



**Office of the Auditor General: Audit of
Environmental Services Department, Tabled at
Audit Committee – December 1, 2016**

Contents

Executive Summary	1
Purpose	1
Rationale	1
Findings	2
Conclusion	3
Potential savings.....	4
Recommendations and Responses	5
Detailed Audit Report.....	11
Audit of Environmental Services Department	11
Introduction	11
Background and Context	11
Audit Objectives and Criteria	13
Scope	15
Audit Approach and Methodology.....	16
Audit Observations and Recommendations.....	17
Conclusion.....	36
Potential savings.....	37

Acknowledgments

The team responsible for this audit, staffed from PwC LLP, under the supervision of Sonia Brennan and the direction of Ken Hughes, would like to thank those individuals who contributed to this project, and particularly, those who provided insights and comments as part of this audit.

Original signed by:

Deputy Auditor General

Executive Summary

Purpose

This audit examined the effectiveness and efficiency of the human resource management practices and processes within certain branches of the Environmental Services Department (the Department)¹.

Rationale

The City of Ottawa, through the Environmental Services Department, delivers essential services to protect the health and well-being of residents, and the quality of the City's air, water and land resources. The Department's mission is to provide environmental services that balance the protection of the City's natural resources with planned growth requirements and fiscal constraints. In 2015, the Department had a workforce of 702 Full Time Equivalent (FTE) positions responsible for managing \$18 billion of City assets. Sound management of human resources is crucial to deliver these services in a timely, efficient and effective manner for operational success.

The objective of this audit was to determine whether the Department is managing its human resources in a way that supports the achievement of the departmental objectives and provides the City with reasonable assurance that its operations are carried out effectively, efficiently and in compliance with applicable policies.

The scope of the audit included all operational branches of the Department with the exception of the Solid Waste Services branch, as an audit of Solid Waste Services is planned for the near future. Within the remaining branches, specific units selected for detailed audit testing were as follows:

- Drinking Water Services – Water Production (East and West Units) and Water Distribution Unit

¹ On July 13, 2016, the City merged the Environmental Services Department with the Public Works Department to form the new Public Works and Environmental Services Department. This new department is led by the General Manager, Public Works and Environmental Services.

- Environmental Business Services – First Response Section of the Customer Contact Unit
- Surface Water Management Services – Stormwater Management Unit, and
- Wastewater Services – Wastewater Treatment Unit and Wastewater Linear Network Section of the Wastewater Collection Unit

Findings

The audit focused on seven key areas of human resource management. The key findings associated with each are as follows:

1. **Governance and Oversight:** The Department uses various systems (SAP, Maximo and Maximo Mobile) to schedule and allocate work activities. These systems can aid in providing useful information to determine optimal levels of resourcing to achieve departmental objectives. However, the Department's management currently does not have a standardized approach to planning and scheduling work, or monitoring unit performance and productivity.
2. **Allocation of Resources and Scheduling and Assignment of Work:** Amongst and within the branches of the Department, different processes and practices are in place to schedule and manage work. As a result, the quality of scheduling and work order management varies across the Department. We found opportunities for improvement regarding job plan estimates, formal assignment of work and route scheduling. Improving the quality of scheduling and work order management is important to minimize employee idle time and ensure the most efficient use of available resources.
3. **Management of Assets in Support of Fieldwork:** Each branch and unit within the Department has developed their own informal practices to manage the release, use and return of City vehicles and equipment. Supervisors and managers do not confirm the return of all keys daily. Improved monitoring of the use of these assets, for example, installation of GPS, would help ensure that they are being safeguarded and used exclusively for City activities, in line with the City's *Personal Use of Vehicles Policy*.
4. **Systems and Processes to Support Accurate Time Reporting:** The Department has not provided clear guidelines to staff for charging time against non-specific work order codes such as "Administrative" or "Miscellaneous", resulting in inconsistent practices. For example, the recording of travel time may be included as part of labour hours or tracked separately. Without a standard approach to recording non-specific work activities, the Department's management

and supervisors cannot evaluate whether the times reported are reasonable. Further, it does not allow for comparison of productivity across and within branches, or the ability to assess the overall impact on human resource capacity needs.

- 5. Monitoring of Work Performed:** The audit examined supervisory oversight practices in the Department. Inconsistencies exist in current practices, for example, supervisory site visits are performed regularly by some and infrequently by others. Site visits can provide valuable insight to supervisors on the productivity of their field teams.

The Department's management currently does not have a standardized approach to monitoring employee performance and productivity. While some units use performance metrics, there are limited measures to monitor productivity, such as work order completion time. In several units, performance and productivity monitoring is only performed when assessing or responding to a particular performance issue or concern. As a result, management does not have reliable information to evaluate the efficiency and effectiveness of the workforce.

- 6. Management of On-call and Overtime:** We found that practices such as staggering work shifts and more scheduling of contractors during regular working hours has contributed to a favourable trend in overtime costs, with a 35% reduction (approximately \$779,000) when compared with the same period one year earlier.

- 7. Performance Management:** The City does not currently have a formal monitoring process for the status of the completion of the annual Performance Development Program for CUPE staff, who represent approximately 80% of the staff in the branches within the audit scope. Based on a sample of employees, we found that only 24% of the individuals selected had a completed 2015 Individual Contribution Agreement (ICA) on file. Further, 52% of the employees selected either did not have a completed ICA in their personnel file, or their most recent one was dated over four years ago. Employees are not receiving formal job performance feedback in a timely manner to enable them to identify opportunities to develop their skills.

Conclusion

In order to fulfill its mandate, and efficiently and effectively manage its resources, the Environmental Services Department branches must schedule resources, allocate work

Audit of Environmental Services Department

orders, oversee the work and measure results; both at a unit level and an individual level.

The practices currently in place across the Department to schedule, manage and allocate work to staff are inconsistent. In some units, this restricts the ability to hold individuals accountable for job performance, and it does not allow for sufficient supervisory oversight and measurement of productivity. Further, supervisory oversight practices, in many cases, do not provide the insight to supervisors of the activities of their staff and do not allow them to validate the activities reported on work orders and timesheets. Finally, a standard approach to measure unit performance has not been established across the Department and for the most part, does not consider productivity measures and targets.

Overall, improvements are required to standardize the work order management process and associated monitoring of departmental staff to allow for improved accountability, productivity and oversight. Existing good practices and technologies used within the branches should be considered for adoption across the Department.

Potential savings

The following are potential saving opportunities for the City relative to the Department:

- Standardized scheduling and work order management processes will reduce supervisory time in the allocation of work to staff and improve the effectiveness of planning of appropriate staffing levels.
- Implementation of the Maximo Mobile solution would reduce duplication of efforts through the elimination of paper work orders and the streamlining of the data entry process. More specifically, staff will be able to update the status of work orders directly in the field, eliminating the need for data entry at the end of the day.
- Improved supervisory oversight and time reporting against non-specific work orders will help supervisors identify productivity issues on a timely basis, and enable more effective planning of appropriate staffing levels.
- The consideration of route planning in the scheduling of work orders may reduce the gas and maintenance costs of the vehicles used by staff along with travel time. More specifically, route planning will enable staff to complete more work orders in less time by reducing their time spent on the road.

Recommendations and Responses

The audit resulted in a number of recommendations, as listed below. Please refer to the attached audit report for additional details.

Recommendation #1

That the Department implement a standardized approach to scheduling and managing work orders across the Department. This should include formally assigning work orders to staff based on priority and geography and the establishment of formal route planning strategies. Consideration should be given for the implementation of Maximo Mobile for units currently using Maximo. A phased approach by unit may be most prudent until existing technological issues are resolved.

Management response:

Management agrees with this recommendation.

As a newly formed department Public Works and Environmental Services (PWES) is beginning the process of harmonizing operational practices and guidelines across the department. There are many operational synergies throughout the PWES branches and most operational units have established work order procedures; which, with adequate resources and technology, can be further developed to fit within a consistent departmental approach.

Resources have been identified within the department that will implement a project to support this process by evaluating and identifying current functionalities of SAP and Maximo that are not being utilized to their full capacity. Additionally, the project will identify any potential upgrades that may facilitate an enhanced and consistent approach to managing work orders in both SAP and Maximo.

The first phase of this initiative will focus on evaluation, assessment and analysis. This phase will be completed by Q4 2017 and will form the larger project plan for implementation moving forward.

Recommendation #2

That the Department update existing job plan estimates within SAP and Maximo on a regular basis, based on the knowledge and experience of supervisors, maintenance planners and employees. Consideration can also be given to expanding the use of job plan estimates where feasible.

Management response:

Management agrees with this recommendation.

As part of the 2017 PWES work plan, the department will be moving forward with a project to provide historical data to help identify past averages for completing different jobs. This will be the first phase of a multi-phase project to develop more accurate job plan estimates. This phase will be completed by Q4 2017.

Upon completion of the first phase, the department will be in a position to evaluate the timelines for the subsequent components of the project. This will include consultations with supervisors and maintenance planners and, the necessary support for updating the information in SAP and Maximo.

Recommendation #3

That the Department establish a standard set of non-specific work order codes, including formal guidelines on how and when to use them, to enable the effective monitoring of resource capacity and administrative costs to identify areas for improvement in productivity and cost management.

Management response:

Management agrees with this recommendation.

As a newly formed department PWES is in the process of harmonizing policies and guidelines in all areas of operations. This process will be a component of a broader comprehensive alignment strategy for PWES. The first phase will be focused on evaluating and assessing the existing policies and guidelines and identifying the operational gaps. This phase will be completed by Q4 2017.

Resources have been established within the department to support the implementation of a standard set of non-specific work order codes with the necessary configuration, documentation and training once the guidelines have been established. Upon completion of the first phase, the department will be in a position to evaluate the timelines for the subsequent components of the project.

Recommendation #4

That the Department adopt a consistent approach to tracking travel time for all work orders.

Management response:

Management agrees with this recommendation.

The functionality currently exists in both SAP and Maximo to track this information however; the benefit of time-tracking for all work orders needs to be evaluated against the amount of operational staff time that would be dedicated to performing the task of time-tracking.

This level of detail would require the establishment of a new business process and the revision of the existing paper forms to capture the additional layers of information. Capturing this additional level of detail will require additional time for operational staff to further break down how their time is spent in the field, along with additional time for data entry into SAP and Maximo.

Management will pursue the development of more robust job plan estimates and reserve any actual time-tracking for specific circumstances to be evaluated on a case-by-case basis. The first phase of this initiative will focus on data collection and analysis and will be completed by Q4 2017. Upon completion of the first phase, the department will be in a position to evaluate the timelines for the subsequent components of the project.

Recommendation #5

That the Department establish an appropriate set of metrics and targets to improve the evaluation of departmental performance and productivity.

Management should establish a regular review of performance results against targets and take appropriate actions, as necessary.

Management response:

Management agrees with this recommendation.

Departmentally, there are many units with established metrics and reporting procedures and PWES will be leveraging synergies between branches to develop more consistent and meaningful metrics and targets. This will also be dependent on acquiring appropriate technology and resources to record, interpret and disseminate the data.

Audit of Environmental Services Department

Staff are evaluating the potential upgrades to newer versions of Maximo and SAP, which would provide improved reporting functionalities. Additionally, the implementation of a new business intelligence tool (e.g. Cognos, Tableau, Qlik, and Microsoft Dynamics etc.) would allow for more robust, powerful and multidimensional reporting capabilities to improve the evaluation of ESD performance and productivity across all systems.

PWES will be developing a comprehensive departmental strategy to improve the evaluation of performance and productivity by Q4 2017.

Recommendation #6

That the City establish clear expectations for supervisory oversight, including:

- **The review and approval of daily timesheets and work orders.**
- **The completion and documentation of the results of site visits of field teams for regular review with operational management.**
- **An appropriate level of documentation necessary to demonstrate ongoing monitoring activities (e.g. supervisor log book or annotations on the work order).**

Management response:

Management agrees with this recommendation.

There are currently well established supervisory oversight practices across the department however, because PWES is a newly formed department, the approaches are inconsistent. As the department continues to harmonize, there are plans to host a department-wide mandatory supervisory forum that will review core accountabilities for supervisors and managers. This will include consistent business processes for oversight in the following areas:

- Staff time management and reporting,
- Clearly documented information regarding site visits and operational unit meetings,
- Monitoring and recording of work activities, and
- Performance monitoring and development.

The supervisory forum will be added to the 2017 PWES workplan and is expected to be completed by Q4 2017.

Recommendation #7

That the Department implement a program to monitor the use and return of City vehicles and equipment. Consideration should be given to the installation of GPS in departmental vehicles.

Management response:

Management agrees with this recommendation.

PWES will be evaluating the implementation of GPS technology in the departmental fleet. This initiative will be considered as part of a broader mobility program for the department and will be implemented as funding permits. The project plan will be developed by Q4 2017.

Recommendation #8

That the Department ensure that all managers and supervisors participate in the timely completion of the annual performance development process for all employees.

Management response:

Management agrees with this recommendation.

Performance review and development will be included as a key accountability for managers and supervisors in upcoming mandatory departmental supervisory forums in 2017. Senior leaders will ensure that managers and supervisors have consistent knowledge of, and will ensure timely completion of, the annual performance development process.

Recommendation #9

That the City consider implementing a formal monitoring process over the completion and approval of ICAs for CUPE staff, whereby:

- **Supervisors are responsible for reporting on the status of each ICA they are responsible for completing.**
- **Managers are required to review the reporting prepared by supervisors on a timely basis and follow-up on ICAs which have not yet been completed.**

In the long term, the City should consider the adoption of the e-Performance system for all departmental units because of its capability to report on the status of ICAs.

Management response:

Management agrees with this recommendation.

PWES will support the corporate-wide strategy once established within the newly aligned organization in 2017.

Audit of Environmental Services Department

The detailed section of this report is available in English only and may be translated in whole or in part upon request. For more information, please contact Ines Santoro at 613-580-2424, extension 26052.

La section détaillée de ce rapport n'existe qu'en anglais et pourrait être traduite en partie ou en totalité sur demande. Renseignements : Ines Santoro, 613-580-2424, poste 26052.

Detailed Audit Report

Audit of Environmental Services Department

Introduction

The Audit of the Environmental Services Department (the Department) was included in the 2015 Work Plan of the Office of the Auditor General (OAG), approved by City Council on March 12, 2015.

Background and Context

The City of Ottawa (the City) delivers essential services through the Department to protect the health and well-being of residents and the quality of the City's air, water and land resources. The Department's mission is to provide environmental services that balance the protection of the City's natural resources with planned growth requirements and fiscal constraints.

The Department delivers on its mission through six branches with different service areas:

- **Drinking Water Services** branch is responsible for providing quality drinking water to the City's residents using a water supply system comprised of two Water Purification Plants (Britannia and Lemieux Island), five communal well systems, and a large network of pipes, pumping stations, storage facilities, valves, fire hydrants and water meters across the City.
- **Wastewater Services** branch is responsible for the operation of the City's wastewater collection and treatment systems, which include the City's Treatment Plant known as 'Robert O. Pickard Environmental Centre' (ROPEC), and a network of over 5,800 kilometers of sewer pipes, 85 pumping stations and several odour control facilities.

Audit of Environmental Services Department

- **Solid Waste Services**² branch operates the municipal residential solid waste removal and disposal system.
- **Surface Water Management Services** branch operates the City's storm water drainage and treatment systems (made up of storm water ponds, underground treatment facilities and municipal drains), supports the resolution of jurisdictional issues on waterways and valley lands that provide storm water drainage, delivers water quality testing, and operates a water quality laboratory.
- **Environmental Business Services** branch delivers the City's environmental policy, program and outreach activities, including environmental grant programs, operates the First Response Unit and the Locate services, and provides clerical and administrative support services to the operational branches mentioned above.
- **Environmental Engineering** branch is responsible for providing engineering and technical services to the Department in the areas of asset management, buildings and grounds, strategic investment and capital planning, and network and IT project implementation.

In 2015, the Department operated and maintained City assets valued at \$18 billion with a workforce of 702 Full Time Equivalent (FTE) positions. The annual operating budget was \$174 million. Solid Waste Services, Drinking Water Services and Wastewater Services represented the largest share of the Department's total operating costs as shown in the table below.

² The Solid Waste Services Branch is not included in the scope of this audit.

Table 1 – Environmental Services Department Total Operating Budget and FTEs by Branch for the year ended December 31, 2015 (rounded)

Branch	Operating Budget (in millions of \$)³	Total FTEs⁴
Solid Waste Services	61	59
Drinking Water Services	53	265
Wastewater Services	35	159
Environmental Engineering	10	86
Environmental Business Services	8	76
Surface Water Management Services	6	52
Other	1	5
Total	174	702

On July 13, 2016, the City merged the Department with the Public Works Department to form the new Public Works and Environmental Services Department. This new department is led by the General Manager, Public Works and Environmental Services.

Audit Objectives and Criteria

The objective of this audit was to determine whether the Environmental Services Department is managing its human resources in a way that supports the achievement of the departmental objectives and provides the City with reasonable assurance that its operations are carried out effectively, efficiently and in compliance with applicable policies.

Based on an assessment of risks, the audit focused on human resource management within the Department, including the following:

- Governance and oversight

³ Source: Operating Status Report, June 15, 2016; operating budget net of recoveries and non-departmental expenditures.

⁴ Source: ESD Talent Scorecard – Q4 2015

Audit of Environmental Services Department

- Allocation of resources and scheduling/assignment of work
- Management of assets in support of fieldwork
- Systems and processes to support accurate time reporting
- Management/supervisory monitoring of work performed
- Management of on-call time and overtime
- Performance management

Based on the prioritized areas of focus listed above, audit criteria were developed and applied during the audit to assess the Department's performance as follows:

Table 2 – Audit Criteria

Audit Criteria	
Governance and Oversight	
1.1	An appropriate governance/organizational structure is in place to allow for supervision and oversight of departmental resources and supports the achievement of Departmental objectives.
1.2	Roles, responsibilities and accountabilities have been formally established and communicated to all levels within the Department.
1.3	Management's oversight and reporting on resource management (i.e. performance indicators and financial results) is accurate, timely and effective.
Allocation of Resources and Scheduling/Assignment of Work	
2.1	Branches within the Department are able to recruit/retain and adequately allocate tasks to qualified staff to allow efficient and effective completion.
2.2	The approach to scheduling/assignment of activities/tasks to operational units allows for the efficient use of available resources and avoids employee idle time.
Management of Assets in Support of Fieldwork	
3.1	There is a formal process in place to assign supporting assets (e.g. equipment, vehicles and tools) to staff in the field to ensure safeguarding of City assets.
3.2	Processes are in place and oversight is ongoing to confirm that supporting assets allocated to departmental staff are being safeguarded and used exclusively for City activities.

Systems and Processes to Support Accurate Time Reporting	
4.1	Processes/controls and tools are in place to accurately and completely report the activities conducted by operational staff (including data entry, where applicable).
4.2	Performance indicators and measurement capabilities have been established to evaluate the performance of operational staff by supervisors/management.
4.3	Supervisory oversight and monitoring is in place to identify and follow-up on potential issues with work performed/time reported by operational staff.
Management/Supervisory Monitoring of Work Performed	
5.1	A supervisory framework has been formally established to allow for real-time monitoring of the activities of operational staff against work schedules/task allocation.
5.2	Monitoring of supervisory activities are conducted by program management.
Management of On-Call Time and Overtime	
6.1	Processes are in place within the Department to approve and monitor on-call/overtime by operational/supervisory staff to facilitate compliance with applicable collective agreements and to enable economical and efficient use of City resources.
Performance Management	
7.1	Performance management activities are undertaken in line with City policies to ensure that performance feedback to employees is timely and that identified performance issues are escalated, as necessary, and appropriate actions taken.

Scope

The scope of this audit included all operational branches of the Department, with the exception of the Solid Waste Services branch as an audit of Solid Waste Services is planned for the near future.

Within the in-scope branches, specific units were selected for detailed audit testing:

- Drinking Water Services – Water Production (East and West Units) and Water Distribution Unit

Audit of Environmental Services Department

- Environmental Business Services- First Response Section of the Customer Contact Unit
- Surface Water Management Services – Stormwater Management Unit
- Wastewater Services – Wastewater Treatment Unit and Wastewater Linear Network Section of the Wastewater Collection Unit

The audit coverage period was July 1, 2015 through June 30, 2016.

Audit Approach and Methodology

The audit methodology included the following activities:

- Interviews with staff members within the in-scope branches/units of Environmental Services Department at all levels and other directly related City departments (e.g. Finance, Human Resources).
- Review of relevant documentation (e.g. organizational charts, job descriptions, training documents, policies/procedures, process documentation, and performance reports).
- A variety of audit testing techniques including testing of sample activity/time tracking documentation, evidence of supervisory monitoring and review, evidence of approvals of overtime and sample reporting.

The audit plan was finalized in July 2016 and the audit fieldwork was substantially completed by September 2, 2016.

Audit Observations and Recommendations

A) Scheduling and Work Order Management

A.1) Some Environmental Services Department units do not have effective processes in place to assign and schedule work orders to staff and teams, monitor activities in real time, and ensure work is completed timely and efficiently by assigned staff.

A large component of the Department's operations consists of managing the maintenance of the City's assets for drinking water, wastewater and stormwater services. The asset maintenance activities can be preventative, corrective, part of a capital project, or in response to an emergency; for example, a flooded basement of a city resident.

No matter the type of work to be performed, a work order is required for the assignment and scheduling of resources. Two main automated information systems are used to generate work orders for all maintenance activities:

The Plant Maintenance (PM) module of SAP is used to generate and manage work orders for wastewater and drinking water treatment plants (i.e. ROPEC, Lemieux Island and Britannia plants and pumping stations, and storage facilities), stormwater facilities and wastewater pumping stations. It is also used to maintain information on the lifecycle of the equipment within these facilities.

Maximo is used to generate work orders and manage asset maintenance for the First Response Section and for field units managing a linear infrastructure network, such as watermains and sewers.

Without a departmental standard, it was found that the Department's units use different processes to schedule and manage work, regardless of whether they use SAP or Maximo for asset maintenance. As a result, the quality of scheduling and work order management varies across the Department, as follows:

In some units, supervisors produce a formal schedule using Maximo or other tools, such as Excel for assigning and scheduling work to staff, including estimated completion times and due dates.

Other units have a less formal process in place, whereby workers select their own work orders for the day, and supervisors do not assign estimated completion times and due dates.

One unit has implemented the Maximo Mobile electronic application to replace the existing paper-based work order system for the scheduling and completion of work orders.

Units with Formal Scheduling and Work Order Assignment

In two of the units audited, maintenance planners are responsible for supporting work order planning, including organising, coordinating and developing job plan estimates for supervisors. Each month maintenance planners inform supervisors of upcoming work orders to be completed. As required, other work orders are created by either the maintenance planners or the supervisors. In those units using SAP, supervisors prepare a preliminary weekly schedule in Excel that details the work orders and the estimated hours to be completed by staff.⁵ Managers, maintenance planners and supervisors meet to discuss, coordinate and finalize the upcoming schedules on a weekly or biweekly basis.

In most units, supervisors hand out paper copies of work orders to staff. Staff members receiving the work orders are accountable to complete the work they are assigned. As these staff members complete work orders during their day, they write on the work order or timesheet a description of completed tasks and on their respective activity sheets, completion hours and the vehicle(s) used. They return these documents to the supervisor at the end of the day. A separate unit enters the data from the work order into SAP or Maximo.

Units without Formal Scheduling and Work Order Assignment

In contrast to the above, the audit identified units that do not rely on formal schedules and allocation of work orders. For example, one unit's supervisors assign work orders to staff representing several days or weeks of work, without providing estimated completion hours and due dates. In another unit in a different branch, staff are assigned to a specific geographic area, and they are responsible for all asset maintenance work orders in that area. The audit team observed that a large number of work orders for that team are open for the full year and that many 2015 work orders had not been closed by the end of the second quarter of 2016. Follow-up on the status of these work orders

⁵ The audit noted that in at least one unit supervisors assign staff to teams and work duties on a monthly basis (e.g. contractor oversight, construction, etc.), and they prepare daily schedules to reflect these work assignments.

Audit of Environmental Services Department

identified that some had not been closed although the work had been completed. In other cases, decisions had been made to postpone the work to the subsequent year but this was not documented and the work orders had not been closed.

Without established schedules and assignment of work orders to staff, there is limited transparency or ability to demonstrate timely and efficient completion of the work. Additionally, supervisors cannot effectively monitor the status of outstanding work orders or obtain assurance that the work has been completed other than through site inspections.

In the units tested, no formal route planning is used in work order scheduling. Route planning provides planners and supervisors opportunities to reduce overall travel time between work sites; allowing for increased productivity.

Maximo Mobile for Work Order Management

Maximo Mobile technology was introduced in one unit in 2015 as part of the ServiceOttawa Program to enable a more effective and efficient process for scheduling and managing work orders.

As service requests come in, they are entered into Maximo and assigned a priority. A coordinator generates a work order based on the service request and assigns it to a staff member. The staff member is responsible for accessing the work order in Maximo on their laptop computer in the field and completing the work. Once the staff member completes the work, they enter their labour and vehicle hours and any materials used directly in the work order in Maximo. The staff member will then call their coordinator for their next work order assignment.

To date, only one unit within the Department is using Maximo Mobile; however, one other unit is scheduled for implementation in 2017.

Based on information gathered during the audit, the use of Maximo Mobile can lead to several benefits⁶:

⁶ The audit noted that current issues with connectivity have affected the results of the Maximo Mobile implementation within ESD and have impacted staff productivity. Resolution of these connectivity issues is necessary to maximize the benefits of this application.

Audit of Environmental Services Department

- Enhanced supervisory oversight – With the real-time update of the mobile technology, supervisors have increased visibility as to the whereabouts of their staff.
- Increased accountability – By assigning work using the mobile technology, ownership of a work order is assigned to a specific individual whose responsibility it is to complete the work order. They are then responsible to report back to the coordinator once the task is completed.
- Efficiency of work scheduling – Using the mobile technology avoids the needs for other manual methods for assigning work orders as the work orders are assigned in Maximo based on priority and geography.
- Timeliness and accuracy of time reporting – The mobile solution allows updating of work orders in real-time, using a laptop computer; instead of handwriting updates on a physical work order with data entered into SAP or Maximo, at a later time. This reduces the risk of data entry errors, eliminates the need for duplication of effort and increases the timeliness of time reporting.

Recommendation #1

That the Department implement a standardized approach to scheduling and managing work orders across the Department. This should include formally assigning work orders to staff based on priority and geography and the establishment of formal route planning strategies. Consideration should be given for the implementation of Maximo Mobile for units currently using Maximo. A phased approach by unit may be most prudent until existing technological issues are resolved.

Management Response:

Management agrees with this recommendation.

As a newly formed department Public Works and Environmental Services (PWES) is beginning the process of harmonizing operational practices and guidelines across the department. There are many operational synergies throughout the PWES branches and most operational units have established work order procedures; which, with adequate resources and technology, can be further developed to fit within a consistent departmental approach.

Resources have been identified within the department that will implement a project to support this process by evaluating and identifying current functionalities of SAP and Maximo that are not being utilized to their full capacity. Additionally, the project will

identify any potential upgrades that may facilitate an enhanced and consistent approach to managing work orders in both SAP and Maximo.

The first phase of this initiative will focus on evaluation, assessment and analysis. This phase will be completed by Q4 2017 and will form the larger project plan for implementation moving forward.

A.2) Job plan estimates in SAP and Maximo are outdated in some units.

The effectiveness and efficiency of the Department's asset maintenance management requires that SAP/Maximo work orders contain accurate information including descriptions of the tasks to be completed and forecasted completion hours.

SAP and Maximo have routine tasks already included within the system that are used to populate individual work orders with an associated estimated time to complete. The process and frequency to review and update estimated completion times for these routine tasks vary across departmental units. It was noted that some job plan estimates can be out of date (examples as old as 2002).

Due to the outdated job plan estimates in SAP and Maximo, some supervisors reported that they rely on their judgement and knowledge of the estimated time to complete a task to create the work schedules. In some units, supervisors do not update the work order with their estimated time to complete before allocating the work orders to staff. The audit noted that hours scheduled for a task can sometimes vary significantly with hours estimated in SAP and Maximo.

Without accurate job plan estimates in SAP and Maximo, management cannot accurately measure actual completion time against their estimates. Having this data would enable management to more accurately analyze their resource capacity.

Recommendation #2

That the Department update job plan estimates within SAP and Maximo on a regular basis, based on the knowledge and experience of supervisors, maintenance planners and employees. Consideration can also be given to expanding the use of job plan estimates where feasible.

Management Response:

Management agrees with this recommendation.

As part of the 2017 PWES work plan, the department will be moving forward with a project to provide historical data to help identify past averages for completing

Audit of Environmental Services Department

different jobs. This will be the first phase of a multi-phase project to develop more accurate job plan estimates. This phase will be completed by Q4 2017.

Upon completion of the first phase, the department will be in a position to evaluate the timelines for the subsequent components of the project. This will include consultations with supervisors and maintenance planners and, the necessary support for updating the information in SAP and Maximo.

B) Time Reporting

B.1) Reporting of time spent on non-specific activities is inconsistent.

Departmental units have established work order codes to track non-specific activities (i.e. activities that are not associated with preventative or corrective maintenance, part of a capital project, or in response to an emergency). Various names have been given to these non-specific work order codes, including “Administrative”, “Miscellaneous”, “Downtime”, “General Supervision”, “Truck Maintenance” and “Yard Work”.

It was highlighted during our audit that no clear guidelines or directives have been provided on how to charge time against these non-specific work order codes. As a result, inconsistent practices were observed, including:

- Charging time spent preparing trucks first thing in the morning. It was noted that in specific units, this time was charged to ‘Administrative’ and, in other units, to the first work order of the day.
- Differentiating between ‘Yard Work’ and ‘Downtime’; specifically, what defines each category of work.
- How to charge different types of ‘Downtime’; for example, vehicle breakdown as compared to idle time.

The table below compares hours charged to non-specific work order codes for four teams – two at Location A and two at Location B. The teams are of similar size and conduct similar work at similar locations within the same branch.



Table 3 – Comparison of Time Charged (in hours) to Non-Specific Work Order Codes for Four Teams within two units of the Same Branch for Q3 and Q4 2015 and Q1 and Q2 2016

Work Order Code	Q3 and Q4 2015				Q1 and Q2 2016			
	Location A	Location B	Difference	Percentage (%)	Location A	Location B	Difference	Percentage (%)
Miscellaneous	271	190	81	43	241	184	57	31
Truck Maintenance	114	63	51	81	282	89	193	217
Total	385	253	132	52	523	273	250	92

Table 3 demonstrates that the teams servicing Location A consistently charge a higher number of hours to the non-specific work order codes as compared to the teams at Location B. Overall in the last two quarters of 2015, Location A teams charged 52% more hours than Location B. In the first quarters of 2016, this increased to 92% more hours charged to non-specific work order codes.

Without a standard approach to recording non-specific activities, the Department's management and supervisors cannot evaluate whether the times reported are reasonable. Further, given the practice in some units of recording time for non-specific work related activities in the first work order of the day, the Department is unable to compare productivity across and within branches and to assess the overall impact on human resource capacity needs.

Recommendation #3

That the Department establish a standard set of non-specific work order codes, including formal guidelines on how and when to use them, to enable the effective monitoring of resource capacity and administrative costs to identify areas for improvement in productivity and cost management.

Management Response:

Management agrees with this recommendation.

As a newly formed department PWES is in the process of harmonizing policies and guidelines in all areas of operations. This process will be a component of a broader comprehensive alignment strategy for PWES. The first phase will be focused on evaluating and assessing the existing policies and guidelines and identifying the operational gaps. This phase will be completed by Q4 2017.

Resources have been established within the department to support the implementation of a standard set of non-specific work order codes with the necessary configuration, documentation and training once the guidelines have been established. Upon completion of the first phase, the department will be in a position to evaluate the timelines for the subsequent components of the project.

B.2) The Department's units have inconsistent approaches to reporting travel time.

The audit identified that the general practice within the Department is to report travel hours as part of the overall work order labour hours. Managers and supervisors reported that the inability to separate travel time from work order completion affects the

Audit of Environmental Services Department

quality of the data on actual work order completion times, as completion times depend on work location and traffic conditions.

Two field units confirmed that travel time is reported separately in their work orders so they can be tracked separate from labour hours related to service activities. The Department's representatives confirmed that both SAP and Maximo have the capability to code and track travel time separately from work order labour hours.⁷

Without separately tracking travel hours, the Department does not have accurate information to assess and monitor the 'true cost' of service task completion, net of travel time, to allow for more efficient resource planning and scheduling. Further, it limits the ability for managers and supervisors to assess whether reported travel times are excessive and whether additional departure locations should be considered.

Recommendation #4

That the Department adopt a consistent approach to tracking travel time for all work orders.

Management Response:

Management agrees with this recommendation.

The functionality currently exists in both SAP and Maximo to track this information however; the benefit of time-tracking for all work orders needs to be evaluated against the amount of operational staff time that would be dedicated to performing the task of time-tracking.

This level of detail would require the establishment of a new business process and the revision of the existing paper forms to capture the additional layers of information. Capturing this additional level of detail will require additional time for operational staff to further break down how their time is spent in the field, along with additional time for data entry into SAP and Maximo.

Management will pursue the development of more robust job plan estimates and reserve any actual time-tracking for specific circumstances to be evaluated on a case-by-case basis. The first phase of this initiative will focus on data collection and

⁷ Future implementations of Maximo Mobile will introduce the capability to record travel time separately from completion time against an individual work order. This capability is not currently available for Maximo Mobile.

analysis and will be completed by Q4 2017. Upon completion of the first phase, the department will be in a position to evaluate the timelines for the subsequent components of the project.

C) Performance Monitoring

C.1) Monitoring of unit performance and productivity is informal.

The Department's management does not currently have a standardized approach to the monitoring of unit performance and productivity. In several units, performance and productivity monitoring is only performed when assessing or responding to a particular performance issue or concern.

Three units who use SAP have established performance metrics, and are tracking those through quarterly reports, including trends between quarters. Some of the metrics being tracked include:

- Work order turnover (e.g. ratio of work orders completed to work orders requested).
- Percentage of time spent on work orders vs. Downtime.
- Percentage of total work order hours scheduled vs. total work order hours.
- Total planned work order hours vs. total available staff hours.

These quarterly reports are presented to operational managers and supervisors, and variations to expectations are discussed.

Within these performance metrics, there are limited measures to monitor productivity. While the quarterly reports do measure downtime, they do not include other metrics such as work order completion times and variances between actual completion times and expected completion times. Additionally, for the most part, these units have not established performance and productivity targets.

Units using Maximo have also developed performance metrics and targets; for example, for work order completion times. With Maximo Mobile, real-time data allows management to have access to daily reports on performance metrics such as workload by employee and average response time, and to track performance against targets.

The implementation of performance and productivity metrics and targets for each unit would provide management with reliable information to evaluate of the efficiency and effectiveness of the workforce, and the optimal workforce size.

Recommendation #5

That the Department establish an appropriate set of metrics and targets to improve the evaluation of departmental performance and productivity. Management should establish a regular review of performance results against targets and take appropriate actions, as necessary.

Management Response:

Management agrees with this recommendation.

Departmentally, there are many units with established metrics and reporting procedures and PWES will be leveraging synergies between branches to develop more consistent and meaningful metrics and targets. This will also be dependent on acquiring appropriate technology and resources to record, interpret and disseminate the data.

Staff are evaluating the potential upgrades to newer versions of Maximo and SAP, which would provide improved reporting functionalities. Additionally, the implementation of a new business intelligence tool (e.g. Cognos, Tableau, Qlik, and Microsoft Dynamics etc.) would allow for more robust, powerful and multidimensional reporting capabilities to improve the evaluation of ESD performance and productivity across all systems.

PWES will be developing a comprehensive departmental strategy to improve the evaluation of performance and productivity by Q4 2017.

D) Supervisory/Managerial Oversight

D.1) Key components of supervisory oversight are not performed consistently.

Supervisors are expected to monitor worker productivity and output, and mentor staff according to their formal job descriptions and feedback from operational managers. The audit observed that almost all supervisors meet with their teams at the start and end of each day to assign work, provide instructions, and discuss issues. However, the audit noted inconsistencies in how and when supervisors are conducting site visits, and in their review and approval of timesheets and work orders.

Site Visits

One key activity that supervisors are responsible to perform according to departmental operational managers is site visits.⁸ A site visit is where a supervisor arrives to a work site to confirm their team is where they are expected to be, are completing the tasks to the necessary requirements, and are adhering to health and safety regulations. During these site visits, supervisors also provide support to their teams as required and respond to questions. Site visits can provide valuable insight to the supervisor on the productivity of their field teams. One unit established the expectation that supervisors spend approximately four hours per day in the field visiting their teams.

Across the field units within the scope of the audit, site visits are being performed inconsistently; for example:

- Some site visits are focused primarily on health and safety elements only, while others include elements of work quality and productivity.
- Most site visits are announced in advance which allows teams to prepare for the visit.
- Some supervisors conduct site visits regularly to allow sufficient oversight of work teams, while other supervisors perform visits infrequently.

It was noted that limited documentation was available to confirm completion of the site visits.

Without the consistent completion of site visits, supervisors cannot be assured of the reliability of activities reported by field staff on completed work orders and timesheets.

Review and Approval of Timesheets and Work Orders

Another key responsibility of supervisors is the review and approval of staff timesheets and work orders before data entry in Maximo and SAP. Supervisory approval of timesheets and work orders provides an opportunity for supervisors to assess the reasonability of time reported and follow up on variances to expectations (including overtime).

The audit testing confirmed that supervisory approval rates vary across units and, at times, between supervisors within the same unit. In some of the units, 100% of the

⁸ The audit noted that when staff works within the boundaries of a plant there is no explicit expectation of site visits by supervisors.

Audit of Environmental Services Department

sampled timesheets and work orders demonstrated a supervisor's approval. However, in one unit, supervisory approval of timesheets and work orders was available for only 33% of the samples tested.

Interviews confirmed that, generally, timesheets are reviewed to assess whether the information reported is reasonable; however, the time reported is not reconciled with the time logged in work orders.

Without a thorough review and approval of work orders and timesheets prior to data entry, supervisors do not have the opportunity to highlight and follow-up on variances to expectations with staff.

The audit further noted that in most cases, no formal process has been established to review the oversight activities performed by the supervisors. Since supervisors are not required to submit timesheets for approval (with the exception of reporting overtime), managers use periodic one-on-one meetings with their supervisors to discuss their activities, issues and challenges. However, the audit noted that limited details or documentation is requested by these managers to demonstrate the ongoing supervision and monitoring activities performed by the supervisors for their staff. Without specifically requesting support and holding supervisors accountable, operational managers cannot be assured that supervisors are adequately undertaking their supervisory responsibilities.

Recommendation #6

That the City establish clear expectations for supervisory oversight, including:

- **The review and approval of daily timesheets and work orders.**
- **The completion and documentation of the results of site visits of field teams for regular review with operational management.**
- **An appropriate level of documentation necessary to demonstrate ongoing monitoring activities (e.g. supervisor log book or annotations on the work order).**

Management Response:

Management agrees with this recommendation.

There are currently well established supervisory oversight practices across the department however, because PWES is a newly formed department, the approaches are inconsistent. As the department continues to harmonize, there are plans to host a department-wide mandatory supervisory forum that will review core accountabilities

Audit of Environmental Services Department

for supervisors and managers. This will include consistent business processes for oversight in the following areas:

- Staff time management and reporting,
- Clearly documented information regarding site visits and operational unit meetings,
- Monitoring and recording of work activities, and
- Performance monitoring and development.

The supervisory forum will be added to the 2017 PWES workplan and is expected to be completed by Q4 2017.

E) Overtime

E.1) Efforts have been made to reduce overtime within the Department.

The City's *Overtime Policy* has approval clauses that stipulate that all overtime must be approved in advance by an individual at the Program Manager level or above.⁹ As per the policy, it is the responsibility of the Department to manage overtime to ensure that it is kept to a minimum and the cost is justified. Interviews with departmental staff confirmed that the pre-approval of all overtime, except for emergencies, by managers or supervisors is an established practice.

In an effort to reduce overtime costs, the Department has changed its practices. Current practices implemented by specific units include staggering shifts and proactive scheduling of contractors to align the work with the Department's working hours. Data analysis confirmed a considerable reduction in overtime occurred across the Department. In the 12-month period from July 1, 2015 to June 30, 2016, overtime costs were reduced by approximately \$779,000, or 35%, when compared with the same period one year earlier. Details of the overtime hours and costs incurred by the in-scope units are illustrated below in Figure 1.

⁹ City of Ottawa, *Overtime Policy*, Revision Date January 1, 2012.

Figure 1: Overtime data (A: Hours and B: Costs) for July 1, 2014 to June 30, 2015 and July 1, 2015 to June 30, 2016 time periods for each of the in-scope units as reported within SAP.



Source: City of Ottawa

Description of Figure 1: Figure 1 compares the total overtime hours and costs for the in-scope branches for the periods July 1, 2014 to June 30, 2015 (2015), and July 1, 2015 to June 30, 2016 (2016). Table A shows a reduction in overtime hours from 47,332 in

Audit of Environmental Services Department

2015 to 29,191 in 2016, or 38%. Table B shows a reduction in overtime costs from \$2,209,000 in 2015 to \$1,431,000 in 2016, or 35%.

As demonstrated above, the efforts taken across the Department are resulting in reductions in overtime. The practices put in place could be considered across other branches and units throughout the Department.

F) Vehicles and Equipment

F.1) There is insufficient oversight relative to the use and return of City assets.

The use of City-owned vehicles, equipment and tools is necessary for departmental staff to complete their assigned tasks. In order to provide direction to staff, the City has developed a *Personal Use of Vehicles Policy* outlining expectations regarding the personal use of vehicles. The policy states that “personal use of City vehicles is strictly prohibited”¹⁰; however, this policy does identify specific circumstances where personal use may be permitted, including use by on-call employees and when employees are on break. When a vehicle is not being used for work purposes, the *Personal Use of Vehicles Policy* stipulates that the vehicle must be parked at the normal base of operations – for the Department, this is the assigned facility parking lot.

Each branch and unit within the Department has developed their own informal practices to manage the release, use and return of vehicles and equipment. In some units, vehicles are formally assigned to an individual, whereas in others there is a fleet of vehicles available for staff to draw upon, as required. In both circumstances, the audit noted a lack of supervisory oversight over City-owned vehicles. More specifically, the audit noted that there is currently no formal requirement for:

- Units to reconcile actual vehicle mileage with estimated mileage to complete assigned work orders, and follow up on discrepancies.
- Supervisors to verify of the return of all City-owned vehicles (with the exception of on-call vehicles) at the end of the day.

Although three of the units tested require staff to use their access cards to sign-out the keys for a vehicle through an automated ‘key watcher system’, supervisors or managers are not confirming the return of all keys daily. For these units, the Facilities Support Coordinators (Environmental Engineering branch) review reports at periodic intervals to

¹⁰ City of Ottawa, Personal Use of Vehicles Policy, Revision Date June 1, 2016.

Audit of Environmental Services Department

verify whether vehicle keys have not been returned for several days. When they observe anomalies, they notify the relevant managers or supervisors.

The audit noted that, although departmental supervisors and managers are in touch with field staff periodically throughout the day, it is difficult for them to ensure staff are fully compliant with the *Personal Use of Vehicles Policy*. Vehicles have not been equipped with GPS, unlike City-owned snow clearing vehicles. GPS have the benefit of monitoring vehicle activity and usage during and outside of working hours. Further, as noted in the observation above, supervisors are not consistently performing site visits to provide insight into the whereabouts of field teams. Without effective supervisory oversight over the use of vehicles, managers and supervisors are unable to provide assurance of their staff's compliance to the City's *Personal Use of Vehicles Policy*.

Recommendation #7

That the Department implement a program to monitor the use and return of City vehicles and equipment. Consideration should be given to the installation of GPS in departmental vehicles.

Management Response:

Management agrees with this recommendation.

PWES will be evaluating the implementation of GPS technology in the departmental fleet. This initiative will be considered as part of a broader mobility program for the department and will be implemented as funding permits. The project plan will be developed by Q4 2017.

G) Performance Development

G.1) Demonstration of the timely completion of the Individual Contribution Agreements (ICAs) under the Performance Development Program was not consistently available.

The City has an existing Performance Development Program (PDP) in place for unionized employees. Since CUPE represents approximately 80% of the Department's staff¹¹, the PDP is critical to provide formal feedback to employees on their performance and to identify development opportunities. Existing guidance published by the City for the completion of the PDP process for union employees states:

¹¹ Excludes Waste Management Services

“The City of Ottawa is committed to creating a culture of excellence by providing cost effective, high quality programs and services to the public we serve. For this reason, it is important that all employees are both skilled and motivated to perform their jobs to their utmost capacity. The Performance Development Program (PDP) for Unionized Employees has been designed to give employees effective feedback on their job performance and provide them with support for developing their skills”.¹²

The PDP process for unionized employees must be completed annually with the managers and/or supervisors responsible for conducting the performance evaluations. A formal performance evaluation (i.e. an ICA) must be completed at least once in a 12 month cycle¹³ and must be formalized, as follows:

“When a formal assessment of an employee’s performance is made, the employee concerned must be given an opportunity to discuss and then sign the assessment form in question upon its completion to indicate that its contents have been disclosed”.¹⁴

The City currently does not have any formal monitoring and reporting of the status of completion of the CUPE PDP. Based on our enquiries, it was confirmed that branch managers rely on their operational managers and supervisors to manage the process for their staff without any coordinated departmental oversight.

The audit tested a sample of ICAs for 2015 from the in-scope units. All were CUPE 503 members, with the exception of one CIPP member. Audit testing identified that only 24% of the individuals selected had a completed ICA in their personnel file for 2015 (as per the expectation outlined in the PDP guidance material). Further, the testing found that 52% of the employees selected either had no completed ICA in their personnel file or the last one found was dated over four years ago.

Based on follow up directly with the branch managers, the Department provided an additional six ICA forms from 2015 for the sample selected, which had not been found in the employee files. Of these, two had been signed off by the manager but not the

¹² *Performance Development Program (PDP) for Unionized Employees, Guidebook for Managers, Supervisors and Employees, Version: Updated: January 2013, Introduction*

¹³ *Performance Development Program (PDP) for Unionized Employees, Guidebook for Managers, Supervisors and Employees, Version: Updated: January 2013, Section 3: PDP Cycle and Steps*

¹⁴ *Performance Development Program (PDP) for Unionized Employees, Guidebook for Managers, Supervisors and Employees, Version: Updated: January 2013, Section 21.1*

Audit of Environmental Services Department

employee, so there was no indication that it was reviewed with the employee. One had been signed by the employee and not by the manager. Two had been printed but did not have signatures; however, a notation indicated that the originals had been sent to Human Resources. These forms were not found in the employees' files.

For CIPP and MPE employees, an e-Performance system has been implemented to facilitate the annual performance development process. With this system, employees and managers and/or supervisors receive e-mail reminders as the deadlines approach. Completion rates were higher across the Department¹⁵ with 104 out of 123, or 85%, of ICAs completed for 2015 as at June 30, 2016.

Without all employees participating in the PDP, expectations and objectives may not be clearly outlined and potential areas of improvement may not be communicated. Further, without making use of the PDP, managers and supervisors may not be taking the opportunity to discuss career goals with their staff and provide them opportunities for development. Finally, without the formal, annual process, managers and supervisors may not have another way to formally recognize and encourage employees on the basis of their performance.

Recommendation #8

That the Department ensure that all managers and supervisors participate in the timely completion of the annual performance development process for all employees.

Management Response:

Management agrees with this recommendation.

Performance review and development will be included as a key accountability for managers and supervisors in upcoming mandatory departmental supervisory forums in 2017. Senior leaders will ensure that managers and supervisors have consistent knowledge of, and will ensure timely completion of, the annual performance development process.

Recommendation #9

That the City consider implementing a formal monitoring process over the completion and approval of ICAs for CUPE staff, whereby:

¹⁵ Excludes Solid Waste Services

- **Supervisors are responsible for reporting on the status of each ICA they are responsible for completing.**
- **Managers are required to review the reporting prepared by supervisors on a timely basis and follow-up on ICAs which have not yet been completed.**

In the long term, the City should consider the adoption of the e-Performance system for all departmental units because of its capability to report on the status of ICAs.

Management Response:

Management agrees with this recommendation.

PWES will support the corporate-wide strategy once established within the newly aligned organization in 2017.

Conclusion

In order to fulfill its mandate, and efficiently and effectively manage its resources, the Environmental Services Department branches must schedule resources, allocate work orders, oversee the work and measure results; both at a unit level and an individual level.

The practices currently in place across the Department to schedule, manage and allocate work to staff are inconsistent. In some units, this restricts the ability to hold individuals accountable for job performance, and it does not allow for sufficient supervisory oversight and measurement of productivity. Further, supervisory oversight practices, in many cases, do not provide the insight to supervisors of the activities of their staff and do not allow them to validate the activities reported on work orders and timesheets. Finally, a standard approach to measure unit performance has not been established across the Department and for the most part, does not consider productivity measures and targets.

Overall, improvements are required to standardize the work order management process and associated monitoring of departmental staff to allow for improved accountability, productivity and oversight. Existing good practices and technologies used within the branches should be considered for adoption across the Department.

Potential savings

The following are potential saving opportunities for the City relative to the Department:

- Standardized scheduling and work order management processes will reduce supervisory time in the allocation of work to staff and improve the effectiveness of planning of appropriate staffing levels.
- Implementation of the Maximo Mobile solution would reduce duplication of efforts through the elimination of paper work orders and the streamlining of the data entry process. More specifically, staff will be able to update the status of work orders directly in the field, eliminating the need for data entry at the end of the day.
- Improved supervisory oversight and time reporting against non-specific work orders will help supervisors identify productivity issues on a timely basis, and enable more effective planning of appropriate staffing levels.
- The consideration of route planning in the scheduling of work orders may reduce the gas and maintenance costs of the vehicles used by staff along with travel time. More specifically, route planning will enable staff to complete more work orders in less time by reducing their time spent on the road.