold with minimal impacts. Where a potential road widening is justified (for example, it is deemed a bottleneck) and no property is required and there is no impact to the natural environment, adherence to the process is mandatory. In certain cases, municipalities should have the ability to apply for an exemption and avoid adding years to the project schedule and unnecessary costs.

As the environment, growth and development became a concern, in addition to the increase in traffic, people became increasingly vocal. People demanded a voice and highly organized groups were formed with a mandate to protect communities and the natural environment. Groups such as Save the Rouge Valley System and Environment Hamilton have been successful in working with agencies and local governments to protect the environment.

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We saw a tremendous change in how groups lobbied the provincial agencies as a way to object to a project. By pressuring the permitting agency, such as the Ministry of the Environment for a permit to take water, groups could effectively delay a project.

Although organized groups have become more common, municipalities have been able to work towards solutions. By identifying issues of concern early in the process, all of the major concerns can be addressed before construction initiates. Since traffic is a concern in most neighbourhoods, it is important to recognize that minimizing impacts during construction is beneficial to all.

It was a gradual transition, as there was a gradual withdrawal of funding. Likewise, there was a gradual opposition to road construction and automobile usage. Interestingly, there was also a gradual opposition to surface transit infrastructure construction. Infrastructure became intrusive to people – visually, operationally and physically.

The EA process is not unsound and for almost 30 years has proven to be beneficial. The process allows a voice to those who are “concerned about the quality of life and the preservation of established neighbourhoods” (Tindal 2004) with the threat of development. The concern of citizens has been gradual but growing from the days when the public was not engaged, and thus thought not to be concerned about the environment or municipal matters. The process is not perfect and improvements could be made, especially as the need for municipalities to replace the aging infrastructure increases.

4.6 Other External Factors

The Ontario government has added a number of other complicating factors limiting the ability of municipalities to improve the transportation infrastructure. Some of the factors can be related to efforts to protect the environment, reduce taxes, and improve the delivery of democracy (Denhardt 2003). As a result, municipal capital works projects are becoming increasingly difficult to deliver due to the added burdens placed upon local governments.

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In the mid 1990's, the provincial government under the leadership of Mike Harris implemented their Common Sense Revolution. The purpose of this plan was to reduce government expenditures, reduce the debt and deficit, and ultimately reduce the income tax. The result was drastic staff and funding cuts at provincial ministries and the reduction of services provided by the province.

In 1996 the Provincial Government downsized various Ministries including MOE and in turn downloaded major programs and services to local government. With the staff reductions was the irreplaceable loss of their expertise and knowledge. Until that point, the process had been relatively efficient; however, response times and services were seriously affected. Prior to the layoffs, we dealt extensively with MTO on issues related to transportation infrastructure. MTO experienced significant downsizing with the responsibilities for transportation issues in many cases thrust onto municipalities who were not equipped to accept those responsibilities in such short order.

In addition to the downloading of former provincial services to municipalities, a number of legislative requirements have been introduced related to the delivery of transportation services, which is well suited to municipalities (McMillan 2006). Growth and the required supporting infrastructure justify additional capacity and efficiency of the road network. To accommodate growth and respect the environment, the province introduced additional guidelines and restrictions on planning and development, which directly impacts municipal infrastructure improvements:

- Oak Ridges Moraine Conservation Plan (2001)
- Greenbelt Plan (2005)
- Places to Grow (2005)

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These documents, especially Places to Grow, set clear goals and boundaries on growth. Although Magnusson (2005) challenges the concept that municipalities are “creatures of the province”, these three pieces of legislation define the planning opportunities available to affected municipalities. Contrary to these plans are the barriers that restrict a municipality’s ability to construct the infrastructure necessary to support this growth.

Provincial approval and permits are now far more difficult. We worked with the Ministry of Municipal Affairs and Housing in terms of growth rates and planning. However, there were other provincial ministries that would not issue the necessary permits for infrastructure improvements. We were frustrated by the inconsistency at the provincial level. On one hand, development was proceeding at a rapid pace, but on the other we had agencies denying permits for infrastructure improvements to support this development, which was permitted and encouraged by the province in the first place. I couldn’t believe how this growth was to occur without the infrastructure.

Although permits and approvals are not necessary for maintenance related work, considerable planning is necessary for reconstruction projects. There is evidence to suggest that in an effort to be more respectful of the environment and ensure all stakeholders have been consulted, many factors have been gradually introduced that now contribute to scheduling delays and increased costs of municipal capital works projects. These factors often take the form of approvals and permits. Where a project may have taken a single year to plan, design and construct, the mandatory requirements have lengthened the project schedule to multiple years and added significant costs.

5 CONCLUSIONS AND RECOMMENDATIONS

Over the course of a generation the delivery mechanism for municipal capital works projects has changed dramatically. In comparing the “early days” to the process and procedure followed today, one can recognize the significant changes that have affected the ability of Ontario’s municipalities to improve the transportation infrastructure.

The construction of roads and bridges has remained relatively unchanged for more than 40 years. New techniques, materials, and methods have been introduced, but the fundamental ingredients have remained relatively the same: roads are built using gravel and asphalt, and bridges are constructed from concrete and steel. What has changed is the number and complexity of permits and approvals and the accumulative affects of internal bureaucratic controls and external legislative restrictions. This has led to the process of delivering municipal capital works projects becoming more complicated and time consuming. “We’ve gone from a system of little or no control where the contractor simply proceeded with or without the required environmental approvals to a system with intensive scrutiny of all aspects of the project by various agencies.”

Based on the literature review and research, there are numerous factors that have resulted in municipal capital works projects becoming increasingly difficult to deliver when compared to the “early days”. However, the primary factor was the introduction of the Environmental Assessment Act.

The Environmental Assessment Act, and the associated Municipal Class EA process, which all municipalities in Ontario follow for road and bridge projects, has resulted in a lengthened schedule and added costs. Protecting the environment and consulting with the public have become the cornerstones of good governance, but so is the accountability of tax payer dollars.

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The EA process encourages good environmental planning by assessing the potential effects of infrastructure projects. The process also recommends a stakeholder consultation methodology. However, the level of mitigation and consultation can be extreme if not carefully considered in advance, with respect given to the type of project and the potential impact on cost. As proven in this paper, it is more difficult than ever to delivery municipal capital works projects due to environmental restrictions and excessive consultation. If roads and bridges are to be rebuilt or improved to maintain appropriate levels of service, it is recommended that:

- The Municipal Engineers Association (MEA) adjust the \$1.5 million benchmark construction cost. This value is dated and must be raised to a level representative of current construction costs. This benchmark should be adjusted annually according to inflation.
- Permit projects with only minor impacts to proceed as pre-approved or follow the Schedule B process, regardless of the estimated construction cost.
- Municipalities work with the MEA on issues of concern relating to the Municipal Class EA process.
- Carefully consider the need for additional planning and consultation, above that which is specified in the Municipal Class EA, especially for projects that are pre-approved or clearly required.

The loss of provincial funding was another significant factor, in addition to other service realignment initiatives, which has contributed to the rising infrastructure deficit as municipalities are finding the scheduling of necessary projects particularly problematic. With the municipal revenue stream directed in numerous areas, and with the rising cost of construction activities, each project must be weighed against competing priorities. Funding is required for improvements

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but in the form of permissive conditional grants not specifically tied to individual projects. A continuous and stable funding source, available to all municipalities, should be made available for the purpose of infrastructure rehabilitation or reconstruction. As a condition of such grants, road and bridge inventory data could be collected thus improving the database and recognizing the state of repair of municipal infrastructure. The province and federal government currently provide grants for such purposes, but is often insufficient and unpredictable.

Not only does Ontario have a small construction window due to weather restrictions, environmental concerns have narrowed that window. Good planning is, therefore, required in order to work within the schedules imposed. As with weather, it appears that municipalities must continue to work with property owners and utility companies. The acquisition of property has become more costly and time consuming, and will probably continue to be. Further study is required to determine if improvements can be made to the expropriation process, for example, if legal fees can be the responsibility of the land owner unless an agreement is reached. Utility companies are now profit driven and only continued co-operation will encourage the decrease in possible complications.

The internal accounting and purchasing policies that exist at Ontario municipalities have been introduced to ensure accountability and good financial management. Although responsibility has been removed from public works staff and additional time must be built into a project schedule for the purchasing and tendering process, the primary mandate of ensuring the proper spending of public funds is upheld.

Ontario's municipalities do not undertake multi-billion dollar projects on a regular basis and are therefore not subject to technical, psychological, economic and political factors on the same level

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as mega-projects. Although municipal capital works projects are susceptible to these factors to some degree, they are subject to an ever increasing complicated planning process. Municipalities are the custodians of transportation and mobility and if some relief from the barriers is not provided, the infrastructure will continue to deteriorate and be replaced only on an emergency basis. Opportunities are available to municipalities that can facilitate the approval of projects, but municipal leaders must initiate the process and engage stakeholders early so that all concerns can be addressed quickly and directly. All issues, no matter how beyond the scope of the project they appear may delay a project. Also, elected officials must recognize that projects take longer and as such, with the growing societal concern for the environment, the level of planning must be commensurate with the potential impact of the project.

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Appendix A
Interview Questionnaire

7. Was provincial funding ever a factor in the delay of scheduling projects?
8. The following is a list of agencies we are required to contact as part of delivering municipal capital works projects. Please select those approvals that were applicable in the early years of your career.

<input type="checkbox"/>	Environmental Assessment	<input type="checkbox"/>	
<input type="checkbox"/>	Archaeological	<input type="checkbox"/>	Ministry of Community and Social Services
<input type="checkbox"/>	Traffic forecasting / operations	<input type="checkbox"/>	Ministry of Agriculture, Food and Rural Affairs
<input type="checkbox"/>	Geotechnical	<input type="checkbox"/>	Ministry of Public Infrastructure and Renewal
<input type="checkbox"/>	Noise Study	<input type="checkbox"/>	Ministry of Citizenship and Immigration
<input type="checkbox"/>	Natural Environment	<input type="checkbox"/>	Ministry of the Environment
<input type="checkbox"/>	First Nations	<input type="checkbox"/>	Permit to take water
<input type="checkbox"/>	Indian and Northern Affairs Canada	<input type="checkbox"/>	Conservation Authority
<input type="checkbox"/>	Ontario Native Affairs Secretariat	<input type="checkbox"/>	Meander Belt Analysis
<input type="checkbox"/>	Canadian Environmental Assessment Agency	<input type="checkbox"/>	Bird migration
<input type="checkbox"/>	Environment Canada	<input type="checkbox"/>	Erosion and Sediment Control
<input type="checkbox"/>	Health Canada	<input type="checkbox"/>	Fish habitat
<input type="checkbox"/>	Department of Fisheries and Oceans	<input type="checkbox"/>	Ministry of Transportation
<input type="checkbox"/>	Department of Canadian Heritage	<input type="checkbox"/>	Ministry of Labour
<input type="checkbox"/>	Transport Canada	<input type="checkbox"/>	Ministry of Natural Resources
<input type="checkbox"/>	Navigable waterway	<input type="checkbox"/>	Public Transit
<input type="checkbox"/>	Trans-Canada Pipeline	<input type="checkbox"/>	Area municipalities
<input type="checkbox"/>	CNR	<input type="checkbox"/>	Public School Boards
<input type="checkbox"/>	CPR	<input type="checkbox"/>	Utilities
<input type="checkbox"/>	Ministry of Consumer and Business Services	<input type="checkbox"/>	Agricultural Advisory Committee
<input type="checkbox"/>	Ministry of Education	<input type="checkbox"/>	Emergency Services
<input type="checkbox"/>	Ministry of Municipal Affairs and Housing	<input type="checkbox"/>	Other
<input type="checkbox"/>	Ministry of Culture	<input type="checkbox"/>	Public consultation
<input type="checkbox"/>	Ministry of Tourism	<input type="checkbox"/>	Property owners

9. Do you find that the current process could be streamlined and what is your opinion on the methodology / process currently followed by Ontario's municipalities?
10. Research indicates that for all project types, large and small, the risk of cost escalation is high. Transportation projects typically run over budget by 20%. Comments?
11. Most research has been directed toward the mega projects, projects with capital costs from hundreds of million to several billions. The research analyzed the reasons for massive cost overruns and scheduling delays. There are a number of explanations given, such as technical, economic, psychological and political. Comments?

Appendix B
Regional Municipality of Durham
1974 Road Budget Summary and MTC Letter

REGIONAL MUNICIPALITY OF DURHAM

1974 ROAD BUDGET.

SUMMARY

Correspondence from M.T.C. re: 1974 Subsidy allocation.

- Part 'A' - Road & Bridge Construction.) Parts 'A' and 'B' consume
 Part 'B' - Maintenance of Road & Bridge System.) the allotment of normal
 Part 'C' - Overhead.) Overhead portion of normal subsid
 Part 'D' - Items not Subsidizable.) allocation.
 Part 'E' - Traffic Signal - Relocation and Installation. Subsidizable from other funds.
 Part 'F' - Special Category. Regional Road System Study. Subsidizable from other fun

	<u>Subsidy Dollars</u>	<u>Total Expenditure</u>	
Part 'A'	1,146,700	2,293,400	2,293,40
Part 'B'	666,400	1,332,800	
Part 'C'	126,900	253,800	
Part 'D'	--	275,500	
Part 'E'	5,500	11,000	
Part 'F'	18,700	25,000	
	<u>\$ 1,964,200</u>	<u>\$ 4,191,500</u>	



Ministry of
Transportation
and
Communications

Municipal Branch,
1201 Wilson Avenue,
Downsview, Ontario.
M3M 1J8

January 10, 1974.

Clerk,
Regional Municipality of Durham,
505 Rossland Road, E.,
P. O. Box 623
Whitby, Ontario.

Dear Sir:

The Honourable Gordon Carton, Q. C., Minister of
Transportation and Communications, has allocated for your County
subsidy funds in the amounts of

\$ 1,227,000.00 for Construction, and
\$ 713,000.00 for Maintenance.

Please file a completed work program showing how this
allocation is to be spent with the District Engineer before the 31st day
of March.

This allocation is given subject to the approval of each individual
work of road and bridge construction, each contract for construction or
maintenance and the purchase of each unit of equipment. For the protection
of the County's interests, the District Engineer should be advised and his
consent obtained before such works or purchases are advertised or tenders
called or any commitment made by the County with respect to them.

The approval of the Ontario Municipal Board must be obtained
before any expenditure is authorized or work commenced which will be
financed by the issue of debentures or moneys raised in years subsequent
to the term of the present Council.

Yours truly,

A. A. Ward,
Director, Municipal Branch.

AAW/vc

Appendix C
Fence for Land Agreement

APPLICATION FOR FENCE CONSTRUCTION AND OFFER TO SELL

I/We _____ of EAST WHITBY
(Name in Full)

in the County of ONTARIO being the Party/ies of the First Part
and the Corporation of the County of Ontario being the Party of the
Second Part:

WHEREAS the Party of the First Part is the owner of part or all of Lot _____
Concession V Township of EAST WHITBY which said property abuts the
EAST side of County Road Number 32 (RITSON ROAD)

AND WHEREAS the Party of the First Part 's desirous of having a new fence
erected;

THEREFORE, the Party of the First Part agrees to convey free of encumbrance
to the Party of the Second Part a parcel of land having a width, measured at
right angles to the limit of County Road Number 32 of 17 Feet and Extending
NORTH-SOUTH FOR 3217 FEET.

In consideration of the conveyance of the aforementioned parcel of land and
at such time as an executed registerable conveyance is received by the Party
of the Second Part, the Party of the Second Part shall

- a) supply and erect a new eight-strand post and wire fence along
the new limit of land to be conveyed;
- b) prepare a deed of conveyance of execution by the Party of the
First Part;
- c) other 1) NO FENCE REQUIRED IN FRONT OF HOUSES.

2) ONE 16 FOOT GATE REQUIRED

3) EXTRA 15 FOOT WIDENING AT CREEK

4) ALL WOOD PESTS FROM SOUTH LIMIT TO NORTH HOUSE

5) 1 STEEL - 1 WOOD ON REMAINDER.

The Party of the First Part acknowledges that no verbal promises have
been made to him by the Party of the Second Part or any employee or agent
on its behalf.

Witness my hand and seal this 3 day of May A.D. 1972.

WITNESS

Appendix D
Exhibit A.2
Municipal Class EA Planning
and Design Process

EXHIBIT A.2

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA

