NOTE REGARDING NEXT STEPS AND IMPLEMENTATION

This Service Efficiency Study provides advice and recommendations to the City Manager and was conducted in consultation with the Division. The Study identifies actions and directions that could result in more efficient and effective service delivery, organizational and operational arrangements and associated savings.

The City Manager will work closely with senior management to determine which of the actions are feasible and can be implemented, implementation methods and timeframe and estimated savings. In some cases, further study may be required; in other cases the actions may not be deemed feasible. Implementation will be conducted using various methods and may be reported through annual operating budget processes or in a report to Council or an applicable Board, where specific authorities are necessary. In all cases, implementation will comply with collective agreements, human resource policies and legal obligations.

Preliminary estimated savings have been identified in the study by year where possible. In some cases savings have been included in the 2012 budget submission. Achievement of these savings is highly dependent on the viability of these actions as determined by senior management, timeframes, and other implementation considerations.

KPMG

cutting through complexity™

City of Toronto

Transportation Services Efficiency Review Project

Final Report

December 23, 2011

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Disclaimer

This report provides a description of the results of an Efficiency Review of the City of Toronto (the City) Transportation Services Division (the Division), conducted by KPMG LLP (KPMG). This document has been prepared and is intended solely for the City of Toronto's City Manager's use. It may not be edited, distributed, published, made available or relied on by any other person without the express written permission by KPMG, which will not be unreasonably withheld.

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Executive Summary

Background

Project Background

Faced with a significant budgetary gap, the City of Toronto (the City) has initiated a program of Service Efficiency Studies covering several large municipal divisions and agencies. The purpose of these studies is to identify and supply actionable recommendations that will provide the maximum of service efficiency savings in the shortest period of time.

Transportation Services Division (the Division) has been selected to undergo a Service Efficiency Study primarily due to its size, reach, and customer facing nature of the services it provides. With a budget of $291.8M in 2011, the Division delivers essential municipal services, such as Road and Sidewalk Maintenance, Transportation Network Control and Safety, and Public Right of Way Management, among others. It is the tenth largest service provided by the City and is highly operational in nature, suggesting that efficiency opportunities of significant value may potentially be identified through a third party review.

Terms of Engagement

In October 2011, the City Manager engaged KPMG to undertake a Service Efficiency Review of the Division, with the expectation that cost savings, worthwhile investments, productive resource reallocations, and improvements in the way City of Toronto services are delivered would be identified. The City Manager also expected examples from other jurisdictions that convey leading practices in transportation services to be explored as part of the analysis. Finally, the City Manager required actionable recommendations on how to transition from current practices to a futures state of a more efficient and streamlined Transportation Services. Six areas of focus have been identified: **Claims Investigations**, **Construction Permitting for Right-of-Way Operations**, **Road and Sidewalk Maintenance**, **Utility Cut Repair**, **Winter Maintenance**, and **Infrastructure Management,** which included Major Capital Infrastructure Coordination Office and the associated Capital Planning process.

Understanding This Report

The purpose of this report is to provide our comments and recommendations based on our work on the Transportation Efficiency Review, as outlined above for the City Manager's consideration. These comments, by their nature, are critical, as they relate solely to opportunities for enhancement and do not address the many positive features of the City's current activities and undertakings.

Our procedures consisted of inquiry, observation, comparison and analysis of City-provided information. In addition, we considered leading practices of other organizations. Readers are cautioned that the potential savings outlined in this report are estimates, which are predicated on the City reducing its personnel resources and other future events. Actual results achieved as a result of implementing recommended opportunities will vary from the information presented and these variations may be material. Such work does not constitute an audit. Accordingly, we express no opinion on potential savings that the City may realize should it decide to implement the recommendations contained within this report. The City is responsible for the decisions to implement any recommendations and for considering their impact. Implementation of these opportunities will require the City to plan and test any changes to ensure that the City will realize satisfactory results.

Observations and Issues

Observations and Issues

Upon conducting a review of the City's Transportation Division in the six streams, KPMG team made a number of observations relating to the Division's operations, structure and delivery models. The Division's management has made significant strides in improving operations, exploring alternative service delivery models, enhancing communication and collaboration, and seeking innovative solutions. Several examples of this progress are listed below:

- Contracting the majority of winter maintenance activities to external vendors in order to save costs
- Integrating GPS technology into maintenance and ploughing vehicles
- Advancing harmonization of bylaws subsequent to amalgamation, including the introduction of the "Streets By-law"
- Improving communications within the Division and with other City stakeholders.

In addition to the Division's initiatives, the City has created the Major Capital Infrastructure Coordination (MCIC) office to facilitate dialogue among key infrastructure stakeholders. These programs and initiatives have already started to yield benefits with respect to cost of service, flexibility of operations, and decision-making capabilities.

However, as with any large organization, the evolutionary process is never complete. This review has identified several issues that hinder the Division's ability to be a fully-efficient and effective organization. Overarching themes emerged as part of the analysis:

- Distributed district model often prevents realization of economies of scale, standardization of processes, and harmonization of customer-facing services and activities. This issue was observed among most of the streams.
- Antiquated, non-scalable, and ineffective Information Technology systems act as a barrier to automation of onerous and duplicative tasks. Furthermore, they do not support effective decision-making through analytical methods, performance management, and monitoring.
- Highly specialized staffing approach contributes to several roles that have similar duties but divergent reporting relationships. This causes rigidity with respect to staff allocation and planning and creates unnecessary hand-offs.

A number of stream-specific issues were also identified. These mostly relate to process inefficiencies, inadequate communication, coordination and planning, lack of leading practice adoption, and absence of timely, relevant, and accurate information to support fact-based decision-making. In this report, identified issues are addressed through a series of recommendations, organized by each stream.

Recommendations

Recommendations

While significant progress has been made in improving transportation services in the City, additional opportunities exist to generate efficiencies through a number of approaches, which include automation, business process reengineering, and outsourcing, among others. Furthermore, several changes could be implemented, which would result in customer service improvements and enhancement of customer experience. Select recommendations are listed below.

This section summarizes the changes the City should consider in an effort to **generate efficiencies through automation and the use of Information Technology (IT)**:

Automation and Information Technology Improvements				
Stream	**Recommendation**	**Rationale / Benefit**	**Financial Impact ***	**Timing**
Construction Permitting, Utility Cut Repair, Claims Investigations, Road and Winter Maintenance	Increase the use of mobile technology and automation to support field work	The City would likely realize efficiencies by allowing field staff to complete work while out of the office. Electronic capture and storage of information would replace work-intensive, paper-based processes and allow for speedier access, use, and analysis of field information	Requires a comprehensive business case to determine financial impact	Implementation may begin in 2013. Potential savings projected for 2014
Construction Permitting, Claims Investigations	Centralize construction permit processing and claims investigations. Consider the use of technology to support the centralized process	Moving from a decentralized model to a centralized processing of construction permits would help decrease application administration costs, produce efficiencies in how the applications are processed across the districts, and improve customer service by having a consistent method of handing applications. Centralizing claims investigations would make the Division more responsive, fair, and accurate in gathering information related to claims. Furthermore, the Division would be able to reallocate field resources to more productive tasks	Upfront investment of up to $100K may be required, potentially yielding $100-150K	Implementation may begin in 2012. Potential savings projected for 2013

* Potential savings figures in this section and elsewhere in this report are annual, unless stated otherwise. See “Understanding This Report” section for more details.

Recommendations (continued)

This section summarizes the changes the City should consider in an effort to **gain efficiencies in staffing and workload:**

Staffing and Workload Improvements				
Stream	**Recommendation**	**Rationale / Benefit**	**Financial Impact***	**Timing**
Construction Permitting, Utility Cut Repair, Claims Investigations, Road and Winter Maintenance	Consider pooling and cross training of staff in the field, who are involved in road and winter maintenance, construction permit, utility cut permit and claims investigations processes	The City could realize medium-term to long-term cost savings through more effective utilization and allocation of field staff. Remove duplication of activities between field workers and re-allocate staff to different activities	Initial investment of $100-150K may be required, with operational savings estimated at up to 15%. Road and Winter Maintenance and Utility Cut Repairs streams may generate greater operational savings due to large budget size and volume of activity.	Implementation may begin in 2012. Potential savings projected for 2013-2014
Road and Sidewalk Maintenance, Winter Maintenance	Facilitate communications with staff operating in the field by supplying appropriate tools, services, and access to information	Field staff could use their time more productively if provided appropriate communication tools (e.g., Smartphones, phone headsets for in-car use, access to a centralized weather information line, wirelessly connected laptops, etc.) to respond to maintenance issues	Investments are estimated to be minimal. Financial benefits are expected to be realized due to increased productivity of staff	Implementation may begin in 2012. Potential savings projected for 2013
Utility Cut Repair	Consider developing a mechanism to improve the utility cut management by tracking the utility company that is responsible for each cut using a marking system.	Currently, cut examiners spend up to two to three days to determine which utility company is responsible for a damaged / defective cut. A tracking mechanism to manage all coordinates can reduce time spent tracking utility cuts, and increase efficiency in billing utility companies, resolving issues related to damaged / unsafe cuts and reallocate time to other utility cut activities.	Investment of up to $100K may be required, depending on the system chosen. Projected operational savings are estimated at $300K	Planning can commence in 2012, with a pilot program in 2013 Cost savings / efficiencies are likely to be yielded in 2014+

Recommendations (continued)

This section summarizes the changes the City should consider in an effort to **improve customer service**:

Customer Service Improvements				
Stream	**Recommendation**	**Rationale / Benefit**	**Financial Impact***	**Timing**
Construction Permitting, Utility Cuts	Enhance customer service standards for the construction permitting process	Service standards will potentially lead to increased customer satisfaction by keeping applicants informed of the timing and status of applications. Service standards also act as incentives for better performance, thereby reducing construction project delays due to slow permit application processing time resulting in longer-term economic benefits for the City	This recommendation deals with improving customer service. The financial impact will be minimal.	Standards could be established in 2012
Construction Permitting	Create a customer-friendly guide for Chapter 743 “Use of Streets and Sidewalks” of the Toronto Municipal Code to improve its readability and usability	The current format and structure of the by-law can be perceived as relatively complex, which may result in low compliance by residents. Creation of a simplified user guide or a decision tree for construction projects will likely enhance customer satisfaction and compliance	This recommendation deals with improving customer service. The financial impact will be minimal.	User guide can be established in 2012
Claims Investigations	Expedite urgent / serious claims through the city to address immediate safety issues and reduce the number and dollar value of claims	Rerouting urgent claims from the Clerk directly to respective Supervisors and Field Investigators would allow the City to quickly respond to damage-causing conditions, thereby reducing the likelihood of further injuries and minimizing additional legal/financial exposure	Savings could accrue from fewer claims filed from the same area / incident site. A 1% reduction in claims would amount up to $250K savings	Implementation may commence in 2012

Recommendations (continued)

This section summarizes the changes the City should consider in an effort to **improve service delivery models:**

Service Delivery Improvements				
Stream	**Recommendation**	**Rationale / Benefit**	**Financial Impact***	**Timing**
Road and Sidewalk Maintenance, Winter Maintenance	Develop an approach for determining what to outsource and what to do in-house based on evaluation of the costs and other factors relevant to the service, including the need for a seasonally-balanced in-house workforce	Effective competition between in-house and contracted resources can produce the lowest cost outcome. This can be accomplished through financial analysis or through the submission of "in-house" bids during competitive processes. Given anticipated shifts in staffing, (e.g., retirements, voluntary separations, etc.), there may be a need to consider extending contracting in some areas. However, it is important to maintain a balance of in-house work between seasons to ensure staff is fully deployed year round. The City can benefit from maintaining in-house staff when outsourcing options are less cost-effective.	Savings are likely to be gained from more cost-informed contracting and service delivery	Implementation may begin in 2012. Potential savings projected for 2013
Road and Sidewalk Maintenance, Winter Maintenance	Review existing and upcoming contracts to increase flexibility, reduce cost, and productively reallocate resources	As the outsourced services change and / or contracts come up for renewal, there is an opportunity to structure contracts to achieve more value. A variety of suggestions are provided in this report. It is worth noting, however, that some cost reduction opportunities could involve taking on more risk related to service levels, including snow storm response times, clearing and salting prioritization, and ability to respond to very large storms	Reduction in standby costs could be significant, potentially reaching 25% or $8.7M, including a mix of operating and capital savings	Likely upon contract renewal, in 2015+
Road and Sidewalk Maintenance	Consolidate grass cutting contracts on road right-of-ways with requirements for parks, City buildings and other corporate requirements	Grass cutting requirements from various divisions are scattered across the City and each has a range of needs for various types of equipment and level of service. Economies of scale can be attained by tendering for the requirements on a consolidated basis. The City could consider using workers on modified duty as resources in grass cutting activities	Savings on road and sidewalk requirements will be modest as work is currently contracted. Larger savings can be expected in other divisions.	Implementation may commence in 2012

Recommendations (continued)

This section summarizes the changes the City should consider in an effort to **enhance Division's decision-making capacity:**

Decision-making Capacity Improvements				
Stream	**Recommendation**	**Rationale / Benefit**	**Financial Impact***	**Timing**
Claims Investigations	Adopt a business intelligence approach to claims management by analytically identifying trends, determining root causes, and monitoring outcomes of claims and cases	This recommendation will result in improved decision-making by Division's management, development of a continuous improvement focus, and eventual proactive management of causes and factors contributing to claims against the City	Better decision-making and continuous improvement efforts could reduce the number of claims by up to 5% or $1.25M	Implementation can commence in 2012, with changes from improved decision-making occurring in 2013

Recommendations

Recommendations (continued)

This section summarizes the changes the City should consider in an effort to **better manage the City's infrastructure:**

Improved Infrastructure Management				
Stream	**Recommendation**	**Rationale / Benefit**	**Financial Impact***	**Timing**
Infrastructure Management	Take measures aimed at increasing the percentage of capital budget available for projects through the strategic management of capital expenses and budgetary processes	Given the limited funds available for capital expenditures within the City and existing backlog of necessary capital projects, optimizing the percentage of the overall fund dedicated to the repair / replacement of assets (as opposed to those capital costs associated with capital planning, co-ordination, delivery, etc.) will increase the efficiency and effectiveness of funds	Difficult to estimate due to lack of available data. However, even an efficiency gain of 1-5% could potentially yield benefits in the range of $2-10m	This is likely a longer term opportunity, potentially yielding results in 2014+
Infrastructure Management	Further develop the City's asset management framework, applying it to transportation assets and other asset classes	An asset management framework is a set of standardized approaches, methodologies, principles and tools to guide the improvement of asset management practices and processes. It also lowers the cost of keeping assets in good repair over the lifecycle of the asset, while maintaining acceptable levels of risk. Developing and using the framework would allow the City to make more informed decisions in prioritizing asset maintenance, approving capital projects, assessing performance, and prolonging the use of assets	Initial investment of up to $500K may be required, resulting in enhanced effectiveness of capital spend across multiple asset classes	Implementation may begin in 2012. Potential savings projected for 2014+
Infrastructure Management	Strongly consider the increased use of an IT system(s) in support of infrastructure management activities, which could include the deployment of a robust multi-asset class management system	Increasing use of IT systems in support of infrastructure management activities is likely to lead to better coordination of capital projects through greater automation and enhanced decision-making. Improved coordination could result in higher project completion rates and cost savings in the long term	Upfront system costs may be in the $5-10M range. A marginal efficiency gain of 1-5% could potentially yield benefits in the range of $2-10m	Implementation may begin in 2013. Potential savings projected for 2014+

Recommendations (continued)

This section summarizes the changes the City should consider in an effort to **better manage the City's infrastructure (continued):**

Improved Infrastructure Management				
Stream	**Recommendation**	**Rationale / Benefit**	**Financial Impact***	**Timing**
Infrastructure Management	Strengthen the governance of capital infrastructure initiatives by further defining and clarifying roles of all affected stakeholders. This includes articulating how decisions are made, by whom, and who is accountable / responsible for carrying them out. Consider broadening the role and mandate of MCIC in this initiative	Despite progress made related to planning and project coordination, an enhanced MCIC mandate and improved overall governance of asset management is likely to result in greater coordination efforts and, potentially yielding greater cost savings through higher project completion rates, slower growth rate of State of Good Repair backlogs, and service improvement	Investments are estimated to be minimal. Financial benefits are expected to be realized due to increased productivity of staff	Formalized governance structure and mandate can be in effect in 2012. Results are likely to be realized in 2013+

In summary, if implemented successfully, these recommendations have the potential to yield significant efficiencies and savings for the City. Both operating and capital expenditures can be reduced up to $10M or more, depending on the scale and scope of initiatives. Furthermore, additional funds (tens of millions) could be raised through alternate use (sale, lease, repurpose) of City's transportation related assets, such as yards and depots.

Project Background

Project Background

According to the latest budgetary projections, the City is facing a substantial budgetary deficit, amounting to $774 million. It is widely acknowledged by the City Council and Administration that closing this gap would require identification and realization of efficiencies within divisions, programs, and services. In order to bring the City back to a fiscally sustainable environment, the City, among other initiatives, has begun a program of Service Efficiency Studies. Several areas have been identified for review during 2011, including the Transportation Services Division. The purpose of the Service Efficiency Studies is to identify and supply actionable recommendations that will provide the maximum of service efficiency savings in the shortest period of time.

Transportation Services Division was selected to undergo a Service Efficiency study primarily due to its size, reach, and customer facing nature of the services it provides. The Division oversees and manages approximately 5,500 km of roads, 7,100 km of sidewalks, 530 bridges, 600 pedestrian crossovers, 2,200 traffic control signals, 4,100 bus shelters, one million signs, as well as over 400 km of on-street and off-street bikeways. The 2011 gross operating budget is $280.0M and the capital budget is $250.0M. The Division has four districts divided by region: Etobicoke York District, North York District, Scarborough District, and Toronto and East York District. It is the tenth largest service provided by the City and is highly operational in nature, suggesting that efficiency opportunities of significant value may potentially be identified through a third-party review.

The Division's management has made significant strides in improving operations, exploring alternative service delivery models, enhancing communication and collaboration, and seeking innovative solutions. Several examples of this progress are listed below:

- Contracting the majority of winter maintenance activities to external vendors in order to save costs
- Integrating GPS technology into maintenance and ploughing vehicles
- Advancing harmonization of bylaws subsequent to amalgamation, including the introduction of the "Streets Bylaw" and
- Many others.

Furthermore, recognizing the value of coordination in asset management, the City has created the Major Capital Infrastructure Coordination (MCIC) office to facilitate dialogue among key infrastructure stakeholders. These and other examples demonstrate the City's ability to make strategic investments that generate a positive return. Such programs and initiatives have already started to yield benefits with respect to cost of service, flexibility of operations, and decision-making capabilities.

However, as with any large organization, the evolutionary process is never complete. In this continuing maturation process, coupled with the City's fiscal pressures, the Division needed to review some of its critical service areas to develop further efficiencies and service improvements. As a result, the City engaged KPMG to undertake an independent third party review of the Division, with the expectation that further cost savings, worthwhile investments, productive resource reallocations, and improvements in the way the City services are delivered would be identified. The City also expected examples from other jurisdictions that convey leading practices in transportation services to be explored as part of the analysis. Finally, the City required actionable recommendations on how to transition from current practices to a future state of more efficient and streamlined Transportation Services.

Objectives and Scope

Project Objectives

This project was intended to identify efficiency opportunities by considering a broad range of strategies, including, but not limited to:

- **Business Process and Work Method Streamlining –** explore how to reduce waste and duplication, and eliminate non-value added activities from operations
- **Organizational Restructuring –** explore how to optimize roles, responsibilities, reporting mechanisms, and operational governance in order to yield efficiencies and improve effectiveness
- **Outsourcing –** explore how to adjust the delivery model for labour to reduce costs and enhance flexibility
- **Automation –** explore the use of technology (physical capital and information technology) in the delivery of front line and back office services
- **Shared services –** explore the pooling of similar resources, activities, and tasks in order to gain economies of scale, standardize and improve operations, and enhance customer service.

Areas of Focus

The City identified six areas to review for this engagement. The City sought to improve processes related to these areas:

- Claims Investigations
- Construction Permitting for Right-of-Way Operations
- Road and Sidewalk Maintenance
- Utility Cut Repair
- Infrastructure Management
- Winter Maintenance.

The City's perspective on these streams is multidimensional. While the primary driver for the review is to generate cost savings through efficiencies, the City is also interested in identifying opportunities for improving customer service and residents' experience with City services, making investments projected to yield efficiencies over a longer term, considering innovative ideas from other jurisdictions, and making better and more productive use of its existing resources.

Objectives and Scope

Project Scope

1. Confirm Focus Areas and Methodology

- Using the baseline information, initial focus areas suggested by the City and additional data, identify the areas of focus and the most appropriate methodologies with the greatest potential for cost savings and improved service delivery.

2. Assess Service Efficiency

Within the areas to be focused on:

- Identify and assess the costs and cost drivers of current practice
- Review and assess services, activities and methods
- Compare against service providers in other jurisdictions using comparable and relevant best practices
- Analyze and compare service benchmarks and measures
- Assess against other relevant information

3. Identify and Recommend Opportunities for Improved Efficiency and Cost Savings

- Identify and recommend changes to work methods, processes, responsibilities, and other factors that will result in the significant cost savings and the greatest improvement in service delivery
- Identify opportunities for introducing more cost-effective and efficient program delivery applications that would result in the same benefits
- Provide cost savings estimates and implementation details and steps that will address the changes you have identified and recommended
- Provide advice and recommendations about which changes can be made quickly (e.g., for savings in 2012, and which will take longer to implement)
- Identify and provide advice on the costs required to make changes, including any short-term financial investments
- Provide advice about any risks and implications for service delivery, policy development, finances, cross-divisional or enterprise-wide human resource impacts, and other effects of alternatives and changes

Objectives and Scope

Project Scope (continued)

4. Provide reports and documentation

- Provide documentation, reports and presentations for the City Manager as required for each of the deliverables and providing other advice as identified throughout the review process

5. Work with divisional and agency staff as required

- Attend, support and provide documentation for status and/or planning meetings with the City Manager, the designated Project Manager, the divisional General Manager, the City staff team, the City Steering Committee established for Service Review activities, and/or other City officials as required

Timelines

The timeframe for execution of this project was driven by the schedule of the overall City of Toronto Service Review program. Project milestones and deadlines were defined with the aim of incorporating key recommendations into the City's 2012 budgeting process. The project took place over a eight-week timeframe, commencing in the beginning of October 2011 and ending in the third week of November 2011.

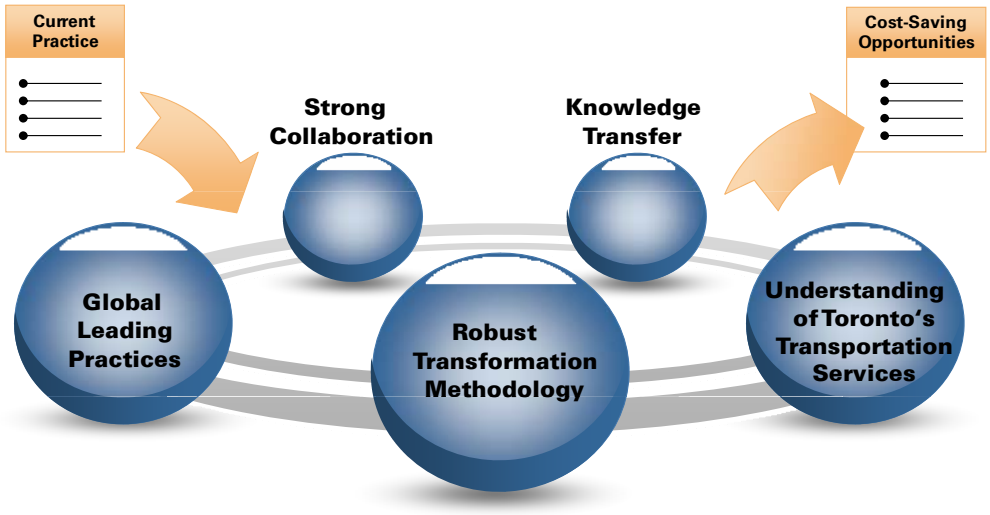
KPMG Approach and Methodology

Methodology

Overall Approach and Methodology

KPMG developed a customized approach for this engagement that incorporates a balanced mix of experience, methodology, interpersonal interaction, and thought leadership to guide the execution of the work.

The approach was rooted in five fundamental elements: strong collaboration, knowledge transfer, leading practices, understanding of the City (as well as Transportation Services), and robust methodology. The combination of these factors is visually depicted in the figure on the right.



Data and Analysis

Building on this approach, KPMG drew on several sources of information and data to perform the review. Specifically, the following inputs were critical in conducting the analysis:

- **City documentation –** the team incorporated numerous documents, reports, and statistics supplied by the Transportation division, the City Manager's Office, and various other stakeholders contacted as part of the project
- **Interviews and workshops –** a number of individual interviews and group workshops were held to gather relevant information and factual details about the operations of the Division and issues experienced by management and staff (see Appendix A for a list of interviewed stakeholders, by stream)
- **Jurisdictional research –** several comparable municipalities and jurisdictions were surveyed to determine the practices employed by their transportation divisions. Leading practices from secondary sources were also analyzed and used in the formulation of opportunities and recommendations contained in the report
- **Internal knowledge and experience –** the team deployed experienced advisors on this engagement, with expertise in transportation services, infrastructure management, business process reengineering, and municipal operations. Their knowledge of the City and lessons from other similar projects was leveraged on this assignment

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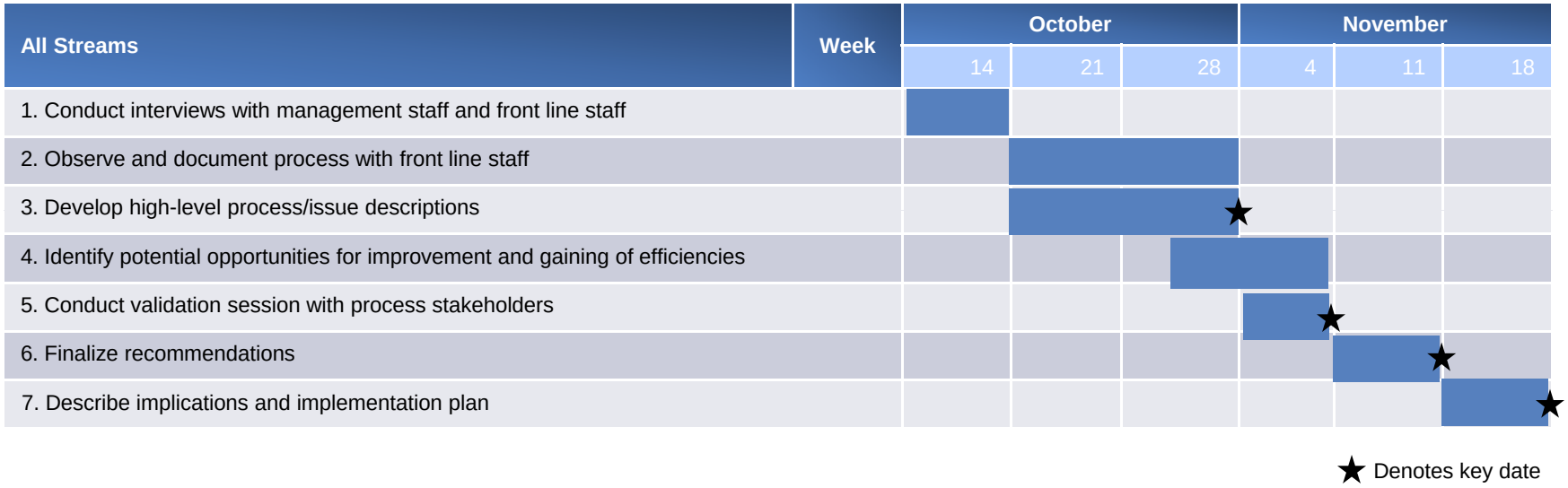
Work Plan

Work Plan and Schedule

In order to execute the scope of the project in the timeframes requested by the City, KPMG developed a work plan structure, which was adhered to by all streams. The work plan is visually depicted below, with highlighted key dates and milestones.



Key Dates

- October 28 – Current State Documentation
- November 4 – Validation Workshop
- November 11 – Recommendation Report
- November 18 – Draft Final Report Submission
- November 25 – Project Close Out Session

Stakeholders / Participants

- City Manager's Office
- Transportation Division Senior Management
- Directors, Managers, Supervisors
- Staff
- Contractors (if applicable)

Construction Permitting for Right-of-Way Operations: Analysis and Issues

Current State

Construction permit processing falls under Right-of-Way Management in the City of Toronto Transportation Services. Regulating the use of requests from developers, agents, utilities and homeowners that apply to Construction Activities for improvements to their right-of-way is done through permits, licenses and agreements. These agreements help to ensure that applicants carry out and maintain their construction activities in accordance with City standards. The Municipal Consent Requirements provides guidance for applicants proposing to undertake work within the City of Toronto streets, including utility companies, commissions, agencies, boards, associations, municipal divisions and private stakeholders.

Toronto has been growing rapidly over the past decade, with significant expansion of condominium high rises and commercial real estate. This growth, which still continues on a higher than historically observed rate, has contributed to an increased pressure for construction permit application processing. Furthermore, the complexity of projects has been increasing, as well, causing more staff time and attention to be allocated to issuance of construction permits. On a relative basis, however, the number of construction permits (1,143 in 2010) is small, significantly overshadowed by the number of utility cut permits issued by the Division (approximately 60,000 per year). As a result, significant economies of scale could be difficult to generate.

Currently, construction permitting is done on a decentralized, district basis. According to stakeholder interviews, the Toronto East York district handles a higher proportion of major construction permit applications in comparison to the other three districts. Stakeholder interviews revealed that there are differences in how construction permit applications are processed across the four districts; however, efforts have been made to harmonize all by-laws through the Streets Bylaw endorsed in principle by Council in July 2011 related to construction permitting to create consistency across the city. There is also a review underway to examine the potential benefits of consolidating the following Right-of-Way activities*:

- Annual excess load permits
- Single trip permits
- Banners permits
- On street / off street parking permits
- Street event permits
- Permanent road permits

The following table demonstrates the number of applications for construction permits, building access, temporary access and Public Utility Coordinating Committee. Construction permits make up the largest proportion of total construction permit types for the City (66.4%) and 90% of construction permits fall within the Toronto East York district.

Right of Way Management – Total Construction Permits Issued (Jan 1 – Dec 31, 2010)**				
Toronto East York	Etobicoke - York	Scarborough	North York	All Districts
806	49	163	125	1,143

*City of Toronto Internal Consolidation of Activities – Utility Cut Permits Business Case
**Source: City of Toronto: Permits issued – Construction Activities Jan.1 to Dec 31, 2010

Current State (continued)

According to stakeholder interviews, efforts have been made to streamline the fee structure for street occupancy to reduce the number of fee options and ultimately improve customer service.

Stakeholder interviews also revealed that there are many staff vacancies in the Division that have not been filled as a result of the City's hiring slowdown. These staff vacancies have resulted in significant backlogs in construction permit processing and increased pressure and stress for staff. According to stakeholder interviews, there are three engineering positions, but only one position is filled in the Toronto East York District. The volume and complexity of applications has increased over the past few years; however, the Division does not have discretion to hire more staff. Current staff resources are managing multiple tasks as a result of staff vacancies, including large volumes of email and phone inquiries from applicants.

Issues Identified

Based on the observations of the current state, KPMG formulated a number of issues related to Construction Permitting. These are described over the next several pages:

- There appears to be a growing backlog of work construction permit applications due to staffing resource constraints.
- The current IT systems used in the construction permits process appear to be outdated, which creates inefficiencies and delays in the permitting cycle.
- Until this year, the City has been operating with construction permitting policies that were uncoordinated across districts. The current draft Streets By-law is aimed at resolving this issue.
- The current decentralized model may result in duplication of tasks, resources and create inconsistency across districts.
- There may be a lack of clear and concise communicated standards, service commitments and key performance indicators.

Permit Applications

Issue

1. There appears to be a growing backlog of work construction permit applications due to staffing resource constraints.

Findings and Observations

- Workload is increasing in volume and complexity yet do not have staff to manage the workload. Toronto is the epicentre of construction nationally, and is one of the fastest growing metropolises in North America. High volume of construction contributes to a large number of Right-of-Way applications, translating into significant pressure on the staff workload.
- There are three engineering positions, however, only one position is currently filled. This creates a bottleneck for the processing of permit applications.
- Due to resource constraints, there is reduced ability to provide back up resources when employees go on leave, take vacation, or terminate employment. This adds additional workload pressure on remaining employees.
- Growing backlog causes longer processing times and results in further customer dissatisfaction. Staff are occupied with tracking applications and answering customer inquiries – the most common question from applicants is how long will it take to receive their permit.

Implications

- Backlog contributes to longer and less predictable processing times.
- The Division needs to reach a steady state of workload in order to begin reengineering process.
- Applicants call in to inquire about the status of their application; however, application processing times are not predictable. Responding to inquiries acts as an additional drag on the Division's ability to process applications.

IT Systems

Issue

2. The current IT systems used in the construction permits process appear to be outdated, which creates inefficiencies and delays in the permitting cycle.

Findings and Observations

- There is a lack of automated work flow in the existing Road Allowance Control System (RACS) system. This necessitates manual hand-offs in responsibility and adds to review delays.
- The RACS system was not set up to deal with the volume of permits currently experienced. Furthermore, it lacks sophisticated functionality to produce tracking and management reports.
- The intake, processing and issuance of permit applications is manually performed, mostly using the counter channel in the Civic Centers for respective districts. Currently, applicants are unable to submit forms electronically.
- Use of paper-based forms (e.g., permit applications) necessitates additional data entry after application submission.
- Neither staff nor customers are able to enter data remotely into the system or extract data from the system.

Implications

- Manual procedures create delays in processing time and result in duplication of effort.
- Without a system that tracks all permit related information, it is difficult to track key performance indicators to support continuous process improvement.
- Customers are unable to track permits in real time or get estimates on issuance of permits.

Permitting Policies

Issue

3. Until this year, the City has been operating with construction permitting policies that were uncoordinated across districts. The current draft Streets Bylaw is aimed at resolving this issue.

Findings and Observations

- The Division has recognized that up to 27 different sets of legislation governed the use of streets across the City. This added to significant complexity, variability, and inconsistency in the processing of construction applications.
- The new Streets Bylaw, drafted by City staff and is in the process of being approved by the Council, is aimed at harmonizing these distinct sets of legislation under a unified code.
- Residual variability in processing by districts creates hand-offs between the multiple divisions and committees that are involved in the application review and approval process. These hand-offs do not appear to be seamless and cause delays.
- There appears to be widespread confusion about the process despite the new bylaw which may be due to implementation challenges. Training staff and regular communications during the roll-out of the new bylaw may have helped to reduce this confusion.

Implications

- Delayed processing times as a result of uncoordinated effort by various groups that participate in the process
- Inconsistent process across the city, creating inefficiencies and perception of unfairness
- Aim of the new Streets Bylaw is to rectify these issues.

Decentralized Model

Issue

4. The current decentralized model may result in duplication of tasks, resources and create inconsistency across districts.

Findings and Observations

- The intake of permit applications is distributed across districts, causing inconsistencies and reducing scale of operations.
- While it is convenient for applicants to deal with their local Civic Centre personnel, it is likely less cost effective for the City. Convenience could be achieved through other means (electronic web submission, email, etc.), while reducing cost, if the intake model is transformed.
- Distributed processing and issuance of permits further adds to inconsistency and non-uniform workloads across districts. For example, Toronto East York District operations are reportedly much more resource constrained than other districts. In the current model, reallocation of resources to the greatest areas of need is not practical.
- While the City has made efforts to centralize and consolidate other back office functions, there is currently no case for a centralized model for construction permits processing.

Implications

- Lack of economies of scale as a result of four different districts.
- Current model of distributed permit processing is likely more costly and less efficient than a larger centralized operation.
- Local inspection staff and local intake / issuance works well in the decentralized model.

Performance Standards and Measurement

Issue

5. There may be a lack of clear and concise communicated standards, service commitments and key performance indicators (KPIs).

Findings and Observations

- Due to a lack of clearly defined and communicated standards, there are uneven and unrealistic service expectations for applicants. Applicants are unable to accurately plan their projects without knowing how long it will take to receive a permit. Limited information is available to applicants regarding the application process, tracking, and status of an application.
- Divisions have no accurate ability to estimate timelines / volumes / resource needs, etc. Furthermore, backlogs introduce further complexity into the process as turnaround times become less predictable.
- There is currently lack of comprehensive management reports. Without sufficient KPIs, management is unable to make informed decisions on changes to the process or track the effects of any improvement initiatives. Typical KPIs for permit processing include:
  - Cycle times – receipt to issuance, receipt to inspection, inspection to decision
  - Accuracy – error rates, reissuance rates
  - Cost – cost per permit (by permit category, inputs, divisions, etc.)
  - Customer Satisfaction – surveys by year, permit category, etc.
- There is no unified application tracking system across the four districts as each district utilizes their own tracking mechanism (e.g., Excel spreadsheet).

Implications

- Without KPIs, it is difficult to begin the reengineering process and benchmark against other municipalities and districts.
- Lack of KPIs hinders the ability to learn or improve.
- There are no motivational drivers to improve performance.

Construction Permitting for Right-of-Way Operations: Recommendations

Readers are cautioned that the potential savings outlined in this report are estimates which are predicated on the City reducing its personnel resources, capital assets, and other future events. Savings presented exclude the costs of transition. Actual results achieved as a result of implementing recommended opportunities will vary from the information presented and these variations may be material.

1. Centralization and Automation

Financial Impact

- Development of online permit submission functionality is estimated at under $100k
- Savings are expected to arise from reduced manual work and pooling of administration and technical resources. These are estimated at approximately $100-$150k

Timing

- Centralization planning and implementation may begin in 2012
- Savings are projected for 2013

Risks

- Closing a physical application channel may reduce options for some applicants
- System failure may prevent submission / processing
- Legal considerations for electronic signatures

Barriers and Enablers

- Not all documents can be shared electronically. Develop a process for submitting supporting documents that cannot be submitted electronically (e.g., drawings).
- Consider the additional cost of training and relocation of staff

Recommendation

Consider centralizing the construction permit process with automation to support the centralized process.

Rationale / Benefit

Moving from a decentralized model to a centralized operation can help decrease administration costs associated with processing construction applications, increase efficiencies in how the applications are processed across the districts, and improve customer service by having a consistent method of handing applications.

Description

- Pool resources to enable resource sharing across the four districts where the application process is similar. For example, all four districts manage minor applications; however, it is primarily Toronto East York District that receives major applications. There may be an opportunity to share resources across the four districts who deal primarily with minor application processing.
- Optimize processes through economies of scale. A centralized model can enable work load sharing that would eventually allow staff to develop consistency in the construction permit process. Stratify construction permits by complexity and create standard processes accordingly.
- Create automated features in the construction permit application submission, review and approval process. Automation can reduce delays in processing time, improve efficiency and support a centralized process. Consider the following changes:
  - Allow for electronic submission of minor, extended minor and major construction permit applications. Currently, drawing submissions are large and complex in nature, particularly for major construction permits; however these hard copy documents can be linked to the electronic application using an unique identifier code for the application and the drawing. For example, upon submission of an electronic application, send an automatic response to the applicant with a unique identifier code. This code should be included with the hard copy supporting documentation to link it with its electronic application file.
  - Currently, the City's Transportation Permit Parking process accepts internet-based applications and submits internet-based permits. Consider how this process can be leveraged in a centralized construction permit process.

1. Centralization and Automation

Description (continued)

- Develop an algorithm that can decipher the complexity of an application (e.g., minor vs. extended minor vs. major application) and send it to the appropriate divisions for review. Develop a separate algorithm to create appropriate system work flow based on permit application type.
- Automate notification to applicants including comments regarding their application, application status updates and required revisions.

- Currently, applicants are required to physically pick-up their permit once it has been approved. Consider issuing the approval letter and permit electronically.
- Currently, a copy of an approved permit is sent to the by-law officer in addition to the applicant. A file copy is also created that contains the applicant's permit, approval letter and stamped approval plans. For major applications, a copy is filed and the utility inspector and by-law officer both receive a copy of the approved proposal. This process can be simplified by providing electronic notifications that the permit has been approved or by providing access to the application status that would show whether the application is complete or under review.
- Aim to further stratify construction permit applications to increase efficiency and improve customer service (e.g., minor versus major applications or by fee structure). This will provide specialization for staff and build knowledge on different types of permits. However, it is important to maintain a degree of generalist skills to effectively pool and share resources.

Key Considerations

- Maintain by-law officers at the district level to preserve local knowledge.
- Based on volume of construction permits, consider centralization of the construction permits at the T-EY district. For example, from January 1 – October 12, 2011, 70% of total construction permits were at T-EY.
- There may not be a FTE to allocate to the centralized office.
- Continue to use specialized staff to manage major permit applications in T-EY.
- Coordinate with other centralization efforts, (e.g., utility cuts).
- Training requirements for staff and applicants.

Case Study: Philadelphia Permit Review Process

City of Philadelphia, Philadelphia's Development Permit Review Process: Recommendations for Reform

The City of Philadelphia identified a need to improve its development permit process as it was found to be confusing, unpredictable, time-consuming and costly for anyone trying to do business in Philadelphia . Due to the absence of a coordinated permit intake system, customers must physically take their applications to different approval authorities, each with its own set of procedures and requirements. Internal and external stakeholders view the development process as a major barrier to entry for construction companies who want to invest in Philadelphia. Permitting delays can have an impact on the cost of development, which Philadelphia found they could not afford in the current economic climate. Several solutions to transform the process into a system that is fast, efficient, clear, affordable and predictable were identified.

Five goals for this project included:

1. Yield quicker and more efficient permitting process
2. Make permitting results predictable
3. Improve customer satisfaction
4. Attract outside developers and investors, and
5. Increase investment and development in Philadelphia

This review included an evaluation of the process and software that could be used to support the process:

- **Process Evaluation**: The project team conducted an evaluation of the permit review process and software development of an electronic permitting system. This included a review of work flow issues and brainstorming of potential solutions for inter-divisional and system-wide challenges. The group worked together to develop process improvement implementation plans for each department and for larger city-wide development process.
- **Software Development**: The project team collaborated with the Division of Technology to evaluate several electronic plan submission software systems and permit wizards. Evaluation criteria included a review of software customization, flexibility and compatibility with existing systems and ease of web communications. In addition, a ‘rules engine’ database was developed to collect all specifications about permit requirements, division approvals and submissions associated with any given project. The rules engine is a logic platform on which the electronic plan submission software would be constructed.

Case Study: Philadelphia Permit Review Process (2)

A focus group comprised of members from each of the Streets Department unit reviewed the permitting process to identify issues and opportunities for improvement. The five major challenges included:

1. **Incomplete plans that cause unnecessary processing delays** – Until recently, the Streets Department did not post submission guidelines on their website. Paper guides at the customer service counter were the only available resources. In 2009, the Streets Department posted a development plan guide, its street closure permit forms and fee schedule and application online.

2. **Excessive review time by external agencies** – The Streets Department unit frequently coordinate with outside agencies to review plans. Yet there was no department-wide policy that holds outside agencies accountable for reviewing plans within a reasonable time frame.

3. **Burdensome regulations** – Prescriptive design standards for street elements are written into the Philadelphia Municipal Code. These regulations ensure the consistent appearance and general safety of street features; but they can be inflexible, requiring the passage of various amendatory ordinances for the smallest change of detail. Amendments are a long and costly process for developers.

4. **Multiple points of entry that muddle communication with the customer** – Multiple permit application intake points create confusion and uncertainty. Customers do not become fully aware of all the approval requirements until the middle of the process, causing unforeseen delays in obtaining development permits. The payment system is equally decentralized with multiple cashiers, which adds more frustration and delays in the permitting process.

5. **Ambiguous Lines of Communication Among Units –** The Streets Department Units have developed informal methods of intra-departmental communication. Despite these efforts at coordination, problems still arise for many development projects. In some cases, applicants receive conflicting comments from different units leaving uncertainty about which opinion constitutes the “official” Streets decision. In other instances, projects may bypass required approvals if the proper Streets units are not alerted.

Case Study: Philadelphia Permit Review Process (3)

A series of recommendations, approaches to addressing the recommendations and potential impacts for the City of Philadelphia were identified in this analysis and are presented in the table below:

Challenge	Recommendation and Approach	Potential Impact on Philadelphia
1. Discourage the submission of incomplete plans that cause feedback loops and lead to delays	**Discourage the submission of incomplete plans that cause feedback loops and lead to delays.** • Post clear and visible submission requirements to improve customer awareness. Make the website user-friendly and add links to all permit forms and submission guides. Work with permit-issuing units in all Philadelphia agencies to package Streets submission guidelines with permit applications that may need Streets Department approval • Impose sanctions for repeat offenders, such as charging increasing fees for re-submittal of poor plans. • Publish ratings of development professionals to incentivize preparation of complete plans	• Reduce workload created by incomplete plans Provide public with the knowledge to make informed decisions when choosing designers, architects, contractors and other development professionals • Speed-up the development permitting process system-wide
2. Review Time by External Agencies	**Hold external agencies to a standard response time** • Clearly define criteria that trigger external reviews to reduce unnecessary reviews • Impose an industry standard review deadline of 14 days for review agencies and enforce the deadline via implied consent	• Reduces City Plans Unit's implied consent policy threshold from four to two weeks • Provides assurance that agencies will review plans within a reasonable time frame
3. Burdensome Regulations	**Regulatory Reform** • Evaluate opportunities to adopt more flexible standards and procedures. For example, the installation of street bollards that exceed the design limits set forth by the Code require the passage of an Ordinance. Such minute details should not necessitate the passing of an amendatory ordinance. The Streets Department could allow the technical staff to approve minor deviations from physical standards (i.e. 10% or less). Alternatively, the Streets Department could adopt a street element design guide, revising the Code to reference the current guide rather than specific numeric standards, which would allow street design standards to remain flexible • Evaluate the rationale for threshold points that trigger review by additional staff (e.g., driveways over 30 feet) and propose changes where appropriate. Collect a long-term and comprehensive record about applications and evaluate whether the rationale behind the established threshold points stands up against this record.	• Potentially reduce the number of approvals required per project

Case Study: Philadelphia Permit Review Process (4)

Challenge	Recommendation and Approach	Potential Impact on Philadelphia
4. Multiple Points of Entry	**Consolidate and streamline points of contact between the customer and Streets** • Unify permitting application intake points by merging customer service resources into a **single customer service counter**. • Assign a "shepherd" to move applications between departments and reconcile conflicting comments, allowing Streets to communicate with the customer as a single department. • **Centralize payment process** by having a single cashier for streets at the Municipal Services Building and create a system for online payments.	• Accelerate the development review process. • Make customers aware of all requirements at the beginning of the process • Allow the city to speak with "one voice"
5. Ambiguous Lines of Communication	**Clearly delineate responsibilities to facilitate smooth internal communication** • Ensure clear understanding of all units. • Formalize process for intradepartmental communication on project issues	• Make certain that all required units see projects • Avoid any unnecessary application re-submittals

Relevance to the City of Toronto

Similar to challenges identified in the construction permitting process for the City of Toronto, the City of Philadelphia found the permitting process to be confusing and unpredictable. They also dealt with the same challenges of having to manage major development applications to very simple building upgrades which prevented the City from effectively allocating their resources so that they could deliver consistent and prompt services to applicants. The City of Toronto should adopt similar changes as those identified by the Streets Department of the City of Philadelphia to improve the permitting process from an efficiency and customer service perspective.

2. Service Standards

Financial Impact

- This recommendation deals with improving customer service. The financial impact will be minimal

Timing

- Standards could be established in 2012, yielding results in 2013

Risks

- Not adhering to service standards can lead to backlog of incomplete applications creating frustration for customers

Barriers and Enablers

- Upgraded system improvements can support management report development (e.g., tracking length of time to process minor applications in 2011) and data capture
- Current low staffing levels may present a challenge in establishing and adhering to service standards

Recommendation

Enhance service standards for the construction permitting process.

Rationale / Benefit

Service standards will potentially lead to increased customer satisfaction by keeping applicants informed of the timing and status of applications. Service standards also act as incentives for better performance, thereby reducing construction project delays due to slow permit application processing time resulting in longer-term economic benefits for the City.

Description

- Currently, major and minor applicants are unable to get accurate estimates of the length of time to receive their construction permit. For example, the Construction Activities Guidelines indicates that the site plan approval process can take between one to three months; however, anecdotally this process can take longer than three months. Customers should have a degree of realistic expectation of when their permit will be issued.
- Share the application processing time with applicants (refer to Recommendation – Centralization and Automation).
- Develop management requirements for monthly management reports. Use management reports to make informed business decisions for continuous improvement of the construction permitting process. Example data points include:
  - The length of time to process construction permits by type (minor, extended minor and major applications)
  - Number of outstanding permit applications by type
  - Cost per permit.
- Track performance against internal and external benchmarks.

2. Service Standards

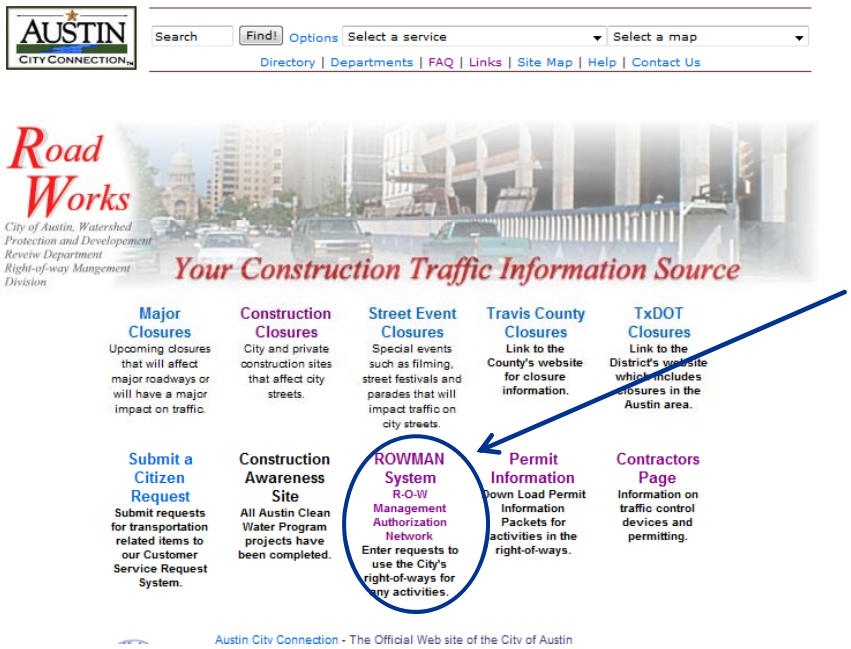
Key Considerations

- Need to collect relevant data to support business decisions.
- Reduce / eliminate backlog of applications to ensure the group is working with a management workload.
- May require filling staff vacancies to be able to handle increased volume and shorter cycle times.
- System requirements to automatically produce reports.
- Allocate management time to performance management through this process.
- Consider expedited processing for an increased fee.
- If service standards are not being met, additional resources may be required.
- Institute learning capabilities to bring down processing time and support continuous improvement.

Case Study: Austin Right-of-Way Management

City of Austin, Department of Transportation, Right-of-Way Management

The City of Austin Right-of-Way Management division provides a 'one-stop shop' for residents and businesses to access information with regards to construction and right-of-way activities.



Source: City of Austin web site

The website provides all construction-related information through one source including information about:

- Street closures
- Citizen requests
- Permit-related information

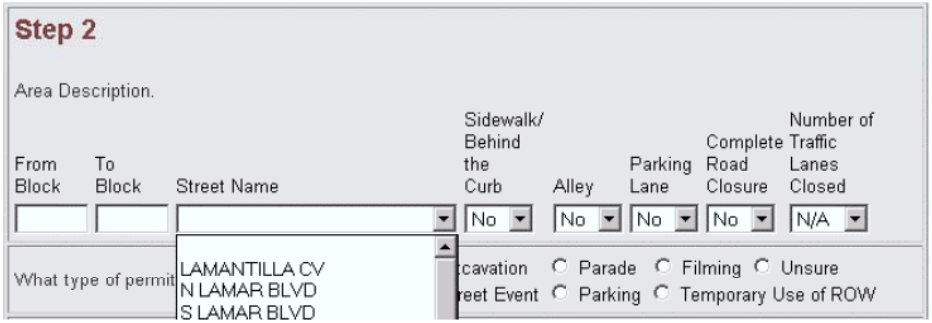
The ROWMAN System is a right-of-way management approval network that is designed to streamline the application process for all right-of-way activities. The types of permits it includes are: excavation permits, temporary use of right-of-way, special events permits and emergency operations.

This system has been in place since February 2003 and is designed to better inform those requesting right-of-way activity about the requirements of the various Austin departments and providing real-time status of right-of-way requests. The system also gives personnel the ability to coordinate ongoing work with upcoming work in order to maximize the use of right-of-way with minimal disruption to the travelling public.

Note that this system is used to schedule right-of-way requests not to obtain permits.

Case Study: Austin Right-of-Way Management (2)

When submitting a ROWMAN request for a new activity, the user is required to submit a user login and password that allows the user to track his / her request and status. When creating a request, the user is able to include up to five streets where the work will be occurring. There are fields to include additional information that best describes the request and how many lanes of traffic that will be affected.



Next, the applicant is required to describe the type of permit he / she is requesting, as demonstrated below:

Additional information about the request include type of activity (e.g., emergency, private or governmental use), the start and end date of the activity, the project / event name, contact information and description of the work or activity. Once this information has been submitted, the applicant is assigned a unique ROWMAN identification number that can be used for all future inquiries concerning the right-of-way request. The applicant can track the status and comments provided from Austin departments by logging on to the system using his / her unique ROWMAN identification number.

Relevance to the City of Toronto

Most larger cities are in the early stages of moving towards increased use of online tools to support the right-of-way management process. Consider developing an online tool similar to ROWMAN that can help the City coordinate ongoing work with upcoming work in order to maximize the use of right-of-way with minimal disruption to the public and provide requestors an opportunity to easily track the status of their right-of-way requests.

3. Harmonized By-Law Review

Financial Impact

- This recommendation deals with improving customer service. The financial impact will be minimal

Timing

- User guide can be established in 2012

Risks

- By-law may be confusing to the public and result in low compliance to the by-law

Barriers and Enablers

- IT system upgrades (e.g., web-based enhancements) can make the bylaw document more user-friendly

Recommendation

Create a customer-friendly guide for Chapter 743 “Use of Streets and Sidewalks” of the Toronto Municipal Code to improve its readability and usability.

Rationale / Benefit

The current format and structure of the by-law can be perceived as confusing and not user-friendly which may result in low compliance to by-laws. Creation of a user guide or a decision tree for construction projects will likely enhance customer satisfaction and compliance.

Description

- Improve the usability of the document by simplifying and guiding applicants through the proposed by-law. Create an electronic user-friendly guide decision tree for an applicant to simplify the process of applying for Right-of-Way permits. For example, develop a decision tree applying for a permit to install a canopy that includes:
  - Information that the applicant must provide (e.g., address where canopy will be installed, physical drawings of the proposed installation)
  - Questions that ensure the applicant understands the terms and conditions of the permit (e.g., Does the proposed canopy fall within 0.50m from the edge of the sidewalk?).
- Create a hyperlink within the web-based by-law to a fee table for all permits where there are references to fees within the by-law.
- Create a hyperlink within the web-based by-law to relevant permit application forms.
- Create a log of changes to the revised by-laws in a separate document for easy reference to regular users.

Key Considerations

- Coordinate web-enabled enhancements with other City web-based by-law documents.

Utility Cut Repair: Analysis and Issues

Current State

The Transportation Division is responsible for the coordination and management of authorized public utility companies and agencies who conduct utility cut repairs within City streets. Part of the Division's mandate is to also preserve and restore the City's infrastructure and minimize the disruption to all road users and abutting stakeholders. The utility cut process consists of three application streams: full-stream applications (includes construction of new underground or surface infrastructure involving the relocation, removal or alternation of adjacent infrastructure; any work that is not classified as emergency or short-stream), short-stream applications (includes exploratory work to investigate subsurface conditions, construction of service drops or subsurface services connecting one or more individuals users to the mainline distribution infrastructure; and other activities of similar scope and complexity) and emergency work applications (work requiring a new excavation, repairs or actions required in response to failure or damage to existing plant resulting in danger to the public, loss of an essential service and / or damage to infrastructure or other utility plant).

All information related to the installation of a plant (e.g., pole, cable, pipe, conduit, etc.) can be found in the Municipal Consent Requirements. This document is found to be very useful and thorough in providing utility companies the information they require to conduct work on City's streets.

The Division manages a high volume of utility cut applications on an annual basis. In 2010, 60,000 utility cut permit applications were processed; as of October 2011, 40,000 permits were processed. The number of utility cut applications has increased by approximately 45% in the last few years and is anticipated to continue to increase. The North York District currently manages the highest volume of utility cut permit applications compared to the other districts.

Average Annual Utility Cut Permit Volumes 2006 to 2009*				
Toronto East York	**Etobicoke York**	**North York**	**Scarborough**	**Average per district**
8,769 (36 / day)	8,383 (34 / day)	12,057 (49 / day)	10,170 (42 / day)	9,845 (40 / day)

The City has made significant strides in moving towards a model that can decrease costs to the City and increase customer service in the utility cut permit process. An example of this progress is the business case put forward by the City to move from a decentralized to a centralized model for processing utility cut permits. Features of the new model include:

- Move all utility cut application processing to operate from the North York District with standardized positions.
- Rationalize and re-locate staff to reduce duplication and maximize staff resources.
- Realize a potential 40% savings in the cost per permit with a centralized structure ($15.40 / permit to $9.23 / permit).
- Identified pros and cons and potential mitigating measures to manage cons. For example, consider training and coordination requirements with road operations staff to manage the loss of local contact for road operations.

*City of Toronto Internal Consolidation of Activities – Utility Cut Permits Business Case

Current State (continued)

Another example of progress made by the City in utility cut permitting are the harmonized utility cut guidelines that are being followed consistently across the four districts. Significant efforts have also been made through an internal business process review to increase efficiency and consistency of the utility cut process through the use of uniform contract templates and standard application of processes across the four districts. Representatives from the four districts meet on a regular basis to identify opportunities for continuous process improvement.

In order to support a coordinated approach to utility cut management between the City and utility companies, the Toronto Public Utilities Coordinating Committee (TPUCC) has been operating since 1933, with mandate to ensure orderly, safe and efficient planning, design, construction and maintenance of transportation, telecommunication, energy, water and sewer service. This committee consists of members from the City and utility companies who own and operate facilities in the public road allowance and meet on a quarterly basis to discuss planned utility work.

Issues Identified

In spite of the improvements made by the City to increase utility cut management, there are still some issues that should be addressed. For example, cut examiners are required to monitor permits and identify all cuts as they are currently not tracked by the utility company that made the cut. Cut examiners can take up to two to three days to determine which utility company is responsible for a cut. Tracking the coordinates of all cuts through software upgrades would increase efficiency in:

- Identifying the utility company responsible for a cut that may be deemed defective, resulted in a claim (e.g., trips and falls) and to accurately bill the utility company.
- Reduce the amount of time cut examiners spend determining which utility company is responsible for a cut and have capacity to support other tasks, such as completing permanent repairs.

Other issues and observations include:

- The current IT systems used in the utility cuts process do not appear to enable process efficiency and result in duplication of effort.
- There is appears to be a delay in the contract administration process due to staffing constraints and manual processes.

IT Systems

Issue

1. The current IT Systems used in the utility cuts process do not appear to enable process efficiency and result in duplication of effort.

Findings and Observations

- Paper-based forms (e.g., Truck Daily Pre-Trip Inspection Report, Daily Work Sheet, Contract Utility Cut Repair Report, Purchase Requisition) are manually entered into RACS. An analyst-level resource is tasked with the entry of data, essentially duplicating the transcription of reports into the system.
- The RACS system does not interface with the GIS system, and is unable to link to graphical data. This prevents utility cuts and related work to be geographically identified.
- There is no coordinated 'one window' to access different reports / logs (e.g., patrol logs). Data retrieval is time-consuming and not effective.

Implications

- There is no single point for accessing reliable data, which creates processing delays.
- Duplication of resources due to non-value add tasks (e.g., duplicate entries) contributes to inefficiencies. This not only increases the cost of utility cut administration, but also adds to the prolonged timelines.

Contract Administration Process

Issue

2. There appears to be a delay in the contract administration process due to staffing constraints and manual processes.

Findings and Observations

- Due to staffing constraints within some divisions that are involved in the contract administration process (e.g., Technical Services) there is a backlog of action requests. For example, it generally takes eight weeks to review a contract but has taken up to 12 weeks due to staffing shortages. In addition, there are higher volumes of work during the summer months and yet no increase in staff to manage the higher volumes (e.g., one buyer has to manage 100 – 130 contracts).
- There are multiple signatures required in the contract administration process that are done manually. This creates delays and unnecessary hand-offs.

Implications

- Contract administration process can be delayed by up to four to six weeks.

Utility Cuts

Decentralized Model

Issue

3. The decentralized application processing model employed by the Division was contributing to duplication of tasks, resources and inconsistency across districts. Current efforts to centralize the process are steps in the right direction.

Findings and Observations

- In 2010, there was a review of the utility cut process to identify opportunities for improvement, including a pros and cons analysis of a centralized model. The proposed processes have been documented by the Division and reviewed by KPMG as part of forming recommendations. It was found that a centralized model would improve the utility cut process and reduce the cost per permit by ~40% by relocating staff to one location, having a single point of contact and consistency with engineering standards and MCR.
- The newly proposed process is seen as an improvement over the existing process; however, some inefficiencies have still been observed. For example, there are a minimum of three field visits needed to measure, monitor, and inspect the site. This can be reduced to two if the roles of the Utility Cut Inspector and Field Investigator are consolidated. Furthermore, there are other manual paper-based processes, which could be automated to yield efficiencies.

Implications

- Lack of economies of scale as a result of four different districts.
- Local inspection staff and intimate knowledge of district road environment works well in the decentralized model.

Utility Cut Repair: Recommendations

Readers are cautioned that the potential savings outlined in this report are estimates which are predicated on the City reducing its personnel resources, capital assets, and other future events. Savings presented exclude the costs of transition. Actual results achieved as a result of implementing recommended opportunities will vary from the information presented and these variations may be material.

4. Utility Cut Management

Financial Impact

- This recommendation may require an estimated investment of $10,000 to over $100,000, depending on the system chosen for implementation
- The projected operational savings are estimated at $300,000

Timing

- Planning can commence in 2012, with a pilot program in 2013
- Cost savings / efficiencies are likely to be yielded in 2014+

Risks

- Need full participation of utility companies to track utility cuts
- Need a detailed tracking mechanism process in place to ensure all coordinates are accurate and up-to-date, otherwise data quality will be compromised

Barriers and Enablers

- IT solutions can enable efficient tracking of utility cut coordinates
- Ability to procure an external vendor for the development and testing of the mechanism

Recommendation

Consider developing a mechanism to improve the utility cut management by tracking the utility company that is responsible for each cut using a marking system.

Rationale / Benefit

Currently, cut examiners spend up to two to three days to determine which utility company is responsible for a damaged / defective cut. A tracking mechanism to manage all coordinates can reduce time spent tracking utility cuts, and increase efficiency in billing utility companies, resolving issues related to damaged / unsafe cuts and reallocate time to other utility cut activities.

Description

- Consider implementing a marking system to track all utility cuts using one of the following options:
  - Color coding mechanism to track utility cuts by type (e.g., hydro, gas) or company
  - Consider investment in technology to track the coordinates of all cuts. For example, insert radiofrequency microchips in each utility cut that can be used to identify which cut belongs to which utility company.

Key Considerations

- Capital investment costs
- Training requirement.
- Resource re-allocation of cut examiners
- Provide a rebate for utility companies that are willing to collaborate in tracking utility cuts
- A pilot study to test the effectiveness of the new mechanism is likely required
- The Division will likely require external assistance with the development and piloting of the tracking mechanism, as this capability is not readily available internally.

Case Study: RFID Tags

Background: (Radio Frequency Identification) RFID for Utility Marking and Buried Asset Management

For many North American jurisdictions, there is little knowledge about existing buried infrastructure including water lines, sewers, telecommunication, gas and electric utilities. Without strong utility-related record-keeping, it is difficult to manage, maintain and expand engineering infrastructure that exists today. In the engineering and construction practice, uncertainty about utility locations can easily lead to budget overruns, project delays, and construction change orders. In worst-case scenarios, it can lead to unwanted legal action, costly damage to existing utilities and safety risks to excavating contractors.

To enable better management of buried infrastructure, radio frequency identification (RFID) for locating underground pipes and cables are used to address issues of generally locating existing utilities, organizing known utility data geospatially, and aiding in visualization. RFID is a broad term that describes any system that consists of RFID tags and readers. A typical RFID tag consists of a microchip attached to a radio antenna which allows the tag to broadcast data over radio waves to readers. The tags can store up to two kilobytes of data and can store unique identification or serial number of whatever object is tagged. Tags come in varying sizes and shapes and are already being integrated into many common objects, including credit cards, clothing labels and shipping packages. RFID readers are used to retrieve data from the RFID tags.

Benefits of using RFID for utility marking and buried asset management include:

- **Ability to operate in challenging environments** – RFID tags for utility marking can be designed to withstand a variety of challenging environment operating conditions.
- **Enables flexible strategies for locating assets** – Field-locating utilities using RFID has the potential to be useful on multiple levels. The most common scenario would be to locate utilities horizontally and mark them in the field.
- **Implements database back-end storage** – The database records are associated with the individual tags using the unique identification number and the database can be used to store all of the information that is pertinent to the tagged asset. The database can store information about the contractor, installation conditions, installation date, installation depth, dimensions, specifications, CAD drawings, shop drawings, installation photographs, and maintenance records.
- **Facilitate maintenance tasks** – A technology such as RFID would not only facilitate location of utilities, it would also ensure that regular maintenance and replacement tasks are more accurately associated with specific assets, over their entire lifetime. Because each RFID tag has a unique identification number associated with it, these tags can be used to mark specific pipe sections, splices, valves, or other appurtenances within the utility network. These different parts may have varying expected life spans, and will likely be serviced individually, over time. With RFID, facility owners would be able to more easily maintain part-specific maintenance records than existing practices permit.
- **Serve as a basis for future decision support tools** – In addition to the uses mentioned above, RFID has the potential to be leveraged as a basis for a variety of innovative decision support tools. The data can easily be integrated into GIS systems, served over the Internet, or manipulated through handheld devices

Case Study: Atlanta Airport RFID Tags

Hartsfield-Jackson Atlanta International Airport, Use of RFID-enabled Utility Markers

Airport roads undergo constant construction for new runways and extensions. Knowing the location of underground cables is vital as disruptions can cause costly delays with airport operations. The prior use of concrete colored markers required high maintenance costs and an alternative was sought.

Radio Frequency Identification (RFID) markers were installed to address these challenges.

An array of information related to buried assets can be virtually tracked and stored using radio frequency markers on site. Information about the contractor, asset owner, installation conditions, date, depth, dimensions, specifications and maintenance records can improve site inventory control and minimize costs associated with legal action, administration and repairs. The use of electronic markers is highly applicable in any area with densely distributed utilities and ongoing construction.

Radio Frequency Identification (RFID) tags are installed alongside different types of utilities. Each RFID tag consists of a microchip attached to a radio antenna that broadcasts data over radio waves. Handheld RFID readers retrieve radio wave data and passes information in digital form to central computers.

Benefits:

- Reduced cost: Administration; Legal claims; Excavation and repairs
- Enables flexible strategies for locating assets
- Implements database back-end storage
- Facilitates maintenance tasks
- Serves as a basis for future decision support tools.

Drawbacks:

- Excavation costs
- Periodic replacement costs.

Relevance to the City of Toronto

The City of Toronto should look to other jurisdictions for effective ways of implementing RFID markers. Using RFID markers can help the City reduce administrative and legal costs as well as enable the City to better manage and locate its assets. Ultimately, RFID markers can facilitate the improvement of decision-making processes for the City.

5. Service Standards

Financial Impact

- Cost savings in this recommendation will not be accrued by the City, but rather be realized by utility companies

Timing

- Standard development and application can begin in 2012
- Cost savings / efficiencies are likely to be yielded in 2013+

Risks

- Purely adhering to a service standard will not take into consideration the reality of a planned cut and some flexibility may be required

Barriers and Enablers

- A centralized model can facilitate a consistent approach to permanent utility cut repairs

Recommendation

Adapt a more rigorous and consistent approach to completing permanent utility cut repairs using consistently applied service standards across the City.

Rationale / Benefit

Efforts have been made to improve consistency in the utility cut process across the four districts; however, further focus on adhering to these standards and making them consistent across the City would yield process efficiencies and cost savings.

Description

- Create a consistent means of tracking the age of a utility cut permit. According to stakeholder interviews, a permanent cut repair should be complete within 18 months of the initial cut. Currently, there is not a consistent means of tracking the number of permanent cut repairs completed within 18 months across the four districts; however, tracking this information using a consistent method would help management work towards identifying opportunities to improve the permanent repair process.
- Ensure permanent repairs are captured in an asset management system to inform the state of assets and their subsequent maintenance needs.
- With the coordination of TPUCC, track exceptions to permanent cut repairs in case it coincides with other upcoming planned utility activities as there may not need to do a permanent repair within 18 months of the initial cut.

Key Considerations

- Dependent on a centralized model
- Consistent data collection to create robust management reports
- Coordination with asset management.
- May require external assistance to carry out the process standardization.

6. Process Improvement

Financial Impact

- This recommendation may require an estimated investment in mobile technology of $100,000 to $500,000
- The projected operational savings are estimated at up to 15% percent of service cost

Timing

- Changes can be made in 2011 or in the medium term depending on the recommendation, impacting 2012 fiscal year
- Cost savings / efficiencies are likely to be yielded in 2013

Risks

- Lack of continuous process improvement can result in inefficiencies, increased cost to the City and frustrated stakeholders

Barriers and Enablers

- Investment in technology will require a positive business case
- Training for staff and utility companies may be required prior to the rollout of the new process
- Need to clearly identify parameters of remote access to technology
- Need to procure an external vendor to fully assess the process and recommend further improvements

Recommendation

Continue to improve the utility cut repair process in order to generate further efficiencies

Rationale / Benefit

Eliminate redundant and duplicate steps that would allow reallocation of resources to other activities.

Description

- Streamline the utility cut permitting process by reducing duplicate steps and using automation to support certain processes as described below:
  - When verifying dimensions of a cut at the beginning of the permanent restoration process, consult the City's infrastructure management data to make more informed decisions before filtering to tender and obtaining confirmation from the utility company.
  - Streamline the utility revision and confirmation process by using the utility cut marking system (refer to Recommendation – Utility Cut Management) to record more accurate cut measurements and reduce the number of oversized measurements.
  - Digitization of cost sheets can eliminate the amount of paper handling, particularly within the random sample audit process:
    - Photocopied adjustments sent to contractor – use automation to send adjustments
    - Receive revised cost sheet and remove from RACS – use automation to update and transfer cost sheets.
  - Consider reducing the number of approvals required for monthly progress payments. Currently approvals are obtained from the manager, director and supervisor for sign off – reduce to one or two approvals based on established thresholds.
  - Utilize photographic or video technology to capture evidence of Field Investigator site visits. This will help to provide more detailed evidence in site visits and support the random sample audit process.
  - Reduce the number of initial site visits. Currently, the Cut Examiner and Field Investigator visit the site of planned cut work where they both are responsible for measuring the repair area. Reduce this to one site visit completed by the cut examiner.

6. Process Improvement

- Reduce the production of triplicate cost sheets upon completion of work.
- Eliminate role of analyst entering cost sheets into TMMS by providing Maintenance Patrollers remote access to TMMS using mobile technology.
- Consider using standard and pre-populated templates for cost sheets to reduce re-entry of data that could be populated through automation.
- RACS should be available using mobile technology so that cut examiners can reduce time spent traveling to their district office to obtain permit-related information. For example, Toronto Water uses remote computing to enable field staff to have system access while on site using web-enabled technology.
- Use online utility cut application submission and permit submission for short stream applications. According to stakeholder interviews, short stream applications use client codes that could be used to provide authentication to utility companies applying for a short stream application. Offer a business portal to utility companies that will allow them to submit applications online and receive their permit online, similar to the process used by Transportation Permit Parking.

Key Considerations

- Initial capital investment in mobile technology will likely be required.
- Training for new process and new systems will be required.
- Improvements in the process should be continuous. There needs to be a feedback loop to inform management of inefficiencies and act to resolve them.
- The Division will likely require external assistance with business process reengineering, as this capability is not readily available internally.

Claims Investigations: Analysis and Issues

Current State

The Division's role in the claims management process consists mainly of presenting evidentiary information to an external adjustors agency, contracted by the City to handle claims. Information requested varies on a case by case basis; however, main elements include patrol logs, site inspections, weather reports, and other physical evidence related to the scene of the incident. In the past, courts have ruled that evidence of negligence on the part of the municipality needs to be demonstrated for cases to have a valid legal basis. Thus, demonstration of regular maintenance, patrolling, and inspections by the City is often considered sufficient defense in countering the claimant's case.

As per the City of Toronto Act, all streets are required to be patrolled at regular intervals, ranging from once every 30 days to once a week, depending on the type of road. Field Inspectors, as part of their regular duties, are responsible for patrolling streets in line with these minimum maintenance standards (MMS). This allows Inspectors to monitor and document the condition of roads, identifying potential hazards and acting to fix them. For example, any sudden elevation changes over 20mm are identified, reported and flagged for ramping in order to prevent trips and falls. Patrol logs are subsequently used in claims proceedings as evidence.

The assembly of supporting documentation is currently handled by Field Investigators with a distributed model across the City's four districts. Currently, patrol logs and other supporting documentation are completed manually and stored in hard copy format. According to interviews, Field Investigators spend approximately 30-40 percent of their time dealing with claims. Divisional reports further indicate that, on average, each case requires approximately 35 hours to prepare. Having observed sample files, these figures appear to be extraordinarily high.

The Division is the primary generator of claims in the City, amounting to 31% of the total. Over the past five years, the Division has incurred a total of $64M worth of claims against the City (combined paid and outstanding). Annually, the average number of claims is approximately 1,900, with significant variation across districts. For example, some areas of the City have older infrastructure causing a greater volume of accidents resulting in claims. According to stakeholder interviews, there are more claims in the downtown area than other areas of the City. However, granular data that convey the volume, nature, severity, value, and urgency of each claim is not readily available. Furthermore, the claims management process currently varies across the four districts. In the Toronto-East York District, there is a process to track outstanding claims.

Broad claim categories have been defined; however, there appears to be no stratification beyond the main two: sidewalk slips and falls and pothole damage. There is also insufficient tracking and identification of causes of claims. The City suggests that in 2008-09, poor winter conditions and intense media scrutiny resulted in a higher number of claims. These two factors, combined with road conditions, appear to be the most significant drivers of claim volume and severity. The City has made advancements in making claim volumes and amounts more transparent. It publishes an annual report of claims, by division, which contains a rolling tally over the past five years. The 2010 report can be accessed on the City's website at the following address: http://www.toronto.ca/finance/pdf/claim_disclosure_2006_2010.pdf.

Current State (continued)

The complexity of the claim can impact the length of time required to manage it. Through stakeholder interviews, it was found that the City is still managing lawsuits from 2003 and 2004. This is due to the fact that bodily injury claims generally take between three to five years and require more supporting documentation. While it is widely acknowledged that timely access to information for a claim can increase the chances of a successful outcome for the City, it typically takes three to four weeks for the Field Investigator to receive a claim after the City has been notified. By that time, conditions on the incident site may have changed, or additional incidents may have occurred.

The City has made some progress in reducing the volume and value of claims. In 2010, the number of incurred comprehensive general liability insurance claims was the lowest in five years. The value of incurred claims was also significantly lower, at $13.9M, compared to a five-year average of almost $25M. The City has also struck a “zero-claims committee”, where supervisors of all four districts meet to discuss regularly issues with regards to claims. Furthermore, the Division has representation on a City-wide committee, which deals with complex and materially significant claims. This committee is tasked with reviewing claims that are over $50,000 and is meeting regularly in cross-divisional groups with litigation and adjustors.

In October 2011, the Toronto Office of the Ombudsman released a report highlighting issues with how the City handles claims against it. In this report, the Ombudsman identified a number of problem areas related to Transportation Division, including inconsistency among districts, delays in claims processing, system deficiencies, lack of performance management, and resource constraints. These issues are consistent with what has been observed through KPMG analysis.

Issues Identified

Despite improvements in communication, proactive maintenance, and coordination, several issues related to Claims Management still exist. These are described over the next several pages.

- Transportation Division does not appear to have ownership over the entire claims process. Currently, the Division’s principle role is to provide data in the process.
- The current decentralized claims management process can create inconsistency across the districts.
- There is no single IT system used to store claims related data.
- There is a lack of clear and concise communicated, service commitments and Key Performance Indicators (KPIs).
- There appears to be varying levels Field Investigator skill sets that are used in discoveries.
- The volume of claims is dependent on quality / frequency of maintenance of roads and sidewalks.

Ownership of Claims Process

Issue

1. The Division does not appear to have ownership over the entire claims process. Currently, the Division's role is to provide data in the process.

Preliminary Findings and Observations

- Transportation Division's resources are responsible for collecting all relevant observations, patrol logs, weather reports that are submitted to Legal. This primarily includes field investigators; however, supervisors are also involved in the process to a significant degree.
- There are multiple stakeholders involved in the process: Transportation, Claim Adjustors, Risk Management, and Legal. As a result, there is only a limited degree of influence by the Division in the handling of the case from beginning to end.
- The October 2011 Ombudsman report further identified issues related to the claims management processes employed by the City. While the findings of the Ombudsman refer to the City's processes overall, the Transportation Division features prominently in the report. There are opportunities to act on the report's recommendation as part of improving the Division's approach to claims management.

Implications

- Due to a large array of stakeholders, there is an inherent hand-off in responsibility – Clerk to Adjustors to Transportation to Legal, etc.
- Transportation's limited role creates misalignment and lack of incentives. Thus, the objective is to fulfill a data request rather than provide all relevant information needed to win / settle the case.
- The causes or win / loss of claims appear to not be fed back into the claims process.

Claims Investigations

Decentralized Model

Issue

2. The current decentralized claims management process can create inconsistency and inefficiency within districts.

Preliminary Findings and Observations

- Claims Investigations are currently being handled by the four districts across the city. As a result, the Adjustors, Risk Management, and Legal need to deal with four areas within Transportation Services to fulfill, in some cases, identical requests. As a result, the approach to gathering, reviewing, and submitting required information is different across the four regions.
- Observation data (e.g., patrol logs, field notes, weather reports) are currently stored in different locations in physical file cabinets. This necessitates local resources (Field Investigators) to visit the district office to gather the required evidence.
- While centralization / harmonization efforts have been pursued in other streams (e.g., Streets Bylaw, Utility Cut Applications); currently, there is no case for a centralized model for claims investigations. Given the significant amount of time spent by field resources in assembling required information, there may be an opportunity to utilize dedicated, lower cost resources for this task.

Implications

- There is a lack of consistency across the four districts in dealing with claims investigations
- Relatively expensive resources are used for completion of administrative tasks. Field Inspectors could be better utilized by performing core inspection activities
- Local inspections are required for gathering of field evidence; however, collection of readily available patrol information could be done centrally.
- Paper files are district based, preventing efficient access to the data by remote staff. There is no search capability, nor ability to identify/monitor trends due to paper-based filing system.

IT System

Issue

3. There is no single IT system used to store claims related data, resulting in significant use of manual labour.

Preliminary Findings and Observations

- The process of storing, accessing, and compiling claims data is almost entirely paper-based. Reports and logs are filed in different districts in chronological order. Retrieval of relevant reports is only possible by year and street name.
- Lack of mobile technology creates inefficiencies in the process. It is not possible to access files from the field or a remote location. Field Investigators need to be physically present at the district office to compile the data.
- Anecdotally, 30-40% of Field Investigators' time is spent on claims management. Divisional reports further indicate that on average each case requires approximately 35 hours to prepare.
- While there is a shared drive functionality in the districts, reportedly it is not being used by most staff.

Implications

- There is no single point for accessing reliable data, which creates processing delays.
- There is no ability to produce management reports, key performance indicators (KPIs), win / loss statistics, performance metrics, etc.
- Significant office time is spent by Field Investigators on claims files, taking away from field duties.

Performance Measurement and Management Reporting

Issue

4. There is a lack of clear and concise communicated, service commitments and key performance indicators (KPIs).

Preliminary Findings and Observations

- There are uneven and unrealistic service expectations for recipients of data (e.g., Legal Services). While districts use checklists to prepare necessary files, requests for follow-up or additional information from the adjustors are frequent.
- There is a lack of comprehensive management reports. Most of the information gathered about time, volumes, and staff workload is anecdotal. Thus, there is no accurate ability to estimate timelines / volumes / resource needs, etc.
- There is insufficient tracking and stratification of claims. Division is unable to efficiently look up cases by complexity, value, type of incident and other important factors.

Implications

- Without KPIs, it is difficult to begin the reengineering process and benchmark against other municipalities and districts.
- Planning and forecasting is challenging.
- There is insufficient ability to learn or improve without clear standards and service commitments.

Skill Sets

Issue

5. There appears to be varying levels of Field Investigator skill sets that are used in discoveries.

Preliminary Findings and Observations

- Some Field Investigators are neither comfortable, nor skilled to perform discoveries. As a result, the presentation of evidence in the hearings is inconsistent, with varying degree of confidence and accuracy.
- Interviewed stakeholders commented that performance of Field Investigators in the discovery process is a critical piece of evidence in a claim case. Better skilled and prepared Field Investigators contribute to better odds of successfully closing the case.
- In many cases, the Supervisor will attend discoveries on behalf of Field Officers to account for skills set gap.

Implications

- Some cases may be lost as a result of a poor presentation evidence at discoveries.
- Supervisor time is used for performing Field Investigator duties rather than overseeing and leading employees.

Claims Volume and Road / Sidewalk Maintenance

Issue

6. The volume of claims is dependent on quality / frequency of maintenance of roads and sidewalks.

Preliminary Findings and Observations

- The number and frequency of claims is dependent on the condition of roads and sidewalks. While weather and media attention greatly contribute to the number of claims received by the City, the underlying issue of road deficiencies often causes the claim-inducing incident.
- According to the interviews, there is a higher degree of reactive road and sidewalk maintenance, rather than a proactive approach to repairing problem areas prior to the occurrence of an incident.
- There is no existing / continuous City-generated inventory of the trips, potholes, or other dangerous conditions. The City uses a combination of Field Investigator patrols and resident-reported information to identify road and sidewalk hazards.

Implications

- The correlation between quality and frequency of road and sidewalk maintenance and claims management suggest that the volume of claims that the City deals with is higher because road and sidewalk maintenance is often reactionary rather than proactive.
- However, dealing with hazards proactively is costly, with only a partial causal link to a decrease in incidents.

Claims Investigations: Recommendations

Readers are cautioned that the potential savings outlined in this report are estimates which are predicated on the City reducing its personnel resources, capital assets, and other future events. Savings presented exclude the costs of transition. Actual results achieved as a result of implementing recommended opportunities will vary from the information presented and these variations may be material.

7. Centralization and Automation

Financial Impact

- Investment in administrative staff is estimated at $100K.
- Savings expected to arise from lower loss ratio of claims (5% reduction in incurred claims would on average yield $1.25M).
- Savings from Field Investigators decreased workload could amount to $1.33M, if time spent on claims processing is reduced by up to 50%.

Timing

- Planning and implementation can begin in 2012. Automation could be in place for 2013.
- Cost savings/efficiencies may begin to accrue in 2013.

Risks

- Loss of local knowledge by the centrally organized administrative staff

Recommendation

Centralize the claims management process with automation to support centralized processes.

Rationale / Benefit

This recommendation would position the Transportation Division to be more responsive, fair, and accurate in gathering information related to claims. Furthermore, the Division would be able to reallocate field resources to more productive tasks.

Description

- Pool resources to create a centralized model for claims management. Currently, claims management staff are distributed across the four districts, resulting in inconsistencies in claims processing. A centralized model would allow increased specialization in the claims process through:
  - **Specialization by role:** The role of discoveries in the claims process is critical to the outcome of a claim; however, it was found through stakeholder interviews that there are some Field Investigators who are more suitable in this position than others. Identify Field Investigators that can specialize in the discovery process and support them with training, as required.
  - **Specialization by type of claim:** Claims management deals with claims that can range between a few hundred to $10 million or more. Each claim requires a different level of effort and supporting documentation based on the type of claim. Consider stratifying claims based on type (e.g., potholes vs. bodily injury) or based on value (e.g., under $10,000, under $50,000, greater than $50,000).
  - **Dedicated clerical position(s):** Create one to two clerical positions to focus on collecting documentation and evidence required for the discovery procedure. Currently, Field Investigators are spending a large portion of their time collecting documents (e.g., hard copy patrol logs, weather reports) where this task could be allocated to dedicated clerical staff that are familiar with document requests. Creating this position would also help to reduce the number of touch points between Transportation and other divisions, such as Legal Services, and may help to reduce the number of follow-up requests from Risk Management.
- According to a recent Claims Summary provided by Transportation Services, a large proportion of claims are misdirected to the wrong district or wrong division. A centralized intake process may help reduce the number of misdirected claims by using dedicated clerks or automation.

7. Centralization and Automation

Barriers and Enablers

- Hiring of administrative clerical staff may not be feasible in the current climate of fiscal constraint – suggest reallocation of positions from other areas of the City with a surplus of administrative positions
- IT investments will be required to automate the process – business case needs to be developed

Description (continued)

- Some field activities will still need to be performed at the district level (i.e., site visits, investigations, evidence gathering). However, it is envisioned that most of the administrative and data collection tasks would be done by the centralized team.
- Automating the claims management process would significantly relieve Field Investigator's time spent on collecting and presenting data. Replace all hard copy documents with electronic forms and store in a centralized system that can be accessed by all relevant divisions.
- Use one system for managing all claims-related information. Currently, every district uses their own tracking system; however, using one system will reduce issues related to:
  - Misdirected claims
  - Delays in tracking documentation
  - Producing robust management reports (e.g., number of outstanding claims).
- Define parameters of access to the system that would allow other parties (e.g., adjustors) to access information required for a claims case.
- Increase communication with adjustors, Risk Management, and Legal representatives in order to provide information that is more accurate, relevant, and timely, thereby increasing the likelihood of successful claim resolution/settlement.
- Use an electronic coding system to track claims and thereby create more robust management reports.

Key Considerations

- Developing an electronic system would support a centralized model, but is not fully dependent on one. Digital record keeping and patrol logs can still yield efficiencies, even if data collection tasks are distributed.
- Reducing the administrative burden on Field Investigators may yield more productive uses of these resources. Alternatively, the City could consider reducing the number of Field Investigators due to lower work volume. The latter option would require ward / patrol area consolidation.
- Initial capital investment in IT may be required to digitize patrol logs and related documents.
- An electronic system would allow for more efficient data entry (e.g., GPS tracking of patrols) and data access for the claims management processes.

8. Expedite Urgent / Serious Claims

Financial Impact

- This recommendation does not require an initial investment
- Savings could accrue from fewer claims filed from the same area / incident site. A 1% reduction in claims would amount up to $250K savings

Timing

- Changes can be made in 2012, impacting the same fiscal year

Risks

- Making urgent repairs to the accident site may be perceived as admission of guilt by the city, reducing the odds of winning the case

Barriers and Enablers

- Current clerical staff are not trained to judge the seriousness of a case. Therefore, training may be required to identify serious / urgent cases
- Field investigators will need to prioritize urgent requests in planning their work schedule

Recommendation

Expedite urgent / serious claims through the City to address immediate safety issues and reduce the number and dollar value of claims.

Rationale / Benefit

Rerouting urgent claims directly to respective Supervisors and Field Investigators would allow the City to quickly respond to damage-causing conditions, thereby reducing the likelihood of further injuries and minimizing additional legal/financial exposure.

Description

- According to interviewed stakeholders, the City previously employed a ‘fast track’ process, whereby urgent / serious claims were sent directly to the Field Investigator from the Claims Clerk, rather than through the Adjustor. That process is no longer being followed. As a result, it now takes between three to four weeks for a claim to go from an Adjustor to a Field Investigator. Consequently, if there are deficiencies that need to be addressed immediately because minimum maintenance standards are not upheld, it could take two to three weeks longer to address the issue.
- Thus, the City needs to reinstate the ‘fast track’ process to resolve urgent / serious claims more timely and efficiently.
- Managing urgent / serious claims promptly would prevent further injuries and claims to the City.

Key Considerations

- Adjustor will require notification that a claim that has been ‘fast tracked’ is under investigation.
- Recommendation is only relevant to road condition-related claims, as conditions related to weather-caused claims are likely to be very short-lived.

9. Business Intelligence and Continuous Improvement

Financial Impact

- Positive financial impact is expected from a lower number of claims and decreased value of claims to the City
- Better decision-making and continuous improvement efforts could reduce the number of claims by up to 5% or $1.25M

Timing

- While some changes can be made in 2012, cost savings / efficiencies are likely to be yielded in 2013-2014, due to longer nature of a continuous improvement process

Risks

- None identified

Barriers and Enablers

- Cross-divisional collaboration will require breaking down silos

Recommendation

Use a business intelligence approach to claims management.

Rationale / Benefit

This recommendation will result in improved decision-making by Division's management, development of a continuous improvement focus, and eventual proactive management of causes and factors contributing to claims against the City.

Description

- According to stakeholder interviews, records management was identified as the number one issue that, if managed correctly, could help improve the outcome of claims. This includes timeliness, accuracy, and relevance of collected information.
- The City needs to identify the standard requirements of a typical claims case based on type (e.g., bodily injury versus pothole claim) or amount (e.g., less than $10,000) and how to better capture and store these requirements to minimize the amount of time spent collecting data for a claims case.
- Identify trends, causes and influencing factors in the claims management process.
- Address the recommendations of the City's 2011 Ombudsman Report regarding claims under $10,000. It states that poor customer service, such as failure to respond to an inquiry in a timely way, failure to provide information requested or providing erroneous information can be perceived as unfair by the public. Establishing claims-related performance measures and communicating them with internal and external stakeholders can help improve customer service and public perception of the City.
- Better collaboration with other divisions with the aim of minimizing hand-offs and learning from previous claim outcomes.

9. Business Intelligence and Continuous Improvement

Description (continued)

- Develop management requirements for monthly management reports. Example data points include:
  - Establish standards for length of time to process a claim by type (refer to Preliminary Recommendation – Stratify Claims) and communicate standard with all relevant divisions
  - Number of outstanding claims by type
  - Cost / benefit analysis by claim type
  - Number of misdirected claims (e.g., belong to other districts or divisons)
  - Number of follow up requests (e.g., based on insufficient information).

Key Considerations

- Multi-divisional dependencies, including Risk Management, Legal, Claims Adjustors and other City of Toronto divisions that manage claims.
- Robust management reports may depend on stratification of claims, automation and centralization.

Road and Sidewalk and Winter Maintenance: Analysis and Issues

Analysis

Current State

Approximately 74% of the City's Transportation Services' 2011 adjusted budget, or $128M, goes to roadway and roadside activities, including winter maintenance. Roadway and Roadside winter maintenance activities comprise nearly $80M of the 2011 adjusted budget, or 62%, of roadway and roadside activities.

Organizational Structure of Maintenance Activities

Transportation Services is organized in four districts: Toronto-East York, Etobicoke-York, North York, and Scarborough. These districts' road and winter maintenance operations cover approximately 5,600 kilometers of roadway and 8,000 kilometers of sidewalk across the City. Each district uses a complement of in-house and contracted labour and equipment to maintain roads and sidewalks year-round. Some differences in approach between districts reflect the local conditions and others derive from historical practices prior to amalgamation.

Districts expenditures and staff generally reflect the size, density and associated intensity of work required to maintain roads and sidewalks year-round. Because Toronto & East York encompasses the downtown area and traffic, it has the most complex requirements and the largest budget. Below is a table that provides an overview of the districts' gross expenditures, net budgets, maintenance facilities and full-time positions, including vacancies.

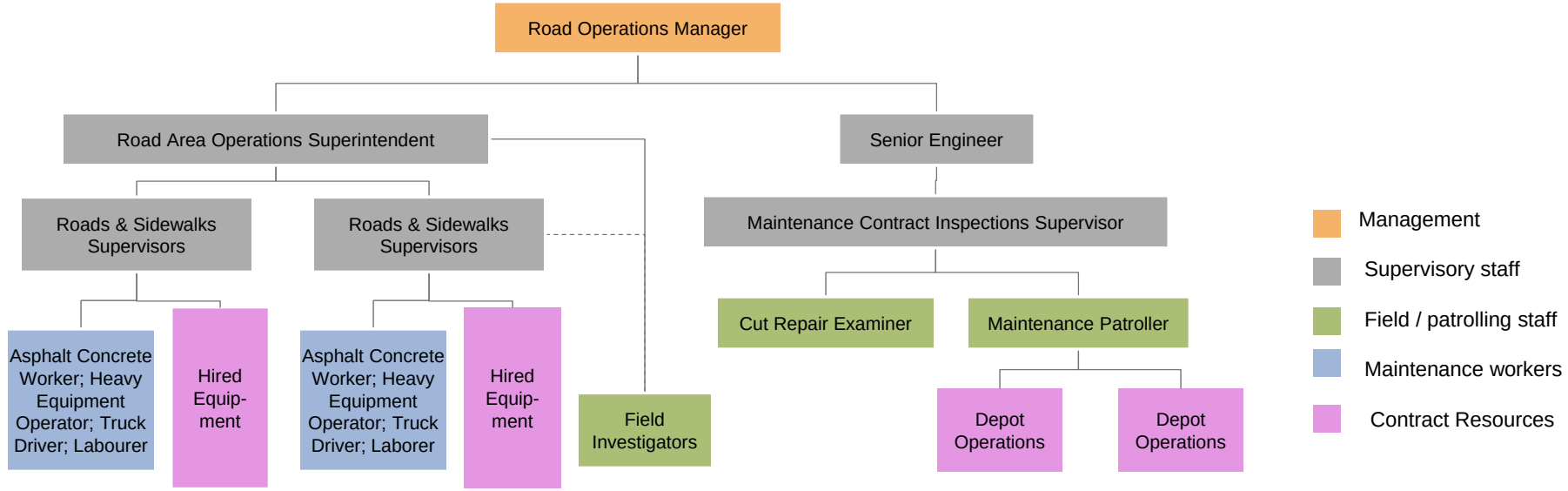
District	Gross Expenditures (adj. 2011)	Net Budget (adj. 2011)	No. of Yards	No. of Depots	Road Operations Staff (full-time incl. vacancies)
Toronto-East York	$85.3M	$29.2M	3	2	248
Etobicoke-York	$52.2M	$34.2M	2	3	156
North York	$43.5M	$26.0M	2	2	133
Scarborough	$44.1M	$32.0M	2	2	125

*Source: City of Toronto budget data and compilation of organizational charts

Analysis

Districts generally operate maintenance activities out of two yards and, in the winter, two depots. Yards house in-house staff and equipment responsible for year round and summer road maintenance activities, along with contracted equipment for winter maintenance on local roads. Depots are operated by contractors responsible for winter maintenance on expressways, arterial and collector roadways, and provide live-in accommodation for staff and storage and maintenance space for equipment. In case of a winter event, depots are required to dispatch some equipment in as quickly as five minutes in order to mobilize virtually all equipment within one hour. Yard operations, including contracts for winter maintenance on local roads and sidewalks are overseen by Road & Sidewalk Supervisors, while contractor operations at depots are administered by the Maintenance Contract Inspection Supervisors and the Maintenance Patrollers.

The Field Investigators are responsible for patrolling all roads and sidewalks on a regular basis as required by the municipal maintenance standards (MMS). They also investigate 311 initiated service requests and investigate claims. District call centers, which used to take service requests, have been collapsed into 311 as part of efficiency improvements. In order to ensure that service requests are handled by the appropriate staff, 311 triages calls and directs them to a Field Investigator in the appropriate district. When they identify deficiencies (e.g., potholes, graffiti, damaged signs or guard rails, etc.), they fix any minor deficiency and direct the yards to complete larger or more complex repairs. Maintenance Patrollers manage road maintenance contracts in the summer and supervise the depot operations in the winter, and patrol major roads to identify when salting or ploughing operations are required. The Cut Repair Examiners are also involved in field work to supervise road cuts and reinstatements by utilities. Field Investigators report to Area Road Operations Superintendents while Maintenance Patrollers and Utility Cut Repair Examiners report to Senior Engineers.



*Source: City supplied organizational charts

Analysis

The City is currently undergoing a review of yard and depot facilities to assess their use and the possibility of consolidation. Consolidation of facilities, as well as management structure, may become a more pressing issue as the City's staff complement declines. As of December 31, 2010, the Transportation Services Division employed 1,102 FTEs and 36 Temporary / Seasonal / Casual FTEs. Approximately 210 positions were vacant at the end of 2010; 50 vacant positions will be eliminated by the end of 2011, including in various roadway and roadside winter and road maintenance areas. A significant number of staff have signed up for voluntary separation and a further decrease in FTEs is expected in the near future.

Service Level Standards

Every district follows the same service level standards, including response times and service priorities. Transportation Services has invested in resources and coordination mechanisms to attain high service level standards for road and winter maintenance. Toronto's service standards for winter maintenance generally exceed standards regulated by the province. For example, while the Ontario municipal maintenance standards require that ploughing on expressways after 2.5-5 cm of snow has accumulated and is completed in four hours, the City Council-confirmed levels of service dictate that expressways are cleared after 2.5 cm of snow and completed within two to three hours. Transportation Services consistently updates its service standards to align with Transportation Association of Canada and relevant quality and safety standards.

Relative to other activities undertaken by Transportation, winter maintenance consumes the greatest budgetary amount. Road cut repair is also a large budget item; however, the costs are recovered from the utilities responsible for the cuts. Repair, largely asphalt and concrete repairs of roads and sidewalks, is a significant activity, as is roadway cleaning, largely the sweeper program.

Service	2011 Adjusted Budget ($ Millions) (Should be as of Oct 3, 2011) *			2010 Actual ($ Millions)		
	Expenditure	Revenue	Net	Expenditure	Revenue	Net
Roadway and Roadside Patrol	$ 5.2	$ (.4)	$ 4.7	$ 4.5	$ (.4)	$ 3.8
Roadway and Roadside Repair	$ 25.5	$ (6.6)	$ 18.9	$ 25.2	$ (4.9)	$ 20.3
Roadway and Roadside Cleaning	$ 21.1	$ (5.4)	$ 15.7	$ 22.4	$ (4.2)	$ 18.2
Roadway and Roadside Cut Repair	$ 54.6	$ (61)	$ (6.5)	$ 40.7	$ (43)	$ (1.8)
Roadway and Roadside Expressway	$ 3.5	$ -	$ 3.5	$ 4.3	$ (.1)	$ 4.1
Roadway Bridge Maintenance	$ 1.8	$ -	$ 1.8	$ 1.2	$ (.8)	$ 1.2
Roadway and Roadside Drainage	$ 4.1	$ (.7)	$ 3.5	$ 2.9	$ (.6)	$ 2.3
Roadway Management and Overhead	$ 6.8	$ (.2)	$ 6.6	$ 10	$ (.7)	$ 9.9
Roadway and Roadside Winter Maintenance	$ 80.2	$ (.2)	$ 80	$ 64.7	$ (.4)	$ 64.3
Total	**$ 203**	**$ (75)**	**$ 128**	**$ 176**	**$ (53)**	**$ 122**

*Source: City of Toronto budget data

Winter Maintenance

In examining other jurisdictions' winter maintenance practices, including Canadian and American cities with roughly comparable snowfall, it appears that the City upholds a relatively high level of service. Toronto conducts anti-icing at levels that are comparable to other cities that use the process, and begins salting when snowfalls begin, like other cities. It begins ploughing as early or earlier than other cities, but appears to use more equipment (see table on next page). For example Ottawa, Calgary and Edmonton tend to use more salt trucks equipped with various plough arrangements, but have very few dedicated plough trucks, where Toronto has a very large plough truck fleet even though there are only four to six events that require ploughing operations. Some other cities plough sidewalks, but in our research, Toronto appears to be the only one to use hand crews to clear areas where ploughs cannot clear. However, it should be noted that sidewalk ploughing is not conducted in some parts of Toronto with narrow sidewalks and on-street parking. A number of other cities plough high priority streets first and then re-deploy equipment to residential streets once the arterial streets are completed. Toronto has equipment to service all streets simultaneously, although the routes serving residential streets take longer to complete. Toronto is the only city reviewed that clears driveway windrows – a factor in the larger plough fleet. The technologies applied to salting have been evolving and Toronto is well-equipped with computerized controls and GPS equipment to support supervisory activities. The City also uses pre-wetting for distribution of salt and anti-icing (judiciously) to maximize effectiveness and reduce transition risks.

The City has developed approaches to coordinate district operations and ensure consistent performance. For example, winter operations is coordinated across districts by a Senior Coordinator of Emergency and Winter Operations. The decision to salt and plough is decentralized and is taken by the Maintenance Patrollers in the first instance and by supervisors at the district level for second applications. However, the Senior Coordinator organizes efforts and communication across districts to ensure a harmonized and appropriate response to winter weather. He also establishes standards and procedures and conducts an extensive "Snow School" to train supervisory personnel and ensure consistent and informed approaches.

As the table below indicates, the cost of winter maintenance per lane kilometer of road is lower than costs in Ottawa and London; however, if the level of snowfall is considered, costs in Toronto are approximately 9% higher than London and 25% higher than Ottawa. While these figures are illustrative, other factors, such as the frequency of winter events, physical layout of streets and sidewalks, relative traffic volumes will also influence costs.

Jurisdictional Comparison of Winter Maintenance Expenses

	Toronto	Ottawa	London
Lane km	14,400	8,543	2,009
Total spent in 2010	$66,000,000	$50,997,000	$13,034,000
Average yearly snowfall (cm)	130	231	202
Cost/lane km	$4,583	$5,969	$6,489
Cost/lane km/cm of snow	$35	$26	$32

*Source: City of Toronto budget data and jurisdictional research

Case Study: Use of Fleet

Equipment Types

There are some similarities in the types of equipment various cities use for winter control. All Canadian cities have been moving towards the use of more technology to help maximize the effectiveness and minimize the environmental impact of salting operations. The use of computerized controllers, specified rates of salt application, selective salting of hills, intersections and school zones in residential areas governed by a salt management plan has become standard, and Toronto uses all these approaches. There has also been a shift away from separate salt trucks and ploughs.

As noted in the table below, the use of dedicated salt trucks has become rare, and Toronto has been moving to "combo" units (salt truck with plough) in the last couple of years for most of its vehicles, and should convert the remaining salters to combo units. Ottawa, Calgary and Edmonton have also moved away from the dedicated plough, adding to their "combo" salter fleet and eliminating dedicated plough trucks. Milwaukee and Chicago have large plough fleets, but their basic winter fleets are combo units and the ploughs are solid waste compactors converted to ploughs for the relatively few winter events the combo units cannot handle.

Both approaches reduce the cost of having ploughs stand-by for relatively infrequent use. The use of graders, however, continues in most cities because of the combination of manoeuvrability and pushing strength, even at low speeds. Chicago also has a small fleet of small units for ploughing very narrow streets in downtown areas.

Municipality	Toronto	Ottawa	London, ON	Windsor	Milwaukee	Chicago	Calgary	Winnipeg	Edmonton
Lane KMs of roadway	**14,400**	**8,543**	**2,009**	**2,323**	**11,265**	**15,218**	**14,000**	**7,846**	**11,400**
CMs of Snow (average)	**130**	**231**	**202**		**133**	**96**	**127**	**110**	**123**
Truck with front Plows	304	5	45	6	**127**	**371**	-	60	-
Salter (no plow)	48	-	1	-	-	-	-	8	-
"Combo" Salter with plow	155	167	25	23	105	272	92	47	111
Graders	198	91	22	-	-	-	27	124	169
Total Vehicles	705	263	93	29	232	643	119	239	280
Vehicles/1,000Lane KMs	49	31	46	12	21	42	9	30	25
Ploughs as % of Vehicles	43%	2%	48%	21%	55%	58%	0%	25%	0%
Salter as %	7%	0%	1%	0%	0%	0%	0%	3%	0%
Combo Salter as %	22%	63%	27%	79%	45%	42%	77%	20%	40%
Graders as %	28%	35%	24%	0%	0%	0%	23%	52%	60%

Note: vehicles listed include city-owned and contracted. Bold font indicates use of garbage trucks.

*Source: City of Toronto and jurisdictional research

Relevance to the City of Toronto

The City could convert its remaining salt trucks to combos and add to its combo salter fleet while reducing the ploughs on stand-by and creating more routes that integrate arterial and residential sections. This would allow faster salting operations, but would slow the ploughing response in residential areas during major storms. Ottawa has elected to take this approach. In considering this approach, the City would have to take into account vehicle weight restrictions and associated risks.

Winter Maintenance (continued)

Transportation Services carries out “managed snow removal’, which seeks to minimize costly snow removal through other timely responses to winter weather. This approach entails anti-icing measures prior to a storm and salting immediately after snowfalls to limit the build-up of snow and the need to plough. A Salt Management Plan is in place to incorporate environmental concerns. In order to anticipate and prepare for winter maintenance needs daily, districts use weather forecasting strategically. Districts receive four weather forecasts specific to their micro-climate four times a day. A number of Road Weather Information System (RWIS) sites have been established.

The City has also begun limiting costs by using the same equipment for combination beats that include some higher class roads that are done first and some residential roads. This is seen as an effective approach used in other cities. Districts are cautious with combined beats, however, due to possible impacts on service level standards. With heavy snow fall, collector roads may be ploughed several times before local roads are addressed on combined beats. For this reason, only North York has selected to implement combined beats: Approximately 10-15% of beats on collector roads are combined with local beats in that district.

Approximately 70% of winter maintenance activities are currently outsourced, equating to approximately $55M of the City’s 2011 adjusted winter maintenance budget of nearly $80M in winter maintenance activities. Toronto appears to contract out more than any jurisdiction examined in this review.

The City's management has advised that they continually evaluate the method of service delivery in light of labour and other costs. For example, the following figures provide information on outsourcing versus in-sourcing analysis. Based on this information, there is a clear case for considering the outsourcing option. However, we advise to the City to verify that these figures are indeed comparable and represent the same set of service levels.

	Units	In-house (Labour & Equipment)	Contracted (Standby & Operating)	Savings
Winter Maintenance - Salters	24 salters	$ 2,140,000	$ 1,740,000	$ 400,000
Winter Maintenance - Ploughs	40 ploughs	$ 2,780,000	$ 2,010,000	$ 770,000
Winter Maintenance - Sidew alk Machines	8 sidew alk machines	$ 450,000	$ 300,000	$ 150,000
Sub Total - Winter Maintenance		**$ 5,370,000**	**$ 4,050,000**	**$ 1,320,000**
Street Sw eeping	25	$ 6,040,000	$ 3,930,000	$ 2,110,000
Sub Total - Street Sweeping		**$ 6,040,000**	**$ 3,930,000**	**$ 2,110,000**
Road Repair	1000 CB or MH repairs	$ 1,460,000	$ 1,040,000	$ 420,000
Sub Total - Road Repair		**$ 1,460,000**	**$ 1,040,000**	**$ 420,000**
Total		**$ 12,870,000**	**$ 9,020,000**	**$ 3,850,000**

Source: City of Toronto data

Winter Maintenance (continued)

The largest expense of contracting services is stand-by costs. These are the costs associated with maintaining equipment (and staff, in the case of depots) on hand to respond to winter weather within the service level standards. The table below demonstrates that stand-by makes up the majority of contracting costs across almost every contracted winter service.

Contractor Operating and Stand-by Fees – Based on Bid Evaluation Estimates					
Activity	Unbudgeted activities (e.g., snow removal)	Operating	Stand-by	TOTAL	Stand-by as a % of total cost
Depot activity	$ 6,010,038	$ 3,073,678	$15,817,033	$24,900,749	64%
Contracted salting of local roads	$ -	$ 26,814	$ 1,358,130	$ 1,384,944	98%
Contracted ploughing of local roads	$ 4,600,906	$ 4,311,730	$10,852,519	$19,765,155	55%
Contracted sidewalk and bus stop	$ 3,988,492	$ 7,456,339	$ 9,836,446	$21,281,277	46%
Contracted trucking	$ 4,476,500	$ -	$ -	$ 4,476,500	0%
TOTAL	**$19,075,936**	**$14,868,561**	**$37,864,128**	**$71,808,625**	53%

*Source: City of Toronto operational data

Stand-by payments ensure that depot contractors are on-site to perform their duties upon call. During the winter season, contractors are ready with salting equipment to handle expressways and arterial roads 24/7. Maintenance Patrollers conduct roving patrols to identify conditions requiring a depot response and then verify that equipment and contractors respond to calls and provide the needed services. Depot contractors are expected to respond to a call with a first piece of equipment within five minutes, with additional equipment deployed every three minutes afterwards, as required. Depots have sleeping accommodations, with some staff living on-site throughout the winter to meet this requirement. Turn-out time for lower priority salting equipment and ploughs at the yards tends to be one hour.

Because this level of response is costly, Transportation Services seeks to contain stand-by costs in the shoulder seasons when winter weather is less likely, but still poses a threat. During these periods, only 50% of contracted equipment and staff is available. Shoulder seasons occur from November 1-15 and April 1-7. By November 15, all salting equipment are in depots. By December 1, all equipment is ready for use.

Contracts have evolved based on historical lessons. In order to lower winter maintenance costs and obtain better rates for contracted services, outsourced depot contracts have recently been extended from five to seven years. In addition, contracts no longer include a minimum guarantee of services.

Analysis

Issues Identified

Despite the progress that has been made in recent years, several issues have been identified in the area of Road & Sidewalk and Winter Maintenance. These are described over the next several pages.

- The current contracting approach does not appear be achieving optimum efficiencies.
- There may be more yards and depots than required to deliver services efficiently.
- Winter control activities on local streets appear to be conducted at higher than planned service levels.
- Staff are unable to access information efficiently in the field.

Approach to Contracting

Issue

1. The current contracting approach does not appear be achieving optimum efficiencies.

Findings and Observations

- The depot contracts are the largest contracted item and most clearly appropriate as outsourced services, since they would be difficult and expensive to provide the 24/7 stand-by time with City staff. These contracts are called and awarded on a centralized, city-wide wide basis and Transportation Services has evolved the approach over time to improve contract rates. The current contracts were extended to seven years (formerly five). However, the contracts do not have any provision to constructively use stand-by resources when they are not deployed, or even during periods when there is very low likelihood deployment will be required.
- There is no systematic analysis of the relative costs of providing yard services in-house or contracting for services. Certain services remain in-house without an articulated evidence-based rationale (Asphalt and Concrete Repairs, including Potholes and Asphalt Repairs; Guardrails; Roadway and Roadside Litter; Minor Bridge Repairs; Graffiti; Street Sweeping; Sidewalk Clearing in Scarborough). Others have been contracted without similar analysis. Our analysis was limited by time and data availability, but could not substantiate current approaches.
- Transportation Services has developed a “desired state” breakdown of contracting and in-house services which seeks to consider future staffing constraints and functions seen as core to “in-house” responsibilities. However, this has been done without significant financial analysis.
- Contract pricing varies widely among winning contractors for similar, or the same, services raising concern about the competitiveness of bidding.
- Some contractors have indicated that they believe the Fair Wage Policy requires them to pay higher than market wages, increasing their costs and therefore their bid prices.
- Both depot and yard contracts for hired equipment contain response times that are not realistic, are generally not required, but which constrain the options for supplying services, increasing costs.
- Contractors use various GPS services instead of one consistent prescribed approach as a result of the tender process adopted. Multiple GPS services make monitoring contractors’ work logistically difficult.
- A significant reduction in the number of staff is anticipated through vacancies and voluntary separation which could challenge the continuation of in-house service delivery.
- Procurement processes and requirements are also reported by contractors and/or staff to be a barrier to efficient, low cost operations. The inability to specify a common GPS system for all contractors, the fair wage policy and the need to avoid any indication of sole sourcing are factors mentioned, although there are appropriate ways to deal with some of these barriers.

Approach to Contracting

Implications

- Cost reductions may be possible by minimizing stand-by costs and increasing vendor options/flexibiity.
- Regular financial analysis of contracted versus in-house services could help ensure that operations are conducted at the most competitive cost.
- A rationale that establishes an attractive balance of outsourcing and in-house service delivery should be made explicit and include performance indicators.
- Some depot contractors may be able to conduct certain maintenance services while on stand-by without risking service levels.
- In-house staff may not have the capacity to continue service delivery at current levels of service going forward.

Consolidation of Facilities

Issue

2. There may be more yards and depots than required to deliver services efficiently.

Findings and Observations

- There are 19 operating facilities for road and winter maintenance across districts. Nine are depots operated as “camps” by contractors for high priority winter maintenance activities. Ten are yards providing some winter maintenance and other road and sidewalk maintenance services with a mix of in-house and contracted resources.
- Some facilities are located on land that is believed to be worth tens of millions of dollars.
- Certain facilities are located closely together.
- Some yards may not be fully utilized and may have individual capacity to hold more equipment.
- Some yards require repair and/or additions (e.g., salt dome, etc.) to function as fully independent facilities.
- Equipment and staff is not currently shared across yards, unless under specified circumstances.
- A study on yard and depot consolidation is underway at the City; its results are not known at the time of this analysis.
- Changing the contracting approach to allow depots to provide other services and integrating the effective use of depot and yard resources would facilitate the reduction in total facility requirements.

Implications

- Land value in the downtown core is high and would provide one-off revenue to the City.
- Some yards require significant investment (e.g., in one case an approximate $4M roof repair) to become fully functional.
- Certain yards are multi-functional and house various City services; consolidation would require considering the impact on those other services.
- An analysis of the impact of facility consolidation on service levels is needed.

Winter Maintenance Service Levels on Local Roads

Issue

3. Service levels for winter maintenance are very high, and the tolerance for risk in the delivery of winter services is very low.

Findings and Observations

- The City is spending a lot to mitigate any risks of not meeting service level standards. If service level standards were more flexible, and some risk was tolerable, significant savings could emerge.
- Local road ploughing and salting is mainly conducted using equipment exclusively designated for local roads. Local road winter maintenance occurs simultaneously to other road categories.
- Numerous pieces of equipment are on stand-by for local roads' winter maintenance. While salting equipment is used frequently (40 to 60 times per season) ploughing equipment is generally only used 4 to 6 times per year, but on stand-by all winter.
- An April 2011 Auditor General's report on winter maintenance services explains that residents' complaints and Councillors' reactions compel Transportation Services to achieve higher than adopted service level standards for additional millions of dollars a year.
- Negative media reports and Councillor reactions have created a strong aversion to taking any risk that could lead to service levels not being met – or exceeded – and the division notes that with the current high service level, low risk approaches, media and Councillor reaction is generally positive.
- Other jurisdictions reduce costs by using the same salting and ploughing equipment on local and other roads (at least in areas where local roads will accommodate the equipment); local roads are serviced after other roads. Only 10-15% of beats are reportedly combined (collector and local in North York) in Toronto. This approach allows use of the equipment to do the high priority roads first and lower priority roads later, and would allow use of fewer pieces of equipment, resulting in lower stand-by costs - but does run the risk that the lower priority roads will not be plowed as quickly during particularly severe or repeat events. Note that this approach has some limitations based on narrow residential streets, but could be much more widespread than it is.
- Similarly, other cities tend to use more plough equipped salt trucks and fewer dedicated ploughs. This approach can give quicker response to initial salting requirements, while reducing the costs of having additional plough equipment stand-by for very infrequent use.

Implications

- The current method of service delivery on local roads appears to result in higher requirements of equipment and staff, and higher stand-by time / costs – but do produce high quality service.

Communications in the Field

Issue

4. Staff are unable to access information efficiently in the field.

Findings and Observations

- Staff (patrollers) have laptops, but do not have access to wireless internet in the field.
- When patrolling, field staff reportedly have to turn back to their yards to obtain weather reports on the Internet. When managing construction contracts in the summer, patrollers are unable to access tools and record findings while in the field.
- Staff are required to stop patrolling to complete phone communications as they do not have hand- free telephones.
- Etobicoke does not share the same radio frequency as other districts.

Implications

- Lack of mobile workforce may cause service delays.
- Staff is not using their time as efficiently as possible.

Road and Sidewalk and Winter Maintenance: Recommendations

Readers are cautioned that the potential savings outlined in this report are estimates which are predicated on the City reducing its personnel resources, capital assets, and other future events. Savings presented exclude the costs of transition. Actual results achieved as a result of implementing recommended opportunities will vary from the information presented and these variations may be material.

10. Outsourcing Scope

Financial Impact

- Savings are likely to be gained from more cost-informed contracting and service delivery

Timing

- Some changes could be implemented in winter 2012, others will take some time to implement
- In-house per unit cost tracking can start immediately

Risks

- There are costs involved in switching from contract to in-house or in-house to contracted service delivery, although these tend to be off-set by changes which allow new concepts, technologies and approaches to be implemented
- A move to contracting all resources could reduce the flexibility for one-off maintenance tasks

Recommendation

Develop an approach for determining what to outsource and what to do in-house based on evaluation of the costs and other factors relevant to the service, including the need for a seasonally-balanced in-house workforce.

Rationale / Benefit

Effective competition between in-house and contracted resources can produce the lowest cost outcome. This can be accomplished through financial analysis or through the submission of “in-house” bids during competitive processes.

Given anticipated shifts in staffing (retirements, voluntary separations, etc.), there may be a need to consider extending contracting in some areas. However, it is important to maintain a balance of in-house work between seasons to ensure staff is fully deployed year round. The City can benefit from maintaining in-house staff when outsourcing options are less cost-effective.

Description

- The per unit cost of in-house service delivery should be tracked and compared to contracting rates.
- Transportation Services should develop additional data and evidence to formulate a cost-effective and logistically feasible balance of outsourced and in-house service delivery, taking into account the need for seasonal balance in work for in-house resources.
- Only services that are more efficiently provided by contractors should be outsourced.
- Certain non-winter roadway and roadside maintenance services could be outsourced to help balance workloads. In particular, street sweeping and pothole repairs could be outsourced, although the provisions of the collective agreement may provide some restrictions.

10. Outsourcing Scope

Barriers and Enablers

- The per unit cost of in-house service delivery has not been historically tracked
- Collective agreements may provide some constraints

Key Considerations

- The relationships and procedures required to outsource the services are already established.
- Further maintenance outsourcing will mitigate risks to service delivery, such as labour disruptions and the reduction in staff through vacancies and voluntary separation.
- Two-thirds of winter maintenance activities are currently outsourced, which appear higher than other jurisdictions examined as part of this review.
- Many jurisdictions prefer to maintain a certain level of in-house expertise to deliver services, including “one off” services, when required.
- A reduction of in-house staff through voluntary separation and attrition would trigger an increase in outsourcing, which could require additional attention to contract management.

Case Study: Pothole Repair Innovation

Pothole Repair

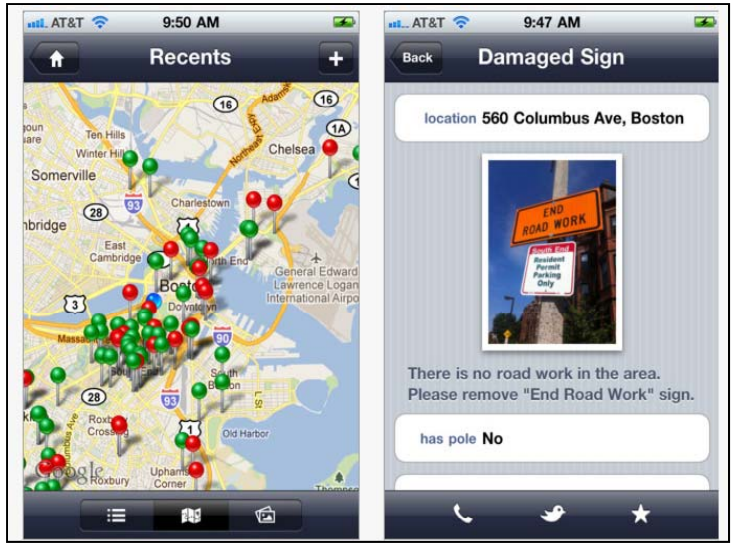
In 2010, the City of Toronto repaired more than 275,000 potholes. Annually, the City spends approximately $6 million to fix potholes, or approximately $25 per pothole. In addition to the municipal maintenance expense, potholes can also cost drivers in car repairs.

There are currently two ways potholes are identified in Toronto: residents can report potholes and record a service request either on-line or via telephone through 311, to be addressed by city staff. In addition, field investigators patrol city streets to identify areas where repairs are needed. Pothole repair is particularly heavy in the spring months, and less so during the summer. In-house service crews, consisting of approximately one to three individuals, typically fix potholes within one to 90 days depending on the request's determined priority and the road classification.

Cities around North America spend millions of dollars on repairing potholes and keeping track of their locations. In order to more efficiently identify and repair potholes, some cities in the United States have begun to integrate new technologies to identify and direct crews to potholes for repair and to quicken the timeline of repair. Their innovation can be used to hold maintenance crews (including contractors) accountable.

- Mobile applications have been developed to enable residents to send service requests about needed pothole repairs via their smart phones. These applications note the GPS coordinates of the pothole, capture residents' pictures of the potholes and direct information to maintenance staff. The mobile service has been implemented in Baltimore, San Francisco and Washington DC, amongst other American cities.
- The average cost of 311 phone calls to centres is estimated at $10-15 per call, thus the implementation of mobile applications can reduce the cost burden on 311 phone centres and the duplication of service requests. As well, municipalities such as New Haven, CT are saving money in staffing by relying on their citizens to detect and report potholes.
- One challenge faced by municipalities using mobile applications is getting residents to actually use these applications.
- In Boston, the mobile application, Citizen Connect, communicates service requests to city employees in less than a minute from the time that residents submit photos of maintenance problems. The resident receives a text message when the work is complete. In the meantime, an on-line map displays the status of the request (See example to the right).

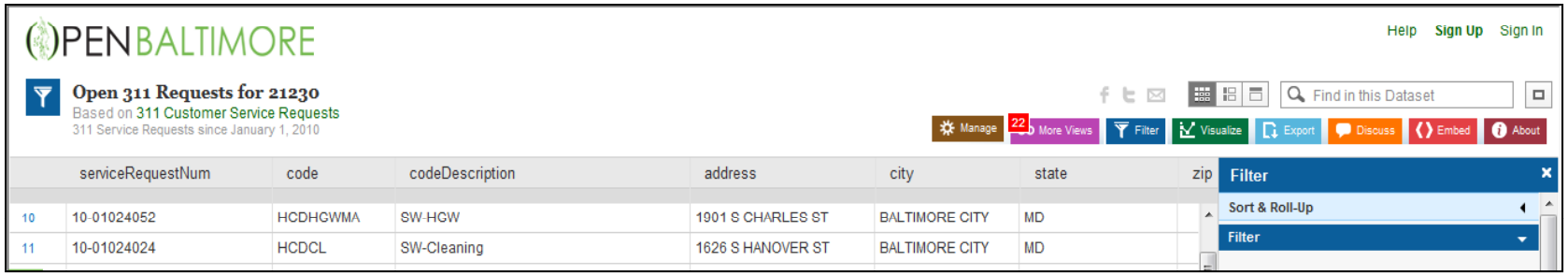
Example Mobile iPhone Application Used in Boston



Source: http://itunes.apple.com/us/app/boston-citizens-connect/id330894558?mt=8
http://www.pothole.info/2011/03/seeclickfix-more-potholes-fixed-money-saved/

Case Study: Pothole Repair Innovation (2)

- In addition, some cities are making data about reported potholes and other service requests available on-line through Open311 in an effort to increase accountability and communicate city responses to service requests. Once they log their requests through 311 on-line, via telephone, or on their mobile device, residents can verify the status of their request and other residents' requests to understand the actions to be taken. This helps to keep maintenance crews accountable to residents and the City (see the City of Baltimore's example below).



Source: http://data.baltimorecity.gov/Community/Open-311-Requests-for-21230/4d7j-z8em

- In the UK, the Automobile Association (AA) has launched a pilot "AA Pothole Assist" program to fill potholes using a "quick solution" without delaying traffic. AA patrols with specially equipped vans are tasked with filling in any potholes they come across when travelling between towing jobs (see right). Optimizing patrolling crews to fill potholes expedites their repair and mitigates service requests.

Source: http://www.theaa.com/motoring_advice/pothole-assist/index.html

Relevance to the City of Toronto:

- As cities consider the option of outsourcing pothole and other road maintenance repair duties to contractors, mobile technology and more direct methods of triaging and reporting on service requests are seen as means of promoting accountability, transparency and customer service. Such a system would likely be managed by 311 and deal with a wider range of service requests, but pothole or other road maintenance requirements could serve as a pilot. The ability for mobile applications to channel various service requests (e.g., pothole or street light repairs, graffiti removal) would also improve uptake by residents.
- In addition, partnering with organizations and businesses already patrolling or travelling roadways to fill potholes is also seen as a more efficient use of resources as opposed to specific pothole patrol crews. In this case, cities must consider liability issues. Cities do not yet have a concrete estimate to determine the cost-savings from these measures, since most have begun only recently.

11. Improve Contracting Strategy

Financial Impact

- Savings are dependent upon the types of contract modifications made
- With stand-by costs equating to over 50% of total winter maintenance contracting spend, any reduction could be significant, potentially reaching 25% of stand-by costs, or $8.7M
- Most projected savings are operating; however, better equipment use can yield capital savings

Timing

- Mutually beneficial opportunities could be discussed for contract alteration in 2012
- Cost savings/efficiencies from altering existing contracts can be yielded after contracts end in 2015

Risks

- Some approaches discussed, including those with the greatest potential savings, would introduce the potential of lower service levels in extreme weather
- Response times, clearing and salting prioritization, and ability to respond to very large storms could be compromised
- Some approaches would require greater emphasis on quality control to cover liability issues

Recommendation

Review existing and upcoming contracts to increase flexibility, reduce cost, and productively reallocate resources.

Rationale / Benefit

As the outsourced services change and / or contracts come up for renewal, there is an opportunity to structure contracts to gain more value.

Description

- Response times, which appear unrealistic and unenforced, at present, could be revised to reflect actual requirements (e.g., patrollers provide contractors unofficial notice that ploughing will be needed on local roads at least three hours prior to response times based on weather expectations, though they are only contractually obligated to provide one hour notice).
- During good weather periods in the winter season, equipment and some staff at depots could be used for other duties such as snow removal, one-off repairs, patrolling, pothole repair maintenance services. In this way, depot contractors could conduct less time sensitive services without jeopardizing depot operations. A small crew for spot salting could be retained at the ready even in good weather. This would require negotiating contract amendments – or waiting five years.
- The Fair Wage Policy could be reviewed for opportunity to not apply to road / winter maintenance contracts.
- The City could supply brine to contractors through its new brine facility, at least in nearby depots, instead of paying contractors to make their own.
- Contractors could all use the same GPS and tracking technology so that the City could more easily monitor their performance and time spent.
- The City could find an appropriate alternative to managing depot assets in the off-season, including allowing contractors to station equipment at depots year-round. Contractors are required to remove camps and reinstall them between contracts, as well. The City could “buy” the camp assets at contract conclusion and “re-sell” them to the winning bidder for the next contract, minimizing contractor costs for set-up and teardown, which are all included in contract prices.
- The City could remove underutilized equipment from contracts. Bobcats at depots were particularly identified and seem to duplicate capacity at the yards.

11. Improve Contracting Strategy

Barriers and Enablers

- These suggestions need to be discussed with contractors and local experts to determine the degree of mutual benefits to the City and the contractors
- Procurement creativity is required to establish a GPS standard among contractors
- City procurement policies constrain actions and require thoughtful approaches
- Contractors may not have the capacity or desire at present to perform "bundled" services or assume full maintenance accountability for a distinct area
- Contracts and monitoring should be structured to ensure that appropriate standards of service are attained
- Contractors appear reluctant to assume services currently performed by City staff

Description (Continued)

- The expansion of the combination route concept could result in a large reduction in standby costs by reducing the amount of equipment required.
- Shifting to fewer plough trucks and more combination salt trucks could reduce standby costs and improve salting (the most urgent) response, although ploughing response would be slower.
- Integrating management of depot and yard contract resources could reduce contract management costs.
- Outsourcing contracts could be bundled. London, UK, recently announced plans to bundle road maintenance contracts in an effort to cut up to 15% of their road maintenance annual costs. London intends on short-listing up to seven contractors to achieve "huge gains to be made from collaborative working." The City's Winter Maintenance alone honours approximately 30 contracts for winter maintenance alone.
- The possibility of bundling contracting for road and winter maintenance activities in Toronto's districts could take an approach similar to the Ministry of Transportation's Area Maintenance Contractors (AMCs), whereby districts outsource all maintenance services to particular contractors.
- Toronto could pilot an Area Maintenance Contract (AMC)-style contracting agreement. The appropriate scope (geographic area and range of services) would require careful determination.

Key Considerations

- All costs imposed on contractors through contract provisions result in increased costs to the City. Any reduction in contractor costs will lead to reduced costs to the City (if appropriately managed).
- Some cost reduction opportunities could involve taking on more risk related to service levels, including snow storm response times, clearing and salting prioritization, and ability to respond to very large storms.
- The allocation of costs between "stand-by" and operations in contract pricing is not key – but reducing the amount of equipment required to stand-by will definitely reduce costs. Some of that equipment may be available when needed even if not required to stand-by. Training programs for current and incoming contractors could alleviate the concern that customer service could be compromised by increased outsourcing.
- Further analysis on the cost of procuring area maintenance compared to in-house area maintenance costs is required before the pilot program is initiated, as is a study of the impact on staff employees and the appropriate scope for such a contract.

Case Study: Contracting Strategies

Contract Strategies

Area Maintenance Contracts and Contract Bundling: A number of provincial transportation ministries award comprehensive maintenance contracts for a designated area. For Area Maintenance Contracts, one contractor performs all maintenance work except for rehabilitation and new construction. Generally, municipalities have not bundled their contracts in this way. However, Transport for London (TfL), the City of London's transportation services, recently initiated a pan-London approach to road maintenance contracts. The bundling exercise is aimed at cutting up to 15% from the £450 million spent annually on London's road maintenance.

This shift recognizes the high cost of administering contracts, as well as the benefits of economies of scale. Of the £450 million currently spent on city road maintenance, around £300m is procured through more than 100 contracts based on geographic area, network type and activity. Every six years, up to £15m is spent simply on preparing contracts. In contrast, TfL intends to shortlist up to seven contractors by January for the contracts for the capital's 32 boroughs. Significant savings are expected in delivery and procurement through collaboration, standardization, common specifications, new contract conditions and e-auctions.

Performance-Based Contracts: The Ministry of Transportation (MTO) in Ontario has moved away from method-based delivery towards performance-based specifications for AMCs. New AMCs focus on performance-based requirements with result-based oversight by MTO. Previous generations of AMCs were prescriptive and method-based; they entailed labour-intensive, time-based oversight methods for monitoring contract compliance and auditing.

Performance-based AMCs require contractors to deliver to outcome targets (service levels) which MTO monitors through results-based oversight, including defined outcome target indicators and consequences of non-compliance concerning each task. For example, if MTO's periodic spot-checks identify maintenance issues that are not addressed within a specified area of roadway, the contractor is penalized. Results-based oversight is intended to hold contractors accountable to their tasks, allow for contractor innovation, and assure quality with less labour-intensive supervision from MTO.

Relevance to the City of Toronto

Contract bundling for a district or perhaps initially a smaller area remains a possibility for City of Toronto to investigate. Concerns about contractors' ability to uphold customer service requirements have been identified and are seen as a barrier to piloting contract bundling. There are similarly concerns about the scope of work that would be appropriate and it may be appropriate to exclude some maintenance activities in a pilot. However, through enhanced use of technology, concerns over customer service could be addressed; residents and city staff could develop performance-based contracting strategies and mobile monitoring to heighten quality assurance. Existing depot contracts do not expire for five years, which will limit the opportunities in the short term, and contracting policy would prevent picking one existing contractor to negotiate an extended scope of work with. However it might be possible to have a competition between depot contractors for the right to participate in a pilot project starting sooner.

12. Consolidate Existing Yards

Financial Impact

- This recommendation may require significant investments to expand certain yards or depots
- The land value of individual yards is estimated in the tens of millions of dollars
- The City needs to consider that the sale of land is a one-time payment and ensure it does produce an annual increase in operating costs

Timing

- Some consolidation can be piloted immediately, impacting 2012 fiscal year
- Further efficiencies are likely to be yielded with more consolidation

Risks

- If not planned properly, consolidation could impact service levels
- Travel distances for maintenance staff will likely increase

Recommendation

Consider consolidating existing yards and depots for smaller footprint and better use of facilities.

Rationale / Benefit

Certain facilities appear to be underutilized, and their utilization may further decrease with changes to the balance of in-house and contracted service delivery and the integration of depot and yard resource use. By selling surplus assets and land, the City could capture their full market value. Alternatively, the City could find more productive uses for these facilities.

Description

- Certain yards or depots could be sold.
- Equipment from facilities could be redistributed to other yards.
- Staff from the yard could be re-allocated across the district.

Key Considerations

- A study is underway by the City on yard capacity, the cost of facility upgrades and revenues from dispositions.
- Space constraints at certain yards must be addressed; the areas around some facilities provide expansion room.
- Some facilities are only partially operational and require investments to become fully useable. Any program for sale of one or more yards should dedicate some of proceeds to removing deficiencies at other facilities.
- The land value of areas around certain yards and depots is believed to be high.
- Some yards have served as snow deposal sites, which the City needs on a sporadic and urgent basis. Additionally, some cities have created alternative ways of disposing of snow. Montreal has developed “snow chutes” into the sanitary sewer system – not dissimilar to Toronto’s placement of snow melter product in the sewers. This approach could provide an alternative, if approved by the province and aligned with environmental policies.
- Some yards are already preparing for consolidation with others.
- Some yards are housed in a multi-use facility, which requires coordination across City divisions to vacate.

12. Consolidate Existing Yards

Barriers and Enablers

- Yards and depots serve as snow disposal sites. With fewer yards and depots, snow disposal will become increasingly challenging
- Yards on the highest value land tend to be in high population areas, implying that greater service capacity may be required
- Residential areas may be resistant to facility changes, either their expansion or removal

Key Considerations (Continued)

- It may be easier to consolidate yards, if more services are outsourced.
- If services are increasingly contracted out, the need for distinct supervisory structures for in-house staff and contracted depots could diminish. This would provide for more effective coordination of all resources available in a district, the City staff, the hired equipment at the yards, and the contracted resources at the depots.
- At present, the work of quality assurance in the field is split among three groups of field staff: Maintenance Patrollers, Field Investigators and Utility Cut Examiners.
- Two sets of office-based supervisors, Roads & Sidewalks Supervisors and Maintenance Contract Inspection Supervisors, oversee field staff and contracted equipment; Maintenance Patrollers also manage depot contracts.
- Eventually, depending on the direction of outsourcing and facility consolidation, all contracts could be managed though one supervisory group, with one patrol / activation function, coordinated use of available resources, and coordinated supervision of depot contracts, contracted equipment, and in-house operations.

13. Facilitate Field Communications

Financial Impact

- Investments are estimated to be minimal
- Financial benefits are expected to be realized due to increased productivity of staff

Timing

- Changes can be made immediately, impacting 2012 fiscal year

Risks

- Technical support for these devices may be difficult for Corporate IT to provide due to stretched technical resources
- Public safety guidelines of refraining from phone use while driving could be difficult to monitor

Barriers and Enablers

- A business case must be compiled to support the purchase of new equipment

Recommendation

Facilitate communications with staff operating in the field by supplying appropriate tools, services, and access to information.

Rationale / Benefit

Field staff could use their time more productively if provided appropriate communication tools to respond to maintenance issues.

Description

- A business case should be formulated to outline the costs and efficiencies to be harnessed through proposed communication tools.
- Patrolling staff could have the communication tools required to input and access information in the field.
- A phone line to inform field staff of upcoming weather conditions could be instituted to enable staff to continue patrolling throughout the day without needing to return back to their yards to obtain weather and other reports.
- Staff could access TMMS and other tools via wireless devices to stay informed about arising service requests and to record contract management information (refer to Recommendation 23 – Mobile Technology to Support Field Work).

Key Considerations

- Policies outlining the use of communications devices should be drafted to limit City liability.
- The allocation of communications devices may not need to be ubiquitous.
- This investment will likely reduce service delays and increase productivity.
- A variety of communication tools are available to address this need; new equipment should be selected strategically to integrate as broadly as possible with the City's various systems.

14. Corporate Grass Cutting

Financial Impact

- Savings on road & sidewalk requirements will be modest as work is currently contracted. Larger savings can be expected in other divisions

Timing

- Savings can start in 2012 fiscal year, but may take longer to be fully achieved

Risks

- Substantial public interest in some areas, particularly parks

Barriers and Enablers

- Need to effectively coordinate between divisions
- Existing commitments to contractors and staff. Staff reduction measures may facilitate process.
- Need to develop packages and tender documents and processes – use of road & sidewalk contracting experience can help achieve early implementation

Recommendation

Consolidate grass cutting contracts on road right-of-ways with requirements for parks, City buildings and other corporate requirements.

Rationale / Benefit

The City is examining grass cutting in the Service Efficiency Study of Parks, Forestry and Recreation to consider alternative models of delivery as well as efficiency measures that could be applied in areas such as work assignment and crew deployment. Findings from the PF&R Service Efficiency Study should be considered in the context of grass cutting across the City organization.

Description

- This issue was raised the September 7, 2011 Public Works and Infrastructure Committee meeting, with the following motion passed: "The Public Works and Infrastructure Committee requests that a further review of grass cutting services delivered by the City on roadside areas and medians be undertaken through Service Efficiency Studies for this activity across the City and that this review include a consideration of contracting the service in, and any recommendations stemming from such a review be communicated to City Council as part of the 2012 Operating Budget approval process.
- The Division is considering acquiring specialized equipment and using existing unionized staff (who are on modified duties) to cut grass in hard to reach areas and trim weeds in traffic islands and boulevards where the existing level of service is limited.

Key Considerations

- Careful attention to service level requirements to ensure requirements are not over-stated.
- Geographic focus will minimize travel time for contractors.
- Supervision regimes will be required for work currently carried out in-house.

Infrastructure Management: Analysis and Issues

Current State

The Infrastructure Management (IM) function within the Division is comprised of those individuals within the Road and Sidewalk Maintenance service. However, the broader infrastructure asset management function involves multiple City divisions (e.g., Toronto Water, Solid Waste) and parties external to the City proper (e.g., Toronto Transit Commission and other utilities). Technical Services is involved in the delivery of some components of capital program delivery for Transportation Division by providing specialized technical services such as engineering design and construction management, development review and surveying and mapping.

The co-ordination of capital planning City-wide is mandated to the Major Capital Infrastructure Co-ordination Office (MCIC), established in 2008. It operates within the Deputy City Manager Cluster B Office and promotes the timely exchange of information between sponsors of individual projects to ensure that concurrent and consecutive investments in linear and site-specific projects are performed in a logical and cost-effective sequence. In doing so, MCIC aims to achieve value for money for taxpayers and reduces disruptions and inconveniences for the public.

It should be noted that in examining that IM function within the Division, KPMG has also considered those components of the broader infrastructure asset management function that interface with the activities of the division. The roles and responsibilities of IM within Transportation Division include the following:

- Monitor condition of assets and assess physical lifecycle performance of infrastructure
- Assess funding priorities and thresholds and develop capital program
- Plan, develop and assess modifications to address accessibility, capacity and safety
- Environmental assessment study preparation and application for approval
- Advice or input to other agencies / proponents regarding their transportation infrastructure planning projects and processes that affect Toronto's interests
- Benchmark divisional services and assets
- Maintain the City's Road Classification System and street center-line data
- Develop, evaluate and harmonize operational practices, standards, policies and guidelines across all functional areas
- Negotiate boundary and service agreements with other jurisdictions
- Develop, support and advance environmental initiatives / objectives in the division including the coordination of environmental and climate change risk assessments

This review is primarily interested in assessing how IM performs the following two major functions:

(1) Asset Management includes the monitoring the performance of the roadway network; providing feedback for the modification of standards and specifications; developing maintenance and rehabilitation strategies and policies; and determining the State of Good Repair needs.

(2) Capital Programming involves setting priorities for capital spending; developing the **Capital Program** with input from various stakeholders; monitoring expenditures for the capital program.

Capital Program - A multi-year plan that provides for the investment in new capital assets and/or capital maintenance of existing City-owned assets. The plan is approved annually by Council, and is comprised of funding for new, change-in-scope, and previously approved projects. In the course of providing its approval, Council determines the City's long term expenditure priorities and manages the City's long term debt. The City's Capital Program is a compilation of individual capital projects that are expenditures for: acquisition or creation of new assets; major rehabilitation; and replacement and/or expansion of existing assets.

Managing assets has become increasingly more complex with more aging assets and stakeholder involvement in recent years. To address this complexity, the City of Toronto adopted in 2007 recommendations in the *Multi-Year Joint Transportation Services and Toronto Water Capital Program* report.

These recommendations aimed to: achieve a more efficient renewal strategy to rehabilitate City's infrastructure; minimize construction disruptions and associated inconvenience; coordinated cross functional initiative; minimize adverse and costly affects of recently completed work; and assist with improvement of construction completion rates.

In 2007, a process was adopted whereby five years worth of work was planned in advance; multi-year capital programming enabled Toronto Water, Transportation Services and Technical Services to coordinate plans; Transportation Service staff were able to proceed with scope and design of capital works program in advance of scheduled implementation dates; an annual capital budget submission process was established; and new project requests could not be accommodated any earlier than three years from request date, unless they are considered urgent concerns to minimize costs and delays in project start date.

The City-prepared 2011-2020 Transportation Capital Plan totals $2.201B, of which $1.166B or 50.8% is projected for the first five years, with the final five years requiring funding of $1.128B or 49.2%. State of Good Repair (SOGR) projects, including maintenance and rehabilitation of bridges, expressways, major roads and sidewalks, will continue to drive the Capital Program. Over the first five years, investment in these projects would increase by 21%, from $143.756M (71%) in 2011 to $173.777M (77%) in 2015. At the end of this period, SOGR funding would amount to $788.815M or 73% of total cash flow. Health and Safety projects including signage and traffic safety projects will represent approximately 5% or $101.066M of the total planned cash flow of $2.201B. Service improvement projects including traffic signal and control projects would represent approximately 8% or $166.209M of the 10 year plan. Growth projects will decline by 21% over the first five years from $30.808M or 15% in 2011 to $25.342M or 11% in 2015. By way of context, the 2012-2021 City-wide capital plan is on the order of $14B with substantial portions of the budget allocated to the Toronto Transit Commission and the Spadina Subway Extension. It should be noted that given the size and scope of Transportation Division's annual capital plan, that even modest percentage efficiencies could yield considerable benefits in terms of absolute dollars.

Issues Identified

Despite the progress that has been made in recent years, several issues have been identified in the area of Infrastructure Management. These are described over the next several pages. It is important to note the issues and recommendations identified address both areas specific to the Division, as well as those that are more broadly applicable to the City's overall approach to infrastructure asset management.

Complexity of Operating Environment

Issue

1. The nature of municipal transportation infrastructure and related asset management is complex and the IM group within the City's Transportation Services operates in a challenging, multi-stakeholder environment.

Findings and Observations

- Transportation has a large linear, structural and multi-level shared infrastructure asset base (expressways, bridges roads, sidewalks) as a result of which infrastructure management and capital plan coordination is complex.
- Coordination of transportation capital projects and other asset management activities, in large cities such as Toronto, is a systemic challenge that exists in other municipalities.
- Transportation infrastructure assets (linear) are integrated tightly with water assets (specifically structures) below the ground; Transit infrastructure assets (specifically tracks) overlap and intersect with transportation assets on the ground; Traffic, facilities and development are somewhat integrated above the ground.
- Transportation and Water are increasingly well coordinated and there are some challenges and constraints shaping integration with transit, utility and telecommunication stakeholders. These challenges sometimes include (but are not necessarily limited to) the timely receipt of capital program information, compatibility of data sets and the availability of stakeholders, etc.
- MCIC has done work to improve the co-ordination between divisions and with other stakeholders.
- Activities which are directly related to other stakeholders assets (on shared transportation assets) has negative impacts on the transportation asset portfolio; unplanned activities increase negative impact.

Implications

- Capital planning and coordination is a challenge – leading to the involvement of many different stakeholders, resources, systems, budget areas, etc.
- Capital spending may not be fully optimized, as a result.

Business Processes and Supporting Data Analysis

Issue

2. The capital coordination and assessment business process and supporting practices are sometimes inconsistent, not integrated, manual, and underpinned by large volumes of data and high amounts of stakeholder engagement, coordination, sharing and integration.

Findings and Observations

- Within Transportation, the business processes involved in planning and coordinating transportation infrastructure asset management involves large volumes of data and manual activities.
- Co-ordination of utility and TTC planned works is highly manual, inconsistent and may be leading to potential inefficiencies. These may be further compounded by inconsistent data, platforms, and processes by parties external to the City.
- Data management, extraction and analysis is interconnected with manual processes to support the current level of automation in the business process for planning and coordinating capital projects.
- Certain asset classes (e.g., Bridges) do not have sufficiently robust asset management tools and supporting data.
- Although coordination efforts to date have primarily been led by the Infrastructure management group in Transportation and across other integrating entities, there appear to be no established City-wide asset management data and process standards.

Implications

- Staff resources are spent on managing manual processes and analyzing large volumes of data.
- Potential for inconsistent application of processes and standards leading to re-work, public disruption, missed improvement opportunities, increased risk and/or inefficient use of capital funds.

Framework and Standards

Issue

3. The underlying asset management framework, infrastructure asset management standards and technical models may not always support consistent and informed decision-making.

Findings and Observations

- Little evidence observed of a standardized asset management framework for all asset classes.
- While opportunities for continuous improvement have been taken, a regular fact-based review of the framework and standards has not been consistently applied.
- Stakeholders indicated that despite some of the issues raised, the overall comfort level with the program was appropriate.
- Changing, non-existent or inconsistently applied standards create potential for significant resource, costs and future obligations.
- Based on information shared by City Transportation IM staff, the infrastructure is aging and some major capital repairs are coming due, as such, this is going to impact and increase the state of good repair backlog.

Implications

- Although the frameworks and standards appear to be reasonable, there is considerable value in evaluating and assessing the robustness of the asset management framework and models driving asset management rehabilitation needs, specifically with the intent to assess if efficiency opportunities exist.
- The inconsistent application of standards may be leading to an increasing future burden of costs of maintenance/repair and/or administration.

Cost of Capital Plan Administration

Issue

4. The cost to deliver and administer the transportation infrastructure capital plan may be too high and increasing.

Preliminary Findings and Observations

- Transportation has a capital plan budget for approximately $220m - $230m in four spend categories, of which state of good repair is the major focus of infrastructure management, specifically for City of Toronto's expressways, bridges, roads and sidewalks.
- The approximately $19m operating budget of IM is funded from the capital budget (primarily salaries). In addition, other salary costs within MCIC and a portion of Technical Services and Consultant costs are also capitalized.
- Project contingency hold-backs are described as increasing and thereby reducing the percentage of capital budget available for projects.
- Unused funds and the process of reallocations appear to be a source of potential efficiency.

Implications

- Efficiency of project planning and delivery has direct impact on cost of delivery and value for money. Effective project management is a key imperative.
- A "disciplined" capital program can yield efficiency; undisciplined capital works compromise state of good repair.

Governance and MCIC Office

Issue

5. The governance model, supporting processes and enabling technology initiatives involved in major capital infrastructure coordination need to be further formalized and enhanced.

Preliminary Findings and Observations

- The coordination of Transportation's major capital projects other City and non City (capital) asset management activities is a core activity of the MCIC and it has been effective in improving the level of coordination.
- MCIC is playing a leading role in coordinating specifically with utility companies for transportation.
- It appears that there may be a need for more formalization and clarity in roles and accountability, specifically with request to the several hand-off points within transportation and external to the division with city, agency and third party stakeholders.
- Role of PM&S (within Technical Services) may need further clarification vis-à-vis Transportation and MCIC.
- Although stakeholder engagement largely drives operational success; technology would be an instrumental enabler to help achieve multi-year coordinated capital plans.

Implications

- The role being played by MCIC can be more strategic and help drive long-term efficiency opportunities.
- MCIC can play an important role in helping to coordinate the planning and delivery of capital projects, specifically conflict resolution and planning externally to the City, and as such any change in role, structure and processes need to consider the change impact on existing systems and processes.

Information Technology

Issue

6. The current Information technology solution(s) appears to be insufficient to support infrastructure management business processes and information technology requirements.

Preliminary Findings and Observations

- Data resides in varying formats, degrees of accuracy and detail in multiple, different , loosely integrated systems and spreadsheet silos across multiple stakeholders, with Transportation being a primary stakeholder.
- There appears to be good progress in common technology strategy for Transportation and Water; however, different underlying systems exist.
- Although asset management systems exist, they are varied across the capital plan coordination process, and are different in each stakeholder and asset class.
- Transportation relies heavily on their pavement system to manage road and sidewalk rehabilitation needs; there is no bridge management IT system.
- Coordination processes are not leveraging leading, best of breed, transportation-specific enterprise scale enterprise technology, nor do they appear to be adopting leading collaboration tools.

Implications

- Staff resources are spent on managing manual processes and analyzing large volumes of data.
- Potential for in-consistent application of processes and standards leading to re-work, public disruption, increased risk and/or inefficient use of capital funds.
- Increased difficulty for the City to manage its overall asset base effectively.

Infrastructure Management: Recommendations

Readers are cautioned that the potential savings outlined in this report are estimates which are predicated on the City reducing its personnel resources, capital assets, and other future events. Savings presented exclude the costs of transition. Actual results achieved as a result of implementing recommended opportunities will vary from the information presented and these variations may be material.

15. Framework for Managing Toronto's Transportation Assets

Financial Impact

- Resource costs associated with developing / updating the asset management framework are estimated at up to $500K
- Enhanced effectiveness of capital spend across multiple asset classes

Timing

- Implementation may begin in 2012. Savings projected for 2014+

Risks

- Asset management framework does not completely account for complex nature of asset management
- Complex stakeholder base with competing demands may not engage in framework development process
- Framework may be too prescriptive and rigid

Recommendation

Further develop the City's asset management framework including both transportation and other asset classes.

Rationale / Benefit

An asset management framework provides standardized approaches, methodologies, principles and tools to guide the improvement of asset management practices and processes. It also lowers the cost of keeping assets in good repair over the life cycle of the asset, while maintaining acceptable levels of risk. Moreover, it ensures adequate investment to keep infrastructure assets in good repair, fund asset replacement and new assets so that they support satisfactory and consistent levels of service to users.

Description

- Transportation services division should further develop a robust asset management framework that is capable of providing clear and informed decision support at the scale required for municipal transportation infrastructure management. Specifically, the fundamentals that are used to determine repair / replace activities, perform condition assessments and identify ongoing standards should be reviewed and updated across all asset classes.
- The asset management framework may be based on PAS055 - The global standard for Infrastructure Asset Management developed by Institute of Asset Management. Moreover, the framework should be policy-driven, performance-based, enable decision-making based on quality and timely information, and provide for clear accountability, monitoring and feedback.
- The target asset management framework should also:
  - Inform Transportation Division's information technology, data and collaboration strategy.
  - Balance maintenance and asset replacement / capital repair and minimize lifecycle cost and manage risk to the City.
  - Include all applicable asset classes and interactions with external stakeholders.

15. Framework for Managing Toronto's Transportation Assets

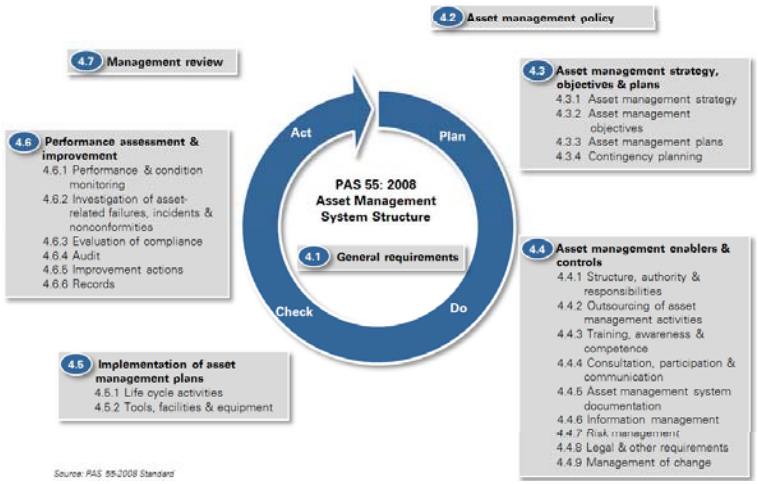
Barriers and Enablers

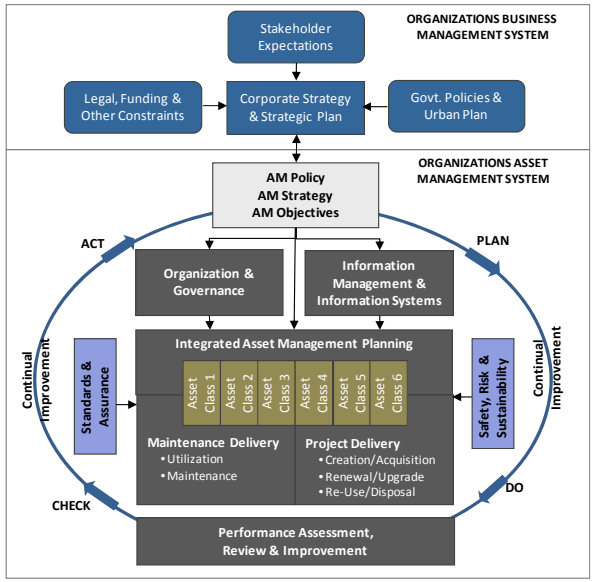
- Design and implementation of asset management framework requires time and political / organizational leadership
- 'Growing pains' associated with developing an asset management process can foster enhanced communications among many different organizational units
- Developing cross-functional teams can augment the understanding of the many aspects of asset management framework
- IT enablement to support decision-making and implementation is a key enabler

Key Considerations

- Informed decision-making in project selection could enhance value from capital spend.
- There is potential in the near future for the repair / replace backlog to grow, as the City's transportation infrastructure ages and, as such, decision-making complexity is likely to increase.
- The Division will likely require external assistance with the development of a robust Asset Management Framework, as this capability / capacity may not be readily available internally.

Overview of Typical Asset Management Components and Outcomes





KEY OUTCOMES

- Strategic Alignment & Control
- "Zero Tolerance" Safety & Reliability
- World-Class Service Delivery
- Long-Term Sustainability
- Structured Lifecycle Approach
- Risk based decision-making
- Balance between cost, risk and performance
- Cross functional teamwork and alliancing
- Operational reliability & continues improvement
- Performance based management

. . . focus should be on the view of the complete asset system as a whole and not independent components . . .

16. Standards

Financial Impact

- Reduction in “non-standard” assets and activities are expected to lower lifecycle costs, including design, procurement, maintenance and repair / replacement

Timing

- More significant cost savings / efficiencies are likely to be yielded in 2013 and beyond; however, savings could be achieved in the shorter term through immediate increased adherence to existing asset standards

Risks

- Decision-making process may be delayed if committee members need to consult with external sources
- Potential for committee members to disagree on standards
- Variable inflation and interest rates could impact lifecycle costs affecting standards
- Additional technical and economic data will need to be continually incorporated

Recommendation

Enhance the adherence to existing asset standards, based on calculated lifecycle costs and the related impact of ongoing maintenance costs and update standards where out-of-date or incomplete. This includes both: 1) Establishing and having a regularly followed process for continually refining standards based on sound technical and economic analyses and 2) Having well-defined governance and decision-making criteria for managing exceptions to standards.

Rationale / Benefit

Standards are an essential aspect of infrastructure management because they create efficiencies in the decision-making and capital delivery processes. A more comprehensive and robust process for the analysis and selection of standards will not only drive support from internal stakeholders, industry leaders and the public, but also further support the justification of expenditures by the City. Non-standard assets and activities currently require increased staff resources to manage and create further complexities in the ongoing management of the City’s infrastructure.

Description

- Standards should be established and enforced such that:
  - Life cycle cost assessment occurs at or before design stage
  - Formalized governance of non-standard requests and related budget implications are effectively managed.
- Standards should be supported by formal governance that requires controlling the cost of deviation from standards (and impact of new material and component standards), based on diligent assessment of net present value and operating/technical implications.
- Continue to endorse committees that they are currently addressing implications of new standards and designing (or implementing) related governance activities and ensure defined procedures in place to review and approve changes in standards.
- Governance of standards improves decision-making consistency, aligns decisions with project goals, formalizes the overall decision-making process and improves accountability and credibility.
- Strong governance mechanisms are essential to manage ad-hoc changes to established standards.

16. Standards

Barriers and Enablers

- Availability of technical and financial resources and data to support implementation of standards
- IT enablement
- Political sensitivities

Key Considerations

- In developing the standards, the division should review its long standing processes and practices, and embed a feature of regular fact-based review of consistent application.
- Integrating life cycle cost assessments into robust standards can permit the re-evaluation of the continued use of existing assets through comparison to new technologies and maintenance approaches, thereby allowing for evolution of standards on an ongoing basis.

17. Information Technology

Financial Impact

- Review of current IT system strategy will have minimal cost
- Resources and procurement costs associated with installation of fully functioning asset management system are estimated at $5-10m
- Efficiencies are expected from improved capital decision-making and reduced resource time on manual activities. Even a modest efficiency gain of 1-5% could yield benefits in the range of $2-10m

Timing

- Review of IT strategy in 2011 / 12.
- Procurement and implementation may begin in 2013
- Savings projected for 2014+

Risks

- Deployment of asset management IT system may pose additional complexities
- Full return on investment may not be realized in the short-term
- Lack of buy-in from staff (during design and testing phases) results in underutilized IT system
- Failure to conduct thorough needs analysis results in IT system with limited functionality

Recommendation

Review current IT strategy and assess if planned investments are appropriate for the scale and complexity of the assets being managed and investments being made. Strongly consider the increased use of an IT system(s) in support of infrastructure management activities, which could include the deployment of a robust multi-asset class management system.

Rationale / Benefit

Increasing use of IT systems in support of infrastructure management activities is likely to lead to better coordination of capital projects through greater automation and enhanced decision-making. Improved coordination could result in higher project completion rates and cost savings in the long term.

Description

- Ensure all transportation asset classes are supported by IT system(s) that enable effective application of the selected asset management framework. Where possible, the IT system(s) should integrate across multiple asset classes. The system should include a component that deals with bridge asset management.
- Investigate shared applications to facilitate data integration.
- Rationalize tools for capital budget allocation and variance tracking.
- A good tool aims to integrate the different systems that exist in the organization to present a coherent and consistent overview of the organizations assets. Furthermore, it should be able to communicate with the different processes of the organization.
- Push for the widespread adoption of geo-spatial technology and underlying data requirements (particularly outside Transportation).

Key Considerations

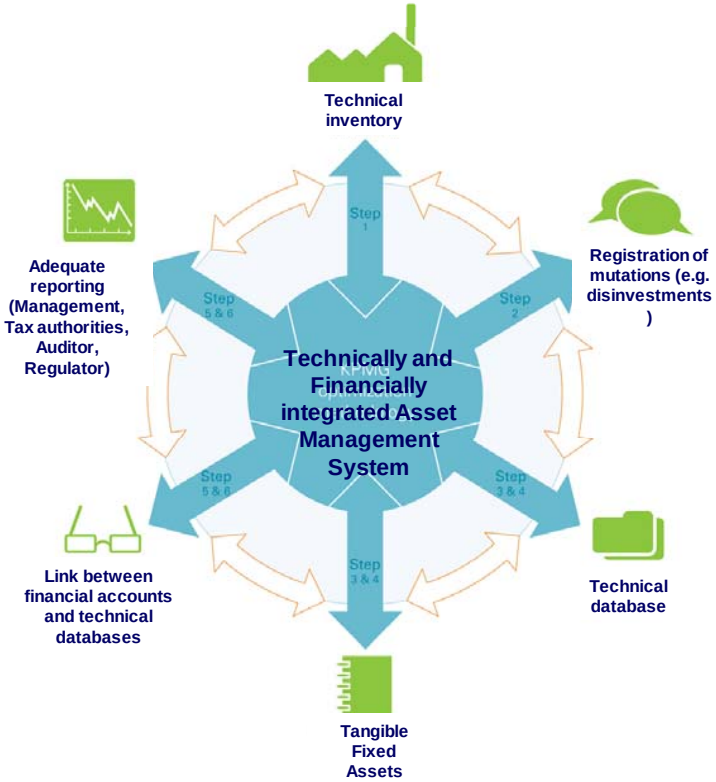
- Invest in appropriate IT across the City to support asset management framework.
- Ensure integration across multiple asset classes and stakeholders.
- Increasing costs associated with aging infrastructure creates urgent demand for efficiencies through IT system.

17. Information Technology

Barriers and Enablers

- Linked to development of asset management framework
- Additional investment required for staff training and IT system maintenance
- Detailed data gathering would be required
- City's procurement policies
- Interoperability challenges
- Ongoing IT support and system maintenance

Schematic of Fully Integrated Asset Management IT system:



Sample Data Fields:

Financial Data	Technical Data	Operational Data
• General ledger account number • Description • Investment year • Acquisition year • Depreciation rule • Amortization schedule • Acquisition value of the asset	• Unique identification number per technical asset • Project number of the project in which the asset was installed • Ownership of the asset • Location of the asset • Specific characteristics of the assets which are relevant for pricing • Status field (active, divested, in warehouse, etc.) • Disinvestment date • Construction date • Insurance status	• Maintenance Cost • Maintenance Schedule • Breakage statistics and failure rates • Work orders • Cost registration • Outsourced work • Planning • Supply chain management

18. Cost of Capital Plan Administration

Financial Impact

- Difficult to estimate due to lack of available data, however, even a marginal efficiency gain of 1-5% could yield benefits in the range of $2-10m

Timing

- This is likely a longer term opportunity, potentially yielding results in 2014+

Risks

- Potential impact on quality if cost cutting measures for administration are inappropriate
- Fewer controls may have additional adverse effects, such as, timely project completion, cost overruns, etc.

Barriers and Enablers

- Cost data stored in financial, infrastructure and maintenance systems may be inconsistent
- Cost tracking may not capture total direct and indirect costs adequately
- IT enablement will support this recommendation
- Reduction in manual processes will further support this recommendation

Recommendation

Take measures aimed at increasing the percentage of capital budget available for projects through the strategic management of capital expenses and budgetary processes

Rationale / Benefit

Given the limited funds available for capital expenditures within the City of Toronto and existing backlog of necessary capital projects, optimizing the percentage of the overall fund dedicated to the repair / replacement of assets (as opposed to those capital costs associated with capital planning, co-ordination, delivery, etc.) will increase the efficiency and effectiveness of funds.

Description

There is an opportunity to increase the value of the capital plan spent on assets repair / replacement through:

- Establishing agreed standards for cost of engineering with Technical Services.
- Ensuring adequate project management standards are implemented to be able to measure efficiency in delivery.
- Having effective balance between in-house and contracted activities.
- Conducting streamlining, standardization and development of asset management framework.
- Modifying procedures that govern the structure of the budget envelope to:
  - Reduce contingency hold backs
  - Maximize unused funds.

Key Considerations

- Review composition of what factors impact cost of delivery and determine true cost of delivery/administration.
- Assess cost of delivery against appropriately selected benchmarks and leading practices.
- Ensure direct labour costs and other related costs associated with capital projects are accurately captured.
- Will require ongoing performance management of funds and outcomes.

19. Governance

Financial Impact

- Resources likely to be required within MCIC (or other overarching mechanism) for implementation
- Efficiencies in capital spend expected as a result of enhanced co-ordination, planning, decision-making and reduced re-work

Timing

- Formalized governance structure and mandate can be in effect in 2012
- Results are likely to be realized in 2013+

Risks

- Overreach of roles / responsibilities
- Compromise likely required by all stakeholders in order to achieve success

Barriers and Enablers

- Lack of an integrated IT system may present a challenge to greater coordination
- MCIC may not have resources to undertake greater mandate
- Lack of asset management guidelines may prevent enhanced mandate from leading to greater coordination
- Link to asset management framework and standards
- Complex stakeholder environment

Recommendation

Strengthen the governance of capital infrastructure initiatives by further defining and clarifying roles of all affected stakeholders. This includes articulating how decisions are made, by whom, and who is accountable / responsible for carrying them out. Consider broadening the role and mandate of MCIC in this initiative.

Rationale / Benefit

Despite progress made related to planning and project coordination, an enhanced MCIC mandate and improved overall governance of asset management will result in greater coordination efforts and, as a result, greater cost savings through higher project completion rates, slower growth rate of SOGR backlogs and service improvement.

Description

- Formalize governance model for responsibilities and commitments with respect to five year joint capital plan across all stakeholders and decision-makers. An effective tool for accountability governance modeling is a RACI framework, capturing stakeholders to be responsible, accountable, consulted and informed.
- Further establish role of MCIC to drive continuous improvement of city-wide capital planning, stakeholder engagement and IT leadership.
- Formalize current City-wide capital plan coordination processes including commitments from all stakeholders, including TTC and other external stakeholders, to improve their contribution to efficient city-wide coordinated infrastructure management planning.

Key Considerations

- Leverage the work done thus far by MCIC in enhancing co-ordination across divisions and stakeholders.
- Continue to support and enhance ongoing IT and business process improvement initiatives.
- Will likely require more resources to be invested.
- Change management of existing processes will be required.
- Ensuring integration with external stakeholders will be required.

20. Process improvement

Financial Impact

- One-time costs associated with business process improvement initiative (<$200k)
- Ongoing efficiencies expected from reduced resource time on manual activities and increased effectiveness of capital expenditures

Timing

- Process Improvement efforts can commence in 2012
- Savings could begin to accrue in 2013+

Risks

- Change required by existing process owners

Barriers and Enablers

- Will require involvement by multiple stakeholders in order to improve overall processes
- Appropriate governance will enhance effectiveness of business process streamlining activities
- Strong link to the use of appropriate IT system(s) to support
- There are potential IT resource requirements and constraints in change readiness

Recommendation

Improve business processes in the capital planning and coordination processes (short-term and long-term horizon) and any further enhancements to the project delivery processes.

Rationale / Benefit

Current business processes are characterized by a significant amount of manual processes, hand-offs and data analysis that, if improved, would lead to reduced costs of administration, improved decision-making and enhanced effectiveness of staff resources.

Description

- Improve communication and data exchange through stronger, more robust and efficient processes.
- Adopt a City-wide business process improvement initiative that:
  - tackles manual processes across the planning, coordination and tracking activities
  - addresses the current limitations of asset management systems
  - is supported by a commitment to City-wide efficient capital planning through increased automation and investment in business technology.

Key Considerations

- The improvement should ensure all assets involved in the joint capital plan process have supporting tools and data to support optimized asset management planning, based on clearly defined, informed and updated decision-making frameworks.
- Data integration and hand-off points need to be identified and efforts made to use IT to automate existing manual spreadsheet based processes.
- Improvements in the capital planning processes would enable the City to better align its plans with those of the Province and the Federal Government.

21. Approach to Asset Management

Financial Impact

- Given the size, scope and complexity of the City's asset base, the overall financial impact is expected to be positive – however, significant costing analysis would be required to confirm

Timing

- This is likely a longer term opportunity, potentially yielding results in 2015+

Risks

- Sustainability of vision over multiple administrations and leadership changes
- Significant change management required

Barriers and Enablers

- Best-in-class management requires dedicated resources (planners, data analysts, engineers), strong leadership and effective use of consultants
- Up-front costs associated with all necessary components are significant

Recommendation

Consider pursuing advanced asset management practices city-wide and across multiple asset classes to lower life cycle costs of assets, maximize use of capital funds and enable further innovation.

Rationale / Benefit

As one of the world's leading cities, the City could invest heavily in becoming recognized globally with respect to infrastructure asset management in a municipal context. In addition to the other recommendations provided in this section of the report, the City can gain further incremental value by moving to an advanced and regularly evolving state of asset management practices.

Description

Leading practices in infrastructure management include clear evidence of a robust and active enhancement of all of the following:

- Clearly prescribed asset management framework
- Established standards
- Effective governance
- Streamlined business process
- Appropriate IT support
- Complete inventory and integration of asset classes
- Guidelines for consistent lifecycle costing
- Performance management.

Key Considerations

- Although there is some risk in taking a leading edge approach (i.e., not being able to fully learn from others' experiences), there are also opportunities to further enhance the effectiveness and efficiency of Toronto's infrastructure asset management.
- Large asset base, future growth, aging infrastructure and high spend are key considerations.

Cross-Stream Opportunities: Recommendations

Readers are cautioned that the potential savings outlined in this report are estimates which are predicated on the City reducing its personnel resources, capital assets, and other future events. Savings presented exclude the costs of transition. Actual results achieved as a result of implementing recommended opportunities will vary from the information presented and these variations may be material.

22. Rationalization of Field Staff

Financial Impact

- This recommendation may require an initial investment of $100-150k to conduct an analysis that identifies where duplication occurs between the various field staff roles
- The projected operational savings are estimated at up to 15% of service cost. Road and Winter Maintenance and Utility Cut Repairs streams may generate greater operational savings due to large budget size and volume of activity.

Timing

- Efforts to pool resources can be started in the next six to nine months
- Given contractual obligations and HR issues, cost savings and efficiencies are likely to be yielded in 2013-14+

Risks

- Potential loss of specialized knowledge

Barriers and Enablers

- Staff agreements / contracts may be a barrier to changing existing job descriptions
- Cross-training on roles can enable the rationalization of field staff

Recommendation

Consider pooling and cross-training of staff in the field, who are involved in road and winter maintenance, construction permit, utility cut permit and claims investigations processes.

Rationale / Benefit

Realize medium-term to long-term cost savings through more effective utilization and allocation of field staff. Remove duplication of activities between field workers and re-allocate staff to different activities.

Description

- There appears to be duplication between the roles of Maintenance Patrollers, Field Investigators, Utility Cut Examiners, By-law Officers and potentially other field staff across the Transportation Division. Conduct a thorough rationalization of all field staff to identify how to better allocate resources and reduce duplication between the various roles.
- Examples of duplication include:
  - In the utility cuts process, the Cut Examiner and Maintenance Patroller role both require similar skill sets and are both responsible for monitoring utility cuts.
  - Field Investigators and Maintenance Patrollers are both responsible for performing patrolling functions and making minor repairs.
  - Municipal Construction Inspectors and Field Investigators are both responsible for investigating claims, maintain files for evidence and may be required to present evidence in court.
- Based on number of field staff FTEs per stream, expect greater operational savings for road and winter maintenance, followed by construction permit, utility cut permit and claims investigation

Key Considerations

- Existing contract implications
- Detailed process mapping to identify duplication of tasks and functions between field staff
- Multi-stream coordination
- May require automation to support new roles and processes.

Cross Stream – Applies to More Than One Stream

23. Mobile Technology to Support Field Work

Financial Impact

- Requires a comprehensive business case to determine financial impact

Timing

- Changes can be made in the next nine to twelve months, impacting 2013 fiscal year
- Cost savings and efficiencies are likely to be yielded in 2013-14

Risks

- System failure
- Resistance to use technology by field staff

Barriers and Enablers

- Consider the additional cost of training required
- Lengthy IT procurement process can create delays in realizing process efficiencies in using mobile technology

Recommendation

Increase the use of mobile technology and automation to support field work.

Rationale / Benefit

The City would likely realize efficiencies by allowing field staff to complete work while out of the office. Electronic capture and storage of information would replace work-intensive, paper-based processes and allow for speedier access, use, and analysis of field information.

Description

- Upon rationalization of all field staff, identify which processes can be supported using mobile technology. For example, if a Utility Cut Examiner is at the site of a unsafe utility cut, he / she must return to the office in order to identify the utility company responsible for the cut in RACS. Providing Utility Cut Examiners mobile access to RACS would reduce the time spent identifying cuts and build capacity to focus on other tasks. Another example would be providing mobile access to TMMS for cut inspectors who currently re-input data from hard copy cost sheets into the system when they return to the office.
- The City has already investigated the use of mobile technology and has piloted it in other areas (e.g., Toronto Hydro and select Field Investigators) where field staff are able to have partial access to RACS based on their requirements while off-site. Conduct a detailed process review to identify which tasks could be accomplished using mobile technology support.

Key Considerations

- Detailed process mapping to identify which processes could be supported using mobile technology
- Capital spending required
- Training requirements
- Determine support service requirements for mobile technology.

Conclusion

Summary

It is apparent from our review of the City's Transportation Division that, while progress in many areas has been made, several opportunities to generate efficiencies, achieve cost savings, and improve customer services still exist. Broad areas for more efficient operations include:

- Rationalization of roles and responsibilities in the field
- Automation of processes using mobile technology, web applications, and information systems
- Standardization and cost reduction by consolidating district operations into centralized models
- More informed decision-making through fact-based analysis and management reporting
- Adoption of leading practices with a consideration to Toronto's unique geographic, urban, political, and social factors.

Some of these opportunities that are drawn from innovative, leading practices will likely yield tangible financial results. Others may have been considered in the past and not pursued due to operational, administrative, and political barriers. The timing and the current fiscal pressures of the City may serve as a receptive foundation for trying these initiatives again.

In addition to operational and structural changes, policy choices by Councilors have the potential to influence the cost, as well as the nature of Transportation services delivered by the City. Service level reductions, particularly in the Road and Sidewalk Maintenance and Winter Maintenance streams could yield cost savings, but will likely inconvenience Torontonians. Deviation from Asset Management standards will also have a cost impact, which could be minimized if full lifecycle costing is used making these decisions. Policies on staff and contractor compensation could drive the wages (and accordingly the cost of service) lower. Similar policy changes have been adopted in other jurisdictions in an effort to reduce the cost of service delivery. In a highly constrained fiscal environment, Toronto may consider following suit.

Appendix A: Sources of Data and Analysis

Permits, Utility Cuts, Claims Management – Overview

Construction Permits

- Director, NY District
- Manager, NY District
- Manager, Etobicoke York District
- Manager, T&EY District
- Acting Manager, T&EY District
- Supervisor, T&EY District
- Supervisor, T&EY District
- Director
- Right of Way Management Supervisor

Claims Management

- Manager, Bering Yard
- Superintendent, Bering Yard
- Manager, T&EY
- Manager, T&EY
- Supervisor, T&EY
- Senior Risk Management Analyst
- Insurance and Risk Management Supervisor

Utility Cuts

- Maintenance Supervisor, T&EY
- Supervisor, T&EY
- Manager, T&EY District

Information Technology

- Supervisor (TMMS), Information and Technology

Documents Reviewed

- Municipal Consent Requirements
- Claims Process Map
- Utility Cuts Process Map
- Proposed Permanent Utility Cuts Process Map
- RACS Utility Cuts Manual
- TMMS Activity Manual
- Business Case for consolidation of the Utility Cut permit processing
- City of Toronto - Monthly Permit Response (Sample management reporting)
- Job duties for construction permitting
- Right of Way Management – Construction Activities for homeowners and contractors
- Internal logs
- Permit application form
- City of Toronto Office of the Ombudsman – Potholes, floods and broken branches: how the city handles your claims (October 2011)

Jurisdictional Research

- City of Austin – Department of Transportation, http://www.ci.austin.tx.us/roadworks/rwwork.htm
- City of Philadelphia – Philadelphia's Development Permit Review Process: Recommendations for Reform, http://www.philaplanning.org/pubinfo/devprocess050510.pdf
- RFID for Utility Marking and Buried Asset Management, http://www.advanced-infrastructure.com/content/rfid-utility-marking-and-buried-asset-management
- Case Study – Use of RFID-enabled Utility Markers at Hartsfield-Jackson Atlanta International Airport http://www.rfidjournal.com/article/view/2647

Road & Sidewalk and Winter Maintenance – Overview

Interviews

- Director, Transportation Services, Scarborough District
- Senior Coordinator, Emergency and Winter Operations
- Supervisor, Morningside Yard, Scarborough District
- Supervisor, Ellesmere Yard, Scarborough District
- Supervisor, Toronto & East York
- A/R Supervisor, Toronto & East York
- Supervisor, Ellesmere Yard, Scarborough District
- Superintendent, Area Road Operations, Toronto & East York
- Senior Engineer, Scarborough District
- Maintenance Patroller, Etobicoke & York District
- Supervisor Maintenance Contract Inspections, North York District
- Acting Supervisor Maintenance Contract Inspections, Scarborough District
- Supervisor (TMMS), City of Toronto Information & Technology
- Contractor, Winter Maintenance
- Manager, Contract, Ministry of Transportation
- Head, Maintenance Contract, Ministry of Transportation

Jurisdictional Research

- Interviews with representatives from Ottawa, ON; Montreal, QB; and Baltimore, MD
- Survey distributed to Chicago, IL; London, ON; Windsor, ON; Milwaukee, WI
- Additional research conducted on Boston, MA; Washington, DC; and San Francisco, CA

Tours and Training

- Day tour, including visits to:
  - 433 Eastern Ave Yard
  - Leslie Street Depot
  - Leslie Street Yard
  - 8270 Sheppard Ave Depot
  - 891 Morningside Ave Yard
  - Ellesmere Road Yard
  - Oriole Yard
  - 677 Wellington St W. Yard
  - 1116 King St Yard
  - 64 Murray Road Yard
  - 64 Murray Road Depot
  - 2011 Snow School (2nd day of training)

Road & Sidewalk and Winter Maintenance (Continued)

Documents Reviewed

- City of Toronto Transportation Services 2011 Snow School Guide
- Organization charts for Transportation Division
- Minimum Maintenance Standards vs. City of Toronto Policy Standards for Winter Maintenance
- Proposed Utility Cut Permanent Restoration Process
- Terms of Reference – Field Investigator, Inspector Municipal Construction, Maintenance Patroller, Maintenance Contract Inspections Supervisor, Roads & Sidewalks Supervisor
- Budget - by accounting category, plus by service, + by service & activity, district, UC, WM
- Operating variance submission
- Local Road Ploughing RFQ (template)
- Sidewalk Ploughing RFQ (template)
- Major Road Ploughing RFQ (template)
- Salt Management Plan
- Fleet Maintenance Estimates Per Division
- 2010 SAP Period 13 Report for Scarborough District
- Council Report on Tendering Winter Maintenance Contract for Seven Years
- Financial Reports from TMMS at the district and yard levels for 2008, 2009, and 2010
- IOC Org Chart Activity Review
- Transportation Emergency Plan
- Road Operations Contract Inspection Manual
- Toronto Maintenance Management System Activity Manual
- Road Operations - matrix / reference
- Yard Operations and Depot locations
- Service Operations- road service request
- Active Transportation Units
- Road Operations Contract Inspection Manual
- 2011 Transportation Services capital budget - analyst notes
- Transportation Services -- Review of Winter Maintenance Services
- 2008-2015 Equipment Summary – list of equipment in Scarborough
- Fleet rates for maintenance and reserve contributions for districts' equipment
- Total Contract Amounts- spreadsheet with contract fees
- 2010 Yearly Variance Report
- Council Report on Confirmation of Levels of Service for Roadway and Roadside Winter Maintenance Services

Infrastructure Management – Overview

Interviews

- Director, Major Capital Infrastructure Coordination (MCIC) office
- Director, Transportation Infrastructure Management & Manager, Infrastructure Asset Management & Programming
- Executive Director, Technical Services
- General Manager, Toronto Water
- Transportation Engineer, Infrastructure Management
- Director PM&S, Technical Services
- Director, Engineering Development, Technical Services
- Attended one Capital Coordination Directors Committee meeting

Documents Reviewed

- Organization charts
- Job descriptions
- Capital coordination process maps and business scenario
- City Budget 2011 Transportation Services Capital Budget Analyst Notes
- Life-cycle cost analysis of composite & flexible pavement structures
- Service profiles
- Pavement performance model
- Briefing Book for the Office of Major Capital Infrastructure Coordination
- Blueprint for Fiscal Sustainability and Economic Prosperity – a Call to Action
- Staff report – State of good repair backlog (2005)