

## **SOLID WASTE MANAGEMENT SERVICES**

### **Previous Business Practice**

Fridges, stoves and air conditioners are just a few examples of bulky metal items—also known as "white goods"—that can be recycled. Until September 2009, Solid Waste Management Services required Toronto residents to call the City to schedule pickup for their white goods. The service standard for this request was between 7 and 13 days. Approximately 2,700 requests were scheduled per month. From September 2008 to September 2009, 311 Toronto received more than 25,000 service requests for white goods pickup. (Note: although 311 Toronto launched in September 2009, it was operational for six months before that.)

Fulfilling these service requests required Solid Waste staff to create a daily task list of addresses, complete with complex, citywide routes in three separate sections. Each section had a two-person crew assigned to it for a total of six FTEs.

It was estimated that the collection recovery from these scheduled service requests was approximately 52% on average. This meant that 48% of the time city staff went out to a scheduled white goods pickup, the material was absent, often because it had been taken by crafty entrepreneurs.

### **Business Practice Changes and Resulting Improvements**

In September 2009, Solid Waste Management Services eliminated the need for a resident to call 311 to schedule a pickup for their white goods. Since that time, all white goods and other bulky items are collected curbside on garbage day with no pre-booking required.

This service improvement resulted in:

- The redeployment of six FTEs to other collections activities;
- The re-allocation of the white goods collections vehicles from reactive work to proactive work, thereby reducing the time that collection vehicles were on the road;
- A reduction in administrative duties associated with scheduling and routing service requests;
- A reduction in the number of calls to 311, thereby reducing wait times during peak 311 Contact Centre operation hours (9:00 a.m. to 12:00 p.m.) and allowing Customer Service Representatives to field other calls; and
- Improved customer service: residents may set out bulky items on any garbage day they choose without making an appointment.

Overall, the City was able to provide better service without adding any new resources. Residents no longer need to call to arrange for pickup, staff spend less time scheduling pickups, field crews are redeployed to more important tasks, and 311 Toronto is able to field more calls.

## **URBAN FORESTRY**

Urban Forestry is responsible for the care and maintenance of approximately 600,000 City-owned trees that line streets and boulevards and 3.5 million trees in parks and natural areas. Because their first priority is to maintain public safety, dangerous conditions or obvious potential hazards are attended to before routine maintenance activities such as pruning.

### **Previous Business Practices**

Before 2006, work done by Arborist Inspectors and work crews in the field was manually documented in paper forms before being entered into the work management system by staff in the Urban Forestry Data Management Centre (DMC). Staff in the DMC were also responsible for answering telephone calls and emails from the public regarding requests for service or information. The time devoted to answering calls and emails resulted in a data entry backlog of the manual forms that are used to update the work management system.

Prior to implementation of the changes discussed below:

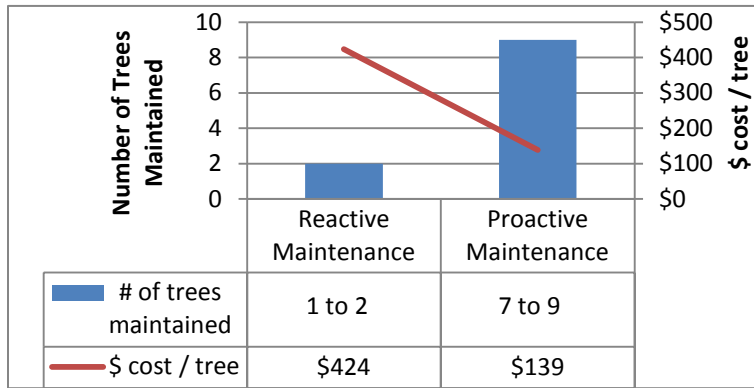
- The average pruning cycle for a street tree was once every 39 years;
- The average wait time for a tree inspection was 12 weeks;
- The wait time (backlog) for a service request from the public such as pruning was 18 to 24 months;
- There was a delay in data entry into the work management system of 3-4 months from the time the field work was completed;
- Of the phone calls received in 2009 by the DMC, 19.9% of the callers received a busy signal and 11.5% abandoned (hung up) the call; and
- There was very little capacity to do proactive maintenance work initiated by Urban Forestry staff; almost all work was reactive in response to requests for service from the public.

### **Business Practice Changes and Resulting Improvements**

Improvements to the City's Tree Maintenance program were achieved through a combination of increased funding and changes to business practices. Between 2005 and 2007, more than \$3 million in additional funding was approved to reduce the tree backlog. In 2008, Council approved an eight-year Service Plan to enable Urban Forestry to achieve the City's tree canopy objectives. The Service Plan increased annual funding over multiple years to transition from reactive-based tree maintenance to a proactive maintenance program with a target objective of a seven-year-average pruning cycle once fully implemented.

This strategy of planned and proactive maintenance commenced in 2009 and utilizes field crews more efficiently by reducing non-productive travel time, fuel costs and time spent loading and unloading equipment. Figure 1, below, contrasts the number of large, mature trees per day that a three person crew can maintain and shows that more than four times as many trees can be maintained per day using a proactive, strategic approach. As a result of these business practice changes, costs dropped from \$424 per tree for reactive maintenance to \$139 per tree for proactive maintenance.

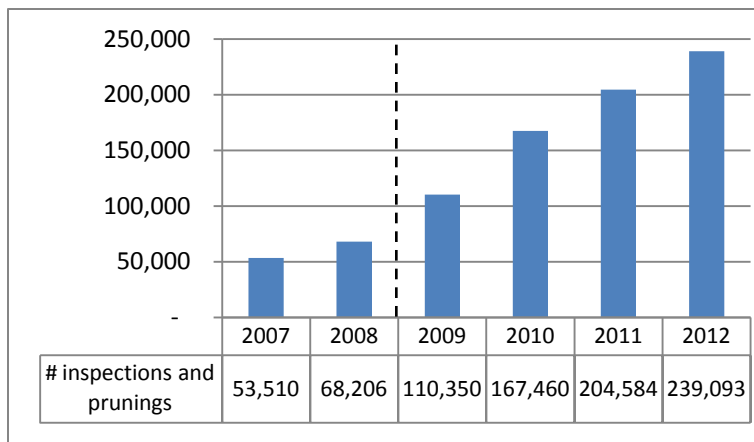
**Attachment A – Examples of Service Improvements Achieved through Improved Business Practices**



**Figure 1 - Reactive vs. Proactive Tree Maintenance (Number of Mature Trees Maintained per 3 Person Crew per Day, and Cost per Tree)**

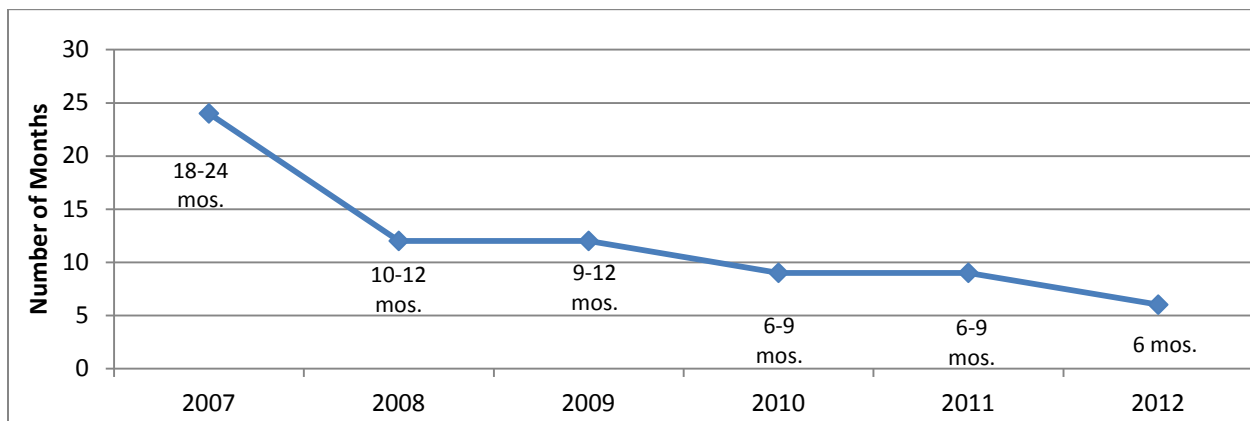
As proactive maintenance continues, trees will be better maintained, which should result in fewer service requests (reactive work) from the public.

Implementation of the Service Plan has resulted in a significant increase in maintenance activities as shown in Figure 2. Between 2007 and 2012 there was a 347% increase in the number of tree inspections and prunings done in a year.



**Figure 2 - Number of Tree Inspections and Prunings**

The increase in tree inspections and prunings has also resulted in a significant reduction in the time required to complete a service request for tree pruning or removal from 18 to 24 months in 2007 to six months in 2012, as shown in Figure 3.



**Figure 3 - Time to Complete Service Request for Tree Pruning or Removal**

In September 2009, mobile computing was implemented for Arborist Inspectors. (Manual forms continue to be used by field crews.) This automation:

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- Eliminated the need for Arborist Inspectors to manually fill out tree inspection forms and for DMC staff to enter the manual forms into the work management system;
- Improved the accuracy of data entered in the system and enabled real-time transfer of inspection information to the work management system; and
- Provided real-time status information on tree inspections that could be communicated to residents.

In May 2010, Urban Forestry operations were integrated with 311. Calls and emails from the public, previously handled by DMC staff, were now handled by 311 with no additional staffing. This reduced the number of calls the DMC received by 80%, with the remaining calls being those transferred from 311 when technical expertise is required. This change had a number of benefits:

- Calls related to Urban Forestry are now fielded by 311 staff without any increase in 311 staffing, leading to increased productivity and improved customer service.
- DMC staff have shifted the focus of their efforts to the entry of data from the field crews in the work management system in order to:
  - Accommodate the increase in data resulting from more maintenance activities by field crews as noted in Figure 2.
  - Reduce the time lag between when field work is completed by field crews and when it is reflected in the work management system (reduced from 12-16 weeks to 2 weeks, as shown in Figure 4). This has the dual benefit of:
    - Providing more current information for management to make decisions.
    - Providing a more current status when updating customers who enquire about their service request.
- The need for an after-hours dispatch function was eliminated. Whereas the Transportation Services dispatch service used to handle after-hours requests, now when tree emergencies

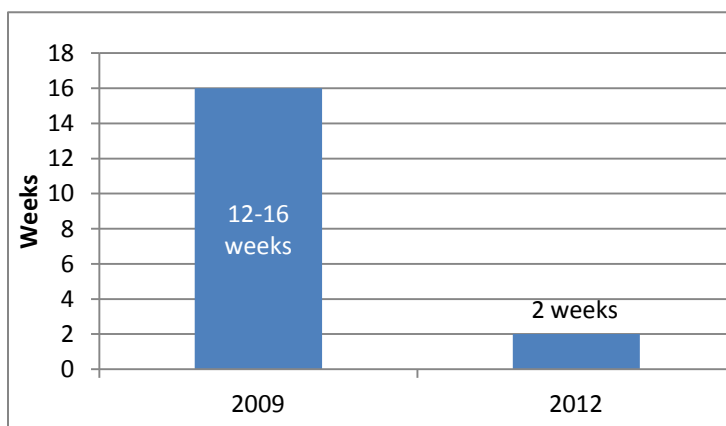


Figure 4 - Time Lag for Data Entry into Work Management System

are reported to 311 an automatic notification is sent to a mobile telephone to alert the on-call Urban Forestry staff person.

The level of service residents receive when calling to request service or information on tree maintenance has significantly improved since 2009, as shown in Figure 5. The latest statistics for 2012 show that only 6.6% of incoming calls are abandoned (hung up after 30 seconds), and there are no busy signals.

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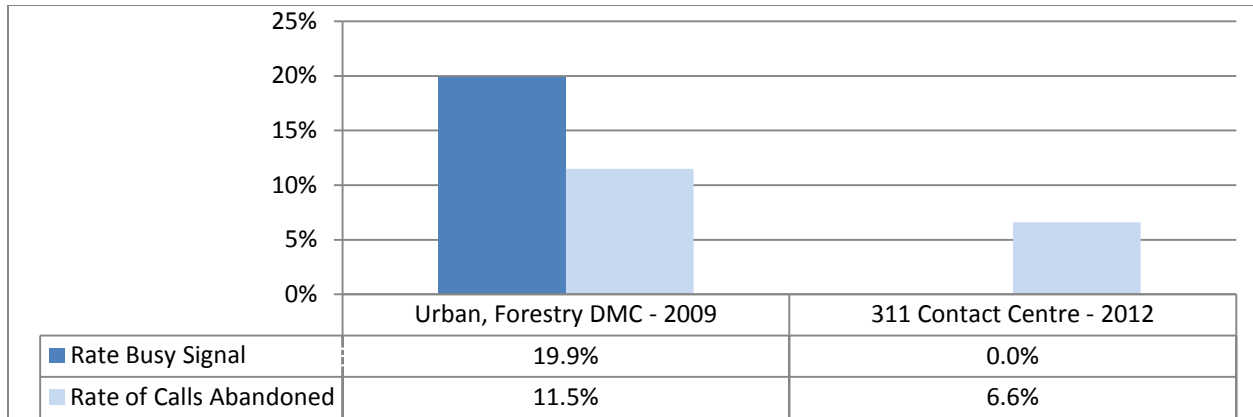


Figure 5 - Rate of Busy Signals and Abandonment for Incoming Calls

### Other Changes Planned for the Future

Staff are working towards incorporating information about the location and timing of upcoming proactive tree maintenance work in the 311 system, which will allow 311 Customer Service Representatives (CSRs) to give residents more information about tree maintenance in their area when they call in.

Staff are also exploring opportunities to increase the use of mobile computing to improve efficiency of data transfer and reduce reliance on manual forms.

## **MUNICIPAL LICENSING & STANDARDS**

### **Previous Business Practices**

The Investigation Services section of Municipal Licensing and Standards (MLS) operates four district offices. Prior to 2009:

- Service requests (complaints) received for investigations were automatically assigned by the work order system to by-law enforcement officers based on pre-defined assignment areas.
- Investigations were documented on paper forms by officers, which then had to be entered daily into the divisional work management system by those officers when they were back at the district offices.
- Complaint/investigation intake and service request creation was done within MLS as opposed to 311.

Results from the Ontario Municipal CAOs Benchmarking Initiative (OMBI) showed it was taking much longer to close a by-law investigation file in Toronto compared to other municipalities. Given the importance of timeliness and customer service, it became a priority to:

- Better understand the reasons why it took longer in Toronto to close/resolve by-law investigation files and make improvements; and
- Identify if it was possible to undertake more proactive inspections.

In 2009 a detailed analysis of data from the division's work management system was undertaken and showed that:

- Results from the four district offices showed significant differences in both the average number of investigation files handled, and the average number of annual open files per officer; and
- 10% of the officers had a disproportionately higher number of open investigation files that were not being closed.

### **Business Practice Changes and Resulting Improvements**

Based on the work management system review and other analyses, a number of changes were implemented starting in 2009 to improve productivity, reduce closure times for files and improve service. These changes included:

- Preparation of reports on a monthly basis for senior management to examine workload distribution and the status of files;
- Dedicating a supervisor to each of the four districts, charged with assigning all incoming work and deploying staff officers (subsequently replaced by the Investigations Support Unit in January 2011, described below);
- The Director of Investigation Services initiated regular conference calls every two weeks with the four district managers, which included discussions on different approaches for

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clearing backlogs and following up with individual officers on older investigation files;  
and

- Issuing targets in each district such that each officer should be completing a minimum of six inspections per day, or 30 per week.

In January 2011, a centrally located Investigations Support Unit (ISU) was established that is responsible for dispatch and investigation support and also serves as a Tier II call centre to handle specialized or escalated calls transferred from 311. The ISU uses a risk-based approach to triage incoming investigation requests from the public. Emergencies and other priorities are assigned immediately to staff in the field, based on an updated-daily roster of available officers.

In 2009 and 2010, a Remote Computing System was implemented for all by-law enforcement officers. This system uses tablet devices in the field that are connected to the work management system and allows for real time updating of inspection and investigation results and retrieval of assigned work. This system has:

- Increased the productivity of officers who no longer need to travel to the office to update the work management system;
- Improved response to complaints, including emergencies;
- Allowed officers to create proactive investigation files based on observations in the field that can be entered in the system in real time; and
- Improved customer service by providing for a real time status update available to the public at <http://app.toronto.ca/InvestigationActivity/setup.do?action=init> that includes all active investigations as well as information on all files and investigations closed within the past two years.

As a result of the changes noted above, there has been significant improvement since 2009 in:

- The average number of days it takes to respond to a non-emergency complaint or investigation request as shown in Figure 6; and
- The average number of days it takes to complete/close an investigation file as shown in Figure 7.

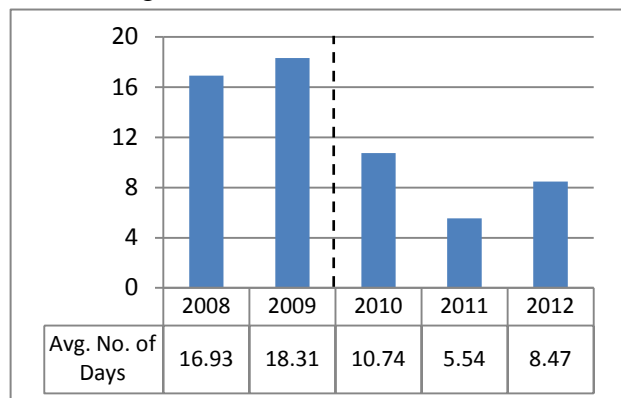


Figure 6 - Investigation Response Time

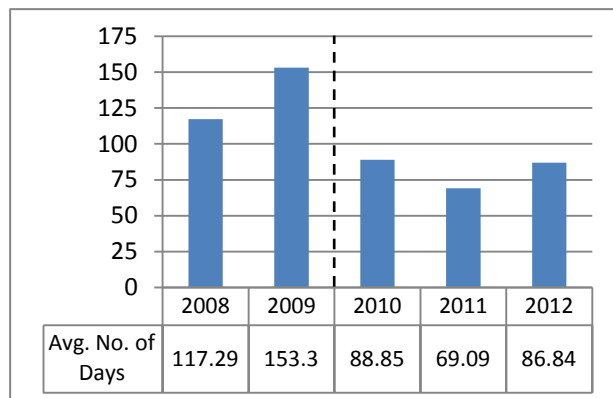
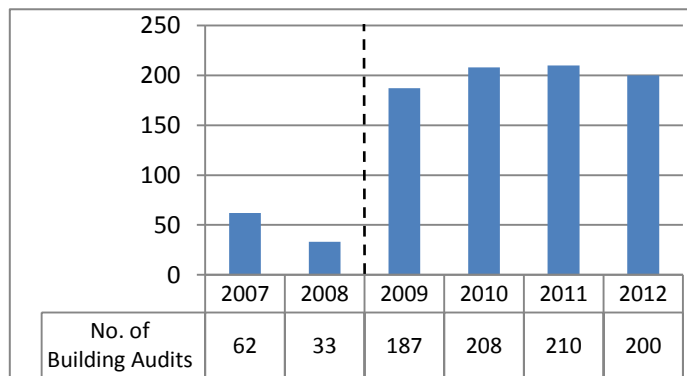


Figure 7 - Time to Complete/Close an Investigation File

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In 2012, the greater amount of time required for initial investigation response and for closing files in relation to 2011 was due to a reduction in the number of officers resulting from a hiring delay.

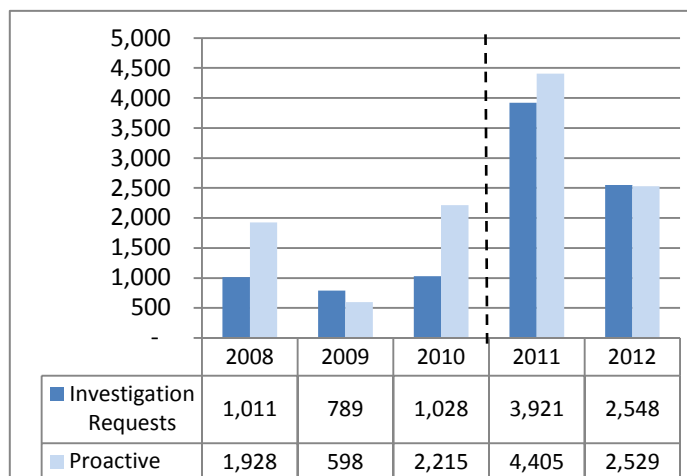
The Division has also been able to free up capacity to form dedicated teams for specific proactive initiatives.



**Figure 8 - Number of Building Audits completed through the MRAB Program**

In December 2008, 14 officers were re-deployed to form the Multi Residential Apartment Building (MRAB) Inspection Program team to ensure minimum property standards are maintained in apartments. As shown in Figure 8, 187 buildings were audited in 2009, 200 or more were audited in subsequent years and more than 44,000 deficiencies have been identified to date through the program.

In 2009, staff from across the districts focussed additional proactive work on illegal mobile sign infractions. This initiative resulted in the removal of 735 mobile signs and 7,300 plastic signs from city streets.



**Figure 9 - Number of Graffiti Enforcement Investigations**

In December of 2010, officers were re-assigned to form a Graffiti Enforcement Team to address graffiti vandalism. This plan involved encouraging the public to report incidents of graffiti vandalism, and proactive efforts by officers to identify incidents and take appropriate action. As illustrated in Figure 9, there was a significant increase in investigation activity, both reactive and proactive, in 2011. Investigation requests (reactive work) dipped in 2012, likely resulting from a huge influx of proactive investigations in the previous year.

Toronto Animal Services has also made recent business practice improvements. In September 2011, a city-wide Animal Enforcement and Mobile Team was deployed in conjunction with a new 24/7 shift schedule. This resulted in both an annual reduction of approximately \$300,000 in overtime and standby costs, and an improvement in response times to service requests.



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### **Other Changes are Planned for the Future**

The following team-based initiatives are planned:

- The Housing Occupancy Standards Team (HOST; started in December 2012) will address the issue of illegal rooming houses on a citywide basis.
- An initiative to reduce posters that are adhered to fixtures/furnishings/light standards/etc. on the road allowance (2013).
- An initiative to manage and document vacant or derelict properties or buildings throughout the city to ensure they are safe and secured in accordance with the property standards by-law (2013).

These proactive approaches to specific by-law enforcement issues will likely result in further efficiency gains and improved service quality. More proactive investigations tend to reduce the number of reactive investigations arising from service requests from the public.

## **TRANSPORTATION SERVICES**

Transportation Services are responsible for the maintenance of 5,355 km of roads, 7,100 km of sidewalks, 539 bridges, 2,200 traffic signals, 73 expressway and arterial road monitoring cameras, 6 customizable highway signs, 77 red light cameras, more than 200 automatic traffic detection stations, over 100 km of bike lanes and 6,043 pieces of street furniture. Activities to maintain this infrastructure are divided into two categories:

- Proactive maintenance that is planned by staff in designated areas of the City at specific times. This forms the majority of the maintenance work, and is the most efficient method because it minimizes unproductive travel time, fuel costs and time spent loading and unloading equipment.
- Reactive maintenance that is done in response to service requests made by the public.

### **Previous Business Practices**

Prior to 2008, when planning started for the integration of Transportation Services with 311, the processes for generating and tracking service requests was as follows:

- The service request was created by the Transportation Services Call Centre and then faxed to one of the works yards. Those requests received at the yards during the day (when crews were out) were addressed the following day.
- Field notes were handwritten on a service request form, faxed from the yards back to the office and then entered into the work management system.
- There were often cases of service requests being assigned and cancelled or transferred upon field investigation if it was determined they should have been directed to another City division.
- No priority status was assigned to service requests when created, although emergency responses were addressed as soon as possible.

### **Business Practice Changes and Resulting Improvements**

Improvements made by Transportation Services in 2008 until the launch of 311 in September 2009 included:

- Development of a process flow chart for the lifecycle of a service request to identify steps in those processes that could be changed and improved;
- Enhancements to the existing work management system (TMMS) to streamline the approach for closing service requests;
- Training of more than 600 Transportation staff on the new enhanced work management system with emphasis on the updating and reporting of field notes to provide better and timelier information to the public regarding the status of service requests;
- Front end service request integration of the existing work management system with 311; and
- Development and implementation of more than 500 questions and answers related to more than 150 types of service requests as part of the 311 knowledge base used by 311 CSRs. Along with providing better and more consistent information to customers, this

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knowledge base content reduced the number of calls transferred by 311 to Transportation staff, freeing up their time to perform other duties.

Improvements made by Transportation Services after the launch of 311 in September 2009 included:

- Generating service requests at the time of the call to the 311 CSRs; service requests are automatically loaded in the work management system;
- Piloting of wireless solutions through mobile computing for Field Investigators and Right Of Way By-Law Enforcement Officers that allowed for better response times to service requests and real-time updating of the status on those service requests in the work management system. This eliminated the need to fax information back and forth between locations and do manual data entry;
- Creating a weekly Service Request Status Report for management to monitor the timeliness of service delivery and initiating bi-weekly reviews by Senior Management;
- Piloting a mapping application that allows for a real time geographic depiction of crews deployed throughout the City and the status of open service requests. This is used to better co-ordinate deployment of resources, and monitor the patterns and status of service requests. A screenshot of this system is shown in Figure 10; and
- Working with 311 CSRs to:
  - Provide a better understanding of Transportation activities, especially in the area of winter maintenance, to better serve callers; and
  - Review the reasons behind cancelled service requests to minimize these instances and avoid needless deployment of field staff.

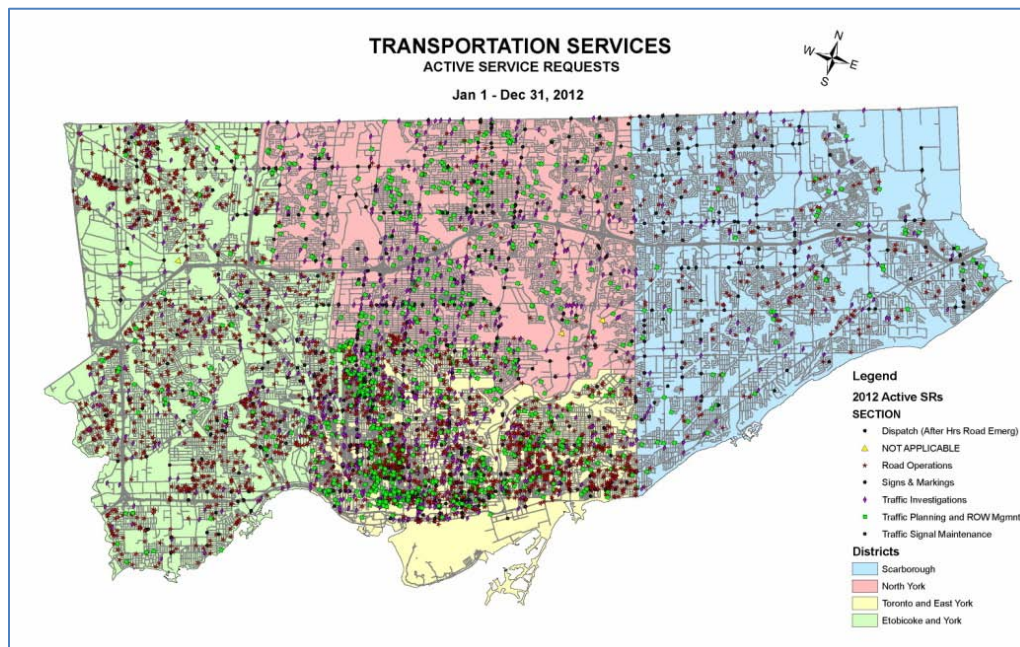


Figure 10 - Illustration of Active Service Requests for Transportation Services, 2012

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As a result of the changes noted above, staff have become more productive and timely in responding to and completing service requests, as well as providing more accurate and current information that can be used to update customers on the status of their service requests.

As noted in Figure 11, there has been a significant improvement in the percentage of service requests that have been completed within the service standard from 68% in 2008 to 96% in each of the past three years.

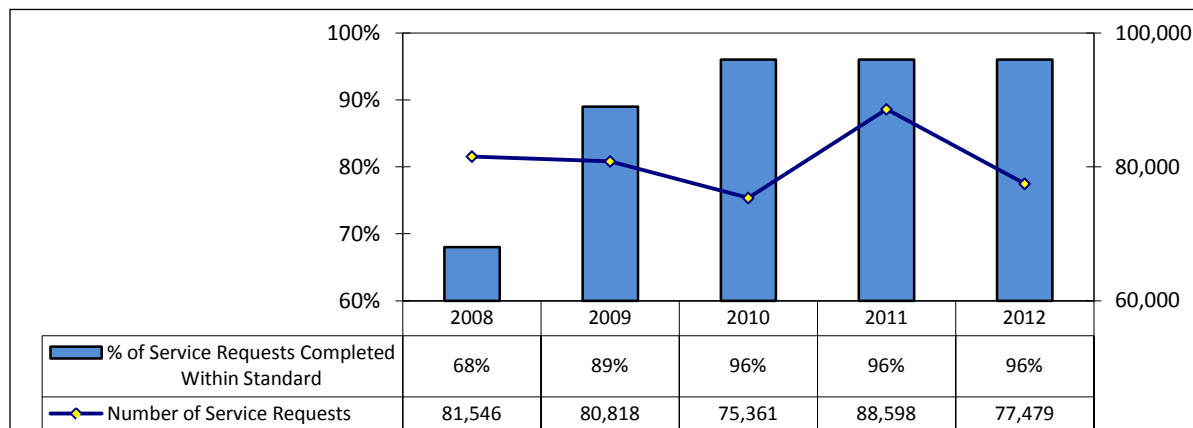


Figure 11 - Number of Transportation Service Requests & Percentage of Requests Completed Within Standard

### Other Changes Planned for the Future

Initiatives planned for 2013 include:

- A pilot project on mobile computing for field crews that would allow for real-time updating of service requests and the work management system; and
- Adding other types of service requests not currently integrated with 311 such as bicycle post-and-ring maintenance and street furniture maintenance.

## **TORONTO WATER**

Toronto Water is responsible for the maintenance of 11,261 km of wastewater pipe, 11,096 km of water pipe, 100 pumping stations, 4 water treatment plants, 4 wastewater treatment plants, reservoirs, storage tanks, stormwater ponds, maintenance yards and water laboratories. It responds to approximately 70,000 service requests from customers annually and generates internally more than 100,000 proactive work orders.

### **Business Practice Changes and Resulting Improvements**

#### Automated Vehicle Locating System (AVL)

In 2012, first responder service vehicles in Toronto Water were equipped with geographical identification equipment. This equipment has provided the capability to track and identify the current geographic position of each field crew and vehicle and their status (i.e., on a call or available). This tracking will improve the planning, dispatching and monitoring of crews in order to utilize the most appropriate resources and provide a better estimate of the time required to get to the next service request.

Tracking and deploying the most appropriate crews, vehicles and equipment to respond to service requests will result in improved response time to service requests and reduced travel time and optimized utilization of resources.

#### Geospatial Viewer of Service Requests

Toronto Water is testing a system that allows staff to see specific and real-time service requests on a map of the City. The service requests are categorized by priority and age of the request relative to the service standard and are represented by colour coding (new, due and overdue requests). The current version focuses on those service requests that have short response times and have the greatest impact on the customer. A screenshot of this system is shown in Figure 12.

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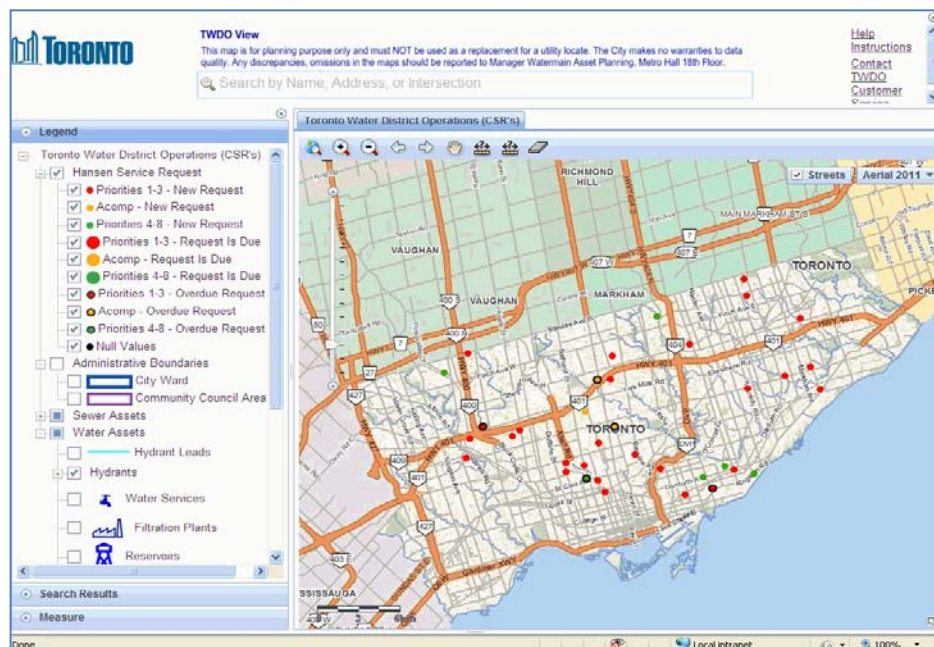


Figure 12 – Screenshot of Toronto Water District Operations View (TWDO View)

This application also maps out the City's water and sewer assets. This information can be used to assist the crews in locating access points and determining where service interruptions could have occurred.

TWDO View will be used to monitor the patterns and statuses of service requests in order to meet service standards, better co-ordinate deployment of resources utilizing the vehicle tracking system noted above, and will help Toronto Water respond more quickly to events such as storms that could result in widespread flooding.

### Other Changes Planned for the Future

Toronto Water is implementing a Reliability Program, which will optimize resource utilization and improve efficiency by doing more proactive maintenance on equipment and assets, which in turn should lead to less reactive maintenance.

Special maintenance practices have been developed for critical process areas in the water and wastewater plants and are now being replicated for work areas and assets in the District Operations. The Reliability Program will also help Toronto Water:

- Meet regulatory compliance requirements;
- Facilitate field inspections and failure analysis to eliminate repetitive process interruptions;
- Improve usage of the work management system; and
- Assist with legislative documentation for both planned and unplanned work.