6-2012

Management Assessment of the Public Works Department: City of Lowell, Massachusetts

Edward J. Collins, Jr. Center for Public Management, University of Massachusetts Boston

THE EDWARD J. COLLINS, JR.
CENTER FOR PUBLIC MANAGEMENT

MCCORMACK GRADUATE SCHOOL
OF POLICY AND GLOBAL STUDIES

University of Massachusetts Boston
100 Morrissey Boulevard
Boston, MA 02125-3393
P: 617.287.4824
www.collinscenter.umb.edu

Management Assessment of the Public Works Department

CITY OF LOWELL, MASSACHUSETTS

JUNE 2012

UMASS BOSTON

TABLE OF CONTENTS

1. INTRODUCTION AND EXECUTIVE SUMMARY

This report presents the results of the management assessment of the Lowell Public Works Department conducted by the University of Massachusetts Boston's Collins Center for Public Management ("the Center").

This first Section introduces the analysis – outlining principal objectives and how the analysis was conducted – and presents an Executive Summary.

1. AUDIT SCOPE AND OBJECTIVES.

The project team conducted a comprehensive organization and management analysis of the Department's existing operations, service levels, infrastructure management, organizational structures and staffing levels. The analysis was to be fact-based and include all aspects of service provision by the Department. The analysis focused on:

- Organizational structure, including the division of labor, manager/supervisor spans of control, and potential for consolidation of currently-separate functions;
- Effectiveness of staffing levels including, but not be limited to, staff assignments, workload, training, and cost-effectiveness of service levels and service delivery; and
- Benchmarks and other objective indicators of program effectiveness.

The approach of the project team in meeting this scope is portrayed below.

- Developed an understanding of the key issues impacting the Public Works Department. The Center conducted interviews with Public Works Department management and staff. Interviews focused on goals and objectives, management systems, the use of technology, the levels of service provided by the Department, the resources available to provide those services, etc.
- Developed a descriptive profile of the Public Works Department. The Center conducted interviews with Departmental managers and staff to document the

current organization of services, the structure and functions of the Department, budgets, workload data, management systems, inventory of the infrastructure, etc.

- Compared Public Works Department programs and practices to 'best management practices.' The best management practices included comparisons to the American Public Works Association's, *Public Works Management Practices Manual*, standards developed by the American Water Works Association, and the experience of the project team. The project team also conducted a comparative survey of services in other cities to compare the Public Works Department programs and practices to these cities.

- Evaluated the staffing, organization structure, and service levels in the Public Works Department. This included interviews with key staff to develop an understanding of the current service delivery model, evaluation of the adequacy of current service levels, work practices, work planning and scheduling systems, productivity and staffing levels, the plan of organization, and asset management.

The objective of this assessment was to identify opportunities for improvement in the operational, organizational and economic efficiency of the Department and practicable opportunities for enhancing the quality of its product and services.

2. THE PUBLIC WORKS DEPARTMENT EMPLOYS A NUMBER OF BEST PRACTICES.

An organizational and management analysis by its nature focuses on opportunities for improvement. However, there are a number of strengths in the Public Works Department. Examples of these strengths are portrayed below.

- The Wastewater Utility has acquired and installed MP2 as its work order management system. This computerized maintenance management system (CMMS) accumulates work activities, time, dates, crew sizes, and other pertinent aspects of work for most of its divisions. The Utility has also embarked on a replacement for this CMMS to further enhance its data accumulation and reporting capabilities.

- The safety training program that has been implemented in the Wastewater Utility is exemplary. The Public Works Department has expanded upon this and has implemented a safety manual and certain safety training. This program should be examined for use in other operating departments of the City as well.

- The Department generally does a very good job of leveraging the use of contractors to allow in-house staff to focus on the repetitive, non-specialized work.

- The outreach programs in the Department's Recycling Unit of the Streets Division are exemplary and should, over time, result in steadily improving waste stream diversion rates.

- The City has instituted energy management programs that have produced significant dollar savings over the past several years.

- The Public Works Department has initiated certain operational improvements, such as the outsourcing of cemetery maintenance, which has resulted in significant costs savings.

These strengths provide a sound basis for further enhancements.

3. FOUR-POINT AGENDA FOR CHANGE

The assessment of the Public Works Department identified many recommendations for improvement that the Center believes should provide the basis for positive change in the Department in the coming years. These recommendations fall into four major improvement areas including:

1. Management systems;
2. Preventive maintenance;
3. Organizational transition; and
4. Cost effective service delivery.

Each of these major points in the improvement agenda are briefly summarized below.

(1) Management Systems

The driving forces behind any high-performing organization are clear direction and the management systems that communicate and translate policy into action. The Wastewater Utility has made efforts to provide that direction and the management systems with the MP2 computerized maintenance management system. In the Public Works

Department, generally, however, managers and supervisors have little information available through automated and summarized means with which to make key service delivery and budgetary decisions. The Public Works Department faces a number of challenges in using its resources more efficiently and effectively, and more importantly, in redirecting resources and investing in maintenance and preservation of the City's assets. The Department is limited in its ability to address these challenges as a result of the lack of management systems and, in some cases, the staff and/or sufficient funding, which the project team addresses in this report. The management of the Public Works Department needs to enhance the management systems within each of its respective divisions through such steps as:

- Invest in a new, standardized computerized maintenance management system (CMMS) to lay the foundation for a standardized approach to work management and for data accumulation. The Wastewater Utility has utilized MP2 in previous years, and is now in the process of a search for a replacement system. This initiative should be expanded into the Public Works Department in general, with input from each of its divisions.
- Develop formal work planning and scheduling systems;
- Develop comprehensive goals, objectives, performance measures and reporting systems.

The Public Works Department should employ these management systems to make its respective divisions places where performance is centered around goals that serve to drive their operations.

(2) Preventive Maintenance of the Infrastructure

Lowell taxpayers have a significant investment in buildings, parks equipment, streets, sidewalks, traffic signals, water plant and distribution systems, sewer plant and collection systems, as well as stormwater collection systems. Preserving these assets

prolongs their useful life and reduces the long-term maintenance and rehabilitation costs. This is the primary objective of preventive maintenance.

The Public Works Department is not preventively maintaining this infrastructure on a comprehensive basis. The Department should pursue a comprehensive effort to ensure the efficient and effective preventive maintenance of those assets assigned to its respective divisions. This includes such efforts as:

- Developing and installing strategies for the preventive maintenance of the City's street system, and expansion of the non-structural overlays such as chip seal;
- Developing and installing strategies for the preventive maintenance system of the City's water distribution systems, including valve exercising, fire hydrant maintenance, etc.;
- Developing and installing strategies to preventively maintain the City's buildings; and
- Investigating opportunities to outsource certain maintenance functions and activities that may be more cost-effectively provided by private contractors.

Preventive maintenance improves an asset's operating efficiency, prevents premature replacement, and avoids interruptions in service for residents. Preventive maintenance reduces long-term costs by maximizing the operating capacities of an asset, minimizing downtime, and avoiding breakdowns that would otherwise lead to higher repair costs later.

The effective preventive maintenance of these assets must be an essential goal of the Public Works Department – one that is utilized to judge the effectiveness of the Department's management.

(3) Organizational Effectiveness

Optimizing organizational structure is imperative in ensuring cost-effective, efficient

and effective services. A well-designed structure minimizes reporting levels, enhances communications, eliminates duplication and inter-divisional hand-offs, and even reduces cost. The project team has analyzed the organizational structures of the Department, as well as the intra-divisional structures, and has made recommendations in this report that:

- Reduce spans of control;
- Consolidate similar functions;
- Enhance opportunities for sharing services;

(4) Cost-Effective Service Delivery

The Public Works Department faces a number of challenges, including fiscal limitations and aging infrastructure. An effective response of the Department to these challenges requires that it transform how it conducts business by installing accountability systems for managers and supervisors, and by reengineering work processes.

The Public Works Department should reduce costs and increase productivity, performance, and service levels by redesigning and reengineering the way some services are delivered. This could entail certain steps, including the following:

- Selective use of outsourcing to evaluate opportunities to reduce costs while maintaining adequate levels of service;
- Potentially consolidating fleet maintenance and management, not only in Public Works, but also throughout the City; and
- Ensuring that department managers have access to, and utilize, timely financial data to enable them to manage the budgets for which they have been given responsibility.

The Public Works Department should take steps to assure that it effectively utilizes existing resources, and looks for opportunities to leverage external resources such as private service providers to ensure maximum value and benefit to City residents.

4. EXECUTIVE SUMMARY

The Center has prepared this summary of the recommendations and their fiscal impacts contained in the report.

Page	Recommendation	Time Frame	Revenue Increase	Cost Increase	Cost Reduction	Capital Outlay
	Section 2 – Management Systems and Accountability					
21	Develop an overall asset management plan for the management of the infrastructure and assets for which the Department has been given responsibility.	FY13	NA	NA	NA	NA
22	Develop an inventory of the infrastructure and assets for which the Public Works Department has responsibility. This should include a definition of the assets to be collected, assignment for collecting data, and a schedule for the collection of data.	FY13	NA	NA	NA	NA
25	Invest in a new Computerized Maintenance Management System. This CMMS should be the primary vehicle by which the Department reports on work activity and the productivity of the resources utilized in accomplishing work in accordance with the work plan.	Jul. 2012-Dec. 2012	NA	NA	NA	$30,000 +
26	Develop a comprehensive set of work activities performed by each division in the Public Works Department.	Jul. 2012-Dec. 2012 (and ongoing)	NA	NA	NA	NA
28	Define the service levels that are appropriate to be accomplished.	Jul. 2012-Dec. 2012 (and ongoing)	NA	NA	NA	NA
29	Define performance standards which outline, for each major activity, the methods of accomplishment, crew sizes, levels of service, the probable materials needed, and the expected average daily production levels to be achieved.	Jul. 2012-Dec. 2012 (and ongoing)	NA	NA	NA	NA

Page	Recommendation	Time Frame	Revenue Increase	Cost Increase	Cost Reduction	Capital Outlay
35	Develop a formal work planning and scheduling system.	Jul. 2012-Dec. 2012 (and ongoing)	NA	NA	NA	NA
38	Generate a monthly performance report comparing planned versus actual performance and costs.	Begin in FY13. Ongoing	NA	NA	NA	NA
	Section 3 – Organizational Structure					
45	Eliminate the position of Water Distribution Superintendent, and transfer the positions reporting to it to the Water Maintenance Manager.	As vacancy occurs	NA	NA	$104,580	NA
48	Create the position of Deputy Commissioner of Finance and Administration to oversee and direct administrative functions in the Department.	FY13	NA	$94,500	NA	NA
50	Enhance the communication and coordination of engineering services among the three currently-separate units within the Department of Public Works providing these services.	Immediate	NA	NA	NA	NA
54	Consolidate the fleet maintenance function under the Division of Streets. This organizational transfer will require the transfer of one Mechanic to the Streets Division, but it will allow the reallocation of mechanic positions in the Water Utility to field responsibilities in that division.	FY13	NA	NA	NA, however, a greater service level should be possible in Water Utility	NA

Page	Recommendation	Time Frame	Revenue Increase	Cost Increase	Cost Reduction	Capital Outlay
56	The City should consider the transition to a centralized vehicle maintenance repair shop that is set up as an internal service fund, fully funded by user charges for services which are established to ensure that the shop breaks even on a cost basis at the end of each year.	After admin. procedures are established in Streets	NA	NA	Should result in City-wide cost reduction, but will definitely standardize approaches	
58	Transfer the Recreational Services function outside of the Department of Public Works to an organization with which its mission is more closely aligned. This move may allow the City to consider the establishment of further consolidation of other similar organizations to create, for example, a Health and Human Services Department comprised potentially of such functions as Veterans Services, Public Health, and Council on Aging.	FY13	NA	NA	NA	NA
60	Consolidate the Public Works Department's Streets Division with the Parks Maintenance and Cemetery units of the Parks, Recreation and Cemetery Division. This will allow the elimination of either the Streets Deputy Commissioner or the Parks, Recreation and Cemetery Commissioner, as an y vacancy may occur (e.g., through retirement or voluntary leave) thereby allowing the conversion of the vacated position to an ME03 Laborer.	As vacancy occurs	NA	$65,400	$110,930	NA
62	Clarify reporting relationships among managers and employees to ensure effective communication and priorities of tasks and responsibilities.	Immediate and ongoing	NA	NA	NA	NA

	Section 4 - Operations					
71	Redesign the positions of Maintenance Man, Working Foreman/Maintenance Man, and MEO3 Laborer/Watchman to perform duties more closely aligned with the Streets Division's core functions of infrastructure maintenance.	Fall, 2013	NA	NA	NA	NA
73	The City should fund the replacement of its fleet on a more timely basis, as the age of the fleet is approaching very high levels, and, likely, the expenditures for maintenance and repair. The City invested approximately $1 million last fiscal year, however the required dollar amount that is required to lower the fleet age to acceptable levels should be determined, and the City should commit to this funding level.	FY13 and beyond	NA	NA	NA	Unknown. This should be a longer term task undertaken by the Streets Division, or through outside consultant
76	Develop a Tree Master Plan, including a tree inventory. Further, the Public Works Department should initiate a review of the Tree Ordinance in Chapter 260 to either ensure compliance with its tenets, or revise them to reflect the current operating conditions.	Begin in fall/winter 2012/2013	NA	NA	NA	NA
78	Expand the set of non-structural overlays that it utilizes for preventive maintenance of the City's streets beyond overlay to include slurry seal and/or micro-surfacing.	Begin assessment of appropriate surfaces for the City in FY13	NA	NA	Unknown. However, the City should experience a significant decrease in cost through use of less costly overlays than is now the case	Unknown. There should be a decrease in capital costs over a period of years, however.

80	Begin to add skilled trades mechanics to the Lands and Buildings Division. The number of building mechanics is insufficient to provide necessary preventive maintenance on the City's facilities currently.	FY13 and ongoing	NA	$64,170 for a single Technician initially	NA	NA
84	Investigate the feasibility of outsourcing the remaining acreage currently being mowed by Public Works staff. This will allow the reallocation of staff time to more critical core services of the Parks and Streets units of the organization.	Fall-Winter 2013	NA	NA	To be determined	NA
85	Investigate the availability and interest of private cemetery operators in the region in assuming responsibility for operating the six cemeteries in the system. The City reports that the deficit was $200,000 greater than the current level, however, it should investigate the feasibility of outsourcing the operations, with the possibility of abating or eliminating the current deficit of over $46,000 annually.	Fall-Winter 2013	NA	NA	To be determined. However, the cemeteries currently operate at an estimated annual loss of over $46,000	Unknown
90	The Parks Unit of the Parks, Recreation and Cemeteries Division should develop formal service level standards for parks and grounds it maintains.	Immediate, with final plans for each park in place for Spring, 2013	NA	NA	NA	NA
91	The Parks and Forestry Division should develop quality standards for the maintenance of City parks.	Immediate, with final plans for each park in place for Spring, 2013	NA	NA	NA	NA

92	Certify at least one Parks Maintenance employee as a Certified Playground Safety Inspector (CPSI).	Investigate times and places for course offering	NA	$340 for one person for one course	Unknown. However, the cost reduction is equivalent to the amount paid sporadically to private inspector	NA
93	Fill the position of Stadium Manager at Cawley Stadium.	Prior to summer season, 2012	NA	None, as this is a currently-budgeted but unfilled position	NA	NA
100	The Water Utility should eliminate one Meter Reader position in the short term.	As vacancy occurs	NA	NA	$53,200	NA
102	Delay the hiring of the position of CMMS Administrator in the Water Utility. The Water and Wastewater utilities should consolidate the responsibilities of this position, and determine the longer-term feasibility of a single position versus two separate dedicated positions in the two utilities.	Immediate	NA	NA	$77,141	NA
103	Make the transition to a consolidated infrastructure maintenance crew for water and wastewater.	2013	NA	NA	NA	NA
105	Transition the position duties of the Administrative Assistant in the Finance and Administration Unit of the Department to a dispatch and customer service role.	Immediate	NA	NA	NA	NA
108	The Public Works Department should begin to plan for succession in key positions in order to retain critical knowledge and skills.	Immediate	NA	NA	NA	NA

112	Enhance divisional web pages to provide more information to users.	Fall/Winter 2013 and beyond	NA	NA	NA	NA
113	Institute a standardized training program within the Department of Public Works.	Fall 2012	NA	NA	NA	NA

2. MANAGEMENT SYSTEMS AND ACCOUNTABILITY

Management accountability is the expectation that managers are responsible for the quality and timeliness of program performance, increasing productivity, controlling costs, mitigating adverse aspects of agency operations, and assuring that programs are managed with integrity and in compliance with applicable laws.

This section evaluates the management accountability practices within the Department, as well as the management system infrastructure required to ensure that managers can monitor and report their status and progress against accepted measures of accountability. This includes goals, objectives, and performance measures, and as well as a communication plan designed to inform and engage City management, staff and Council.

1. THE PUBLIC WORKS DEPARTMENT SHOULD DEVELOP AN ASSET MANAGEMENT PLAN TO ENSURE THAT LIMITED RESOURCES ARE FOCUSED ON MAINTAINING THE INFRASTRUCTURE OF THE CITY IN THE MOST EFFICIENT AND EFFECTIVE MANNER.

Like many cities across the country, Lowell is experiencing downturns in revenues that have forced it to curtail services and invest less in the maintenance of infrastructure. The Public Works Department has been affected by this trend, along with other departments in the City. This is evidenced by:

- The resurfacing of less than 1% of the roughly 253 miles of paved surfaces per year for the past three years. This compares to industry standards of between 5% to 8% of paved surfaces. This situation is made worse by the fact that 46% of the City's road segments are unaccepted by the City, and therefore ineligible for Chapter 90 funding for resurfacing and replacement.

- Replacement of less than 0.5% of water mains annually for the past 10 years.

- An aging Department-wide fleet. The average age of the fleet (non-Enterprise Fund) of heavy on-road vehicles (vans, pickups) is 11.7 years, and the heavy off-road fleet (dumps, rollers, etc.) is 11.2 years. These are well beyond the normal

economic life cycles for these classes of vehicles and equipment, even considering the recent investment of capital funds.

Clearly, investments are needed to repair and rehabilitate the City's infrastructure and to enhance essential services. However, because of the current financial situation, the City is unable to invest the resources that may have been available in prior years. Therefore, the City has three broadly-defined ways to confront this situation in the short-term:

- Impose new fees or increase existing fees.
- Scale back the range of services that the City provides, via the Public Works Department, and/or reduce the level of services provided.
- Enhance the efficiency and effectiveness of existing operations.

From a historical perspective, there is relatively little development occurring in the City currently. Therefore, the imposition of new fees, or increasing existing fees, cannot be viewed as significant alternatives to fill the funding gaps, although there may be some limited possibilities. Similarly, the Department provides only basic services, and scaling back these services cannot be accomplished without a risk to the infrastructure itself. That leaves enhancing the efficiency and effectiveness of existing operations as the option with the greatest likelihood of making a substantive impact. .

The Wastewater Utility has accomplished much as it relates to the management of its assets. This includes the input of all of the infrastructure for which it is responsible (plant equipment, underground infrastructure, etc.) into its computerized maintenance management systems (CMMS) for the purposes of scheduling preventive maintenance, identifying high-maintenance assets, etc., and reporting the achievement of all maintenance and repair performed on these assets.

However, the Public Works Department as a whole, including the Wastewater Utility, should consider the enhancement of the efficiency and effectiveness of existing operations, including the improvement of activity reporting and data accumulation, and the establishment of an asset management plan and performance measures that will define and report the progress, and improvement, of crews against definable objectives.

Asset management focuses on the facts about the City's infrastructure assets, their performance, their preservation, and their anticipated longevity. Effective asset management is important for at least two reasons, including:

- The City's aging infrastructure, and associated risks and liabilities;
- Insufficient funding for asset renewal and rehabilitation, as described above, requires that available funds be invested in projects with the maximum benefit; and

Effective asset management relies upon accurate asset information to facilitate decision-making regarding the condition and performance of those assets with a long-term view of their preservation and renewal.

Given the significant replacement cost of these assets, it is imperative that the Public Works Department maximize the useful life of the assets for which it has responsibility. The actions that should be taken by the Department are presented below.

- Update the long-term plan for the water distribution and sewer collection systems. The City should be replacing or rehabilitating an average of 1% to 2% of this infrastructure each year, but has replaced only 8.5 miles of its water mains in the past 10 to 20 years.
- Develop a long-term rehabilitation and replacement plan for the street system. Available funding has been sufficient to replace only 5.5 center line miles, less than 1% annually for the past three years, compared to a benchmark of between 5% to 8% on an annual basis.
- Commit to a five-year replacement plan to address deferred replacement requirements of the City's vehicles and equipment. It is clear from the age of the

fleet, at least in the non-Enterprise Fund fleet, that there has been a significant deferral of expenditures on this important element of operations.

The Department needs to address these challenges in the rehabilitation and replacement of the City's assets, and can address the challenge of asset renewal and rehabilitation, in part, by enhancing the effective deployment of its staff, and not relying solely on capital improvement program funding.

The framework for an asset management plan can be described in terms of seven questions.

- What do we have and where is it? (Inventory)
- What is it worth? (Costs/replacement rates)
- What is its condition and expected remaining service life? (Condition and capability analysis)
- What is the level of service expectation, and what needs to be done? (Capital and operating plans)
- When do we need to do it? (Capital and operating plans)
- How much will it cost and what is the acceptable level of risk(s)? (Short- and long-term financial plan)
- How do we ensure long-term affordability? (Short- and long-term financial plan).

An asset management policy is the starting point for unifying asset management practices across the Department. Without this, alignment and consistent management control is not possible.

The Department should develop formal, written policies and procedures regarding asset management that are related to clear goals, objectives, and measures of performance. These should define organizational roles and responsibilities in the implementation of the

asset management policy and procedure. The specific aspects of this policy and procedure are presented below.

- Goals and objectives reflect a comprehensive, long-term view of asset management.
- Policy goals and objectives are comprehensive, and integrated with other City policy objectives, and supported by quantitative and measurable criteria or performance measures.
- Principles of good asset management are articulated in the policy and procedure and are clearly recognized as the driving force for resource allocation and utilization.
- The goals and objectives support the preservation of existing infrastructure assets.
- Goals and objectives embody the perspective of life-cycle economic analyses of asset performance and cost, and encourage strategies with long-term benefits.
- The goals and objectives recognize the importance of reliable information on asset inventory and condition.
- The policies encourage the development and updating of long-range asset management plans (e.g., water and sewer master plans) to provide clear and specific guidance for the capital program development process.
- The policies include criteria for allocating resources, setting program priorities, and selecting projects consistent with stated policy goals and objectives and defined performance measures.
- The policies require the regular, ongoing collection of information on the condition of assets.
- The policies require the use of information on changes in asset condition over time to develop and improve forecasts of asset life and deterioration.

The City's asset management policies and goals will define its most important priorities with regard to allocation of scarce financial resources. In summary, the project team recommends that the Department develop asset management policies and procedures for the consideration of the City Manager and City Council.

Recommendation: Develop an overall asset management plan for the management of the infrastructure and assets for which the Department has been given responsibility.

2. THE PUBLIC WORKS DEPARTMENT SHOULD DEVELOP ASSET INVENTORIES FOR THE ASSETS ASSIGNED TO IT FOR MAINTENANCE AND REPAIR.

The Public Works Department should develop a comprehensive inventory of its assets. To do this, the Department should take the following steps:

- **Identify the objectives of the computer maintenance management system, including how the asset inventory data will be utilized to maintain and repair these assets**. Understanding how the asset inventory data will be utilized is necessary to identify the data to collect. Data could initially be utilized to establish a preventive and corrective maintenance program. In the longer term, data could be utilized to document the asset maintenance, repair, rehabilitation, and renewal expenditures as a percentage of current replacement value. Not all data need to be collected initially. Some may be essential to the initial phase of the deployment of the CMMS, while others, such as current replacement value, can be collected during later phases. It is unrealistic to expect that all objectives of the CMMS will be achieved at once. Public Works should start with the most important and expand the data within the system over time.

- **Identify sources of pertinent data.** Once the required data for the CMMS are defined, the Department must determine how to obtain the data and how they will be entered. Necessary data are currently in paper and electronic records or must be documented and collected.

- **Determine who will collect and enter the initial asset inventory**. The collection of data is time intensive and costly, and will not be accomplished by personnel dedicated solely to this task. Rather, given the current economic climate, this will be an effort that takes months to accomplish, and must be conducted by multiple personnel in each of the component divisions of the Department.

- **Assign responsibility for updating the asset inventory data**. The time and expense of collecting this asset inventory data will be wasted unless the inventory is kept current. The responsibility for updating this asset inventory needs to be clearly assigned.

- **Consider how the information will be collected and transferred to the CMMS**. Consider if new forms should be created or if the information could be collected using handheld electronic devices.

- **Document specific asset inventory data to be collected as well as the quality**

control procedures. In addition to identifying the data entry and collection staff, determine how the data will be quality controlled. Data validation must ensure accuracy and identify inconsistencies and potential problems, particularly during the early stages of the data collection.

- **Establish a timeline for data collection and a project manager responsible for managing data collection on a City-wide basis**. The Public Works Department should develop a schedule for data collection and clearly assign responsibility for managing this process.

- **Before beginning the initial asset inventory, install and familiarize all data collection personnel with software and hardware tools, the required data and data collection and entry procedures**. Training could be provided to all team members. Since the initial inventory will involve manual data collection, the Department could develop electronic forms to gather the information in the field.

- **Conduct a pilot program.** Completing a pilot program is an important part of making sure the asset inventory data collection meets needs and expectations. The assets selected for the pilot program should be limited in size. Once pilot program data are in the system, both the data and the process could be reviewed and quality controlled. Based upon the findings of the pilot project, the Department could revisit the timeframe for collecting the asset inventory data.

Instead of collecting all asset inventory data from the beginning, a phased approach would allow the Department to start small and gradually grow the inventory. A phased approach would allow the adoption of a system and set of procedures that are affordable and effectively meet immediate goals, but also flexible enough to grow with the changing needs of the Department.

Recommendation: Develop an inventory of the infrastructure and assets for which the Public Works Department has responsibility. This should include a definition of the assets to be collected, assignment for collecting data, and a schedule for the collection of data.

3. THE PUBLIC WORKS DEPARTMENT SHOULD INVEST IN A NEW COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM.

It was noted above that the primary means by which the Department can confront the recent decrease in available funding to invest in infrastructure renewal is through

enhancing the productivity of the workforce. This is one of the main functions of a CMMS. However, another, less-obvious, benefit of a well-functioning CMMS is in assisting managers in controlling service levels.

The Wastewater Utility has utilized for some years the MP2 software system that is functioning as the CMMS in its component divisions currently. As noted, the Utility is researching a replacement. The project team recommends that all divisions of the Public Works Department be involved in this research, with each defining its main requirements for a system. However, whatever system is ultimately selected, it should have two primary goals: increased productivity and control of levels of service.

- The benefits of increased productivity are that the same work levels may be accomplished at less cost, or more work will be accomplished for the same cost, with work quality remaining constant.

- The benefits of effective service-level control are not so obvious. Maintenance managers typically think in terms of increased performance, without considering the impacts on the quantities of work accomplished. For example, if productivity of pothole patching is doubled, should twice as much pothole patching be performed, or should the resources be released for some other kind of work? How much work should be performed – and what service levels should be attained – activity by activity? The point is that increased productivity is less meaningful if no effort has been made to identify how much is to be performed, and to control that level of service.

The Public Works Department should utilize the maintenance management system to enable the identification of the services provided (e.g., sewer main flushing), the levels of service (e.g., sewer mains are cleaned once every three years), the outputs of each of these services (e.g., the linear feet of sewer mains cleaned), and the cost of those services in terms of the total cost and the cost per unit of output.

This maintenance management system should be utilized within each division of the Department that is responsible for maintaining infrastructure. The components of a successful maintenance management system include the following:

- The number and type of maintenance features (physical assets) and the condition of these features should be documented. These are major factors in determining the types and amounts of work needed.

- Maintenance management is based upon work activities. Work activities should be defined for the significant maintenance work that is performed. Definitions should include an activity code, title, description, work unit and inventory unit. Such complete descriptions of activities are referred to as Activity Guidelines and provide standards of performance for individuals and crews by setting forth the quality and quantity of results anticipated from each activity.

- An annual work program and budget should be prepared. The activity-based work program and budget represent the products of the planning process and summarize the kinds and amounts of work planned, the productivity of the work force, and the costs of the planned work. It also provides the basis for managing the annual work effort.

- An annual work calendar should be prepared showing the monthly distribution of planned maintenance activities. Labor, equipment and material resource requirements needed to accomplish the planned workload should also be identified.

- Work scheduling procedures should be developed. The preparation of annual, seasonal and short-term schedules, as well as daily plans, can provide guidance in achieving annual work program goals.

- Reports that will enable showing work accomplishment and cost data, and a comparison of planned and actual work program accomplishment, should be prepared. These should comprise a primary piece of the monthly work report provided by the Department Commissioner to the City Manager.

- Linking a database and geographic information systems (GIS) provides more options to analyze asset information.

    - A GIS can display asset symbols on a map with links to their corresponding database records. The GIS provides the ability to analyze data based on geographic information, allowing patterns to emerge on a map that may not be as obvious in rows and columns of data.

    - Asset information can be shared in a visual format that is often better

understood by others, including the City Council and the public.

- Finding an asset's location is faster and easier with the help of a map.

The steps that need to be accomplished before the automated maintenance management system can be effectively utilized are described in the following sub-sections. As is noted in the next section, most divisions currently manually record the basic elements of work activity, and therefore, there is little additional investment of time required to automate this process. The project team recognizes, however, that this automation will need to be carried out in the short term by administrative and clerical personnel who do not possess the training and skills necessary to effect this management tool. Tyler Technologies, the manufacturer of the MUNIS system, provides comprehensive user support, and typically provides on-site training for its software solutions for a fee. The project team recommends that the DPW take advantage of these services as it initiates its asset management, work order process and performance reporting programs.

Recommendation: The City should utilize the MUNIS maintenance module to develop an annual work program and scheduling plan. This CMMS should be the primary vehicle by which the Department reports on work activity and the productivity of the resources utilized in accomplishing work in accordance with the work plan.

4. A COMPLETE INVENTORY OF WORK ACTIVITIES PERFORMED BY THE PUBLIC WORKS DEPARTMENT IN THE MAINTENANCE OF INFRASTRUCTURE ASSETS NEEDS TO BE DEFINED.

The managers and division Assistant Commissioners, Commissioner and Executive Directors in the Public Works Department should define the work activities performed by their crews. They need only assure that all of the primary work activities (e.g., pothole patching, sidewalk repair, etc.) that consume the majority of staff work hours are defined. This would include all forms of leave. In other words, all staff hours for each employee's

year of work should be included within the system. The work activities need to be carefully defined to assure that the same terminology is used for the work performed by staff. Each of these work activities should define the unit of measure. Examples of work activities and units of measure are provided below.

Work Activity	Unit of Measure
Pothole patching	Tons of asphalt
Base repair	Square yards
Skin patching	Square yards
Catch basin cleaning	Number of catch basins
Sewer televising	Linear feet
Vehicle Maintenance	Preventive labor hours, unscheduled labor hours
Facilities Maintenance	Preventive labor hours, unscheduled labor hours

Most divisions of the Department currently at least capture the fundamental elements of a particular task in manually-completed work sheets. However, the project team recommends going another set of steps in these divisions to ensure that the work activities used are comprehensive and meaningful in terms of their usefulness in management decision-making. Further, the data collected on these manual sheets should be entered into a CMMS.

Recommendation: Develop a comprehensive set of work activities performed by each division in the Public Works Department.

5. DEFINE THE LEVELS OF SERVICE TO BE PROVIDED.

It is common in Public Works operations to assume that the unpredictability of work and work locations makes annual planning infeasible or, at best, a widely varying target. While the basic "unpredictability" assumption is true, it does not negate the value of planning efforts related to historically-probable events. The project team has noted the fact that activities *are* being accomplished in the field, and are generally being accomplished in a low-cost manner. However, there are at least two concerns regarding

the accomplished work that the project team noted during the conduct of the study. These include the following:

- With relatively few exceptions, the activities performed by non-Utility divisions appear to be performed almost solely in reaction to requests for services.
- Managers have not actively sought information which would enable them to anticipate workloads, location and timing of services, and staffing needs for the various crews under their supervision.

Although both of the above issues present separate problems, they are related insofar as the lack of historical workload measurement data prevents the establishment of meaningful targeted service levels for the Department. And given the significant staffing reductions sustained over the past several years in most divisions, it is imperative that reasonable service levels be defined, or re-defined, as may be required. It is simply infeasible to continue providing the same service levels on a sustained basis with fewer resources than were allocated in previous years. However, in order to define what impacts resource additions or reductions will have upon work output and service levels, it is imperative to possess the data that will facilitate the analysis.

Levels of service should vary depending on the type of infrastructure and intensity of use. For the purposes of maintenance management, service levels must be specific. Examples of specific service-level standards in Streets are:

- Digout and rebase shall be performed when the asphalt surface becomes badly cracked and does not adhere to the base (surface failure) or where there is evidence of base failure (such as rolling, pumping, etc.); and
- Crack and joint sealing shall be performed whenever cracks in asphalt reach 1/4-inch to 2 inches in width.

Some judgment will be needed in applying the standards, but they do provide specific and useful guidelines – in terms of what maintenance should be performed and

what maintenance can be deferred. These standards are useful in determining the amount of work needed to attain desired levels of service. In some cases, these standards will also need to be expressed as quantitative standards as well.

Recommendation: The Department should define the service levels that are appropriate to be accomplished.

6. PERFORMANCE STANDARDS NEED TO BE DEVELOPED.

The next step in deploying a maintenance management system is to define the work to be done. The work must be identified in terms that are measurable and that can be related to resource requirements on a consistent basis. The work activities should be identified by name (such as pothole patching). These specific work activities account for most of the annual workload – typically 85% to 90%. The remaining 10% to 15% of the workload is usually comprised of relatively minor activities that can be grouped as "miscellaneous."

A standard should be developed to define a level of service for a specific activity. That is, the standard is used to define the amount of work that needs to be done to provide the desired level of service. These are established largely on the basis of experience. Once established, a value can be used as a standard and may be adjusted upward or downward to raise or lower the level of service for, for example, pothole patching.

These standards are used to define the best way to accomplish each activity. The optimum crew size and equipment complements are specified, along with the major materials needed and the preferred procedure for doing the work. Also, the expected amount of work to be accomplished each day is specified, based on using the standard over a period of time under average conditions. Lowell's Public Works Department is relatively

small, and it is more the rule than the exception that the work of a specific crew is interrupted to respond to either an emergency or to an activity with a higher importance. Therefore, it may be more meaningful for the Department to express expected work outputs not on a daily basis, but on a half-day, or even hourly, basis. Whatever output basis is selected, each standard should include at least six components:

- A brief description of the specific work involved – the work that is to be performed by the crew;
- The frequency with which the work should be performed (or the level of service) and the criteria for scheduling the work;
- The crew size required for the job;
- The equipment, material, and tools needed;
- The performance expectations for each job or average daily productivity; and
- The recommended procedures for completing the job.

A sample performance standard for cleaning culverts and pipes is presented in the exhibit on the following page.

Recommendation: Once all activities have been defined, performance standards should be defined, which outline, for each major activity, the methods of accomplishment, crew sizes, levels of service, the probable materials needed, and the expected average daily production levels to be achieved. A sample of such a performance standard has been provided.

Example of a Performance Standard
EXHIBIT

SAMPLE PERFORMANCE STANDARD FOR THE STREETS DIVISION

<table>
<tr><td>Activity No.:

S-001</td><td>Activity Name:

Cleaning Culverts</td></tr>
<tr><td colspan="2">Description and Purpose:

Removal of obstructions and debris from culverts, inlet channels and outlet channels. Straightening out of bent ends and restoration of headwalls and eroded areas around culvert inlets and outlets. Culvert condition should be logged while performing routine cleaning.</td></tr>
<tr><td colspan="2">Schedule

All culverts should be inspected and cleaned (if required) once annually. Typically, this will occur over the spring and fall. However, emergencies may occur throughout the year and should be addressed as emergency dictates, or as other routine, scheduled work allows. This is a preventive activity, but may also occur during flood related problems.</td></tr>
<tr><td>Authorized by:

Division Deputy Commissioner</td><td>Level of Service:

Ensure the free flow of water through culverts through the routine inspection and cleaning at least once annually.</td></tr>
<tr><td>Crew Sizes:

1 MEO 3
1 Laborer

Equipment:

1 Dump truck
1 Backhoe</td><td>Work Method:

1. Place safety signs and devices at work site in accordance with MUTCD standards.
2. Remove debris and any other foreign substance which impeded the flow of water from inlet and outlet channels, restoring original grade.
3. Clean out silted materials from pipe.
4. Check for damage to structure.
5. Report damage and/or need for other scheduled maintenance and repair to Deputy Commissioner.</td></tr>
<tr><td>Material:

Sod
Other, as required</td><td>Average Daily Production

10-30 per day</td></tr>
</table>

7. DEVELOP A FORMAL WORK PLANNING AND SCHEDULING SYSTEM.

This task would involve the development of a formal work scheduling system. The objective of this formal work scheduling system is to ensure that only the planned amount of work is done. After the annual work program is approved, division managers must have a simple method of authorizing and scheduling work to ensure that the work program is carried out as planned. Usually, monthly schedules are prepared, using the annual work calendar as a guide. To the extent possible, the planned work should be carried out and every effort should be made to stay on schedule.

If activities such as storm damage repairs and cleanup, snow removal, etc., are greater than planned, the work program will have to be adjusted or additional funds will be requested to complete the planned work.

A sample annual work program for the Streets Division is presented in the exhibit on the following page.

Exhibit

Sample Annual Work Program for the Streets Division

	Labor Days		Amount of Work		Total Cost		Productivity	
Work Activity	**Plan**	**Actual**	**Plan**	**Actual**	**Plan**	**Actual**	**Plan**	**Actual**
Shoulder Maintenance	160	168	160 shoulder miles	144 shoulder miles	$48,640	$51,072	4 shoulder miles per day	3.4 shoulder miles per day
Culvert Cleaning	62	55	1,240 culverts	1,266 culverts	$18,848	$16,720	20 culverts per day	23 culverts per day

This exhibit is only an example and is not based on actual data from the City

The project team examined the work activity reporting forms that each of the operating divisions utilizes currently. While each does, in fact, capture the basic elements of the work (e.g., date, crew member, activity, location, hours expended), they are not input into an electronic work order reporting system to summarize the types of activities and the time expended on the various sub-elements of the jobs. Further, the activities are simply described in free-form text, leaving open the possibility that the same activity could be described differently depending upon either the day or the individual assigning the work.

Aside from the Water and Wastewater Utilities' use of the MP2 system, the only automated vehicle by which work is received and reported in the Department is the E-Gov system. E-Gov work requests may be received from the public, from internal City departments, or even by the division performing the work. The Lands and Buildings and Streets divisions utilize the system to some degree, and although several pieces of valuable data are captured, they are not summarized in any meaningful way in order to make management decisions. Appendix G provides a sample of the data recorded by the Lands and Buildings Division. Note that the data captured include the following for each functional service (e.g., Carpenters, HVAC, Plumbers, etc.):

- Building
- Description of completed work
- Date of completion
- Men (crew size)
- Hours per crew member

- Total hours (crew size times hours per crew member)

These are clearly critical elements of the work performed. However, note in the sample that the hours are not summarized by functional grouping (for Carpenters, in this case), there is no calculation of the total number of available hours per crew member, which would enable a secondary calculation of the productivity of each crew member, and the work descriptions are in free-form style, as is the case with the manual work order systems in other divisions, which does not facilitate an analysis of work groupings (for example, Carpentry door repairs, Pluming irrigation repairs, etc.). Further, the reported hours only reflect the work that was completed, and not the total number of work requests that were not completed, which is an important indicator of the degree to which backlogged service requests may be accumulating. In short, the data that are being recorded are sufficient only to record the completion of an event, and the likely location of a specific crew member on a particular day. (For a sample of a completed manual work order, see Appendix H, which contains a Parks Division "Work Location Record." This Record exhibits most of the same attributes as the E-Gov sample provided in Exhibit G, and is included in order to illustrate an example of the variation in report formats currently utilized.)

Each division should begin the accumulation of the major work activities performed and should begin to categorize these to facilitate analysis. The project team has provided a sample of these work activities for the Streets Division at the end of this issue discussion. This sample is not intended to be a full listing of the activities performed by the Streets Division, but rather is provided in order to

facilitate the process of determining the types of activities each division should be developing, and at what level of detail.

Although the presence of a manual work activity system such as is present in the Public Works Department's component divisions currently is an excellent step, none of the data are being used to define the desired levels of service that *should* be provided.

Recommendation: The Department of Public Works should develop a formal work planning and scheduling system.

Exhibit

LIST OF MAINTENANCE ACTIVITIES FOR STREETS DIVISION

Work Inventory

4002.100 **Street Maintenance**

Code	Activity Description	Unit of Work	Unit of Inventory
.111	Gravel replacement	Cubic Yards	Road mile
.112	Pothole repair	Tons	Paved road mile
.113	Crack sealing	Hours	Paved road mile
.114	Blade patching	Tons	Paved road mile
.115	Seal coating	Tons	Paved road mile
.116	Shoulder maintenance	Shoulder miles	Shoulder mile
.117	Shoulder repair	Cubic Yards	Shoulder mile

4002.200 **Drainage**

Code	Activity Description	Unit of Work	Unit of Inventory
.211	Ditching with grader	Ditch mile	Ditch mile
.212	Ditching with ditcher	Ditch foot	Ditch mile
.213	Culvert cleaning	Culverts	Culverts
.214	Culvert repair/replace	Linear feet	Culverts

4002.300 **Structures**

Code	Activity Description	Unit of Work	Unit of Inventory
.311	Bridge maintenance	Hours	Bridges
.312	Bridge repair	Hours	Bridges

4002.400 **Traffic**

Code	Activity Description	Unit of Work	Unit of Inventory
.411	Sidewalk maintenance	Hours	Sidewalk segments
.412	Special purpose paths	Hours	Paths
.413	Sign maintenance	Signs	Signs
.414	Guardrail maint/repair	Linear feet	Road miles
.415	Snow/ice control	Hours	Road miles

8. A MONTHLY PERFORMANCE REPORT SHOULD BE GENERATED COMPARING PLANNED VERSUS ACTUAL PERFORMANCE AND COSTS.

This last step involves the development of a work reporting system. Manual daily production activity reporting sheets are being used in the component divisions to track labor, locations, and dates for maintenance activities. These log sheets should be standardized among all divisions, as there are multiple forms utilized currently. This will become a relatively important facet of operations as the Department makes the transition to a common CMMS, as the standardized form will facilitate input by clerical staff. The Deputy Commissioners, Commissioners and Executive Directors should promptly review these work reports to ensure that they were completed properly and to determine if the performance standards were substantially followed, and to make a determination as to the reasonableness of the units of measure accomplished during the day. Significant variations should be followed up to determine the cause and, if necessary, take corrective action.

A system should be developed to summarize the daily work reports on a monthly basis to produce performance measurement reports. The Commissioner/Assistant City Manager should be required to provide a monthly status report to the City Manager, which should be more than a simple statement of the work that was accomplished. It should reflect not only this, but the efficiency and effectiveness of the resources utilized, and the degree to which the actual performance met the objectives stated in the monthly plan. For example, the performance measurement data generated by this report could include:

- A comparison of planned versus actual staff hours per work activity for the previous month and year-to-date for each work activity;

- A comparison of actual versus planned work output (e.g., numbers of vehicles scheduled for preventive maintenance vs. the number entering the garage for PM within 48 hours of schedule) per month and year-to-date for each work activity;

- A unit cost analysis that compares the planned versus actual unit costs for each work activity per month and year-to-date; and

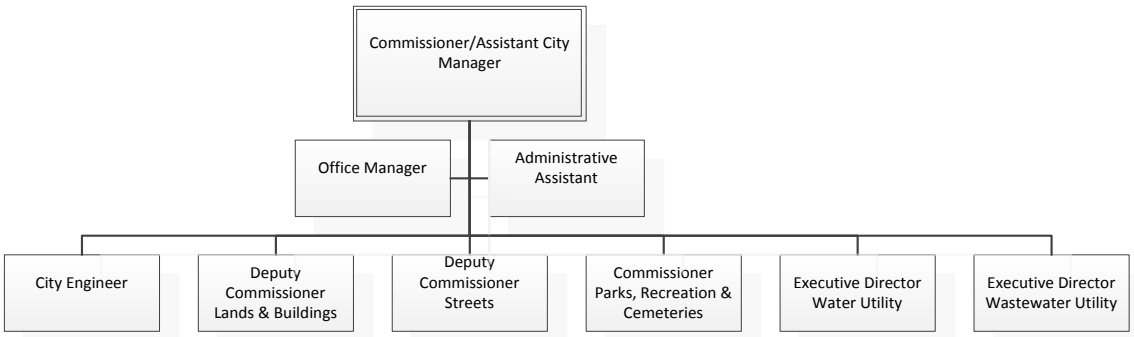
- A comparison of actual productivity (work output per staff hour) versus the expected productivity as stated in the performance standards.

Recommendation: The Public Works Department should generate a monthly performance report comparing planned versus actual performance and costs. The intent of the monthly performance report is to report actual accomplishments against the annual work plan. This report should provide the basis for the Commissioner's monthly performance reports to the City Manager.

3. ORGANIZATIONAL STRUCTURE

This section of the report analyzes the organizational structure of the Department of Public Works. The section begins with a review of the current organizational structures, and a statement of the premises utilized to ensure organizational efficiency and effectiveness in the analyses to follow.

The Department of Public Works is organized along the following functional lines of supervisory and reporting authority.



A more detailed organizational chart with respect to each position type is provided in the descriptive profile, as an attachment to this report. The above reflects sufficient information for discussion.

When evaluating any organizational structure, the purpose is to address questions regarding lines of authority, responsibility and accountability. Well-managed organizations are designed to deliver services to customers, maximize management control over service delivery, and provide for accountability of managers and staff through the provision of clarity of lines of reporting. The following tenets of organizational design frame the discussion relating to the future structure of the Department in this study.

- **A Department should be organized on a form-follows-function basis with a clear, distinct and comprehensive sense of purpose or mission for each division.** Functions are grouped consistent with their periodic interaction, management systems, delivery of services, and are linked in some way, resulting in functional cohesion.

- **The organizational structure should foster accountability.** The organizational structure fosters accountability among management, supervisory staff and line staff.

- **The plan of organization should enhance communication and coordination**. The number of handoffs/exchanges required among different divisions providing service to the public is minimized. The structure enhances shared knowledge and understanding among divisions with similar mission goals and objectives. The channels of communication are clear and consistent.

- **Staff resources should be utilized efficiently.** The plan of organization minimizes administrative overhead. Workload can be distributed/shared to maximize the productivity of staff through peaks and valleys and offer cross-utilization capabilities. Processes can be fully standardized to enhance the efficiency and customer responsiveness of services (e.g., the provision of estimating, design, and inspection services).

- **The potential of human capital should be maximized.** The plan of organization enhances career development opportunities, training, recruitment and retention.

- **The services provided to customers should be responsive.** The plan of organization enables staff to provide better and transparent service to the public. Customers are the hub – with the Department designed around them**.**

- **Each operating division/section should be placed at a level in accordance with its importance in achieving departmental goals.** Divisions have not been placed too high in the departmental structure or too low relative to their importance.

- **The number of layers of management should not result in a tall, narrow configuration for the organization.** Organizations with many layers of supervision are associated with vertical decision-making that is becoming less common due to the need to rapidly effectuate change. Flatter organizations facilitate decentralized decision-making, as more authority for making decisions is given to the front line employees.

  Any reorganization efforts that ignore these principles could create new,

unintended and unfortunate consequences for the future.

1. SOME ORGANIZATIONAL SPANS OF CONTROL ISSUES EXIST WITHIN THE DEPARTMENT.

An important organizational issue that deserves attention in any organizational structure is the number of supervisory versus staff positions and the potential for one-over-one reporting relationships. The following table further demonstrates the supervisory and staffing relationships in the Department of Public Works.

Department of Public Works Supervisor-to-Staff Ratios

Division	Position	Supervisor-to-Staff Ratio
Administration	Commissioner/Assistant City Manager	1:8
Engineering	City Engineer	1:5
Lands and Buildings	Deputy Commissioner	1:3
	City Electrician	1:4
	Foreman HVAC	1:8
Streets	Deputy Commissioner	1:2
	General Foreman	1:8
Parks, Recreation, Cemeteries	Commissioner	1:4
	Superintendent of Parks	1:1
	Parks Foreman	1:11
	Recreation Program Director/Planner	1:3
Wastewater Utility	Executive Director	1:4
	Maintenance Superintendent	1:4
	Engineering Manager	1:1
	Operations Superintendent	1:2
Water Utility	Executive Director	1:5
	Operations Superintendent	1:5
	Water Billing Administrator	1:4
	Distribution Superintendent	1:2
	Water Foremen (2)	1:4
	Maintenance Superintendent	1:4
	Office Manager	1:2
Average Divisional Level Ratio		**1 : 3.83**
Average Second Level (Non Administrative) Ratio		**1 : 4.38**

2. MOST OF THE RELATIVELY LOW SPANS OF CONTROL HAVE EXPLANATIONS RELATED TO THE VOLUMES OF HANDS-ON WORK SUPERVISORS ACCOMPLISH, OR THE TECHNICAL NATURES OF THE JOBS THEMSELVES.

The average first level supervisor (defined as the first level under the Department Commissioner) to staff ratio in the Public Works Department, currently, is 1 supervisor to 3.83 staff positions. The average second level supervisor (defined as the non-administrative/clerical first level under divisional management) is 1 to every 4.38 staff positions.

Second level supervisor to staff ratio guidelines generally suggest a range from 1:6 to 1:11, depending upon numerous variables such as the amount of technical, administrative and field work accomplished by the supervisor/manager beyond personnel oversight, the type and complexity of the profession, geographical dispersion of staff, skill level and training/certifications of staff supervised, etc. The ratio of 1 to 4.38 positions in the Lowell Public Works Department is somewhat lower than the low end of the comparative range. However, in analyzing the individual instances in which these ratios fall below the average, there are explanations in some cases. These generally relate to the instances in which the second level supervisors carry an actual field workload in addition to their supervisory and managerial duties. This is the case for the City Electrician (1:4 ratio), the Wastewater Engineering Manager (1:1 ratio), and Recreation Program Director/Planner (1:3). It is not possible for the project team to make a definitive determination as to the percentage of time expended by these individual supervisors in actual supervision versus "hands-on" duties. However, it should be

noted that were the figure known, it would increase the right-hand side of the average ratio to some degree.

Another explanation for the relatively low average span of control for second-level supervisors is the combination of recent staff reductions and the technical nature of the function being supervised. This is the case for the Wastewater Utility's Operations Superintendent (1:2 ratio). The position oversees the operation of the treatment plant, which includes the laboratory. These are two technical functions that require dedicated oversight of certified personnel. Further, the Superintendent recently lost the incumbent in the position of CMMS Administrator to the Streets Division. The position will reportedly be filled in the near future, thereby increasing this ratio once again to 1:3.

Another position which exhibits a relatively low span of control is the Water Billing Administrator position. This position oversees the four Water Meter Readers. The project team does not believe that the number of Meter Readers should be increased in order to increase the span of control ratio, as the number of meters read by each Meter Reader currently falls below typical benchmarks. (This issue is analyzed in more detail in the next section of the report). One option is to eliminate the position and transfer the responsibility for the function to the Water Distribution Superintendent. However, this is not viewed as producing great value in the longer-term, as the project team believes that the Utility will, at some point in the future, make the transition from the current ARB technology to radio read technology for the 25,500 residential accounts in the City, which will then reduce the number of necessary Meter Readers in the field.

Concerns are usually noted when 1-over-1 or 1-over-2 reporting relationships are identified, as they are typically redundant, often reflect spans of control that are too narrow, and can complicate internal communications. Unless there are unique technical expertise or requirements of a supervisory position that preclude spending time supervising, or alternatively, supervision of the position is of minor emphasis compared to total duties and responsibilities performed, these offer opportunities for consolidation of responsibilities.

The position of Water Utility Distribution Superintendent is one which exhibits a low span of control, has no field responsibilities, and oversees a function with staff who have relatively few technical skills or certifications. The position supervises two (2) Water Foremen who themselves have responsibility for six (6) Water System Maintenance Mechanics who are primarily engaged in hydrant replacements and rebuilds, running new lines, meter repairs, replacing ARB boxes, and similar duties. The Superintendent also nominally supervises the two (2) Backflow Inspectors. However, interviews and observations indicate that these positions are almost entirely self-directed in their daily duties of inspection. Within the Water Utility, the position of Maintenance Manager has responsibility for the repair and maintenance of plant equipment, as well as pump station in the field. The functions performed by the Distribution crews are maintenance-related as well, and would not present a technical challenge or create an unwieldy span of control for the Maintenance Manager to assume were it transferred to that position. The project team therefore recommends that the position of Water Distribution

Superintendent be eliminated, with the positions currently reporting to it transferred to the Maintenance Manager.

Recommendation: Eliminate the position of Water Distribution Superintendent, and transfer the positions reporting to it to the Water Maintenance Manager. The elimination of the Distribution Superintendent results in a cost reduction of $104,580, including salary and benefits calculated at 40% of salary.

3. THE ADMINISTRATIVE OFFICES OF THE DEPARTMENT PERFORM MANY OF THE SAME FUNCTIONS, BUT IN DIFFERENT LOCATIONS.

The administrative and clerical functions of the Department of Public Works are staffed with 14.5 FTEs. These staff members support 178 technical positions, as the table below indicates by division.

Division	Technical Staff	Clerical and Administrative Staff
Finance and Administration	1	5
Engineering	5	1
Lands & Buildings	32	0
Streets	30	0
Parks, Rec., Cemeteries	30	3.5
Wastewater	46	2
Water	34	3
Total	**178**	**14.5**
Average Ratio		**12.3 : 1**

As can be seen in the table, there are 178 technical positions (some are vacant currently, and some are occupied by employees on long-term leave) supported by 14.5 FTE in the Public Works Department as a whole. There is no "correct" ratio of administrative support staff to technical and operational staff. These ratios are dependent upon such factors as geographical dispersion of staff supported, workload reporting requirements, public interaction, maturity of the maintenance and financial reporting systems, and others. However, in the experience of the project team, "typical" support staff ratios vary between 1:9 to

1:25 or more for small to medium sized infrastructure maintenance organizations. This places the Lowell Public Works Department somewhat closer to the lower end of the typical range. However, the ratios do vary according to the physical location of the clerical staff.

Although there are some mitigating factors related to the relatively low ratios, it is clear that the numbers of administrative staff are sufficient to handle typical workloads associated with the support of 178 technical staff members. However, although the absolute numbers should be sufficient, the administrative and clerical workloads vary between divisions, and are fragmented among locations. In the introduction to this section of the report, the project team presented several defining characteristics of efficient and effective organizational structures. Among these were the following:

- The plan of organization should enable the efficient use of resources
- The plan of organization should enhance communication and coordination

The current situation is that clerical and administrative staff are, for the most part, located in physical proximity to the divisions they support, which, in the cases of the Head Clerk at the Cemetery and the Clerk in the Engineering Division, are reasonable placements, as these positions greet and assist the public. However, the separation of the part-time and seasonal clerical staff at the Cemetery and the Administrative Assistant at the Parks building on Stedman Road creates a certain duplication of work, as these positions' duties relate primarily to functions that do not normally require a physical presence in close proximity to the staff they support, and they perform many of the same types of duties, such as payroll processing,

generation of purchase requisitions, office supply ordering, etc. Therefore, the physical consolidation of these positions in one location offers the opportunity to reduce or eliminate the duplication through specialization of job duties, and allows for a more efficient use of all staff resources.

Another feature of well-designed organizational structures is the fostering of communication and coordination. Currently, each of the administrative units in the Department function as "silos," with little or no coordination or interaction between them. In the case of the Parks, Recreation and Cemeteries Division, this is true even within the Division, as was pointed out above. Given that few positions in the overall Department have significant public interaction, there is little reason for this silo effect, as most job duties can be performed at a single location with the ability to assign tasks to clerical staff who can specialize in the performance of certain duties, and attain certain economies of scale through processing, for instance, all accounts payable or purchase requisitions for the entire Department rather than fragmenting the work among various staff members in disparate locations.

Although the project team's analysis of current support staff ratios, as well as observations of operations, indicates that there are significant opportunities to achieve greater clerical and administrative efficiencies within the Department, these will not simply happen without centralized control. Currently, no single employee within the Department is aware of the job duties and workloads of all others, as each has continued performing the same duties over time, with those employees who are thought to have capabilities and capacities to perform additional assigned Departmental tasks being given these as they are given to the Department. Over

time, this has resulted in each staff member having collected a very diverse set of duties, with the result that there is no significant specialization or accountability for a single function, and for workloads that are at times unevenly distributed.

The project team recommends that the Department create the position of Deputy Commissioner for Finance and Administration with the responsibility for allocating job assignments among the clerical and administrative staff of each of the divisions. As workload cycles for individual employees rise and fall, the Deputy Commissioner would be responsible for the reallocation of workloads of staff. Further, the position would be responsible for the development of the budget, the reporting of budget and expenditure status, the initiation and reporting of workload measures, and the standardization of processes, including the payroll and work order processes.

Recommendation: Create the position of Deputy Commissioner of Finance and Administration. Although the position does not currently exist, and therefore, no actual salary can be attributed to the position, the project team estimates that the position represents an added cost of approximately $67,500 in salary. Adding 40% to this figure for estimated benefits cost results in a total estimated cost of $94,500.

4. ENGINEERING SERVICES ARE FRAGMENTED IN THE DEPARTMENT.

Currently, there are three divisions within the Department that provide engineering services. These are summarized below:

- **Engineering Division**. This Division performs engineering services related to construction plan review of street, bridge, sidewalk construction and repair, as well as compliance with stormwater regulations (MS4).

- **Wastewater Utility**. Provides engineering services related to inspection and plan review of wastewater capital projects, including plant upgrades, collection system, SCADA implementation, as well as some plan design for smaller projects. The Wastewater Utility is also involved in compliance with stormwater regulations and the City's flood control system.

- **Water Utility**. The Water Utility procures almost all engineering services related to plant, outlying structures and the distribution system through a private consulting engineering firm.

As noted above, these services are fragmented, duplicative to some degree, and lack sufficient coordination among the three divisions. Further, the Water Utility has a different philosophy of service provision from the other two, opting to outsource the engineering function almost entirely.

Referring to the criteria for designing optimal organizational structures, the provision of engineering services in these three divisions of the Public Works Department:

- Is not organized along a form-follows-function basis, and does not have a comprehensive sense of purpose or mission. As noted, the Water Utility has a differing service provision model from the Engineering Division and the Wastewater Utility.
- Does not enhance communication and coordination. With the exception of some periodic coordination between the Wastewater Utility and the Engineering Division on stormwater issues, there is little communication between divisions otherwise.
- Does not efficiently utilize resources.

The project team strongly recommends the enhanced coordination between the separate divisions relating to all engineering issues. The functional consolidation of all engineering services is complicated by the enterprise fund status of the two utilities. However, Wastewater and the Engineering Division should meet formally on a weekly basis regarding stormwater issues. Beyond this, however, the project team recommends that the Water and Wastewater utilities functionally consolidate engineering services, with all plan reviews being submitted to the Engineering group that currently resides in the Wastewater Utility. The Water

Department should begin submitting all contractor design review to the Engineering services division for mark-up.

Recommendation: Enhance the communication and coordination of engineering services among the three currently-separate units within the Department of Public Works providing these services.

5. THE DEPARTMENT SHOULD CONSOLIDATE FLEET MAINTENANCE AND MANAGEMENT UNDER A SINGLE ORGANIZATIONAL UNIT.

Currently, there are three divisions in the Department providing vehicle maintenance and repair. The Streets Division is responsible for the majority of the fleet, which includes all vehicles and equipment not in either the Water of Wastewater utilities. This includes 88 pieces of equipment. The Water and Wastewater utilities are responsible for the maintenance and repair of their own fleets of 22 and 27 vehicles and pieces of equipment, respectively.

The Streets Division has a total of five personnel responsible for vehicle maintenance services. These include an MEO3 Mechanic/Welder, three (3) MEO3 Repairmen (one of which is currently vacant), and one Motor Equipment Repairman, who repairs the Parks Division fleet, the latter of which has recently been transferred to the Streets Division from Parks.

The Water Utility allocates a reported 25% of two Skilled Mechanics' time to vehicle maintenance and repair (equating to approximately 0.5 FTE), and the Wastewater Utility contracts with local repair shops for similar services, with a budget of $86,700 in the current fiscal year for parts and labor.

The Department of Public Works, therefore, has a total of 137 vehicles and pieces of equipment, and is maintaining this inventory with a combination of 5.5 mechanics (again, one of the positions is currently funded, but vacant), and outside

repair services. A very simplified way of analyzing the appropriateness of staffing is through the calculation of a vehicle to mechanic ratio, which in the Public Works Department is about 25 : 1, which does not include the equivalency of the outside repair services provided by private mechanics, primarily on Wastewater Utility equipment. This ratio is only meaningful when placed in the context of other fleets with similar mixes of fleets to that of Lowell, which argues for a better, more informative measure.

There are a number of performance indicators that provide an assessment of the overall cost-effectiveness of a City's fleet. The Center project team uses vehicle equivalency units (VEU's) to benchmark the appropriateness of fleet maintenance staffing. The use of VEUs is an improvement over the simple statement of the numbers of vehicles and pieces of equipment since not all require the same maintenance intensity, and thus cost and required mechanic staffing, of maintenance and repair. The baseline for maintenance and repair is a sedan, which is defined as requiring one VEU. A piece of heavy equipment, such as a backhoe or front end loader, on the other hand, requires more maintenance, and is assigned a VEU of 5. Although the City of Lowell's Public Works Department has 137 total vehicles and pieces of equipment, the calculation of VEU for its fleet is 493.7, as the table below indicates.

Division	Vehicles and Equipment	VEU	Mechanics
Streets	88	388.1	5.0
Water	22	49.0	0.5
Wastewater	27	56.6	NA
Total	**137**	**493.7**	**5.5**

The primary advantage of the use of VEUs is that it allows the assignment of a standard number of hours of expected annual maintenance to each vehicle equivalent. This number can vary for fleets of exceptionally high or low average age, however, it is typically in the range of 14 to 18 hours of annual maintenance per VEU. If this were the case in Lowell's DPW experience, and an average of 15 hours of annual maintenance per VEU is assumed, its fleet would require approximately 7,406 hours of labor (493.7 VEU * 15 hours per VEU).

To determine the number of mechanics required to maintain the full DPW fleet of 137 vehicles and equipment, it is necessary to determine the actual number of hours that mechanics can spend in maintenance and repair efforts in a typical year. Again, this number can vary significantly depending upon a variety of factors. However, the Center uses a figure of 1,381 hours of "wrench turning" time per mechanic, the calculation of which is provided in the table below.

Item	Number
Total Paid Hours	2,080
Vacation (@12 days per year)	96
Sick Leave	80
Training	40
Lunch/Breaks 200 days * 45 minutes)	150
Meetings	40
Total Available	**1,674**
Chargeable Rate	82.5%
Total "Wrench Turning" Time	**1,381**

Note that the table makes an allowance for the chargeable time for mechanics. Although the average mechanic may, in fact, be in the garage for 1,674 hours per year, the reality is that not all of this time will be spent performing maintenance and repair services on a Department vehicle. This is due to such activities as cleaning the garage bay in between repairs, completing paperwork,

waiting for parts, and discussion related to an upcoming assignment. Generally, between 80% and 85% of all available time can be expected to be chargeable time to a specific work order. For the purposes of the calculation in this instance, the project team uses the midpoint of this range, or 82.5%, to derive a figure of 1,381 total annual "wrench turning" hours per mechanic.

If each mechanic, therefore, expends 1,381 hours on vehicle maintenance and repair, the number of mechanics required to maintain the fleet becomes a mathematical calculation of the number of VEUs divided by the number of chargeable, wrench turning, hours expended in its repair, as the table below shows.

Element	Number
A. VEUs	493.7
B. Maintenance Hours per VEU	15
C. Annual Hours of Maintenance Required (A*B)	7,406
D. Hours of Wrench Turning Time per Mechanic	1,381
E. Mechanics Required (C/D)	**5.4**

As the table shows, the maintenance of the current DPW fleet requires 5.4 mechanics. This is an important figure given that the current Streets Division staffing is 5 mechanics. The derivation of the need for 5.4 FTEs (or, in reality, 6 actual personnel) indicates that the full Departmental fleet of 137 units can be maintained with the addition of a single mechanic at the Streets Division garage, thereby allowing:

- The reallocation of 25% of the time currently expended by the two Skilled Mechanics in the Water Utility, and
- The avoidance of essentially all of the outside repair and maintenance costs currently expended by the Wastewater Utility.
- A standardized approach to vehicle maintenance and repair in the Department, and the performance of vehicle maintenance and management by a staff that if fully dedicated to these services.

Recommendation: Consolidate the fleet maintenance function under the Division of Streets. This organizational transfer will require the transfer of one Mechanic to the Streets Division, but will allow the reallocation of mechanic positions in the Water Utility to field responsibilities in that division. The Public Works Department has begun this consolidation with the transfer of a Parks Mechanic to Streets, and with the assumption by Streets of Wastewater Utility fleet maintenance. The project team recommends the continuation of this effort into the Water Utility and, in the longer term, in the City as well, as is discussed in the next section.

6. THE CITY SHOULD CONSIDER THE ESTABLISHMENT OF FLEET MAINTENANCE AND MANAGEMENT AS AN INTERNAL SERVICE FUND.

Currently, the Department's Streets Division is responsible for the maintenance and management of the vehicles and equipment for its own units, as well as for the Lands and Buildings Division. It is also responsible for the stocking and issuance of parts and fuel. The Water Utility also repairs and maintains it fleet, and the Wastewater Utility contracts for its repairs and maintenance. Although the project team's scope of services did not include the analysis of any City organization other than Public Works, given that this Department does not maintain any other organization's fleet of equipment, it is clear that the Police and Fire Departments are either performing this maintenance internally, or are contracting the services out to private providers.

The provision of fleet maintenance services in such a fragmented manner fails both to provide a standard level of service for the City's fleet, and to retain a centralized repository of data and information on the cost of maintenance and repairs. Currently, with each City department acting autonomously in the maintenance and repair of their respective fleets, there are effectively many

different "fleet managers" who are utilizing disparate processes in making their maintenance, repair and equipment replacement decisions.

In Public Works alone, the vehicle and equipment assets are likely worth over $6,000,000, with the Fire and Police Department fleets each likely above this figure. These are substantial investments, and the failure to properly manage the maintenance and replacement of the fleet can result in substantial wasted funds.

In a centralized vehicle and equipment maintenance organization, the "ownership" of equipment is typically transferred from the user department to the central maintenance organization. Although this is not universally the case, and does not necessarily inhibit the effectiveness of the delivery of services, it does ensure that vehicle repair and replacement decisions are made on the same bases and sets of criteria, as opposed to being made by many different department managers, most of whom have no particular expertise in the field of vehicle management.

The establishment of a central vehicle maintenance and management organization in the City would have many positive benefits. These include the following:

- An accurate accounting of each department's costs and usage of mechanic services.
- The operation of the vehicle maintenance shop on a business basis, requiring that rates be set, and charged, to ensure that the organization "breaks even" on a cost basis.
- The replacement of the City's fleet of vehicles and equipment on the basis of the same criteria. The vehicles and equipment should be funded through a Replacement Fund that is funded by monthly user charges that ensure that sufficient funding is available at the end of the vehicle's useful economic life cycle.

- The monitoring of vehicle utilization by a central organization, with the authority of that central organization to remove under-utilized vehicles from the fleet, or enforce shared usage of specific units among certain Department.

- The ability of the City to compare the costs of vehicle-related services to those available at local, private repair shops.

These benefits come, however, at the cost of intensive oversight of costs and charge-back mechanisms. Therefore, the administrative infrastructure should be well-established prior to embarking on this particular organizational move. The project team's assessment of the fleet maintenance and management function currently is that the Public Works Department does not yet have the staff or the infrastructure (both from a process and technological standpoint) in place to assume the role of centralized fleet maintenance provision. Therefore, the project team does not offer the discussion of this issue as a recommendation that Public Works be given the role of overall Fleet Manager, but rather to point out an opportunity in the future to manage an extremely valuable asset in a more standardized and professional manner.

Recommendation: The City should consider the transition to a centralized vehicle maintenance repair shop that is set up as an internal service fund, fully funded by user charges for services which are established to ensure that the shop breaks even on a cost basis at the end of each year. This organizational transition should be accomplished only after the establishment of the administrative infrastructure required to ensure a successful transition, including the collection and analysis of all rate components, the establishment of a Vehicle Replacement Fund, with appropriate life cycles established for each piece of equipment, and with the transition of the ownership of the fleet to the central shop. This centralized department or division may or may not ultimately reside within the Department of Public Works. However, irrespective of its organizational placement, the over-arching objective should be to standardize the maintenance and repair of the total City fleet.

7. THE RECREATION DIVISION'S MISSION IS DISTINCTLY DIFFERENT FROM THAT OF THE PUBLIC WORK DEPARTMENT.

The Public Works Department is comprised primarily of units engaged in the delivery of maintenance, repair and production services related to the City's infrastructure. These services include the maintenance and repair of streets, grounds, facilities, plant, vehicles and equipment, as well as water production and wastewater processing. In addition to these services, the Department of Public Works, through its Parks, Recreation and Cemeteries Division, manages the provision of recreational services primarily to at-risk youth through after-school activities.

Effective organizations should be designed around a common mission, and the services provided by the Public Works Department generally are grouped accordingly. However, recreational services do not fit a common theme within the organization, and, aside from the resident expertise of the Parks, Recreation and Cemeteries Division Commissioner, managers and staff throughout the organization do not possess any particular skills, expertise or experience in the provision of recreational services.

A compelling case for the inclusion of recreational services within the same organization in which parks and grounds maintenance services can be made for cases in which the recreational services function provides a substantial number of programs involving athletic fields. In these cases, close coordination is required between organizations responsible for the programmatic activities and the preparation of fields. In Lowell, the Schools are the primary provider of athletic

activities, with the City's Recreational Services organization providing mostly non-field related athletics, such as hockey and basketball.

The project team recommends that the City consider the transfer of the Recreational Services unit of the Parks, Recreation and Cemeteries Division outside of the Department of Public Works, and to either an existing organization, or a newly-created one with a mission that is more closely aligned with the provision of recreation and leisure activities. Although the project team's current engagement does not involve the analysis of the appropriate organizational unit outside of Public Works, in many cities, towns and counties, this function is grouped either in the Schools or in an organization including Veteran's Services, Public Health, the Council of Aging, and other similar services.

Recommendation: Transfer the Recreational Services function outside of the Department of Public Works to an organization with which its mission is more closely aligned.

8. THE STREETS DIVISION, AND THE PARKS AND CEMETERY FUNCTIONS SHOULD BE COMBINED INTO A SINGLE "STREETS AND GROUNDS" DIVISION.

The Streets Division of Public Works is responsible for the maintenance and repair of the City's streets and highways. This includes asphalt and sidewalk maintenance and repair, snow removal, culvert cleaning, special events, special projects, and other activities.

The Cemetery and Parks Maintenance units of the Parks, Recreation and Cemetery Division are responsible for maintaining City grounds and the six cemeteries in the City, including mowing, trimming, raking, mulching, fertilizing, irrigating, etc.

The Streets Division is also responsible for the maintenance of all City-owned street trees along roadsides and on City property, by planting, pruning, cutting and removing dead and diseased trees and limbs. In many cases, the Streets crews are in close proximity to the staff of the Parks Maintenance unit, who are responsible for the maintenance of parks and traffic islands. Further, the Streets Division "loans" a crew of, typically, two crew members per day to the Cemetery.

The three Public Works units of Streets, Parks Maintenance and Cemeteries are very similar in both work locations and skill sets required for the performance of their respective duties. These similarities are underscored by the sharing of personnel resources currently on a near-daily basis, also using similar equipment, such as dump trucks, backhoes, loaders, etc. Further, among them they constitute the large majority of the Public Works Department's unskilled labor classifications, suggesting that there may be opportunities to transfer these positions flexibly between functions if placed under a single organizational structure.

The placement of these functions under a single division would further foster accountability for the maintenance and appearance of the City's rights of way and, given the similarity of work sites, there are not only opportunities for shared equipment and personnel, but for the identification of needed work in the rights of way. Currently, this communication and flexibility are somewhat inhibited by the placement of these functions under different divisions.

The project team has, in a separate section of this report, recommended that the City investigate the feasibility of outsourcing Cemetery operations and all mowing functions, each of which currently are performed by the divisions in this

particular proposed merger. Should any, or all, of these functions be outsourced, clearly the structure of the merged organization would be altered.

Recommendation: Consolidate the Public Works Department's Streets Division with the Parks Maintenance and Cemetery units of the Parks, Recreation and Cemetery Division. This will allow the elimination of either the Streets Deputy Commissioner or the Parks, Recreation and Cemetery Commissioner, thereby allowing the transfer of the vacated position to a lower-cost field maintenance position. The project team makes no recommendation as to which of the two positions is eliminated, but it should be effected only as a position vacancy occurs (e.g., through retirement or voluntary separation from the City, etc.). However, the average salary of the two is $79,240.20. With 40% added for fringe benefits, this equates to an approximate $110,930. If the Department added the position of MEO3 Laborer to the merged Division, this would equate, with 40% benefits, to about $45,530, resulting in a probable net cost savings of $65,400.

9. THE PUBLIC WORKS DEPARTMENT SHOULD CLARIFY REPORTING ROLES AND CHAINS OF AUTHORITY.

During the course of on-site activities, the project team noted that, at least in limited instances, the reporting relationships of managers are unclear. This, in and of itself, is not an unusual phenomenon when there is a change in the upper management of a department. And such was the case last year when the Public Works Department named its new (and current) Commissioner.

An organization's chain of command should be an unbroken line of authority that links all employees in an organization, and defines who reports to whom. This chain of command has two underlying principles:

- **Unity of command**, which is the principle that each employee (and manager) should have one and only one supervisor to whom he or she is directly responsible (i.e., no manager or line employee should report to two or more people). This avoids the employee receiving conflicting demands or priorities from two or more superiors.

- **Scalar principle**, which refers to a clearly defined line of authority that includes all employees in the organization. This line of authority should be

clear and unbroken, and links every employee to one and only one superior, leading ultimately to the Director of the organization.

Some of the current component divisions of the Department of Public Works have not always been a part of this Department. The Water and Wastewater utilities have, in the past, operated autonomously, as has the Parks, Recreation and Cemeteries Division. Therefore, it is understandable from a historical perspective that managers of these sub-units of the organization would continue in their previous roles as direct reports to the City Manager on occasion. However, the continuation of these reporting relationships violates fundamental and generally-accepted organizational design concepts.

This phenomenon works both ways, however, as it was fairly common in discussions with employees in the divisions of Streets, Engineering and Lands and Buildings to refer to "Public Works" and mean only their own divisions (i.e., not the utilities and Parks, Recreation and Cemeteries). In fact, although the Electrical Unit has for many months been consolidated under the command structure of the Lands and Buildings Division, it is still referred to, even by the Commissioner, as an autonomous unit, whose supervisor is an attendee at all Department level management meetings.

The project team recommends that reporting relationships be clarified and adhered to. On those occasions in which managers and employees bypass the authorized chain of command, it should be incumbent upon the superior to refer these discussions to the appropriate managerial level. Principles of effective organizational design dictate that employees and managers should have a single superior in order to facilitate communication and to ensure that tasks and priorities

are clear.

Recommendation: Clarify reporting relationships among managers and employees to ensure effective communication and priorities of tasks and responsibilities.

4. OPERATIONS

This section analyzes the current operations of the Public Works Department and makes recommendations for more efficient delivery of services.

1. THE DEPARTMENT SHOULD ENHANCE STAFFING AND SERVICES IN ITS STREETS DIVISION

There are many factors to consider in the determination of the "right" size of a Streets or Highways Division. The project team discussed many of these in Section 2 (Management Systems and Accountability) of this report. However, at a minimum, these include:

- Services provided
- Desired service levels
- Existing conditions of asphalt and concrete infrastructure
- Availability and adequacy of tools and equipment
- Geographical size of the area of responsibility
- Number of center line (or lane) miles of roadway

The following sub-sections discuss and analyze both the staffing levels and the services provided by the Streets Division of Public Works.

(1) Staffing Levels Are Relatively Low in the Division Compared to Both Benchmarks and to Other Comparable Municipalities in the State.

As can be seen from a review of just a partial listing of above attributes on which the determination of "optimum" staffing depends, there is no correct answer to this question. Rather, the most definitive statement that can be made in this regard is that, given the same infrastructure, the same levels of effort, the same

geographical size of the area of responsibility, and the same equipment, tools and technology, the municipality with a greater level of staffing is highly likely to provide a greater level of service than one with a lower staffing level.

With these caveats in mind, the project team's experience with many other similar public works operations across the country indicates that:

1. The Lowell Streets Division is understaffed by most measures to accomplish even the services for which it is responsible.

2. The Division is not responsible for many of the services which are typically provided by similar streets and highways organizations with which the project team has experience.

One method by which comparisons may be made is to compare staffing to established benchmarks, one of which is the number of center line miles for which streets crews are responsible, and by making certain compensating adjustments to the ratios based on either the types of service that are not performed in the organization, or that are provided by the organization but are not typically performed in other similar streets and highways organizations.

There are 253 center line miles for which the Lowell Streets Division has responsibility, and it has three Working Foremen and nine MEOs in the street maintenance unit. (There are more staff members in the Division. They perform recycling services and fleet maintenance services, and are therefore not included in this analysis.) However, two of these MEOs are routinely loaned out to the Cemetery for burials, and two are routinely loaned to the Tree Unit within the Streets Division. In analyzing the actual days on which street maintenance employees were loaned to the Tree crew, this appears to average about 1.7 to 1.8 per day since September, 2011. In the Cemetery, this is closer to about 1.5 per day.

Therefore, the total of 12 street maintenance employees actually performing street maintenance functions is routinely closer to nine, which equates to about 28 center line miles per street maintenance employee, which is well above the benchmark norm of 10 to 12 miles per FTE.

However, it is also true that the Streets Division does not perform certain services that are typically found in similar organizations. These include such services as sign installation, creation and maintenance, berm maintenance, asphalt striping, road construction inspection, and catch basin cleaning. These services are being provided in the City, but are being performed by other departments and divisions. These services typically consume between 1.5 and 2.0 FTE, bringing the equivalent comparative staffing to between 11.5 and 12.0, for a comparable ratio of between 21.1 and 22.0 center line miles per FTE crew member.

Another complicating factor is that the Water Utility dedicates some of its resources to the patching of utility cuts during both construction and repair of breaks. This would tend to lower the modified range of 21.1 to 22.0 center line miles per employee somewhat. However, as no records exist to determine the number of hours expended in this function by Water Utility crews, the project team can only make subjective qualifications as to the degree to which this figure is reduced.

The project team conducted a survey of other Massachusetts cities that have similar populations and other demographic attributes to those of Lowell. Of course, not all of these cities have similar streets maintenance functions to that of Lowell. For example, although Chelsea was included in the sample, the street maintenance

crews maintain only about 110 center line miles of asphalt surfaces compared to the 253 maintained by Lowell crews. Similarly, West Springfield maintains only 134 center line miles. And although the calculation of ratios of center line miles per street crew member should, in theory, be comparable for any number of center line miles maintained, the relatively small size of some communities' infrastructure typically means that the crews in these communities perform many duties unrelated to the performance of streets maintenance, thereby making the staffing ratios incomparable to larger organizations. With this caveat, the following table presents the ratios of center line miles per streets maintenance crew member for the four most comparably-sized cities in the survey:

City	Center Line Miles	Street Crew Members	Ratio
Chicopee	225	21	10.7 to 1
Fitchburg	230	20	11.9 to 1
Haverhill	240	9	26.7 to 1
Lynn	330	16	20.6 to 1
Lowell	**253**	**11.5- 12**	**21.1 to 22.0 to 1**

From a review of the above table, it would appear that Lowell's Streets Division is at least staffed comparably to those of Haverhill and Lynn, if not to those of Chicopee and Fitchburg. However, it must also be pointed out that Haverhill contracts out all sidewalk maintenance, culvert cleaning and utility cuts and excavations, each of which is a service performed by Lowell's Streets Division. Additionally, Lynn's Water and Sewer Commission performs all culvert maintenance, with the effect that the 20.6 to 1 ratio is likely somewhat less than it would appear.

It should be noted that the project team did not evaluate the condition of roadways in any of the communities in the sample. Further, the project team cannot

make the compensating adjustments for these communities' street maintenance crews that were possible for Lowell's crews (e.g., the daily transfer of personnel to cemetery maintenance or tree maintenance). Therefore, it is not possible to state that any of the surveyed communities' levels of service are any greater or less than those provided by Lowell. It is notable, however, that Chicopee and Fitchburg both exhibit ratios of staffing in their respective streets and highways functions that are within the expected range based on the project team's previous experience with well-managed streets organizations with adequately-maintained infrastructure. Further, it is probable that, with adjustments for services not provided (i.e., they are contracted out), Haverhill's streets crew ratio is likely much closer to the expected range of 10 to 12 center line miles per crew member than the ratio presented in the table for this City.

(2) The Lowell Streets Division Does Not Perform Certain Services That Are Commonly Performed by Other Streets and Highways Organizations.

The project team has noted above that the Lowell Streets Maintenance Division is insufficiently staffed even to perform the services that it is currently tasked with providing. Therefore, it is neither feasible nor desirable for the Division to assume more responsibilities with its current staffing contingent. There are, however, some services that with either additional staff, or with the transfer of staff from other City organizations performing these services, that service levels may be enhanced if provided by the Streets Division. These include the following:

- **Sign maintenance, installation, repair and creation**. Although the project team's scope of services included an analysis only of the Public Works Department, these services are not performed in this Department. However, the responsibility for these services typically resides in this Division due to

the placement of sign in the streets and rights of way, for which the Division is responsible. Further, the skills required in maintenance, repair and installation are generally similar to those of crew members in the Division, and can be performed in conjunction with other duties being performed at the same time and location. The project team's experience indicates that, although staffing levels can vary for this function based on quality and condition of signage and materials used, the ratio of the number of signs that can be well-maintained per FTE ranges from 12,000 to 15,000. The project team has no data indicating the number of signs in the City of Lowell.

- **Pavement striping.** This is typically outsourced, as it is a function that it performed only seasonally, and requires an investment in equipment and materials that cannot be utilized for any other purpose. However, the oversight of the function is typically done under the streets maintenance organization (or Engineering), as striping occurs on the roadways where these crews are commonly located in their daily activities. Additionally, close coordination of pavement striping activities is required with the streets maintenance organization since it is responsible for asphalt reconstruction, repaving, and surface treatments.

- **Berm maintenance**. Building and maintaining roadside berms on unimproved streets, and those with no curb and gutters, should be performed in selected locations where it's necessary to protect the road edge. These berms should be 6 to 18 inches from the pavement edge. Berming is done to support the asphalt edge and prevent deterioration, to provide a smooth transition from the road edge to the existing grade of the landscape, to prevent stormwater runoff from ponding and freezing, and sometimes to allow for handicapped accessibility.

The project team cannot definitively make the recommendation that these functions should be transferred to the Streets Division without additional information regarding which City departments are currently providing them, and at what service level and cost. However, there are compelling cases to be made that there are valid reasons that they should be performed in the Public Works Department if reasonable staffing levels were either currently present in the Streets Division, or there were existing staff who currently perform these functions who could be transferred into the Streets Division.

(3) There Are Opportunities to Reallocate Staff Internally to Enhance Services in the Streets Division.

In the Organizational Section (Section 3) of this report, the project team recommended that the City investigate the feasibility of outsourcing the operations of its six cemeteries. In the discussion, the project team presented justification related to cost and efficiency. Further, the outsourcing of the function would also allow some greater degree of organizational flexibility, as it would facilitate a merger of the Parks Maintenance function with the Streets Division (creating a "Streets and Grounds" division), and would allow the elimination of a management position, and the addition of a field worker (MEO3 is suggested) in exchange. In addition, the merger of the Parks Maintenance unit with Streets would have the advantage of allowing the transfer of maintenance staff between parks maintenance and streets maintenance, based on daily and seasonal needs.

In addition to this organizational move, there are other means by which the Streets Division may enhance its level of service. These are discussed below.

- There is one Working Foreman/Maintenance Man position in the Streets Division who reportedly expends a large portion of each day transporting documents between the Public Works complex on Middlesex Street to and from City Hall. The incumbent also delivers trash and recycling bins to residences, and handles missed garbage collections. The duties performed by this position are peripheral to the core functions of the Streets Division and, if redirected to activities of streets and sidewalk maintenance, would enhance the service levels delivered in support of the infrastructure.

- One Maintenance Man position is reportedly dedicated full time to pothole repair. The project team cannot state that the position is not fully engaged each day in the filling of potholes. However, it is highly unusual to allocate a full FTE to the repair of potholes on only 253 center line miles of asphalt surfaces. It has been noted in a previous section of the report that the City has not resurfaced a substantial number of roadway miles in the past three years, but this is not a highly unusual circumstance in the current economic

climate, and few municipalities dedicate this level of resources to filling potholes. More typical is the allocation of a full FTE during six to eight weeks in the summer months, with cold patch applied to hazardous potholes throughout the remainder of the year. Again, a reallocation of this position's time to asphalt and sidewalk repair, as well as one or more of the functions noted above that are not being performed currently, would have a significant effect on the service levels in other areas.

- There are two MEO3 Laborers/Watchmen who work evenings and weekends, and who provide services that could be provided by other staff and other City departments. These positions, if attached to day crews, could further enhance the ability of the Streets Division to provide a greater level of service in its core service areas of infrastructure maintenance. These two employees provide the following services:

  - **Pick up dead animals**. The project team recommends that the Animal Control Officer or Police Department collect and dispose of these animals after hours on regular time.

  - **Sand water leaks**. This is an activity that is typically performed by water operational crews as they clean up during and after a water leak.

  - **Grease trucks**. This may be performed by one of the mechanic staff during the day during scheduled preventive maintenance events.

  - **Clean up after car accidents**. If an accident is such that Police Officers cannot easily clean up the debris, Public Works employees should be called in on overtime to handle this function more economically.

  - **Sweep downtown streets**. The current sweeping contract could be modified to accommodate this function. However, if it is found not to be economically feasible, the schedule of one of these positions could, pending labor negotiations, be re-designed to report to work at 6:00 am to sweep the downtown area on a periodic basis.

  - **Fill potholes after hours**. It is rare that a pothole is severe and hazardous enough to require filling after hours. However, if this were found to be the case, a pothole crew could more economically be called in after hours to fill it.

The project team does not intend to state that the functions performed by the above staff members are not valuable. However, given that personnel resources are

scarce in the Streets Division, and it is failing to accomplish basic and core activities in support of the City's infrastructure, it becomes a matter of determining the priority of use of available resources.

The reallocation of these staff members should result in substantial enhancements to current service levels, which should be focused on infrastructure maintenance. Of the four positions described above, only the position of Maintenance Man, who is dedicated to filling potholes each day, was included in the calculation of the ratio of center line miles per Streets Maintenance staff member, as the other three are performing peripheral duties. Should these three positions be redesigned to perform infrastructure maintenance work, the ratio of center line miles per employee would be reduced from a range of 21.1 - 22.0 to 1, to 16.9 - 17.4 to 1, a much more reasonable range. Further, if one of the current managerial positions (Streets Deputy Commissioner or Parks, Recreation, Cemetery Commissioner) could be converted to a MEO3 position, this would further reduce the range to 15.8 – 16.3 to 1.

Recommendation: Redesign the positions of Maintenance Man, Working Foreman/Maintenance Man, and MEO3 Laborer/Watchman to perform duties more closely aligned with the Streets Division's core functions of infrastructure maintenance. This will allow the Division not only to provide a higher level of service in the functions it currently performs, but will also allow the performance of certain functions not currently performed by the Division, but which are typically performed within Streets Maintenance organizations.

2. THE CITY SHOULD SUBSTANTIVELY INCREASE REPLACEMENT FUNDING FOR THE FLEET.

The project team analyzed the age of the vehicles and equipment maintained by the Department's Maintenance Mechanics and determined that they maintain a

relatively old fleet. The project team placed all 88 pieces of equipment maintained by the Streets Division of the Department into five categories and determined the average age of the fleet for each of these categories. For purposes of classification, the following were used.

Category	Description	Number	Average Age
1	Sedan, Van	1	18.5
2	Heavy Van, Pickup	37	11.7
3	Heavy Equipment	46	11.2
4	Trailer	2	10.5
5	Pump, Generator	2	14.0
Total	**N/A**	**88**	**11.5**

As the table shows, the weighted average age of the Streets, Lands and Buildings and Parks fleet is 11.5 years, suggesting a replacement cycle of about 23 years for the "average" unit in the fleet. Clearly, not all units in the fleet require the same replacement cycle. The economic life cycle of an administrative sedan or pickup truck is well below that of, for example, a front loader. Therefore, the "average" age of the fleet is meaningless as a composite number other than as a comparison to another benchmark, such as that of other municipal fleets with similar compositions. In the experience of the project team, a composite fleet age of over 11 years is substantially above this benchmark. However, even in examining specific categories of the fleet, it is clear that many vehicles and pieces of equipment are well beyond their economic lives, and are almost certainly contributing to excessive expenditures for fleet repair and maintenance. For example, the typical economic life cycle for a pickup truck is approximately 7 years, suggesting that the average asset in this category should be about 3.5 years. Lowell's average age of this class of unit is almost 12 years. The average ages of vehicles and equipment in the

Water and Wastewater utilities raise similar concerns, although the Water and Wastewater Utilities' heavy equipment is relatively new.

Although the project team does not possess the dollar value of vehicles and equipment replaced in recent years, a review of the current inventory suggests that few of these have been replaced over a period of several years. The Streets Division has replaced several of its critical pieces of equipment in the past two years, and the City has reportedly invested approximately $1 million in its fleet in the past year, but clearly, the fleet remains relatively old. Like many cities and cities both in Massachusetts and nation-wide, Lowell has limited funding available. However, it should substantively increase the amount of funds allocated for replacement of its fleet in order to avoid a significant maintenance, and possibly safety, issue. The development of a five-year vehicle and equipment replacement plan is useful in planning for these expenditures.

Recommendation: The City should fund the replacement of its fleet on a more timely basis, as the age of the fleet is approaching very high levels, and, likely, the expenditures for maintenance and repair. The City invested approximately $1 million last fiscal year, however the required dollar amount that is required to lower the fleet age to acceptable levels should be determined, and the City should commit to this funding level.

3. THE TREES UNIT OF THE DEPARTMENT SHOULD DEVELOP AN URBAN FORESTRY MASTER PLAN.

The Trees Unit of the Streets Division lacks an urban forestry master plan. The trees that make up the Lowell urban forest provide shade, clean the air, reduce storm water runoff, provide wildlife habitat, increase property values, and provide a sense of well-being, lending beauty and character to the community. Often taken for granted, these benefits will not continue without good planning. An urban forestry

master plan should be designed to provide a comprehensive plan to protect, develop, and maintain diversified and appropriate tree plantings on City rights-of-way.

The planning and the development of an urban forestry plan forms the foundation for an effective and systematic tree care program. The elements of a master plan include the following:

- Existing laws, policies, and standards for the urban forest and needs for revision. The project team has reviewed the City's ordinance, Chapter 260, relating to trees, and there are several facets of the ordinance that should be updated, or efforts should be made to comply with the provisions of the ordinance. These include the assurance of qualifications and certifications for the Tree Warden, issuance and oversight of all tree work and removal permits, composition of the Tree Board, and even the issuance of an annual Urban Forestry Plan (Section 260-5.B (2));

- A complete inventory of street, park and median trees;

- A species distribution to enable the City to develop management and planting strategies that are aimed at providing a balanced range of tree species;

- A condition assessment of the urban forest based upon information collected by the inventory;

- The maintenance needs of the urban forest that include an assessment of the maintenance needs of the street, park, and median trees, a strategy for the removal of hazard conditions, and the development of an operational maintenance program;

- The pruning needs of the urban forest that address a cycle of pruning maintenance for trees, recognizing different pruning needs depending on location, size, and growth habits of the species;

- A tree planting plan including the identification of planting locations, the exact planting specifications, canopy coverage, and policies for species and age diversity of the urban forest; and

- Goals and policies including tree resource protection, tree resource expansion, management, maintenance, and care, education and outreach, Citywide coordination and support, and staff development.

As is noted in one of the points above, one important element of the Master Plan is the development of a tree inventory. There are several reasons to accomplish this task, which should be accomplished either by the Tree Unit, or by volunteers under the direct supervision of the Tree Warden (who, in the case of the Public Works Department, is the Commissioner/Assistant City Manager). These include the following:

- To determine the elements and composition of the City's forestry program. If, for example, the inventory indicates that there are diseased trees, or areas in which there is a lack of trees, this suggests that tree planning may need to be the primary thrust of the program.

- To prioritize the work schedules of workers involved in removing dead and diseased trees in order to minimize the hazards these trees present.

- To provide education to residents and businesses regarding the benefits of a healthy tree inventory. This also includes educating the public about the types of trees that are best, and worst, suited to the area.

The Trees Unit should ensure that only information that is going to be used is collected in the process of developing the tree inventory, and given the limited resources to which the Unit has access, it should begin at a very basic level that includes:

- Tree species. This should use scientific names, not common names.

- Tree diameter. This should be taken at a standard height for all trees. A common height is 4.5 feet, or, diameter at breast height.

- Tree condition. Record any maintenance needed, including removal. This should include any diseases or damage that is apparent, and a recommended treatment.

- Site condition. This should include an estimate of the probable space available for the root system, as well as the general soil condition. Also, how close are power lines, and will trees cause impairments to traffic site distances?

- Locations of historic or distinctive trees.

The tree inventory should, optimally, be conducted in the winter so that hazardous and diseased limbs and dead wood can be more easily observed. However, again, with limited resources, the Unit should take any available opportunity and access to resources regardless of the season.

The inventory, once it is completed, should not exist in manual form, but should be entered into an electronic database. There are software programs available to facilitate the entry and storage of the data, but the data may also be easily stored in an Excel spreadsheet, as the intent of electronic storage is to facilitate statistical analysis, charts, graphs, etc.

Recommendation: Develop a Tree Master Plan, including a tree inventory. Further, the Public Works Department should initiate a review of the Tree Ordinance in Chapter 260 to either ensure compliance with its tenets, or revise them to reflect the current operating conditions.

4. THE PUBLIC WORKS DEPARTMENT SHOULD EXPAND THE EXTENT OF NON-STRUCTURAL OVERLAYS THAT IT USES AS PREVENTIVE MAINTENANCE FOR THE CITY'S STREETS.

When used properly as preventive maintenance, non-structural overlays prevent future cracking by delaying the aging process of the pavement. They can also correct minor flaws such as rutting, raveling, minor cracks, and reduced pavement friction. Certain products, because of their structure, can only be used on low volume traffic roads and the friction aggregate requirements for these treatments reflect this limitation. At present, the City relies strictly on overlays for these treatments.

Non-structural overlays include:

- **Slurry Seal**. Quick-set slurry is a mixture of asphalt emulsion, aggregate, mineral filler and water. The slurry is continuously mixed and applied to the pavement in a single lift with specialized equipment. There are two aggregate gradations available: Type II and Type III. No compaction is required for quick-set slurry, but the emulsion must be allowed to cure before opening to traffic, usually 2-3 hours. Quick-set slurry will seal the pavement, reducing oxidation and weathering of the surface. The reduction in oxidation will allow the pavement to remain resilient to fatigue and low temperature cracking. Minor surface distresses such as raveling may also be corrected or prevented. The expected surface life for quick-set slurry is 3 to 5 years. It should be used for low volume traffic streets. Type III should be used for streets with higher levels of distress.

- **Chip Seal.** Chip seal has a low to moderate initial cost depending on labor and aggregate sources. Chip seal consists of a heavy asphalt emulsion application followed by a single layer of clean, uniformly sized coarse crushed stone. The emulsion is applied to the cleaned road surface, and immediately covered with the stone. The stone is placed, producing a dense one aggregate thick layer with no bald spots or bleeding areas. The stones are then oriented and seated with pneumatic tire rollers. The emulsion must be allowed to cure before the road can accept traffic. Surface treatment will seal the pavement, reducing oxidation and weathering of the surface. The reduction in oxidation will allow the pavement to remain resilient to fatigue and low temperature cracking. Minor surface distresses such as raveling may also be corrected or prevented. A good chip seal provides excellent skid resistance and can provide attractive color by choice of stone. The average life is 5 to 8 years. Exceptionally good ones have gone much longer. The 3/8" - 1/2" chip seal is the most common seal coat treatment used in New England.

- **Micro-surfacing**. Micro-surfacing is a mixture of polymer modified asphalt emulsion, aggregate, mineral filler, and water, that has a slurry consistency during mixing and application. The micro-surfacing is continuously mixed and applied with specialized equipment. There are two mix types available based on aggregate gradation: Type II micro-surfacing and Type III micro-surfacing. Micro-surfacing overlays are always applied in two passes. No compaction is required, however, the emulsion must be allowed to cure before traffic is applied. Micro-surfacing will accept traffic within 1 hour after application under most conditions. Micro-surfacing will seal the pavement, reducing oxidation and weathering of the surface. Minor surface distresses such as raveling may also be prevented or corrected. The expected surface life for micro-surfacing is 5 to 7 years. It can be used for high volume traffic streets.

In expanding the types of non-structural overlays utilized by the City of Lowell, the Public Works Department, through its Engineering Division, should develop strategies to assure the effective use of these alternatives. Important points to note include the following:

- The alternative treatment approaches should consider the different traffic volume, with lower volume streets receiving longer cycles between surface treatments (e.g., slurry seal) and pavement overlays; and
- The cycle chosen needs to be grounded upon the development of strategies that are tied to the pavement condition index for the street.

Recommendation: The Public Works Department should expand the set of non-structural overlays that it utilizes for preventive maintenance of the City's streets beyond overlay to include slurry seal and/or micro-surfacing. The Public Works Department should develop strategies to assure the effective use of these alternative non-structural overlays.

5. THE NUMBER OF AUTHORIZED POSITIONS ALLOCATED TO MAINTENANCE AND REPAIR OF THE CITY'S BUILDINGS IS LESS THAN WORKLOAD AND SERVICE LEVEL REQUIREMENTS.

The project team obtained the maintainable space, by building, for the City and Schools, for which the Lands and Buildings Division is responsible for maintenance and repair. These figures are utilized in the sub-sections below. The square footage of buildings maintained by the Lands and Building Division amounts to 2,715,270 square feet. This square footage, by structure, is provided in Appendix D of this report.

The total of 2,715,270 square feet excludes buildings that the Department does not perform routine, ongoing maintenance such as the Water Plant, Wastewater Plan, pump and lift stations, diversion stations, metering stations and other outlying utility structures.

The *International Facility Management Association* conducts operations and maintenance surveys periodically, most recently in 2005. This survey was completed by more than 650 members of the Association comprising city and county governments, educational institutions, the federal government, state governments, insurance companies, electronics and information system companies, etc. The overall building maintenance staffing amounted to a ratio of one skilled or semi-skilled technician per 47,000 rentable square foot. This indicates that the City of Lowell's Lands and Buildings Division would need approximately 57 skilled and semi-skilled positions to maintain the City's buildings (excluding supervisory staff). This compares to the current total of 22 such staff (see the Descriptive Profile in Appendix A for a listing of each of the positions). In addition, there are two positions that are on long-term leave (Mason/Craftsman and Fire Alarm Technician) who, although nominally Division staff members, are not included in the listing of available staff for the purposes of this analysis, since they have been unavailable for some time, and are reportedly unlikely to be available in the near future.

In any municipal operation of a small to mid-size, not all repairs and maintenance services are performed by in-house staff. This is also the case for the Lands and Buildings Division. The Lands and Building Division identifies $80,000 in its 2012 budget for "Repair and Maintenance." Assuming that there is a 1:1 ratio of labor and materials, converting the probable expenditure of about $40,000 to an estimated number of FTEs yields an approximate one-half additional FTE for a private sector trades mechanic. Adding this to the existing total of 22 in-house staff members yields a total of 22.5 effective FTEs available for facilities maintenance.

This results in the effective maintenance of about 120,679 square feet per FTE, a range well above the typical 47,000 square feet per employee.

The number of positions allocated for building maintenance should be increased over time. The project team recognizes the current budgetary limitations faced by the City and, in fact, there are no obvious structural deficiencies in the buildings which the project team viewed. However, it is also true that the project team members are not structural engineers and cannot make this technical assessment. The required number of skilled trades mechanics, exclusive of supervisory personnel, would be 57 simply to achieve the average of the respondents to the IFMA survey, noted above. This is 24 FTE above the current staffing level of the City's staff members providing these services. Clearly, it is infeasible to add the number of staff required to achieve the IFMA survey average. However the project team recommends that the City incrementally add positions, focusing on the skilled trades initially, over a period of several years.

Recommendation: Begin to add skilled trades mechanics to the Lands and Buildings Division. The project team has made recommendations in previous sections of this report that this Division, as well as others, should begin to accumulate adequate records to determine where staff members are expending their time, and where the primary areas of need are. Only after empirical data are collected should the Division make a recommendation as to which trades positions are most needed, however given that only six of the 22 trades positions are plumbers and HVAC Technician/Craftsmen, these two would appear to be likely candidates for additional staff initially. The addition of a single HVAC Technician or Plumber initially would cost approximately $64,170, including salary and benefits calculated at 40% of salary.

The lack of a preventive maintenance (PM) program is likely to result in costly failures of structures and systems over time, and any additional resources obtained by the Division should expend a considerable portion of their time to PM once the major systems inventory has been developed, and at least a rudimentary PM program defined.

6. THE CITY SHOULD CONSIDER CERTAIN OPPORTUNITIES TO OUTSOURCE SERVICES.

As was noted earlier, the City of Lowell has been affected by downturns in revenues, as have many other municipalities across the country. This makes it even more imperative that opportunities for cost containment be analyzed. Many municipalities have explored regionalization efforts, public-private partnerships, and even full outsourcing of services that can be more efficiently performed by private industry, and in which sufficient competition exists to ensure the continuity of services at the lowest possible cost.

The project team analyzed opportunities for regionalizing or outsourcing certain services currently provided by the Department of Public Works. The criteria utilized to identify outsourcing service candidates were as follows:

- Services that are currently being delivered by the City at a financial loss.
- Services that are typically and historically provided efficiently and effectively by private service providers.

The following sections provide analyses of the feasibility of outsourcing certain services.

(1) The Department Should Investigate the Feasibility of Expanding the Role of Contractors in Mowing Operations.

The Parks, Recreation and Cemeteries Division is responsible for the mowing, trimming, raking, mulching, fertilizing and irrigating of all City grounds and green spaces and traffic islands, other than some of the roadside mowing and string-trimming done by the Streets Division. This encompasses approximately 500 developed acres.

Currently, the Streets Division contracts for the mowing of the old landfill, which is approximately 40 acres, and the Parks, Recreation and Cemeteries Division outsources the mowing of the six Cemeteries.

The project team does not possess accurate data regarding either the number of acres currently mowed and trimmed by staff of the Parks Unit or the Streets Division. It is clear, however, that neither of these organizations has a surplus of staff available to perform all of their core services. The project team's experience with other public works and parks organizations indicates that, depending upon many factors such as the configuration of the acreage mowed, number of obstructions, mower width, and time of season, mowing and trimming 100 acres during a "typical" growing season requires approximately two FTEs. Again, the project team does not possess figures for the actual acreage mowed by in-house staff, but this 100 acre figure may be scaled upward or down, depending upon the actual acreage once it is determined.

The purpose of the discussion of this issue is not to determine the financial feasibility of outsourcing the mowing function, but to point out three separate factors:

- The Public Works Department outsources the vast majority of its mowing currently.
- Mowing is a low-skilled function that is tangential to the core missions of both the Parks Unit and the Streets Division. The provision of commodity services such as mowing is an ideal candidate for outsourcing generally due to the abundance of private contractors in an area.
- Neither Parks nor Streets has an abundance of staff to perform their other, more critical, services.

The project team recommends that the Public Works Department determine the exact locations and areas that continue to be mowed and trimmed by Department staff. Once this is determined, the Department should investigate the feasibility of outsourcing all remaining mowing and trimming functions. If this is determined to be feasible, this will allow the reallocation of staff to more critical functions. In Streets, this may include such functions as parking lot and street repairs, sidewalk repairs, culvert cleaning, and even availability for assignment to the Tree crew on an ad hoc basis. In Parks, this may include a reallocation of staff to parks and traffic island beautification efforts, such as mulching, planting of vegetation, irrigation, and other related services.

It should be noted in this section that outsourcing mowing, or any other function, requires that the City dedicate sufficient time and resources to perform consistent quality assurance checks on contractor operations in order to assure both consistency of service and conformance to City specifications. Interviews at the Edson Cemetery indicate that this is not consistently performed at that location due to the understanding of the Cemetery Manager that this is not a requirement of the position. The project team makes no judgment as to whether this is the case, but it is essential that personnel resources be allocated to the important function of checking on the contractor's work at this, and other, locations. Contract management skills are essential assets to possess when outsourcing any municipal service, and if this one is to continue as an outsourced function, the Department needs to dedicate personnel resources to ensure that contractors adhere to contract specifications.

Recommendation: Investigate the feasibility of outsourcing the remaining acreage currently being mowed by Public Works staff. This will allow the reallocation of staff time to more critical core services of the Parks and Streets units of the organization. Ensure that sufficient resources are dedicated to performing quality assurance checks on the contractor's work.

(2) The City Should Assess the Market for the Outsourcing of the Operation of Its Six Cemeteries.

The Parks, Recreation and Cemetery Division operates six cemeteries in the City. The largest of these, and the location at which the administrative offices are located, is Edson Cemetery on Gorham Street.

The following table summarizes the revenues and expenses for the Cemeteries last fiscal year.

Item	Amount
Lot Sales	$56,615
Burial Fees (budgeted)	$180,000
Total Revenues	$236,615
Expenses	$257,805
Deficit	**($21,190)**

In addition to the stated costs in the table, the City is effectively spending more than the $257,805 in the expense line due to the transfer of Streets Division employees into the Cemetery on a near-daily basis. If, for example, two MEO3 Laborers were transferred in for only 100 days for five hours each day, at a salary of $37,500 and 40% benefits, the effective additional cost would be $25,240, increasing the deficit from $21,190 to $46,430.

The City of Lowell's experience reflects trends seen nationally, with flat to declining revenues, and operational deficits at the local level. The total market for cemeteries and crematories services nation-wide was $2.957 billion in 2009, which

is up slightly from previous years, but relatively unchanged when accounting for price escalation for services.

Metric	2004	2005	2006	2007	2008	2009
Market Size	$2.886 B	$2.823 B	$2.869 B	$2.951 B	$2.997 B	$2.957 B
Total Firms	4,516	4,414	4,349	4,307	4,230	4,180
Employees	38,051	36,416	35,417	35,099	34,893	34,112

As the table shows, the overall market size, measured in revenues, has increased slightly (2.5% in 5 years), but the total number of firms providing cemetery and cremation services has declined by 336, or 7.4% in the same 5 year period. Similarly, the total employees involved in these services has dropped steadily. These figures reflect the overall decline in mortality rates nation-wide, and may be representative of trends in Lowell, which may indicate a sustained declining trend in sales at Edson Cemetery.

Although flat to declining sales are, in themselves, troubling for Lowell, these trends are especially problematic when placed in light of the costs of operating the Edson Cemetery. Specifically, the Cemetery operated at a deficit last year, and is likely indicative of a longer-term trend, although the project team was unable to obtain historical figures. The City has reported that the deficit last fiscal year was $200,000 greater than in the current fiscal year, however even the current estimated deficit potentially greater than it could be through outsourcing the operation.

The project team does not possess accurate estimates of potential savings, or abatement of losses, if the operation of the Cemetery were privatized. However, private firms may possess greater marketing capabilities, abilities to share equipment, and may have other expertise that could result in at least a smaller

annual loss for the City. Further, it is likely that a private firm would have the resources to automate cemetery records both accurately and in a more defined schedule. Currently, the Cemetery staff is entering its records into an Excel spreadsheet, and only then as time allows. This is likely to be a very long process at the current pace. The project team therefore recommends that the City investigate the availability and interest of private firms in the assumption of responsibility for operating the six cemeteries.

Recommendation: Investigate the availability and interest of private cemetery operators in the region in assuming responsibility for operating the six cemeteries in the system. If sufficient interest and availability exist, the City should issue a Request for Proposal (RFP) to obtain quotes on the costs associated with transferring this responsibility to a private operator.

7. THE PARKS AND FORESTRY DIVISION SHOULD DEVELOP SERVICE LEVEL STANDARDS FOR THE MAINTENANCE OF CITY PARKS.

If polled, most residents generally prefer a park with lush green turf, healthy and attractive plants, shrubs, flowers, and trees, safe and clean recreational facilities in good condition and an attractive area free from debris and litter. However, while there are standards for the appearance of a park in terms of the condition of vegetation in park facilities, as well as standards on the labor required to achieve this condition, wide latitude is possible on the level of service for different types of parks and facilities. Levels of park maintenance will vary depending on the type of facility, intensity of use, and on local standards. For example, parks that are widely used for a variety of leisure activities generally will require a higher level of maintenance than passive neighborhood parks. This means that different levels of service will prevail throughout the City's park system. Service levels are not fixed

levels of maintenance for all facilities, but rather variable levels to be applied to individual facilities.

The Parks Unit of the Parks, recreation and Cemeteries Division should define the level of service to be provided in the maintenance of its park, landscape, open space, and urban forest system. Important points to note about the alternatives are presented in the points below:

- **Mode A** is state-of-the-art maintenance applied to a high quality, diverse landscape usually associated with City-owned buildings. Mode A areas have the following characteristics.
  - The turf is lush, dark green in appearance, of high quality and free from weeds, insects, fungus, or any foreign grasses.
  - The turf is cut to a precise level, and groomed weekly during growing season.
  - Plants and trees are pruned, trimmed, and shaped to ornamental beauty and are free from insects or fungus.
  - Planter beds are well raked and cultivated weekly and are free of weeds, grass, or any foreign matter.
  - Irrigation systems are constantly maintained and tested weekly.
  - Litter and/or other debris is removed daily.
  - Reseeding and sodding are done whenever bare spots are present.
- **Mode B** is a high level of maintenance associated with well-developed park areas with reasonably high visitation. Mode B level of service is similar to Mode A level of service, with a major difference being the degree of plant and turf grooming. The turf has a lush green appearance and is free from weeds and foreign grasses. Precise cutting and mowing, however, is not practiced. Plants and trees are trimmed, pruned, and shaped to ornamental beauty, but not with the same frequency. Planter beds are free from weeds, debris, or grasses, but flowerbeds are not as extensive.
- **Mode C** is a moderate level of maintenance associated with locations of moderate to low levels of development and moderate to low levels of visitation. Mode C areas have the following characteristics.

- Turf management such as mowing, reseeding and sodding, weed control and fertilization are practiced to ensure lush, green and healthy grass. However, it is applied less frequently than higher maintenance levels since turf area is generally not used for a variety of organized sports and leisure activities (e.g., soccer).

- Weeds and mixed grasses are tolerated in the turf but do not become major problems since turf conditioning is practiced on a scheduled basis.

- Turf edging is performed monthly conducive to a generally neat appearance most of the time.

- Litter and/or other debris is removed weekly or bi-weekly.

- Plants and trees are trimmed and pruned annually to ensure proper growth and a generally attractive appearance.

- Planter bed areas are weeded and cultivated at four-month intervals so wild weeds or grasses may be present for short periods of time prior to scheduled maintenance. They are tolerated at this level as long as they are small in size and the area covered is minimal.

- **Mode D** level of service is for areas in which maintenance is reduced to a minimum. Such areas do not have developed turf or irrigation systems. These areas are maintained only to the extent necessary to control growth to reduce fire hazards, and keep native vegetation alive and healthy during the growing season and to eliminate unsafe facilities. However, open space will need variations in the level of service defined based upon the type of open space (e.g., farmland versus open space that is actively maintained).

The Lowell Parks Unit has sufficient staff during the summer months to achieve a B mode of service. This assumes the continued presence of the 14 full time staff, 12 temporary workers from April through September, and assistance from volunteer groups during this time as well. The project team's on-site work occurred during winter months, so it was not possible to assess the condition of parks at that time. However, the description above for a B level of service should

guide the Department in conducting a self-assessment of parks conditions as it goes forward.

The table on the following page should serve as a guide in allocating staff and in determining the frequency of services in order to achieve varying levels of maintenance of the City's parks.

ALTERNATIVE LEVELS OF SERVICE				
Task	**Mode A**	**Mode B**	**Mode C**	**Mode D**
1. Turf Care				
Mowing	Weekly	Weekly	Weekly	Demand
Aeration	3 Mo. Inter.	6 Mo. Inter.	Annually	N/A
Vacuuming	3 Mo. Inter.	6 Mo. Inter.	Annually	N/A
Fertilization	6 Wk. Inter.	3 Mo. Inter.	Annually	N/A
Edging	Weekly	Monthly	Monthly	N/A
Sprinklers - Test	Weekly	Monthly	Monthly	N/A
Weed Control	Constant	Monthly	Demand	Demand
2. Litter Control	Daily	Daily	Daily	Weekly
3. Pruning				
Trees	6 Mo. Inter.	Annually	Annually	Annually
Shrubs	6 Mo. Inter.	Annually	Annually	Annually
4. Floral Plantings	At least two blooming cycles a year.	Perennials or flowering trees or shrubs only.	Perennials or flowering trees or shrubs only.	None. Maybe plantings or wildflowers at special locations.
5. Restrooms				
Cleaned	Daily	Daily	Daily	N/A
6. Disease and Insect Control	Constant	Constant	Demand	Demand
7. Play Equipment				
Paint & Overhaul	N/A	Annually	Annually	N/A
Inspect	N/A	Weekly	Weekly	N/A
8. Picnic Tables				
Stain & Refinish	N/A	Annually	Annually	N/A
9. Athletic Facilities				
Re-line tennis/basketball courts	N/A	Annually	Annually	N/A
Line athletic fields	N/A	4 Mo. Inter.	6 Mo. Inter.	N/A
Edge turf of ball diamonds	N/A	Bi-weekly	Demand	N/A
Drag infields	N/A	Daily	Daily	N/A
Level infields	N/A	4 Mo. Inter.	Annually	N/A
10. Trash Receptacles				
Empty Receptacles	Daily	Weekly	Weekly	N/A

ALTERNATIVE LEVELS OF SERVICE				
Task	**Mode A**	**Mode B**	**Mode C**	**Mode D**
11. Sweep walkways Sweep walkways	 Daily	 Weekly	 Weekly	 N/A
12. Groundcover/Shrub Areas Weeding Edging Pruning Litter Control	 Monthly Monthly Quarterly Daily	 Quarterly Quarterly Semi-Annually Daily	 Quarterly Quarterly Semi-Annually Daily	 Semi-Annually Semi-Annually Annually Daily

Recommendation: The Parks Unit of the Parks, Recreation and Cemeteries Division should develop formal service level standards for parks and grounds it maintains. A specific level of service should be designated for each site.

8. THE PARKS MAINTENANCE UNIT SHOULD DEVELOP FORMAL QUALITY STANDARDS FOR THE MAINTENANCE OF CITY PARKS.

Quality standards are designed to express the results expected in the maintenance of the City's park system. The standards are stated as "end products" (e.g., turf to be mowed to a height of two inches). This standard is intended to generate a consistent level of service and quality at each of the facilities and parks sites, focusing on why, when, and how well a task is to be accomplished. Possible quality standards for parks are presented in the table below.

SAMPLE QUALITY STANDARDS FOR MAINTENANCE OF CITY PARKS	
Mowing	Turf area to be mowed weekly during the growing season – grass height 2".
Trimming & Edging	All driveways, sidewalks and edging strips shall be edged every two weeks during the "on" season. Grass and weeds around trees, tree wells, header boards, fences, backstops, etc., shall be trimmed monthly or more frequently to maintain appearance. In no case shall grass or weeds exceed 6". Grass clippings and trimmings in walkways shall be swept or blown off walks and removed if required.
Fertilization	Fertilization of the turf area should be completed with a balanced fertilizer such as 16-6-8 annually once during the summer. Turf should be tested if the recommended fertilizer does not produce desired results.

SAMPLE QUALITY STANDARDS FOR MAINTENANCE OF CITY PARKS	
Insecticides, Herbicides, Pre-Emergents, Insect Control, Disease Control, and Rodent Control	A seasonal spray chart will be developed and maintained in the Parks and Forestry Division. Herbicides and pre-emergents shall be applied according to the approved spray program year-round, weather permitting, with the primary objective being the prevention of weed growth.
Aeration	Turf aeration should be completed during the spring while the grounds are still soft from winter moisture.
Irrigation System	The irrigation system should be set to apply enough water to wet the soil to a depth of 4" to 6". The automatic timing system should be set to avoid interference with sports and other uses. Automatic controllers and sprinkler systems should be checked at least once a week for any abnormalities; failure to do so could result in loss of turf area, the waste of water or the interference with usage.
Litter Control	Park areas shall be maintained constantly and kept in a litter-free condition. Trash pick-up shall be on a regular and frequent schedule to prevent over-accumulation of trash and development of unsanitary conditions. Trash pick-up schedules shall be developed to meet the changing conditions of park usage.
General Site Inspection	The Parks and Forestry Division staff shall inspect the areas in which they are assigned to work on a daily basis, and report any hazards or correct them immediately. All acts of vandalism shall be reported at once and a report written.
Play Area	Swings and play equipment shall be inspected on a weekly basis and serviced if required.
Tennis Courts	Shall be blown weekly to clear dirt and other debris from surface. Surface should be washed weekly, if possible. Nets should be inspected and adjusted weekly.

Recommendation: The Parks and Forestry Division should develop quality standards for the maintenance of City parks.

9. THE PARKS MAINTENANCE UNIT SHOULD CERTIFY AN EMPLOYEE AS A CERTIFIED PLAYGROUND INSPECTOR.

Interviews indicate that the Parks, Recreation and Cemetery Division contracts with a private provider for inspections of the City's 43 playgrounds. Given the relatively small investment necessary to obtain certification as a Playground Inspector, this would appear to be a cost-effective initiative on the part of the Division.

A Certified Playground Safety Inspector (CPSI) is a career that was developed by the National Playground Safety Institute (NSPI) and is recognized nationally by the National Recreation and Park Association (NRPA). No prior experience is necessary, but a candidate for the certification must attend a training course, pass a final exam and be re-certified every three years.

The training course costs, on average $340, which includes all course materials, and is generally a two-day, 15-hour course. The course entails classroom lectures, discussions and examples of maintenance problems with playgrounds through hands-on-training. It is based on the Consumer's Product Safety Commission (CPSC) guidelines and the American Society for Testing Materials (ASTM).

The course focuses on understanding the standards and guidelines for public playgrounds, identifying safety hazards within the play environment, establishing repair priorities, fixing items on-site, providing the necessary knowledge to establish a comprehensive program of playground and safety within a given agency and developing long-term plans to upgrade playgrounds.

Recommendation: Certify at least one Parks Maintenance employee as a Certified Playground Safety Inspector (CPSI). The cost is minimal, and would result in greater flexibility as to when these inspections are performed, and could potentially result in a small cost savings for the Division.

10. THE PARKS UNIT OF THE PARKS, RECREATION AND CEMETERIES DIVISION SHOULD BE AUTHORIZED TO FILL THE VACANT POSITION OF STADIUM MANAGER.

The Parks Maintenance unit of the Division is responsible for the operation and maintenance of Cawley Stadium. The maintenance of this stadium entails more than lawn and turf maintenance, but rather maintenance of the entire facility, which

includes over 5,100 seats, a 665 car-capacity parking lot, a 2.2 acre soccer field, a 5.5 acre baseball field, a 7 acre field hockey field, and a 15 acre practice field. The Stadium is used by the High School, Pop Warner teams, Lacrosse teams, as well as others. The Parks personnel stationed at the Stadium are responsible for maintaining the stands, the surrounding facilities, as well as the turf. The Stadium is open from April 1 through November 30, seven (7) days per week. On weekdays, the complex is open from 7:00 am to 10:00 pm. On weekends, the complex is open from 8:00 am to 8:00 pm. Given the requirement that a Parks employee be present at the Stadium during these hours, it is imperative that at least two employees be stationed here during the period from April 1 to November 30.

The benchmark standard for the delivery of a "B" level of service is one maintenance worker per 8-10 developed acre of responsibility. This would minimally require two employees to deliver this level of service at the Stadium if supplemented by other Parks Maintenance workers as the needs dictate.

The position of Stadium Manager was unfilled at the time of this study. The project team recommends that this position, as well as that of Parks Maintenance ME01, be filled, resulting in coverage of the Stadium at all hours of operation.

Recommendation: Fill the position of Stadium Manager at Cawley Stadium.

11. THE DISTRIBUTION DIVISION OF THE WATER UTILITY IS FALLING SHORT OF PREVENTIVE MAINTENANCE STANDARDS.

One of the limitations in the study of workloads in the Department of Public Works, generally, was the lack of either a computerized maintenance management system or the consistent capture of workload data on manual work reporting sheets. The lack of such data required that the project team use benchmarks and certain

assumptions regarding the staffing requirements of the Department.

In calculating the workload requirements for the Water Distribution Division, the project team utilized the following reported infrastructure:

- 213 miles of water distribution line
- 2,400 hydrants

Knowing these figures for the basic water infrastructure, the project team utilized benchmarks of probable workload activity for the Division's crews. These included the following:

- The number of gate valves in the system is not known. However, the project team utilizes a benchmark of 27 valves per linear mile of water line. Applying this ratio to the known number of linear miles equates to about 5,750 gate valves, which should be exercised once per two years.
- The number of water main and service line breaks is high, with an average of about 60 main breaks and about 145 service breaks per year.
- Water lines should be flushed once per 3 to 4 years. However, the system is well looped, and the Water Utility has implemented a corrosion control program in 1998 that has very effectively reduced the presence of trihalomethanes (THMs). The project team will not include crew time for hydrant or water line flushing in the calculation of required staffing.
- The Division repaired 190 hydrants last year, and rebuilt 39.
- Division staff marked out 5,000 water service lines last year.

The exercising of gate valves is an important preventive activity to ensure that crews are able to locate and turn valves during instances of main breaks, which have been between 60 and 70 for the past several years. It is notable that the responses to the comparative survey administered by the project team indicate that, of the six cities that answered the question related to whether they had

implemented a gate valve exercising program, five of these either have such a program in place, or are in the process of implementing one.

Quick location and ease of closure will result in minimizing water loss, easier repairs and less property damage. The project team has estimated that there are likely at least 5,750 gate valves in the distribution system, although this is only an estimate based on experience in other municipalities. If all valves are turned biannually, then this would require that 2,875 be turned each year. The project team's experience in municipalities that have located each of their valves, and have turned these valves for a number of years, indicates that a one-person crew is able to turn an average of 25 valves per day, which , with 2,875 valves in a year, would require 115 person-days annually to accomplish.

The Water Utility does not record the numbers of hours expended in performing its field activities. It does, however, record the performance of the events themselves, and these have been shown above. The project team has restated these figures in the table below, along with the numbers of hours typically associated with the performance of each of the activities in order to estimate the hours expended by the Distribution staff.

Service/Activity	Number	Crew Size	Hours per Service	Total Hours
Main break	60	4-5	4-5	1,215
Service break	145	4-5	4-5	2,936
Hydrant repair	190	2	4	1,520
Hydrant rebuild	39	1	4	156
Line locate	5,000	1	1	5,000
Total				**10,827**
Allowance for Hours Required for Miscellaneous Activities				15%
Total Probable Hours Expended by Staff in Reactive Work				12,451
Annual Hours Available for Field Work per Employee				1,650
FTEs Required for Reactive Services, Repairs and Maintenance				7.5
Hours Available (8 employees at 1,650 hours/year)				**13,200**
Excess Capacity (hours)				**749**

The table shows that the level of Distribution staff is only marginally sufficient to respond to reactive work demands. The figure of 749 "excess capacity" hours is perhaps meaningless in this example, as it is well within the tolerance limits of estimation error. In fact, even the 15% allowance for "miscellaneous activities" does not account for the time that is likely expended in patching asphalt cuts made during main breaks. (The 15% allowance accounts for travel, meetings, random events, etc.) Therefore, it is unlikely that the current staff of eight field workers is sufficient to perform anything more than reactive repairs and maintenance, and most probably the staff is conducting work on overtime in many instances. Therefore, there is little or no likelihood of accomplishing any preventive maintenance work, such as would be involved in a gate valve exercising program, as described above.

Although, by definition, reactive work is beyond the direct control of the Distribution Unit, it has been pointed out earlier in this report that the City has replaced a very low percentage of its distribution lines in the past 20 years, with

almost all of the 8.5 miles (of the 213 mile total) being replaced in the past 10 years. This equates to a replacement of about 0.43 miles per year over a 20-year period, or about 0.2% annually, compared to the benchmark standard of 1% to 2% annually. This may be a primary cause of the high incidence of main breaks in the system.

The project team typically estimates main breaks in the range of one break per 8-10 linear miles per year. In Lowell, the 60 main breaks last year equate to one break per 3.6 miles. This has been relatively steady, with 57 breaks in 2010 (one per 3.7 miles) and 72 in 2009 (one per 3.0 miles). So, although main breaks are beyond the control of the Distribution Unit in the short term, in the longer term a more aggressive infrastructure replacement program may significantly lower the incidence of main breaks, thereby reducing the costly expenditures to repair them. By way of example, if main breaks were reduced to the level of one per 9 miles of the system (equating to about 24 rather than the current 60), this would result in a decrease of about 690 hours in repair, or about 0.4 FTE.

The staffing levels of the Water Distribution Unit of the Utility are below those typically seen by the project team. However, it is also true that these staffing levels are in the mid-range of the comparable cities responding to the survey the project team administered, as the table below summarizes.

City	Distribution Lines (miles)	Field Employees	Ratio
Chicopee	275	12	22.9 : 1
Fitchburg	197	5	39.4 : 1
Haverhill	275	7	39.3 : 1
West Springfield	166	9	16.2 : 1
Revere *	228	5	45.6 : 1
Lowell	**213**	**8**	**26.6 : 1**

* Revere's field workers repair and maintain both water and sewer lines. The 228 miles shown in the table reflect the total miles of water and sewer.

As is the case in any survey of the type administered for this study, the project team cannot verify either the linear mileage or the number of staff reported by the participants. Further, the condition of the infrastructure maintained by these staff members is not known. However, in a strict reading of the results, the Lowell's staffing levels is in line with the rather widely varying ratios of linear mileage per staff member in the responding cities.

Given the current economic climate, and the lack of a computerized maintenance management system (CMMS) that records and summarizes work activities in the Distribution Unit, the project team does not recommend at this time that staffing levels be increased. As was shown in the tables above, the project team has made certain assumptions and estimates of probable times spent on field maintenance and repair activities. However, they are, in fact, only estimates, and cannot be verified through comparisons to actual records of activities. Further, the relative staffing ratios in Lowell appear to be in the mid-range of other, similar, municipalities providing the same services. Therefore, although the project team believes that there is little capacity to implement a preventive maintenance program in the Unit, and that it is probable that an additional crew member is required, this should be verified through a formal documentation of activities, such as has been recommended earlier, in Section 2 of this report.

Recommendation: As has been recommended earlier in this report, the project team reiterates the recommendation that the Water Utility institute a CMMS that documents all activities of the Water Distribution Unit, including activity descriptions, hours expended, crew sizes, materials used, and other important facets of each activity. The project team has utilized estimates of time per activity, and believes that it is probable that the Unit requires additional staff, however this cannot be verified at this time.

12. THE WATER UTILITY SHOULD ELIMINATE A METER READER POSITION.

The Water Utility has a Meter Reading Unit that is comprised of four Meter Readers and a Water Billing Administrator. Approximately 500 meters, which are the larger accounts, are read via radio transmitter. The remaining 25,500 or so accounts are read manually, with the Meter Reader physically exiting his vehicle to read the meter with an ARB unit or touch pad.

In the experience of the project team, a Meter Reader performing manual reads in an urban setting, as is the case in Lowell, should be able to accomplish between 4,500 and 5,000 reads per month. The following table provides a calculation of the average number of meters being read by the staff of four Meter Readers in the Water Utility.

Element	Number
Manual-read meters in the system	25,500
Frequency of reading	Quarterly
Number of meters read per month	8,500
Number read by each Meter Reader per month	**2,125**

As the table shows, the four Meter Readers are achieving roughly half of the expected productivity of 4,500 to 5,000 reads per month, indicating a staffing surplus of at least one position, and perhaps two.

There is, however, another element to this issue. Many cities and towns are transitioning to radio reads for meter reading, or even continuous remote monitoring technology that allows the polling of meter status at any point in time. This technology would fundamentally alter the manner in which water consumption is monitored, and would, at the very least, reduce the need for Meter Readers, perhaps eliminating the need altogether, depending upon the technology selected.

Interviews in the Water utility indicated that meter replacement has been discussed, but the cost is such (reportedly over $26 million for a full City-wide replacement) as to be prohibitive at the current time. The project team does not possess precise salary figures for the four Meter readers, but even if their average salaries and benefits were $53,000 each, the "payback" period for such an investment, just on personal services costs, would be over 490 years. Clearly, this is an infeasible proposition if made strictly on a financial basis. However, there are other benefits beyond the financial. These include greater employee safety, reduced problems in access to homes, relatively immediate theft identification as well as identification of unusual consumption, elimination of problem meters (and rebuilds), improved meter reading accuracy, and likely improved customer satisfaction.

The project team does not make any recommendation regarding the feasibility of transitioning to a new meter technology. However, for the current period during which meters are manually read, the Meter Reading Unit should eliminate one Meter Reader position. The productivity of the remaining three Meter Readers should be assessed following the elimination of the first position, to evaluate the feasibility of eliminating a second position.

Recommendation: The Water Utility should eliminate one Meter Reader position in the short term. The project team does not possess precise figures for any of the four positions' salaries, but if it can be assumed that the average salary is approximately $38,000 annually, with 40% added for benefits, the elimination of one position would result in a cost savings of about $53,200. The elimination of a second position, which may be feasible, as productivity benchmarks suggest this is the case, would result in a cost savings of $106,400.

13. THE WATER AND WASTEWATER UTILITIES SHOULD SHARE THE POSITION OF COMPUPERIZED MAINTENANCE MANAGEMENT SYSTEM (CMMS) ADMINISTRATOR.

During the period of on-site activities, the project team learned that the Wastewater Utility's incumbent in the CMMS Administrator position had transferred into a different position within the Streets Division, thereby causing a vacancy in the Utility, for which it was actively recruiting.

At the same time, it was learned that the Water Utility had obtained authorization to create and fill a similar position.

The following points summarize the responsibilities of the CMMS Administrator:

- Schedules preventative maintenance (PM) through Utility's CMMS
- Receives and inputs work orders into system
- Works with Maintenance Superintendent to discuss upcoming PM and the staff and material resources required
- Ensures maintenance documentation is current
- Ensures all parts, labor costs are entered into system
- Through analysis, identifies locations of recurring repairs
- Performs cost analysis on whether equipment repairs are cost effective, or whether to run-to-failure or replace

The position would be performing very similar job duties at the Water Utility as have been performed for the Wastewater Utility. In much larger, consolidated water and wastewater utilities with which the project team has experience, it is common to have a single administrator to provide these services, and the project team believes that before a dedicated position of CMMS Administrator is hired for

the Water Utility, there should be a trial-sharing of the position to determine the feasibility of consolidated responsibilities.

Recommendation: Delay the hiring of the position of CMMS Administrator in the Water Utility. The Water and Wastewater utilities should consolidate the responsibilities of this position, and determine the longer-term feasibility of a single position versus two separate dedicated positions in the two utilities. The salary paid to the previous incumbent was $55,101 annually. If 40% is added for benefits, this equates to a potential cost savings of $77,141 if the position can be shared between the two utilities.

14. THE WATER AND WASTEWATER UTILITIES SHOULD MAKE A TRANSITION TO A CONSOLIDATED CREW FOR INFRASTRUCTURE MAINTENANCE.

Currently, both the Water and Wastewater utilities possess separate field maintenance crews maintaining their underground infrastructures. The table below summarizes the staffing levels and in-ground infrastructures maintained by each crew.

Utility	Staff	Linear Miles of Line
Water	Water Foreman (2) Water Syst. Maintenance Mechanic (6)	213
Wastewater	Head Collect. Sys. Operator TV Truck Operator (2) Maintenance Mechanic III (3) Maintenance Mechanic II (2) Maintenance Mechanic I (7)	230
Total	Foreman/Head Operator (3) Maintenance Mechanic (18) TV Truck Operator (2)	443

As can be seen from the table, there is a combined total of 443 linear miles of water and sewer lines in the City by a total of 23 operations staff. The Wastewater Head Operator is an administrative (i.e., not involved in field maintenance activities), so the effective number of staff maintaining this infrastructure is 22, for a

combined total ratio of 20.1 miles per crew member. (For reference, the separately-calculated ratios for Water and Wastewater are 26.6 : 1, and 14.4 : 1, respectively.)

Although the two crews maintain different infrastructure, the skills required for this maintenance are similar, and, in fact, the work locations are similar as well. Neither crew is considered over-staffed, but the two utilities have very different orientations toward maintenance efforts, with the Wastewater Utility outsourcing most of its "reactive" maintenance than does the Water Utility, focusing instead on preventive maintenance.

The project team recommends that the two utilities combine staff to form a common infrastructure maintenance crew. This affords both utilities' currently-separate crews greater flexibility in the use of personnel. However, this organizational move should also be viewed as an opportunity to redirect the orientation of both crews toward a more common approach to infrastructure maintenance by outsourcing a greater volume of the "reactive" maintenance (e.g., main break repairs, repair of utility cuts, etc.) in favor of more preventive maintenance (e.g., gate valve exercise, hydrant flushing, catch basin cleaning).

As is typically the case with enterprise funds, the question arises as to how to fund the consolidated crew. The project team suggests that this be accomplished either on the basis of a 50/50 split, on the basis of the number of linear miles maintained, or, once a more mature automated information system is in place, on the basis of the actual number of hours and cost of materials used on the water and wastewater infrastructure.

Recommendation: Make the transition to a consolidated infrastructure maintenance crew for water and wastewater.

15. THE PUBLIC WORKS DEPARTMENT SHOULD ALTER THE DUTIES OF THE POSITION OF ADMINISTRATIVE ASSISTANT TO THE COMMISSIONER.

The position of Administrative Assistant is one that reportedly was transferred to the Department of Public Works from the City Manager's Office with the intention that it would be an assistant to the Public Works Commissioner. However, the Commissioner actually performs many of the administrative duties personally, such as setting up meetings with internal staff, typing certain correspondence, and similar tasks.

The Administrative Assistant has found other duties to perform, and does fill certain necessary roles within the Department, such as responding to City Council motions, entering pothole, plow graffiti, etc., damage into E-Gov, making appointments with external personnel for the Commissioner, developing the Toter list, compiling monthly reports for LowellStat, and other similar duties. However, due to the fact that this position is not a member of the same bargaining unit as other clerical and administrative staff in the Public Works Headquarters building, the position does not assist in the performance of other duties in the 1705 unit.

The project team recommends that the Department alter the duties of the position of Administrative Assistant to perform a dispatch and customer service role in the Department. Although the actual daily duties of the position should be assigned by the recommended position of Assistant Commissioner of the Finance and Administration Division, the project team recommends that the primary duties be receiving requests for service, dispatching appropriate crews to the work sites, managing locations of crew members, and performing a customer service role.

Recommendation: Alter the role of the current Administrative Assistant to the Public Works Commissioner to perform dispatch and customer service functions.

5. OTHER ISSUES

As the project team progressed through the study, there were several issues that arose that, although not strictly categorized in any of the previous sections of the report, should nonetheless be addressed. These are presented here.

1. THE PUBLIC WORKS DEPARTMENT WILL BE CONFRONTED WITH ISSUES RELATED TO AN AGING WORKFORCE WITHIN THE NEXT SEVERAL YEARS, AND SHOULD BEGIN PLANNING FOR THIS NOW.

The aging of the workforce is an issue that will confront many organizations, both public and private, over the next several years. It is one that has been examined thoroughly in many academic papers, and the project team will not revisit those here. However, the issue will present itself to the Public Works Department in a very real sense over the next five to ten years, as the table below illustrates.

Division	Average Age (Jan., 2012)	Total Employees	No. over 55 Years (Jan., 2012)
Administration	51	6	2
Engineering	47	7	3
Lands and Buildings	48	32	7
Parks, Rec. and Cemeteries	49	31	10
Streets	47	25	4
Water	46	35	7
Wastewater	48	48	18
Total	**47**	**184**	**51**

As the table shows, the average age of the current workforce is 47. However, 51 of the 184 employees (27.7%) are now over the age of 55, meaning that it is likely that these employees will reach retirement age within 5 to 10 years. This issue is even more acute in the Wastewater Utility, where 18 of the 48 (37.5%) are over 55 years of age.

The Public Works Department could choose to simply fill vacated positions as they occur over this time period. However, the project team suggests that the

Department should approach the inevitable loss of employees with a well-considered plan for succession. The elements of this plan should incorporate several elements, which include the following:

- **Consider what services are needed in the coming years**. As vacancies occur, the Department should critically examine whether the functions performed by the previous employee are necessary as currently designed, or whether there are unmet needs in the Department that could be filled through job re-design. The tendency in many governmental agencies is to simply fill vacancies as they occur, and thereby continue to perform services in the same manner as had been done for many years prior. However, this hiring model effectively designs the job around the person, when in actuality, the skills of the prospective employee should be designed to fit the requirements of the job.

- **Consider the hiring of new employees for critical positions earlier than may have been forecas**t. Certain positions in the Department may feasibly be filled without regard for true succession planning. However, the Department should take stock of those positions that require a critical skill transfer, and consider hiring new employees in order to capitalize on the fact that older employees are still present and available for this critical function. Job knowledge as well as institutional knowledge may be transferred under much less stressful conditions when it is phased in over a longer period of time.

- **Identify and train the Department leaders of the future**. Potential leaders in on organization typically can be identified relatively quickly, however there are dimensions of leadership that are only partly innate. Others must be cultivated and groomed, and there are many leadership training courses available to refine these skills and qualities in future leaders.

- **Institute programs and processes that ensure that the Department is able to recruit talented employees when they are needed**. Not all vacancies will occur as planned. However, the Public Works Department can ensure that it can recruit talented employees of the highest level by instituting effective practices, and by providing employees with the tools, training and technology that contribute to success.

The current economic and financial climates make it more difficult to add staff to ensure a transition and knowledge transfer to the next generation of Public Works employees. And, in fact, although there are specific employees who are of an

age, and in all likelihood, currently considering retirement, the average age of the workforce is such that the issue of mass retirements is still at least a few years away. One option is to assume that economic conditions will improve to some degree, which will allow the hiring of selected staff members in key positions, affording them the advantage of working alongside employees who can transfer their knowledge over a longer-term period.

The project team recognizes the dilemma of poor economic conditions, and looming retirements on an increasing scale. However, the project team also recognizes the benefits of retaining critical knowledge and skills in the workforce, and recommends that the Department begin identifying those employees who fit this category, and selectively hiring staff at lower levels to ensure that this transfer occurs.

Recommendation: Identify critical employees who are nearing retirement age and begin the transfer of knowledge and skills through hiring employees at lower levels to work with these individuals. One other potential low cost, low-risk option is to provide internships with local universities and community colleges in the critical skills areas of water and wastewater technology, as well as engineering.

2. THE DEPARTMENT SHOULD ENHANCE THE FUNCTIONALITY OF ITS WEBSITE TO CONFORM TO BEST PRACTICES IN THE INDUSTRY.

In the not-too-distant past, the simple provision of a web site of any description for a Public Works Department was considered a progressive and customer-oriented feature of government. Today, however, residents expect that their governments' web sites will be informative, interactive, and easily navigated. In fact, "web surfers" throughout the country and the world scan websites for

information, and a well-designed website says much about a municipality, just as does a poorly-designed one.

The project team has made numerous visits to the Lowell Public Works website throughout the course of this project, and there are several facets of its content and design that perhaps could be refined and enhanced to provide a more informative and useful experience for visitors, whether they are residents, other governmental entities, or simply interested viewers.

Darrell West, of the Brookings Institute, in his book, *Digital Government: Technology and Public Sector Performance*, describes four stages of government websites that progress from the "billboard style," that simply houses information, up to the "interactive democracy style," that offers residents services and a variety of ways to get in touch with public officials and to accomplish tasks. It is this latter style that West says that governments should aspire to in order to develop a more knowledgeable and empowered citizenry.

Although the Lowell Public Works website is more than a simple "billboard" of information, it falls short of being truly interactive. Further, it does not provide certain information that the project team believes should be shared with visitors to the site. The project team noted several areas in which the divisional websites should be enhanced and has listed these in the table below.

Division	Comments on Web Page
Parks, Recreation and Cemeteries	Post Cemetery Rules and Regulations Although the Cemetery is limited in the amount of electronic data available for each grave, it should be a longer-term objective to provide an interactive site at which users may input the name of the deceased, and determine the exact location of the grave site.

	There is little information provided on the web site about the City's parks and swimming pools. The site does note that there are 75+ parks in the system, however the website should be significantly enhanced to provide a link to forms that provide locations, sizes, facilities and amenities available at each, facilities that may be rented (as well as fees), hours of operation, etc. One of the centerpieces of the City's recreational provisions is Cawley Stadium, about which there is no information on the site.
Streets	There is no information on the website relating to the primary activities of the Streets Division. Many residents may not know all the services that may be available, or to whom they should be reported. These may include relatively simple services such as pothole reporting and repair (as well as the time the citizen can expect to receive a response), dead animal pickup, paving and resurfacing plans and schedules, leaf disposal, tree planting, pruning and removal, graffiti removal, and other services. Further, even though the website does provide relatively good winter operations information, best practices of well-managed Public Works operations are to provide snow removal routes, and explanations of when the City plows snow, and when it may only apply sand.
Lands and Buildings	There is no web page for this Division. To some degree this is understandable because the division does not provide direct services to residents. However, it is also true that residents should be aware of such attributes as: • The number and location of buildings in the City's inventory • Total value of facilities under management • "Green" initiatives, and energy saving measures being implemented • Any new construction or modifications under way
Engineering	The Engineering Division has a relatively comprehensive web site that describes its duties and responsibilities, street conditions (showing pavement management index for each street in

	the City), and provides permit applications and descriptions for each.
Water Utility	The web site could be significantly enhanced through the provision of a simplified description of the water treatment process, perhaps even including a schematic that describes, at a very high level, the raw water intake (and a description of the source), addition of coagulants (and their utility), transmission to the coagulation/flocculation process, movement to sedimentation (and what happens in this process), polymerization (and what is used), filtration, disinfection, corrosion control, storage, and finally, consumption. The site could also benefit from the inclusion of information on capital improvements (both recently completed, as well as planned, and the costs of each), backflow prevention program description (as well as types of devices and how installed, and what to expect in an inspection), water rates, conservation measures, typical consumption rates for various family sizes, information on treatment plant tours, as well as others.
Wastewater Utility	The web site could be significantly enhanced through the provision of a simplified description of the wastewater treatment process, perhaps even including a schematic that describes, at a very high level, the intake, screening and grit removal, aeration, sludge removal and processing, clarification, disinfection and return to the waterway. The site could also benefit from the inclusion of information on capital improvements (both recently completed, as well as planned, and the costs of each), the sewer televising program and its benefits, street sweeping schedules (as well as the associated benefits to the treatment process), the industrial pretreatment program (and its benefits), as well as other descriptive information.

The project team has made some specific recommended enhancements to the divisional web pages in the table above. Appendix E of this report also provides a checklist of "best practices" in web design that should prove to be useful as the Department makes upgrades to its site.

Recommendation: Enhance the divisional web pages to provide more information to users.

3. THE DEPARTMENT SHOULD IMPLEMENT A STANDARDIZED AND ROUTINE SAFETY PROGRAM.

Every employee and employer knows the value of safe workplace practices, but for these practices to be effectively implemented, they must be taught and, importantly, reinforced, through routine, repetitive and standardized meetings, training sessions and even simple reminders. The value of creating and nurturing a safe working environment is of paramount importance in itself. However, its value goes beyond safety and the obvious benefits of a reduction in the incidence of days lost due to injury. These benefits include greater morale, higher employee retention rates (and greater ability to attract workers), and a heightened sense of teamwork among workers.

The project team made a point to ask about workplace safety practices in each of the divisional interviews and most divisions did, in fact, report that their employees have been exposed to some degree of safety awareness and training. It is notable, however, that the Wastewater Utility is alone in the DPW in implementing a rigorous, formal and routine safety program. The employees of the Wastewater Utility are strongly committed to workplace safety, and tout the numbers of consecutive days without injury at the facility. The Utility has posted its 2012 safety meeting schedule, which includes the following topics:

- HAZ-COM RTK/Chemical Storage
- Bloodborne pathogens/Slips and Falls/Miscellaneous Work Hazards
- Fork Truck Training/Hoisting

- Fire Extinguisher/ Fire Prevention and Awareness
- Confined Space Training/ Gas Meter Training
- LOTO Refresher
- HAZWOPER 8-hour Refresher/Awareness

The Utility takes attendance as well as meeting minutes at each meeting that shows discussion points and action items. The project team has reproduced a copy of the meeting minutes for the safety meeting on December 16, 2011 in Appendix F of this report.

The project team recommends that the Public Works Department adopt the safety program of the Wastewater Utility. There may be certain topics that are common to all divisions (e.g., bloodborne pathogens, slips and falls, etc.) that would allow for a Department-wide meeting. Others may be divisional-only as the topics are tailored to the specific work environments of each of the divisions.

Recommendation: Institute a standardized training program within the Department of Public Works.

APPENDIX A

Descriptive Profile of the Department of Public Works

DESCRIPTIVE PROFILE OF THE PUBLIC WORKS DEPARTMENT

The pages, which follow, provide a descriptive profile of the Public Works Department and its component divisions. The purpose of this descriptive profile is to document the project team's understanding of the Department's organization, allocation of staff by unit and function and principal assigned responsibilities of staff. Data contained in the profile were developed based on the work conducted by the project team over the past month, including:

- Interviews with staff in the Department.
- Collection of various data describing organization and staffing, workload and service levels as well as costs.
- Documentation of key practices as that relates to work planning and scheduling, policies and procedures, as well as work processes.

In this document, the structure of each division's descriptive profile is as follows:

- Organizational charts showing all staff positions by function and shift as appropriate and reporting relationships.
- Summary descriptions of key roles and responsibilities of staff. It should be clearly noted that responsibility descriptions are not intended to be at the "job description" level of detail. Rather, the descriptions are intended to provide the basic nature of each assigned position.
- Presentation of the actual expenditures for FY10, as well as approved budgets for FY11 and FY12 for each division.
- Summaries of key indices of workloads and service levels provided by each division.

These data should be reviewed for accuracy and completeness by staff in each division. Comments and corrections generated from staff reviews will be incorporated into the final version of this document. Information contained in the descriptive profile will be employed in the analysis of issues during subsequent stages of the project.

PUBLIC WORKS DEPARTMENT

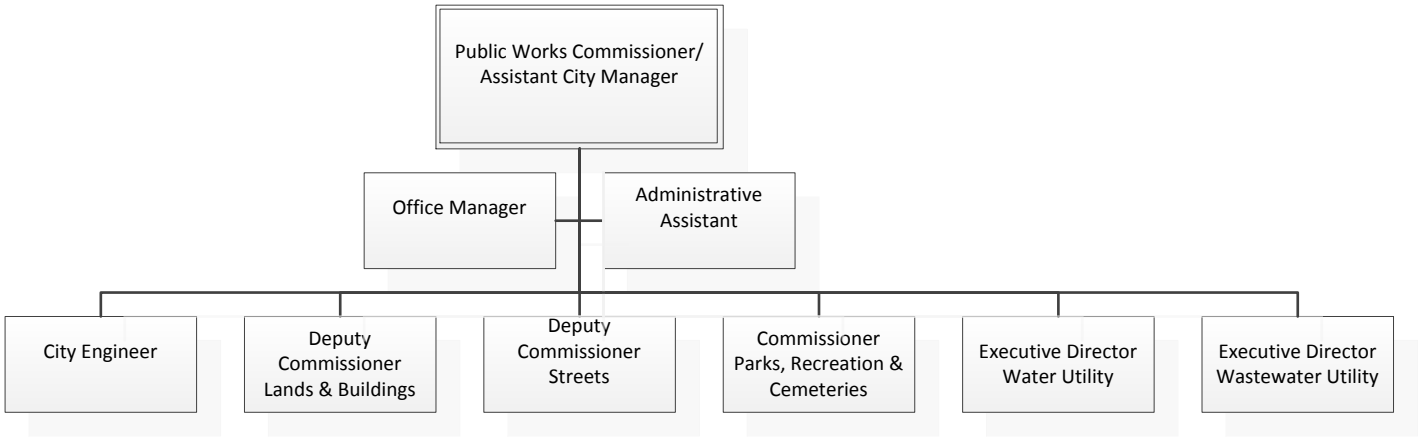
The Department of Public Works (DPW) has broad responsibilities in the City. Included are divisions dealing with finance and administration; engineering; land & buildings including custodial staff; electricians; street improvements; waste collection and disposal including recycling; street lighting; snow and ice removal; and park and cemetery maintenance.

In addition to the internal DPW divisions, the Water and Wastewater departments report to the DPW commissioner, with accounting accomplished through a separate enterprise system. Recreation, though grouped in the Human Services section of the budget, reports through the Parks Division of the DPW.

Each division is staffed by administrators, equipment operators, laborers and specialists such as plumbers, electricians and carpenters. Many of the divisions, such as the utilities, work around the clock. Even those that do not are on call in case of emergency.

The following organization chart provides an overall depiction of the reporting relationships of the divisions of Public Works. Note that the chart depicts the organization as it was described to the project team, and is not offered as an official organizational structure, and has not been codified by ordinance.

Detailed organization charts are provided within the divisional descriptive profiles that follow.



The Department of Public Works has experienced an overall reduction in its workforce since 2007, with the majority of these reductions coming in the Divisions of Streets, Cemeteries and Parks, as the table below shows.

Division	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Administration	12	11	10	8	7	6
Engineering	6	6	6	7	6	6
Lands & Buildings	36	35	36	33	32	32
Messenger	7	7	5			
Streets	34	34	33	22	24	21
Parks	45	45	44	30	28	30
Cemeteries	11	11	11	6	6	1
Recreation	4	4	4	3	3	3
Water	38	38	37	38	36	37
Wastewater	48	48	48	48	48	48
Total DPW	**241**	**239**	**234**	**195**	**190**	**185**

Highlights from a review of the above staffing table include the following:

- From 2007 through 2010, the Electrical Division was a separate organizational entity within Public Works. In 2011, Electrical was merged with the Division of Lands and Buildings. The staffing for both organizational entities has been merged for all years in the table above for ease of comparison. For informational purposes, however, the Electrical Division had 10 employees in 2007, 2008 and 2009, and had nine (9) employees in 2010, one of whom has been on extended Workers Compensation leave.

- Note that the figures for Lands and Buildings includes the remaining Messengers (Custodians), which from 2007 through 2009 were presented in the table as a separate division.

- The Division of Cemeteries has experienced the greatest percentage reduction since 2007, losing 10 of its 11 employees, equating to a reduction of about 91%. It should be noted, however, that much of this decrease was due to the decision to outsource the mowing of cemeteries to a private firm. It should also be noted that the Division receives two Laborers from the Streets Division on each day during which a funeral is performed. Therefore, although there have been substantial reductions in the Division's full time staffing levels, not all of these reductions have resulted in a reduction of services provided by the Cemeteries Division.

- The Administration Division has experienced the next-greatest percentage reduction in its workforce, equating to about 42%.

- The Streets Division experienced the greatest reduction in personnel since 2007, going from 34 to 21, or a decrease of 13 positions.

- Overall, the Public Works Department's full time staffing levels have decreased by 56 positions, or 23.2%, since 2007.

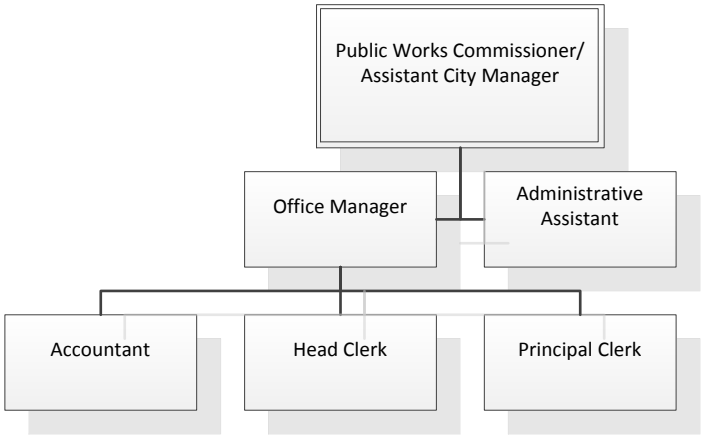
1. FINANCE AND ADMINISTRATION

1. INTRODUCTION

Public Works Finance and Administration is responsible for all administrative and financial functions of the Department such as accounts payable and receivable, purchasing, payroll, permit sales, etc.

2. ORGANIZATION

Public Works Finance and Administration is comprised of the Public Works Commissioner/Assistant City Manager, an Office Manager, an Administrative Assistant, an Accountant, a Head Clerk and a Principal Clerk. Public Works Administration's organizational structure is provided in the chart below.



3. STAFFING

In the table, which follows, a summary is provided of Public Works Administration staffing and key elements of responsibilities.

Division	Staffing by Classification		Key Elements of Staffing and Scheduling
Public Works Administration	Public Works Commissioner/ Assistant City Manager	1	• Provides the overall executive management and administration of divisions within the DPW. • Responsible for developing the overall priorities of the DPW, including the development of policies and procedures, performance goals and objectives, monitoring of budget, etc. • Prepares the operating budget and confers with City Manager and Engineer on formulating the capital improvement program, and meets with division managers on a regular basis to discuss operations, issues, performance, etc.
	Office Manager	1	• Responsible for the development of weekly payroll for Streets, Lands and Buildings, Engineering. This involves transferring info from time cards to departmental time sheets required by City Auditor, transmitting personal assignment sheets to HR, calculating retroactive pay, updating sick and vacation cards, etc. • Makes assignments to Head Clerk, Accountant and Principal Clerk, co-located in the administrative office of DPW. • Handles all property insurance for the City • Processes snow and ice contracts • Completes FEMA reports • Handles trash abatements • Prepares and oversees $12 million annual DPW budget • Handles all property damage claims for the city • Manages all personnel records for DPW (Streets, Lands & Bldgs and Finance)
	Accountant	1	• Handles Electrical, Lands and Buildings Payroll for the Department. • Calculates and reports all snow and ice overtime for the Department

Division	Staffing by Classification		Key Elements of Staffing and Scheduling
			• Handles correspondence for Department messenger to transport to and from City Hall • Oversees all accounts from a budgetary standpoint for Engineering, Lands and Buildings, Streets • Processes purchase orders related to snow and ice for Parks, Engineering, Streets, Lands and Buildings • Processes all Chapter 90 funds and reporting requirements • Pays all invoices for the City for electricity, gas, and oversees these accounts • Processes accounts payable
	Head Clerk	1	• Handles accounts payable for Engineering, Lands and Buildings and Department Administration • Processes Streets, Engineering and Administration payroll • Generates re-cap sheets summarizing charges to each account • Handles injury reports and correspondence for payroll • Handles applications for payments of Chapter 90 funds to contractors • Handles telephones and assists visitors at the counter.
	Principal Clerk	1	• Processes 700-800 permits annually for street openings, trenches and sewer • Handles accounts payable for Streets Division • Handles telephones and assists visitors at the counter.
	Administrative Assistant	1	• Enters pothole repairs, graffiti complaints, plow damage, sidewalk repairs, illegal dumping, etc., work orders into E-Gov automated system • Handles appointments and telephone calls for Public Works Commissioner, Streets Division Asst. Commissioner • Responds to City Council motions. • Develops toter list • Sets up and attends tree hearings. • Handles delivery set up for trash barrels

4. Financial

The following table provides the actual budget for FY10, and the approved budgets for FY11 and FY12 for the Administrative Division of Public Works.

Personnel	**FY10 Actual**	**FY11 Approved**	**FY12 Approved**
Salaries - Permanent	$ 429,690	$ 352,619	$ 331,534
Salaries and Wages Temp.	$ -	$ -	$ -
Overtime	$ 91,750	$ 100,000	$ 500
Total Personnel	**$ 521,440**	**$ 452,619**	**$ 332,034**
Expenses	**FY10 Actual**	**FY11 Approved**	**FY12 Approved**
Utility Electricity	$ 182,902	$ 170,000	$ 150,000
Utility Heating/Gas	$ 30,331	$ 40,000	$ 45,000
Repair & Maint. Equipment	$ 41,624	$ 55,000	$ 45,000
Electrical Repair & Parts	$ 25,290	$ 30,000	$ 30,000
Animal Control-Chg/Expense	$ 11,745	$ 13,000	$ -
Rental of Equipment	$ 67,375	$ 68,000	$ 75,000
Rental of Uniforms	$ 12,772	$ 15,000	$ 15,000
Lease/Purchase-DPW Equip.	$ 12,019	$ 40,000	$ 40,000
Professional Services	$ 64,971	$ 75,000	$ 90,000
Kennel Services	$ 22,855	$ 23,000	$ -
Advertising	$ 2,217	$ 10,000	$ 10,000
Used Vans-Trucks-Autos	$ 2,500	$ -	$ -
Automotive-Tires/Tubes	$ 62,813	$ 125,000	$ 125,000
Gas & Motor Oil-Supplies	$ 102,245	$ 130,000	$ 100,000
Public Works-Supplies	$ 15,310	$ 30,000	$ 30,000
Rep& Maint Electrical Supplies	$ 86,183	$ 90,000	$ 90,000
Ofice Supplies	$ 9,885	$ 8,000	$ 8,000
Trans. Reimbursement	$ 2,456	$ 2,500	$ 2,500
DPW-Various School Projects	$ 36,220	$ 40,000	$ 40,000
Miscellaneous Charges	$ 4,904	$ 5,000	$ 5,000
Plows & Frames	$ -	$ 18,000	$ 18,000
Fire Alarm Systems	$ 4,439	$ 10,000	$ 10,000

Irrigation Equip/Supplies	$ 8,542	$ 8,000	$ 8,000
Expenses Total	**$ 809,598**	**$ 1,005,500**	**$ 936,500**
Division Total	**$ 1,331,038**	**$ 1,458,119**	**$ 1,268,534**

Note that the overtime budget was greatly reduced in the past fiscal year. This was due to the transfer out of the budgets to the Streets and Lands and Buildings Divisions.

5. WORKLOAD

The following table provides selected workload information for the Administration Division.

Service	Workload
Payroll	• Once weekly for 67 staff members (includes only Admin., Streets, Lands & Buildings and Engineering divisions)
Budget	• Department Director oversees and is responsible for a total DPW budget of $29,384,381
Permits	• Issued 1,125 in FY11
Recycle Bin Issuance	• Issued 1,600 recycle bins in FY11
Trash Accounts	• Made 350 trash account abatements and adjustments in FY11. With approximately 24,500 accounts, this equates to adjustments and abatements on about 1.4% of accounts
Accounts Payable	• Process about 5,000 invoices annually

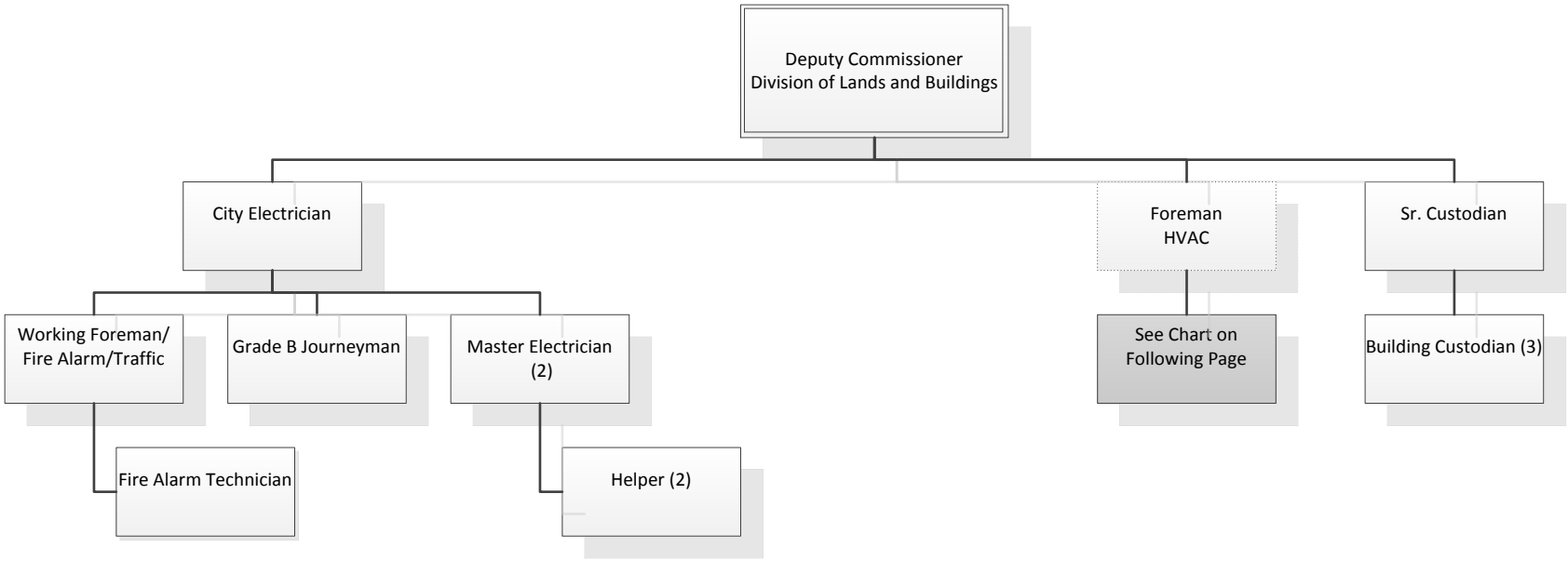
2. LANDS AND BUILDINGS DIVISION

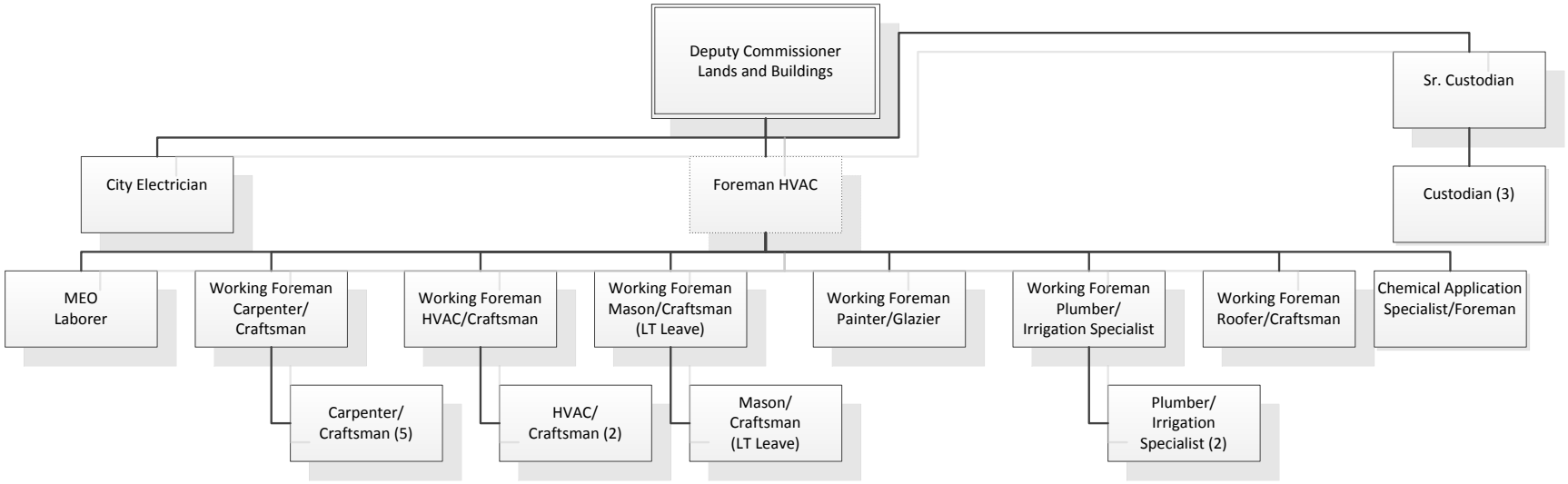
1. INTRODUCTION

The Division of Lands and Buildings is responsible for facilities maintenance and repair services at 34 City buildings and 36 School buildings with the exception of the Water and Wastewater Utilities buildings. It is also responsible for providing custodial services at the Health Department, the Public Works Administrative Building, City Hall and the second floor of the JFK Civic Center.

2. ORGANIZATION

The Division of Lands and Buildings' organizational structure is portrayed in the organization charts below.




Deputy Commissioner
Lands and Buildings
Sr. Custodian
City Electrician
Foreman HVAC
Custodian (3)
MEO
Laborer
Working Foreman
Carpenter/
Craftsman
Working Foreman
HVAC/Craftsman
Working Foreman
Mason/Craftsman
(LT Leave)
Working Foreman
Painter/Glazier
Working Foreman
Plumber/
Irrigation Specialist
Working Foreman
Roofer/Craftsman
Chemical Application
Specialist/Foreman
Carpenter/
Craftsman (5)
HVAC/
Craftsman (2)
Mason/
Craftsman
(LT Leave)
Plumber/
Irrigation
Specialist (2)

3. STAFFING

In the table, which follows, a summary is provided of the Division's staffing and key elements of responsibilities.

Division	Staffing by Classification		Key Elements of Staffing and Scheduling
Lands and Buildings Administration	Deputy Commissioner	1	• Oversees custodial services of the City, and handles any customer complaints related to these services. • Receives work requests through E-Gov system, assigns work, tracks progress of work performed. • Coordinates facilities maintenance services, including electrical, plumbing, HVAC, painting, graffiti removal, structural repairs, etc. for all City and School buildings. • Ensures that services are performed to customer satisfaction. • Ensures the timeliness of service provision. • Determines the needs for contract services and coordinates with contractors on timing and quality assurance.
Electrical Shop	City Electrician	1	• Makes repairs to electrical components in City and School buildings. • Directs the activities of the Division as they relate to electrical repairs, fire alarms, traffic signal controller boxes, etc. • Works 7:30 am to 3:30pm, as do all in the Electrical crew.
	Working Foreman/Fire Alarm/Traffic	1	• Runs wires, changes lights and ballast, etc. • Assists other trades workers in their respective duties.
	Fire Alarm Technician	1	• Incumbent on L-T Leave • Non-certified position • Repairs, changes, maintains street lights • Utilizes bucket truck at work sites
	Helper	2	• Although certification is not required for the position, both Helpers are certified Electricians • Serve as Journeyman Electricians, wiring classrooms, lights, etc. • Repair and maintain traffic signal controller boxes • Work with Master Electricians on certain jobs requiring multiple workers

Division	Staffing by Classification		Key Elements of Staffing and Scheduling
	Master Electrician	2	• Programs boards for fire alarms • Makes assignments to Journeyman Electricians • Accompanies contracted elevator inspectors • Tests smoke detectors • Runs wiring for lights, etc. • Repairs and maintains traffic signal controller boxes
	Grade B Journeyman Electrician	1	• Programs boards for fire alarms • Accompanies contracted elevator inspectors • Tests smoke detectors • Runs wiring for lights, etc. • Repairs and maintains traffic signal controller boxes
HVAC, Plumbing, Masonry, Carpentry	Foreman/HVAC	1	• Position is currently vacant • Assigns work to crews, tracks progress of work, reports on work completion
	MEO Laborer	1	• Cleans up trash and debris at job sites • Delivers stock • Assists with HVAC and trades jobs
	Working Foreman Carpenter/Craftsman	1	• Performs structural repairs • Builds walls • Performs construction activities such as building dog track, sets up flagpoles and banners, sets up stages for bands, etc. • Builds cabinets and refurbishes furniture • Assists all other trades workers in the performance of their duties (Note that all Craftsmen receive an additional hourly stipend for performing duties other than those for which they are most qualified. Therefore, a Carpenter Craftsman, in addition to performing carpentry duties, may be required to perform plumbing, HVAC, masonry, etc., work).
	Carpenter/Craftsman	5	• Builds walls • Performs construction activities such as building dog track, sets up flagpoles and banners, sets up stages for bands, etc. • Builds cabinets and refurbishes furniture • Assists all other trades workers in the performance of their duties .
	Working Foreman	1	• Changes filters in Water and Wastewater utilities buildings, schools and City buildings.

Division	Staffing by Classification		Key Elements of Staffing and Scheduling
	HVAC/Craftsman		• Cleans out condensate pans • Inspects and cleans coils • Changes exhaust fans • Changes belts • Lubricates equipment • Repairs leaks, coils in refrigerant systems. Cleans coils. • Assists others in their respective trades and duties
	HVAC/Craftsman	1	• Changes filters in Water and Wastewater utilities buildings, schools and City buildings. • Cleans out condensate pans • Inspects and cleans coils • Changes exhaust fans • Changes belts • Lubricates equipment • Repairs leaks, coils in refrigerant systems. Cleans coils. • Assists others in their respective trades and duties
	Working Foreman Masonry/Craftsman	1	• Supervises/performs concrete, masonry and brick work. Assists carpenters as needed.
	Mason/Craftsman	1	• Incumbent on LT disability
	Working Foreman Painter/Glazier Craftsman	1	• Paints buildings, walls, fixtures in City and school buildings • Assists others in their respective trades and duties • Position filled with a carpenter/craftsman
	Painter/Craftsman	1	• Paints buildings, walls, fixtures in City and school buildings • Assists others in their respective trades and duties • Incumbent on long term leave
	Working Foreman Plumber/Irrigation Specialist	1	• Perform preventive maintenance on water heaters • Repair and maintain irrigation systems at 64 irrigation sites in the City, including ballparks, schools, City buildings, etc. • Note that the Plumber/Irrigation Specialists do not assist others in their trades, as do Craftsmen, described elsewhere in this section.
			• Perform preventive maintenance on water heaters

Division	Staffing by Classification		Key Elements of Staffing and Scheduling
	Plumber/Irrigation Specialist	2	• Repair and maintain irrigation systems at 64 irrigation sites in the City, including ballparks, schools, City buildings, etc.
	Working Foreman Roofer/Craftsman	1	• Repairs leaks in roofs • Works in pairs – most assistance comes from Mason, and sometimes Carpenter.
	Chemical Application Specialist/Craftsman	1	• Removes graffiti. Typically, this duty consumes 2 days per week. • Paints buildings, walls, fixtures at schools (primarily) and City buildings. This duty typically consumes 3 days per week.
Custodial	Senior Custodian	1	• Performs custodial duties on 2 floors of City Hall • Assigns work to Custodians and inspects work • Orders cleaning materials • Vacuums, mops, cleans bathroom facilities, spills, empties trash, etc.
	Custodian	3	• Vacuums, mops, cleans bathroom facilities, spills, empties trash, etc. • One Custodian cleans Public Works Administrative building and Health Department building, splitting time between the two buildings each day. • One Custodian cleans City Hall building • One Custodian cleans the second floor of the JFK Civic Center building • Note that there is a Custodian at the Library that is paid through the Library budget. This position is not reflected in the 3 Custodians at left. • Note that there is a Custodian at the Police Department. This position is not reflected in the 3 Custodians at left.

4. Financial

The following table provides the actual budget for FY10, and the approved budgets for FY11 and FY12 for the Lands and Buildings Division of Public Works. (Note: for ease of comparison of fiscal years, we have added permanent salaries of the Electrical Division into the FY10 actuals in the table. This Division was formally merged with Lands and Buildings in FY11.)

Personnel	**FY 10 Actual**	**FY11 Approved**	**FY12 Approved**
Salaries-Permanent	$ 1,429,426	$ 1,415,756	$ 1,463,997
Overtime	$ -	$ 2,500	$ 67,000
Personnel Total	$ 1,429,426	$ 1,418,256	$ 1,530,997
Expenses	**FY 10 Actual**	**FY11 Approved**	**FY12 Approved**
Utility Electricity	$ 214,316	$ 240,000	$ 250,000
Utility Heating/Gas	$ 233,196	$ 235,000	$ 290,000
Repair & Maint-Buildings	$ 70,715	$ 80,000	$ 80,000
Custodial - Supplies	$ 8,004	$ 8,000	$ 8,000
Graffiti Supplies	$ 8,256	$ 8,000	$ 8,000
Building Supplies	$ 67,393	$ 70,000	$ 70,000
Trans. Reimburs. & Seminars	$ -	$ 125	$ 125
Building Improvements	$ 86,092	$ 92,000	$ 92,000
Elevator & Building Inspections	$ -	$ -	$ -
Expenses Total	**$ 687,972**	**$ 733,125**	**$ 798,125**
Division Total	**$ 2,117,398**	**$ 2,151,381**	**$ 2,329,122**

5. WORKLOAD

The following table provides selected workload information for the Lands and Buildings Division.

Service	Workload
Maintenance of Facilities	• 34 City buildings • 36 School buildings
Area Maintained	• 2.7 million square feet
Irrigation System Maintenance	• 64 irrigation locations in City
Maintenance of Traffic Signals	• Electrical section of the Division maintains 96 traffic lights, 5,700 street lights (repairs/knock downs only. Private company does routine maintenance, changes ballast, etc.) • Maintain 600 decorative lights, 200 to 300 River Walk lights.

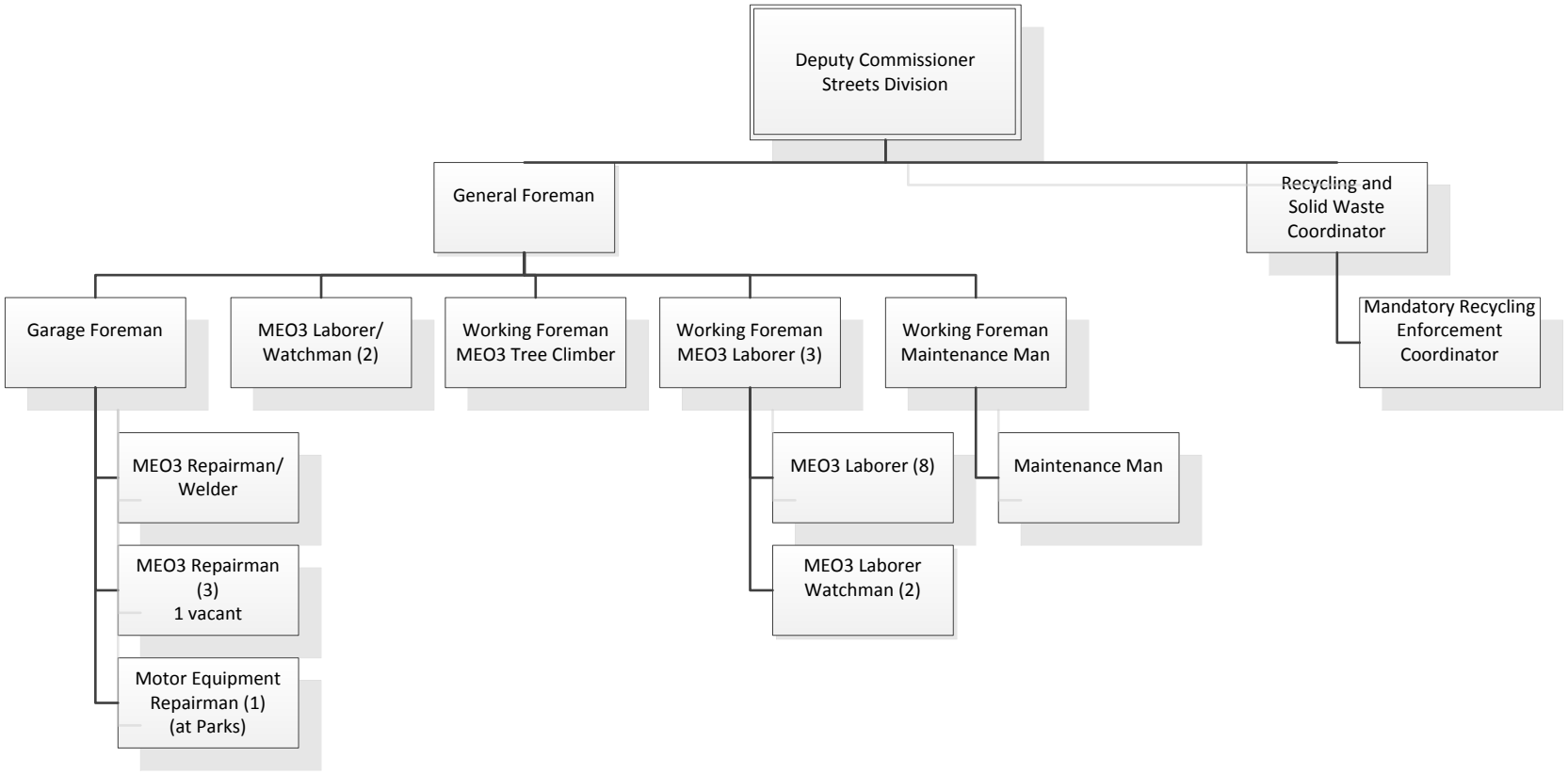
3. STREETS DIVISION

1. INTRODUCTION

The Streets Division is responsible for the repair and maintenance of paved surfaces in the City, of which there are approximately 235 center line miles, plus parking lots. The Division is also responsible for maintaining, pruning, removing and inventorying City trees; managing solid waste removal and recycling efforts; removing snow; removing dead animals from streets; sweeping downtown streets; emptying City trash barrels; maintaining and repairing DPW vehicles and equipment; and other duties.

2. ORGANIZATION

The Streets Division's organizational structure is portrayed in the organization chart below.


Deputy Commissioner
Streets Division
General Foreman
Recycling and
Solid Waste
Coordinator
Garage Foreman
MEO3 Laborer/
Watchman (2)
Working Foreman
MEO3 Tree Climber
Working Foreman
MEO3 Laborer (3)
Working Foreman
Maintenance Man
Mandatory Recycling
Enforcement
Coordinator
MEO3 Repairman/
Welder
MEO3 Repairman
(3)
1 vacant
Motor Equipment
Repairman (1)
(at Parks)
MEO3 Laborer (8)
MEO3 Laborer
Watchman (2)
Maintenance Man

3. STAFFING

In the table, which follows, a summary is provided of the Division's staffing and key elements of responsibilities.

Division	Staffing by Classification		Key Elements of Staffing and Scheduling
Streets Division Administration	Deputy Commissioner	1	• Oversees the operations of Recycling/Solid Waste, Streets Maintenance and Vehicle/Equipment Maintenance, providing guidance in work scheduling and accomplishment. • Receives E-Gov work requests relating to citizen requests for services as well as internally-generated requests, and ensures that these are assigned to appropriate staff, and that work is accomplished. • Serves as the primary point of contact for citizen communications regarding street repairs, snow removal. Coordinates with other divisions on street overlays and repairs, vehicle maintenance. • Plans street resurfacing projects.
Recycling/Solid Waste	Recycling/Solid Waste Coordinator	1	• Oversees the contract for residential trash, refuse and recycling collection for approximately 38,000 households, about 24,500 of which receive curbside trash services. This includes residences of up to 4 units. • Conducts two household hazardous waste collection days per year. Places advertisements in newspaper, web site, etc. Obtains Fire and Police details for these events. • Coordinates activities of senior volunteers through the Council on Aging, as well as the activities of a part time employee (20 hours/week) who performs secretarial duties. • Oversees grant-funded position of Recycling Enforcement Coordinator, who conducts outreach and disseminates recycling information, monitors recycling conformance. • Generates monthly newsletter and writes bi-weekly column in local newspaper.
	Mandatory Recycling Enforcement Coordinator	1	• DEP grant-funded position • Conducts outreach and disseminates information to residents regarding the City's recycling program

Division	Staffing by Classification		Key Elements of Staffing and Scheduling
			• Monitors recycling conformance in field through observations.
	Office Assistant	1	• 20 hours per week position • Answers phones • Performs secretarial duties • Enters data related to the recycling program
	Intern	2	• Both positions are uncompensated. • One works 8 hours per week (currently from UMass Lowell). Other works 4 hours per week (High School student). • College student researches Resource Recovery Center issues • High School student plans Earth Day and America Recycles Day events
	Office Volunteer	2	• Both positions are funded by Council on Aging Grant • Work approximately 100 hours annually, and receive tax abatements for service • Perform various office duties
	Summer Intern	2 (vacant)	• Both positions are currently vacant. Funded through Career Center Grant for 15 hours per week
Streets Maintenance	General Foreman	1	• Oversees daily operation of Street Division, supervises and assigns work. Oversees Working Foreman Mechanic and all other working formen in the Streets Division.
	Working Foreman MEO 3 Tree Climber	3	• Plants, prunes, cuts and removes trees. • Removes hazard limbs and trees, limbs and branches that are diseased or are impairing site distances. • Receives 2 Laborers within the Division each day to accomplish work. • Holds tree hearings • Runs chipper to shred Christmas trees each year
	MEO3 Laborer/Watchman	2	• One works M-Th from 3:30 pm to 11:30 pm. • One works F from 3:30 pm to 11:30 pm, Sat and Sun from7:30 am to 11:30 pm • Perform miscellaneous duties such as responding to dead animal complaints, sanding water leaks, delivering recycling bins, sweeping downtown streets,

Division	Staffing by Classification		Key Elements of Staffing and Scheduling
			repairing potholes after hours, greasing trucks, custodial work at DPW building, checking doors on City buildings, cleaning up at car accidents, emptying City trash barrels, etc.
	Working Foreman MEO3 Laborer	3	• Each has Class A CDL with hydraulics and can drive any piece of equipment in the City • Performs parking lot and street repairs
	MEO3 Laborer	8	• Two work on tree crew most days, assisting Tree Climber in cutting and pruning trees • Two work at the Cemetery most days, preparing for burials and other site work • Others accomplish tasks related to parking lot and street repairs
	Working Foreman/ Maintenance Man	1	• Delivers papers for signatures downtown multiple times daily • Delivers trash and recycling bins • Handles missed garbage pick up calls
	Maintenance Man	1	• Fills potholes each day of the year
Vehicle/Equipment Maintenance	Garage Foreman/ Mechanic		• Working Foreman provides direction, instruction, training and work assignments to the Division Mechanics. • Repairs and maintains vehicles and heavy equipment for City. • Diagnoses mechanical problems. Working Foreman troubleshoots and diagnoses more difficult automotive mechanical problems, and after repair, ensures that work has been performed satisfactorily and to standards.
	MEO3 Repairman/ Welder	1	• Repairs and maintains vehicles and heavy equipment for City. • Welds and fabricates parts
	MEO3 Repairman	3	• Repairs and maintains vehicles and heavy equipment for City.
	Motor Equipment Repairman	1	• Repairs and maintains vehicles and small engine equipment at Parks sites.

4. Financial

The following table provides the actual budget for FY10, and the approved budgets for FY11 and FY12 for the Streets Division of Public Works.

Personnel	**FY 10 Actual**	**FY11 Approved**	**FY12 Approved**
Salaries-Permanent	$ 834,956	$ 990,109	$ 871,891
Overtime	$ -	$ -	$ 12,000
Personnel Total	$ 834,956	$ 990,109	$ 883,891
Expenses			
Improv-Highway-Sidewalks	$ 31,847	$ 30,000	$ 40,000
Expenses Total	$ 31,847	$ 30,000	$ 40,000
Division Total	**$ 866,803**	**$ 1,020,109**	**$ 923,891**

The Waste Collection and Disposal budgets are presented below.

Expenses	**FY 10 Actual**	**FY11 Approved**	**FY12 Approved**
Hazardous Waste Collection	$ 19,592	$ 30,000	$ 30,000
Trash Collection & Disposal	$ 5,634,354	$ 5,907,000	$ 5,907,000
Recycling Supplies and Svc.	$ 7,367	$ 63,000	$ 63,000
Total Expenses	**$ 5,661,313**	**$ 6,000,000**	**$ 6,000,000**

The Street Lighting Budgets are presented below.

Expenses	FY 10 Actual	FY11 Approved	FY12 Approved
Energy-Street Lighting	$ 881,304	$ 635,000	$ 350,000
Repair & Maint-Downtown Light	$ 39,775	$ 50,000	$ 50,000
Total Expenses	**$ 921,079**	**$ 685,000**	**$ 400,000**

The Snow and Ice Budgets are presented below.

Personnel	FY 10 Actual	FY11 Approved	FY12 Approved
Overtime	$ 227,645	$ 160,000	$ 160,000
Expenses			
Purchase of Services	$ 584,658	$ 225,000	$ 225,000
Other Charges & Expenses	$ 175,705	$ 25,000	$ 25,000
Salt and Sand	$ 862,804	$ 240,000	$ 290,000
Total Expenses	**$ 1,623,167**	**$ 490,000**	**$ 540,000**
Total Snow and Ice	**$ 1,850,812**	**$ 650,000**	**$ 700,000**

5. WORKLOAD

The following table provides selected workload information for the Streets Division.

Service	Workload
Maintain Roads	• 253 center line miles • There are 12 MEO/Laborers in the Streets Division maintaining these roads. This equates to about 21 miles per position.
Patch Potholes	• Approximately 2,000 in FY11 • Maintenance Man position primarily accomplishes this, equating to about 10 fills per day, if 200 working days are assumed. It is reported that approximately 3 tons per day are used.

Service	Workload
Snow Removal	• Removed 81.2" of snow in FY11 (note that this function is accomplished by personnel in multiple divisions) • Snow and Ice removal budget was $650,000 in FY11 • Removed 46" of snow in FY10. Actual expenditures were $1,850,812. Cost per inch of snow removal was $40,235 (number of snow and ice events is unknown).
Remove/Prune trees	• 58 pruned in December, 2011 • Removed 21 trees in December, 2011 • Collected 2,671 trees in the latest season • Received 82 tree service requests in December 2011
Christmas Tree Chipper Service	• 9 drop off sites for Christmas trees in City • Chips are stockpiled at landfill
Vehicle Maintenance and Repair	• Approximately 100 vehicles and pieces of equipment • This equates to an approximate vehicle to mechanic ratio of 25:1
Solid waste and recycling program management	• Managed 24,573 wheeled carts in FY11, about 22,500 of which are 68 gallon containers, with the remainder being 34 gallons. • Charge $32 annually for 34 gallon carts (seniors only), and $125 for 68 gallon carts. • Oversaw the disposal of 3,833 tons of yard waste in FY11 • Oversaw the disposal of 3,463 tons of recyclable materials in FY11 • Hold 2 household hazardous waste events annually, with budget of $44,000 • Achieved a 14.5% waste stream diversion rate (measured by tonnage, and excludes yard waste). • Logged 595 calls to the office related to solid waste and recycling from July, 2011 through December, 2011.

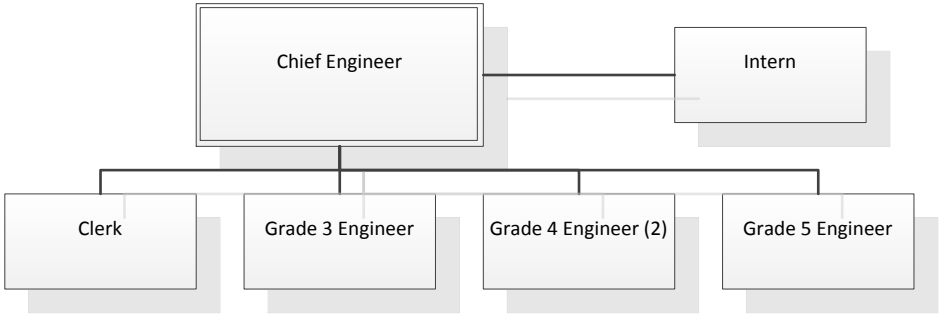
4. ENGINEERING DIVISION

1. INTRODUCTION

The Engineering Division of Public Works is responsible for the responsible administration of stormwater regulations, street pavements and openings, surveying of public properties, managing construction in streets and rights of way, as well as special projects such as the current Hamilton Canal project.

2. ORGANIZATION

The Engineering Division's organizational structure is portrayed in the organization chart below.



3. STAFFING

In the table, which follows, a summary is provided of the Engineering Division's staffing and key elements of responsibilities.

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
Engineering Division	Chief Engineer	1	• Reviews and performs calculations on stormwater regulations. • Assigns and reviews the work of Engineering staff • Primary point of contact for public and for internal City communications with Engineering • Licensed professional engineer
	Grade 5 Engineer	1	• Coordinates summer paving program regarding schedules, review of pay requisitions (quantities, etc.) • Conducts on site inspections of paving by contractors
	Grade 4 Engineer	2	• One works 8:00 am to 4:00 pm • One works 9:00 am to 5:00 pm • One has survey experience and finds boundaries, conducts deed research, reviews plans • One is a degreed Civil Engineer and answers sidewalk questions, etc. Also serves as University Bridge replacement main City contact.
	Grade 3 Engineer	1	• Degreed Construction Engineer • On site construction supervisor of the Hamilton Canal project • Determines cost estimates for street paving projects • Determines widths, depths and lengths of street paving projects, how many catch basins in segments

4. Financial

The following table provides the actual budget for FY10, and the approved budgets for FY11 and FY12 for the Engineering Division of Public Works.

Personnel	FY 10 Actual	FY11 Approved	FY12 Approved
Salaries-Permanent	$ 322,462	$ 328,823	$ 331,866
Overtime	$ -	$ -	$ 5,000
Personnel Total	**$ 322,462**	**$ 328,823**	**$ 336,866**

5. WORKLOAD

The following table provides selected workload information for the Engineering Division.

Service	Workload
Roadway and Pavement Management	• Conducted by private firm, which assigns a pavement management index to about 25% of roadways annually. • Accepted 2 streets in FY11 (note that approximately 46% of street segments in City have not been accepted, and therefore, no Chapter 90 funds may be expended on these) • Managed the repaving of 1.8 linear miles of streets in FY10 and an estimated 2.3 miles in FY11. This equates to an annual average of less than 1% of the total inventory of paved surfaces in the City
Street Opening/Trench Permits	• Issued 737 street opening/trench permits in FY11
Driveway permits	• Issued 141 driveway permits in FY11
Plans Review	• Reviewed 83 projects in FY11
Bridge Management	• 114 bridges in City (Division has undertaken an inventory and repair plan, which will identify locations, years constructed, inventory of inspection reports, etc.)
Construction Management	• Performed on site construction management of Hamilton Canal and Jackson Street projects

5. WASTEWATER UTILITY

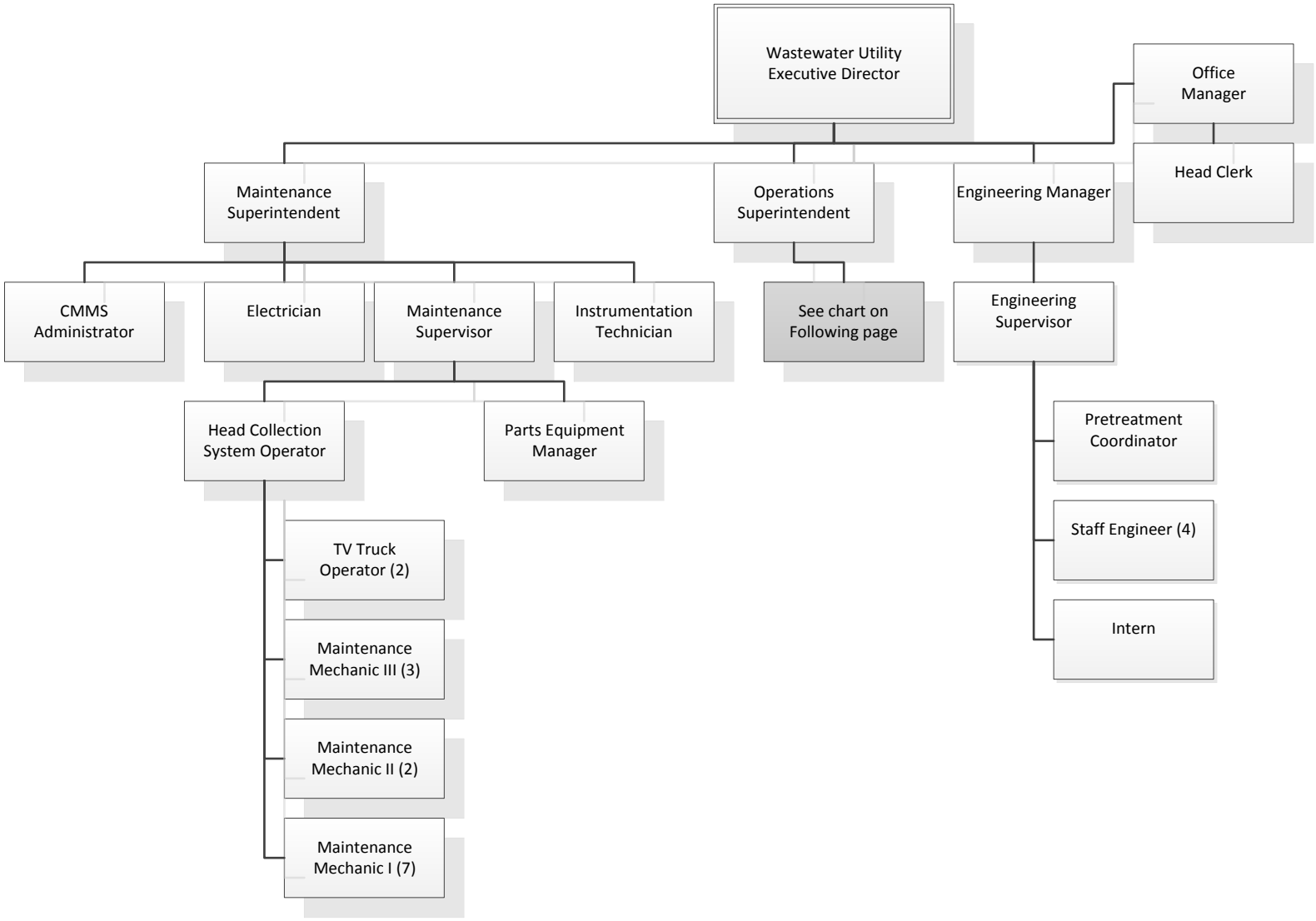
1. INTRODUCTION

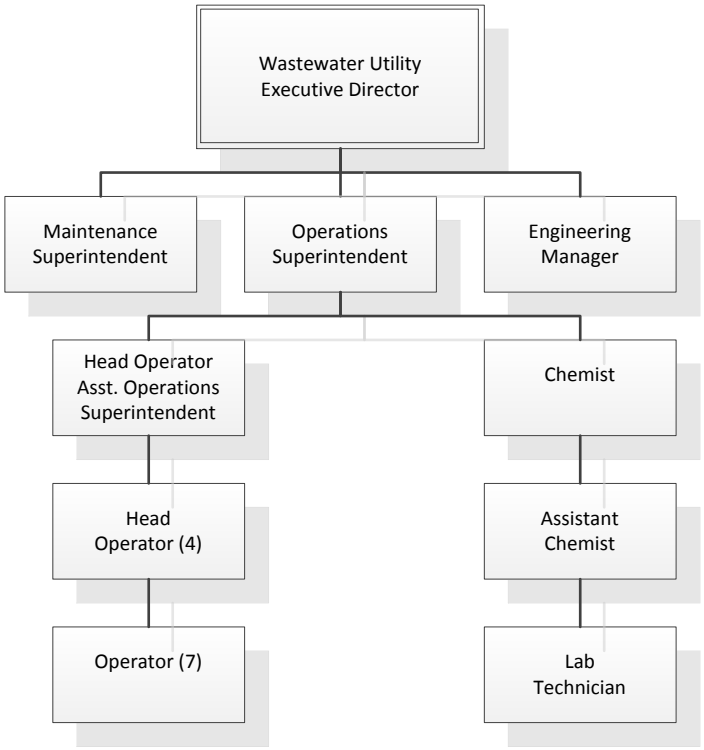
The Wastewater Utility treats the combined wastewater, stormwater and domestic septage for the City of Lowell, and the towns of Chelmsford, Dracut, Tewksbury and Tyngsboro. The wastewater treatment plant has a design capacity of 32 MGD, and is a primary and secondary activated sludge treatment facility. The primary treatment removes settleable solids, grit, and floatable materials. The secondary treatment principally deals with the removal and/or conversion of biodegradable organic contaminants. After secondary treatment, the facility uses sodium hypochlorite to disinfect the effluent prior to discharge into the Merrimack River.

The Utility maintains and repairs 230 miles of sewer and drain lines. In addition, the Utility enforces an industrial pre-treatment program which encompasses approximately 45 significant permitted industrial users.

2. ORGANIZATION

The Wastewater Utility's organizational structure is portrayed in the organization charts on the following two pages.


Wastewater Utility Executive Director
Office Manager
Head Clerk
Maintenance Superintendent
Operations Superintendent
Engineering Manager
CMMS Administrator
Electrician
Maintenance Supervisor
Instrumentation Technician
See chart on Following page
Engineering Supervisor
Head Collection System Operator
Parts Equipment Manager
Pretreatment Coordinator
Staff Engineer (4)
Intern
TV Truck Operator (2)
Maintenance Mechanic III (3)
Maintenance Mechanic II (2)
Maintenance Mechanic I (7)


Wastewater Utility
Executive Director
Maintenance
Superintendent
Operations
Superintendent
Engineering
Manager
Head Operator
Asst. Operations
Superintendent
Chemist
Head
Operator (4)
Assistant
Chemist
Operator (7)
Lab
Technician

3. STAFFING

In the table, which follows, a summary is provided of the Wastewater Utility's staffing and key elements of responsibilities.

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
Wastewater Utility Administration	Executive Director	1	• Oversees the operations of the Utility, assessing requirements for infrastructure and technology improvements, analyzing financials, determining appropriate service levels, administering discipline, etc. • Ensures compliance with regulatory requirements. • Serves as the primary public interface of the Utility. • Oversees the ISO 14001 Environmental Management System.
	Office Manager	1	• Processes purchase orders • Manages paperwork associated with contracts, serving as contact point of the WWTP with City Attorney • Processes injury reports • Processes reimbursements for work boots, wastewater licenses, CDLs, etc. • Receives and processes septage coupons for private haulers dumping into receptacle. • Processes payroll for the Wastewater Utility • Interacts with customers • Sending /Receiving Town Bills • Oversee State Revolving Fund Bonds • E-Gov log in of public complaints • Preparation of Reports and Presentations
	Head Clerk	1	• Processes accounts payable and receivable • Monitors expenditures related to electricity and gas • Answers phones • Processes mail • Orders office supplies

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
Maintenance Division	Maintenance Superintendent	1	• Responsible for the overall maintenance of the Wastewater Utility facility, outlying structures, and underground infrastructure. Includes primary facility, 230 miles of sewer line, 5,000 manholes, 5,000 catch basins. Also 27 vehicles, and equipment. • Attends safety meetings • Handles citizen calls and staff questions • Coordinates divisional efforts with Operations Division. • Observes processes and methods utilized by staff in the field in order to make improvements. • 24 pump, metering and CSO stations
	CMMS Administrator	1	• Schedules PM through Utility's CMMS (currently, MP2, however the Utility is in the process of needs assessment for new CMMS). • Receives and inputs work orders into system • Works with Maintenance Superintendent to discuss upcoming PM and the staff and material resources required • Ensures maintenance documentation is current • Ensures all parts, labor costs are entered into system • Through analysis, identifies locations of recurring repairs • Performs cost analysis on whether equipment repairs are cost effective, or whether to run-to-failure or replace.
	Electrician	1	• Performs electrical maintenance and repairs on assigned systems, including lighting, motors, control panels, switch boards, etc.
	Instrumentation Technician	1	• Licensed electrician, and serves as backup for Plant Electrician • Maintains and repairs assigned systems such as flow meters, samplers, lab instruments, alarm systems, SCADA.
	Maintenance Supervisor	1	• Issues work to staff • Determines jobs to assign, and personnel, equipment and material resources needed for jobs • Observes work in the field to ensure work is done properly and answers questions from staff • Meets daily with Superintendent to discuss work needing to be performed, and work that was accomplished during day.

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
	Head Collection System Operator	1	• Supervises and assigns work to Maintenance Mechanics on Structures Crew, Catch Basin Crew. • Observes work in the field, ensuring work is completed in accordance with plans, answering questions from staff. • Oversees street sweeping and catch basin cleaning contracts.
	Maintenance Mechanic III	3	• Repair and maintain all plant equipment, including pumps, filter presses, etc. • Can weld and fabricate parts • Provide guidance to Mechanic IIs as necessary
	Maintenance Mechanic II	2	• Repair and maintain all plant equipment, including pumps, filter presses, etc. • Can weld and fabricate parts
	Maintenance Mechanic I	7	• Perform sewer and catch basin cleaning, maintenance and repairs on outlying structures, including 9 diversion stations, 11 pump stations, 3 metering stations, 1syphon station • Four Mechanics are assigned to the 2 sewer trucks, 2 are assigned to the maintenance of outlying structures, and 1 is a floater, filling in as needed on crew where needed.
	Television Truck Operator	2	• Work in crew to televise and record interiors of sewer lines to determine condition of infrastructure and locations and severity of failures and potential failures in the lines • Assign grades of 1 through 5 corresponding to condition of line segments
	Parts Equipment Manager	1	• Receives, stocks, disseminates and accounts for parts, tools and equipment for the Wastewater Utility. • Initiates purchase requests for parts and equipment in coordination with Office Manager • Parts room is secured, with limited access
Engineering	Engineering Manager	1	• Oversees the work and work assignments of the Engineering Supervisor, Staff Engineers and intern. • Coordinates with EPA and other towns • Plans and designs capital improvement projects. Reviews and comments on contract designs.
	Engineering Supervisor	1	• Involved with diversion station and WWTP capital project administration, management • Manages the WWTP SCADA system

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
			• Guides the work of Engineering staff from a technical or process-related perspective • Involved with WWTP process control
	Pre-Treatment Coordinator	1	• Samples and inspects waste from 40+ significant discharge industries in the City. Also, permits these industries and bills for permits.
	Staff Engineer	4	• All Staff Engineers may perform any duties assigned to the position, however each has duties that are typically assigned to them separately. • One Staff Engineer assists the Pre-Treatment Coordinator in waste discharge sampling of industries in the City, and also assists in permitting, inspection and billing of the PS&H facility in Bow, NH. • One Staff Engineer identifies outfalls (over 300 to date) into the Merrimack River, integrates the associated data into GIS. • One Staff Engineer is in charge of program documentation, geocoding locations of catch basins, outfalls, collection lines and manholes to the outfalls. • One Staff Engineer primarily is engaged in field work serving as construction manager on the sewer separation program.
	Intern	1	• 20 hours per week • Performs miscellaneous duties, which may include sampling, archiving documents, etc.
Operations Division	Operations Superintendent	1	• Oversees the work and work assignments of staff in the Operations Division • Ensures that all plant equipment is operating properly, checking SCADA for necessary process adjustments • Possesses Grade 7 license
	Head Operator/Assistant Operations Superintendent	1	• Fills in for Operations Superintendent as required • Orders chemicals • Communicates with Head Operators regarding treatment processes • Works as Head Operator on Friday day shift • Schedules Operators to cover absences • Performs lab work on weekends – fecal coliform, BOD, pH. • Possesses Grade 7 license
	Head Operator	4	• Possess Grade 7 license. One Head Operator must be present at all times in WWTP.

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
			• Monitors treatment processes, making adjustments as necessary. • Oversees work of Operators. • One Head Operator works M-F from 3:00 pm to 11:00 pm. • One Head Operator works M-F from 11:00 pm to 7:00 am • One Head Operator works Saturday and Sunday from 7:00 am to 7:0 pm and Mon and Tue from 7:00 am to 3:00 pm • One Head Operator works Saturday and Sunday from 7:00 m to 7:00 am, and from 7:00 am to 3:00 pm on Wed and Thur.
	Operator	7	• Al Operators may perform any duties of other Operators, however most have specific duties assigned. • One Operator is assigned to the septage process and dewatering system. • One is at the filter press. • One is assigned to the primary system and one to the secondary system, completing checklists of these systems. • All Operators are responsible for cleaning tanks, housekeeping, etc. • Operators work on three shifts, corresponding to 7:00 am to 3:00 pm; 3:00 pm to 11:00 pm; and from 11:00 pm to 7:00 am, M-F. One Operator works a 12-hour shift on Saturday and Sunday (7:00 am to 7:00 pm) and from 7:00 am to 3:00 pm on Mon and Tue. One Operator works a 12-hour shift on Saturday and Sunday (7:00 pm to 7:00 am), and from 7:00 am to 3:00 pm on Th and Fri.
	Chemist	1	• Performs and oversees the performance of required tests in lab • Completes required reporting of tests
	Assistant Chemist	1	• Performs required lab tests
	Lab Technician	1	• Conducts sampling • Runs most of the routine lab tests

4. Financial

The following table provides the actual budget for FY10, and the approved budgets for FY11 and FY12 for the Public Works Wastewater Utility.

Personnel	**FY 10 Actual**	**FY11 Approved**	**FY12 Approved**
Salaries & Wages-Permanent	$ 2,356,087	$ 2,396,065	$ 2,544,582
Salaries & Wages-Temp	$ 18,946	$ 26,000	$ 26,000
Overtime	$ 241,958	$ 195,000	$ 195,000
Holiday	$ 17,793	$ 25,000	$ 25,000
Shift Differential	$ 31,948	$ 38,000	$ 38,000
License Initiative	$ 1,500	$ 2,500	$ 2,500
Longevity	$ 1,142	$ 1,150	$ 1,150
Sick Leave Initiative	$ 22,635	$ 23,000	$ 23,000
Personnel Total	**$ 2,692,009**	**$ 2,706,715**	**$ 2,855,232**
Expenses			
Energy-Heating/Gas	$ 1,061,470	$ 1,100,000	$ 1,100,000
Repair & Maint Bldgs & Grds	$ 369,885	$ 700,000	$ 700,000
Sludge Removal	$ 2,635,375	$ 2,700,000	$ 2,700,000
Police-Special Detail	$ 59,320	$ 70,000	$ 70,000
Rental of Equipment	$ 30,096	$ 15,000	$ 15,000
Uniform Rental	$ 14,624	$ 20,000	$ 20,000
Professional Services	$ 118,626	$ 440,000	$ 440,000
Training Safety	$ 20,747	$ 35,000	$ 35,000
Postage	$ 2,605	$ 12,000	$ 12,000
Gas & Motor Oil Supplies	$ 38,217	$ 50,000	$ 50,000
Chemical Supplies	$ 406,293	$ 578,000	$ 840,000
Lab Supplies	$ 33,623	$ 66,000	$ 66,000
Office Supplies	$ 6,307	$ 8,000	$ 8,000
Misc. Supplies-Other	$ 1,904	$ 6,000	$ 6,000
In-State Seminars	$ 75	$ 1,000	$ 1,000
Out of State Travel	$ -	$ 700	$ 700
Misc. Charges	$ 9,435	$ 16,000	$ 16,000
Vehicle Capital Plan	$ -	$ 130,000	$ 363,000
Office Furniture & Equipment	$ 5,901	$ 9,500	$ 9,500
Elevator Repairs	$ -	$ 25,000	$ 25,000
ISO 14001	$ 37,600	$ 38,400	$ 37,600
Contrt. Sweeping/CB Cleaning	$ -	$ 500,000	$ 515,000

Personnel	FY 10 Actual	FY11 Approved	FY12 Approved
Remote Diversions	$ 1,906	$ 8,000	$ 8,000
GIS Work	$ 15,000	$ 15,000	$ 15,000
Combined Sewer Overflow	$ 9,746	$ -	$ -
Improve Sewers & Drains	$ 5,385	$ 15,000	$ 15,000
Inspection San Sewer	$ 286,034	$ 369,000	$ 840,390
Total Expenses	**$ 5,170,174**	**$ 6,927,600**	**$ 7,908,190**
Total Wastewater Utility	**$ 7,862,183**	**$ 9,634,315**	**$ 10,763,422**

5. WORKLOAD

The following table provides selected workload information for the Wastewater Utility.

Service	Workload
Plant	• Maintain the WWTP with design capacity of 35MGD • Primary and secondary treatment • Sodium Hypochlorite disinfection • Ensures compliance with Stormwater regulations
Maintenance of Outlying (i.e.,non-plant) Structures	• 9 diversion stations • 11 pump stations • 3 metering stations • 1 Syphon station • The WWTP Engineering staff have identified over 300 outfalls into the Merrimack River to date • The City's flood control system consisting of earthen levees , concrete walls and pump station.
Collection System Maintenance	• 230 linear miles of sewer line (from 8" to 120") • Cleaned/rodded 19,000 feet of the system in the latest fiscal year (approximately 3.6 miles) • Approximately 65% of the system is combined sewer • Televise system on periodic basis (no data currently on miles televised to date. Utility has been televising for 3 years).

	• Have approximately 4,500 manholes
Street Sweeping	• Oversee the street sweeping contract (No data available currently on value of contract or number of curb miles swept annually)
Catch Basin Cleaning	• Use two-person crew on Vac-Con for assignment with video inspection truck • Oversee the catch basin cleaning contract for cleaning of 3,000 catch basins yearly at a cost of $210,000, or about $70 per catch basin.
Street Sweeping	• Responsible for administering the street sweeping contract for street segments in all areas of City other than downtown • Contractor sweeps approximately 480 curb miles twice annually (960 total curb miles) for $304,000 (about $317 per curb mile).
Vehicle Maintenance	• Maintain 26 vehicles and one (1) trailer
Industrial Pre-treatment	• Permit, sample and inspect 45 significant industrial permitted industrial customers
Safety Program	• Hold 8 training sessions annually (e.g., PPE, lock out/tag out, slips, lifts, falls, etc.)
Capital Improvement Project Management	• In 8 years, the WWTP Engineering staff has overseen and managed construction projects of approximately $100M, including sewer line separation, plant improvements, diversion station improvements, etc.
Combined Sewer Overflows (CSO)	• There were approximately 300 M gallons of untreated wastewater discharged into the Merrimack River in FY11 • The number of CSO events was unavailable
Administrative	• Process payroll for 48 employees weekly • Oversee and monitor budget of $10,763,422

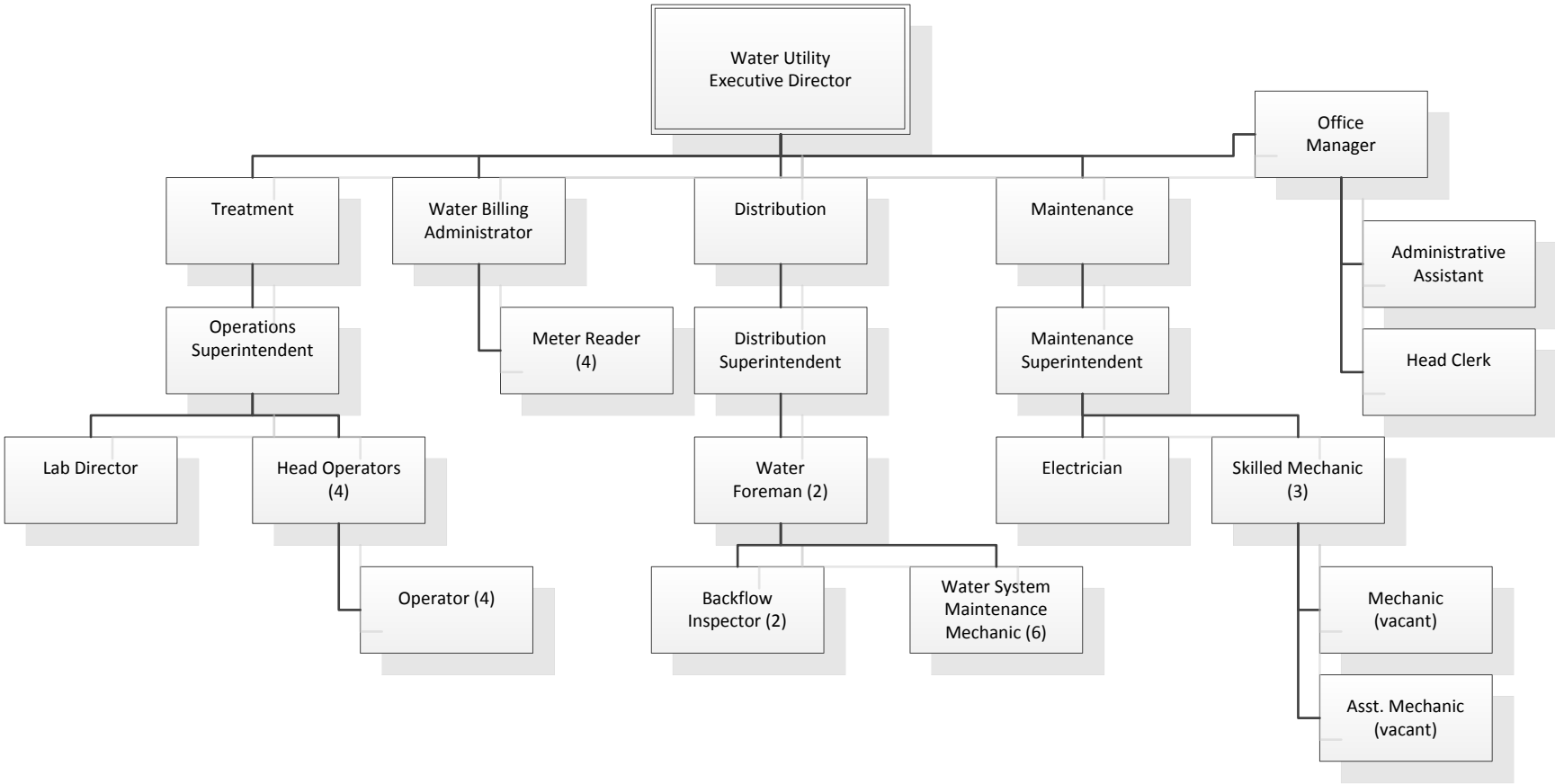
6. WATER UTILITY

1. INTRODUCTION

The Lowell Regional Water Utility provides safe, potable water to the citizens and businesses of the City of Lowell and surrounding communities. It purifies approximately 4.7 billion gallons of water to over 135,000 customers. The staff of the LRWU monitor daily water production, repair and maintain 215 miles of water main and approximately 25,000 water service connections. They also inspect backflow devices, bill for water, wastewater and trash.

2. ORGANIZATION

The Water Utility's organizational structure is portrayed in the organization chart below.


Water Utility
Executive Director
Office
Manager
Treatment
Water Billing
Administrator
Distribution
Maintenance
Administrative
Assistant
Operations
Superintendent
Meter Reader
(4)
Distribution
Superintendent
Maintenance
Superintendent
Head Clerk
Lab Director
Head Operators
(4)
Water
Foreman (2)
Electrician
Skilled Mechanic
(3)
Operator (4)
Backflow
Inspector (2)
Water System
Maintenance
Mechanic (6)
Mechanic
(vacant)
Asst. Mechanic
(vacant)

3. STAFFING

In the table, which follows, a summary is provided of the Water Utility's staffing and key elements of responsibilities.

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
Water Utility Administration	Executive Director	1	• Oversees the operations of the Utility, assessing requirements for infrastructure and technology improvements, analyzing financials, determining appropriate service levels, administering discipline, etc. • Ensures compliance with regulatory requirements. • Serves as the primary public interface of the Utility.
	Office Manager	1	• Processes name changes • Develops final bills for water service • Processes accounts payable and receivable • Processes applications for new services and service billings • Oversees the work and the work assignments of the Head Clerk and Administrative Assistant in the Water Utility
	Administrative Assistant	1	• Bills for water, sewer and trash • Processes elderly discounts • Develops final bills for service • Processes abatements
	Head Clerk	1	• Processes payroll for the Water Utility • Answers telephones • Enters service calls into E-Gov automated system • Makes appointments for ARB repairs, leaks, etc.
Water Billing	Water Billing Administrator	1	• Directs activities of Meter Readers • Responds to customer inquiries, including high reads • Performs final reads
	Meter Reader	4	• Use hand held readers to read meters

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
Treatment	Operations and Safety Superintendent	1	• Performs State and federal regulatory reporting • Completes Tier 2 Hazardous chemicals report • Oversees all lab reports • Ensures compliance with all regulatory requirements • Responsible for all personal property equipment • Labels all pipes in facility • Ensures all eyewashes and showers are operable • Schedules shifts and time off for assigned staff • Writes standard operating procedures • Responsible for the lead and copper testing program • Monitors SCADA remotely and after hours to provide advice on abating more complex problems • Possesses Level IV license
	Lab Director	1	• Assists in determining water sampling sites and sampling/testing frequencies to ensure compliance with the Safe Drinking Water Act and EPA regulations. • Performs quality control and quality assurance related to lab certifications. • Performs bacteriological analyses of water samples from distribution system. • Purchases and inventories chemicals utilized in lab. • Compiles data for the annual Consumer Confidence Report.
	Head Operator	4	• Enforces quality control over processes in water treatment plant; monitors plant processes and makes necessary changes. • Performs QC analysis on treatment chemicals. • Performs bench testing • Conducts finished water testing • Tests clearwell levels, reservoir levels • Adjusts flows • Head Operators staff the Plant on weekends, with one Head Operator working a 12 hour shift beginning at 11:00 pm Friday through 11:00 am Saturday, and from 11:00 pm Saturday through 11:00 am Sunday. Another Head Operator works the complementing 12 hour shift on each day. One Head Operator works from 11:00 pm Sunday through 7:00 am Monday, and one works 3:00 pm -11:00 pm Monday and Tuesday. A "Floating" Head Operator works Mon, Tue, Th, Fri, from 7:00 am – 3:00 pm, and from 3:00 pm – 1:00 pm on Wednesdays.
			• Feeds and batches chemicals

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
	Operator	4	• Measures chemicals • Calibrates instruments • Samples for bacteria in system • Sends letters to residents for copper and lead testing • Performs housekeeping duties such as cleaning restrooms, vacuuming, emptying trash, cleaning filters, etc. • There are two (2) Operators on 1st shift (7:00 am – 3:00 pm), one (1) on 2nd shift (3:00 pm – 11:00 pm) and one (1) on 3rd shift (11:00 pm – 7:00 am) Monday through Friday.
Distribution	Distribution Superintendent	1	• Schedules repair work of the 2 Foremen and 6 Maintenance Mechanics • Assembles work data for reporting and analysis • Coordinates work with contractors performing field work • Retrieves work requests in E-Gov and assigns work to crews. Closes out E-Gov work orders when completed.
	Foreman	2	• Provide oversight and guidance to assigned field crews. • Works in field performing excavations on main breaks, service leaks. • Repair, rebuild and replace hydrants • Installs new/replacement meters
	Maintenance Man	6	• Works in field performing excavations on main breaks, service leaks. • Repair, rebuild and replace hydrants • Installs new/replacement meters • Turn on/off irrigation lines • Makes repairs on Automatic Reading and Billing (ARB) boxes • Performs water utility mark-outs (primarily as requested by National Grid). • Performs customer service. One Maintenance Man is typically left off of field crew assignment each day in order to perform customer service activities.
	Backflow Inspector	2	• Performs inspections of backflow devices at City commercial and industrial establishments, ensuring valves work properly and are properly installed. Valves maybe inspected either once or twice annually, depending upon the hazard posed by the valve. • Completes survey forms and enforcement letters. • Sets up appointments for inspection and survey. • Maintains files of inspections.

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
Maintenance	Maintenance Superintendent	1	• Responsible for the overall maintenance of the Water Utility facility and outlying structures, storage tanks, reservoirs and pump stations. • Ensures maintenance documentation is current • Maintains 25 Utility Vehicles • Functions as the Water Utilities backup electrician • Assembles work data for reporting and analysis • Coordinates work with contractors performing field work • Retrieves work requests in E-Gov and assigns work to crews. Closes out E-Gov work orders when completed. • Currently functioning as the Division's Instrumentation Technician in addition to duties as Superintendent. Repairs video and security card systems. • Manages snow plowing activities in Centerville and downtown areas of the City, managing both City and contractor crews.
	Electrician	1	• Master Electrician • Performs electrical repairs in plant and pump station generators, exercising, load testing, etc. • Repairs and maintains switches, bulbs, plugs, ballast, lighting, wiring. • Restores power in power outages
	Skilled Mechanic	3	• One Mechanic primarily performs duties related to facilities and grounds maintenance, landscaping and beautification. Also paints and performs building maintenance, and takes care of snow plowing and equipment at pump stations. • Other two Mechanics perform repair and maintenance on plant and equipment such as pumps, generators, etc., perform plumbing repairs and maintenance, address chemical leaks, and repair the fleet of rolling stock and relate equipment.

4. Financial

The following table provides the actual budget for FY10, and the approved budgets for FY11 and FY12 for the Public Works Water Utility.

Personnel	**FY 10 Actual**	**FY11 Approved**	**FY12 Approved**
Salaries & Wages-Permanent	$ 1,670,021	$ 1,715,946	$ 1,810,431
Salaries & Wages- O.T.	$ 89,451	$ 80,000	$ 90,000
Salaries & Wages-Holiday	$ 19,261	$ 20,000	$ 20,000
Shift Differential	$ 11,368	$ 13,000	$ 13,000
Longevity	$ 704	$ 710	$ 710
Incentive BB Active Emps.	$ 1,340	$ -	$ -
Total Personnel	**$ 1,792,145**	**$ 1,829,656**	**$ 1,934,141**
Expenses			
Electricity	$ 958,966	$ 1,000,000	$ 1,000,000
Gas Heat	$ 61,063	$ 75,000	$ 75,000
Repair & Maint of Bldg & Equip	$ 12,166	$ 22,000	$ 22,000
Preventive Maintenance	$ 36,146	$ 43,000	$ 40,000
Rental of Equipment	$ 7,338	$ 15,000	$ 15,000
Professional Services	$ 21,504	$ 25,000	$ 30,000
Other Services	$ -	$ 1,000	$ -
Consumer Confidence	$ 9,600	$ 10,000	$ 10,000
Automotive	$ 22,071	$ 28,000	$ 28,000
Gas & Motor Oil	$ 917	$ 25,000	$ 35,000
Chemicals	$ 996,530	$ 969,761	$ 989,761
Lab Supplies	$ 37,930	$ 42,000	$ 39,000
Public Works Supplies	$ 67,292	$ 91,000	$ 91,000
Building Supplies	$ 12,548	$ 20,000	$ 20,000
Miscellaneous Supplies	$ 958	$ -	$ -
Safe Drinking Water Assessmt.	$ 39,000	$ 41,000	$ 41,000
License Reimbursement	$ 922	$ 1,000	$ 1,000
Conferences/Seminars/Ed/Trng.	$ 10,760	$ 4,000	$ 4,000
Transport. Reimburs/Seminars	$ 3,030	$ 16,000	$ 16,000
Miscellaneous Charges	$ 2,192	$ 8,000	$ 8,000
Carbon Replacement	$ -	$ 193,328	$ -
Building Improvement	$ 29,040	$ 35,000	$ 20,000
Electrical Work	$ 846	$ -	$ -
Portable Radios	$ -	$ 1,000	$ -

Personnel	FY 10 Actual	FY11 Approved	FY12 Approved
Hydrants	$ 7,299	$ 30,000	$ 30,000
Meters	$ 29,305	$ 30,000	$ 30,000
PLC/SCADA Equip and Repair	$ 4,640	$ 10,000	$ 10,000
New Vehicles	$ -	$ -	$ 75,000
Total Expenses	**$ 2,372,063**	**$ 2,736,089**	**$ 2,629,761**
Total Water Utility	**$ 4,164,208**	**$ 4,565,745**	**$ 4,563,902**

5. WORKLOAD

The following table provides selected workload information for the Water Utility.

Service	Workload
Plant	• Maintain the WTP, which purified about 4.7B gallons of water in FY11 • Have approximately 135,000 customers, comprising about 26,000 accounts • Have 4 pump stations and 1 intake station • Have two (2) storage tanks, at Wedge Street and 10th Street • Have two (2) underground storage tanks
Water Leak Detection and Repair	• Completed correlation leak detection (contractual service) on 213 miles of distribution line in FY11 • The survey found 13 leaks (expended $50,000 on contractual leak detection service) • There were 60 main breaks in FY11, or one per 0.28 miles of distribution line (57 breaks in 2010, 72 in 2009) • There were 144 service leaks in FY11 (142 in 2010, 154 in 2009)
Distribution System Maintenance	• Maintain approximately 213 linear miles of distribution lines • These range from 2" to 36" in diameter
Hydrant Replacement and Repair	• There are approximately 2,400 hydrants in the City • The Maintenance Division of the Utility replaced 23 of these in FY11 (about 1%) • Repaired 190 hydrants in FY11 • Rebuilt 39 hydrants in FY11 • There are 13 fire districts in the City that inspect each hydrant annually and report leaks and damages. • The Meter Reading section divides the City into 3 sectors. These are split into routes:

Service	Workload
	• Sector A-D has approximately 6,000 accounts • Sector E-H has approximately 8,500 accounts • Sector I-L has approximately 8,500 accounts • Meters are read quarterly, which equates to an average of 2,075 each quarter, and about 519 meters per Meter Reader per quarter, or about 692 per month, and about 23 per day per Meter Reader.
Meter Reading	• Installed 291 new meters in FY11 • Repaired 808 ARB devices in FY11
Service Mark-Outs	• Completed approximately 5,000 mark outs in FY11
Backflow Device Inspections	• There are 1,146 known backflow device in the City • Devices are inspected either once or twice annually, depending upon the hazard posed to the distribution system • About 300 devices are inspected on an annual basis
Vehicle and Equipment Maintenance	• Have 25 utility vehicles • The Skilled Mechanics maintain the fleet vehicles and distribution equipment(pumps, generators, compressors etc.) 25% of their time to vehicle maintenance and repair.

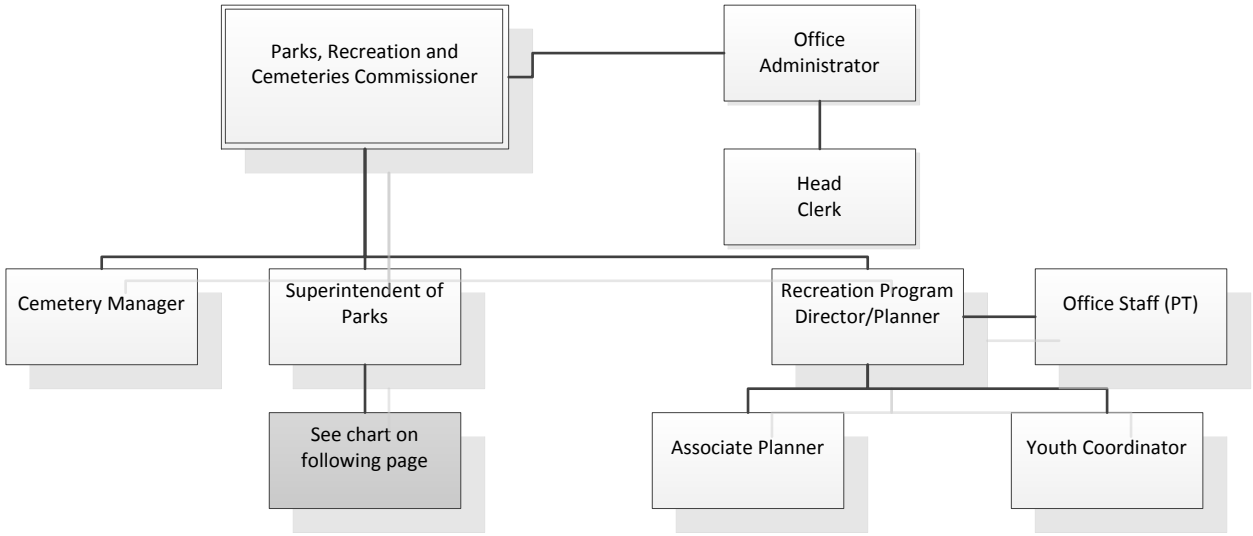
7. PARKS, RECREATION AND CEMETERIES DIVISION

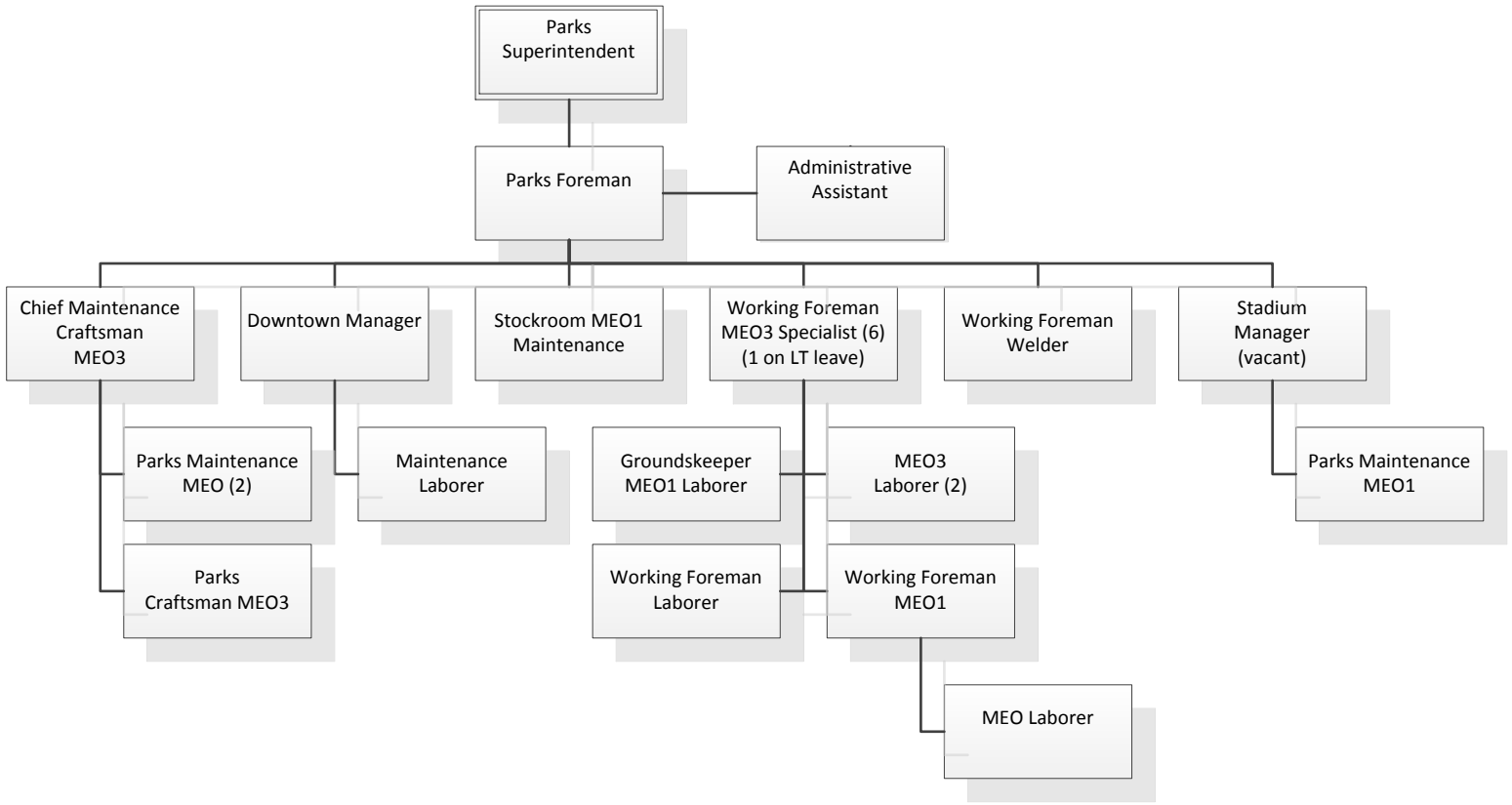
1. INTRODUCTION

The Parks, Recreation and Cemeteries Division of Public Works is responsible for the maintenance, beautification and upkeep of the City's 92 parks, three swimming pools, over 120 green spaces, and 43 playgrounds, various courts, ball fields and fixtures. The Division also provides recreational services to its residents, coordinating these efforts with the schools and with local not-for-profits. The Division also operates and maintains six cemeteries encompassing approximately 77 acres, the largest of which is Edson Cemetery (39.6 acres), at which the Division's administrative office is located.

2. ORGANIZATION

The Parks, Recreation and Cemeteries Division's organizational structure is portrayed in the organization chart below.




Parks Superintendent
Parks Foreman
Administrative Assistant
Chief Maintenance Craftsman MEO3
Downtown Manager
Stockroom MEO1 Maintenance
Working Foreman MEO3 Specialist (6) (1 on LT leave)
Working Foreman Welder
Stadium Manager (vacant)
Parks Maintenance MEO (2)
Maintenance Laborer
Groundskeeper MEO1 Laborer
MEO3 Laborer (2)
Parks Maintenance MEO1
Parks Craftsman MEO3
Working Foreman Laborer
Working Foreman MEO1
MEO Laborer

3. STAFFING

In the table, which follows, a summary is provided of the Division's staffing and key elements of responsibilities.

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
Parks, Recreation and Cemeteries Administration	Commissioner	1	• Oversees the operations of the Division, serving as primary point of contact for internal communications as well as for the public. • Provides operational, technical and budgetary guidance for staff of the Division. • Administers 2012 budget of approximately $2.1M • Oversees all procurement, accounting practices, and related ordinances. • Meets with state, local and federal officials securing grants and related local funding, private donations, gifts, etc. • Attends meetings of City Council, Board of Parks, Cemetery Commission, Council Sub-committee on Parks, Civic Group meetings, and community meetings.
	Office Administrator	1	• Currently, this position is being filled by an employee working two days per week, eight hours each day. • Processes payroll for Parks, Recreation employees. Reconciles leave balances for employees against Munis records. • Processes requisitions for new hires. • Completes budget, processes purchase requisitions, orders office supplies, etc. • Responds to questions related to purchases.
	Head Clerk	1	• Answers phones. • Assists Cemetery visitors in locating graves. • Maintains card files, paper records, maps and books related to grave sites, ownership of lots, records related to deceased. • Inputs current burial records into Excel spreadsheet for electronic retrieval (in addition to maintenance of manual records). • Primary point of contacts for funeral homes, monument companies, etc., in

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
			preparations for burials. • Processes payroll for the Cemetery employees. • Bills funeral homes for services • Orders flowers for those graves that receive them on perpetual basis.
	Clerk (Temporary) Clerk (Seasonal)	1 1	• Temporary Clerk has worked 35 hours/week for approximately one year (the position is non-benefitted). • Seasonal Clerk works 3.5 hours per day, M, T, W. (Non-benefitted) • Process purchase orders. • Assist Cemetery visitors at the counter. • Assist in processing payroll.
Parks	Parks Superintendent	1	• Ensures that daily work assignments are made and that work is accomplished. • Serves as primary point of contact for the City parks operations • Ensures that parks, stadium, pools, courts, playgrounds and fixtures are safe and operable. • Acts as divisional contact in absence of Commissioner • Coordinates with special events department of the City on all festivals, parades, and other events. • Coordinates clean-ups and brush removal, manages vacant lots, enforces codes, etc. • Oversees the downtown center crew responsible for cleaning the downtown area, planting trees, removing snow, sanding, etc. • Coordinates with league officials, House of Corrections personnel, ROTC crews and other organizations performing park management and maintenance.
	Parks Foreman	1	• Coordinates work assignments and distributes work slips documenting these assignments • Observes work to ensure work is completed and done in accordance with instructions • Documents work to be accomplished the following day • Coordinates all work to be accomplished with Superintendent of Parks

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
	Administrative Assistant	1	• Generates and submits purchase orders • Makes utility payments • Processes payments for parks supplies • Answers phones
	Chief Maintenance Craftsman MEO3	1	• Certified Pool Operator • Vacuums, cleans, maintains and prepares pools • Repairs and maintains 43 playgrounds
	Parks Maintenance MEO	1	• Lines and maintains ball fields
	Parks Craftsman MEO3	1	• Operates all equipment in the Division • Maintains playgrounds and fences • Lines ball fields
	Downtown Manager	1	• Maintains sidewalks and gutters in downtown area • Utilizes vacuum machine to perform work • Works in conjunction with Maintenance Laborer. Divide downtown areas by routes.
	Maintenance Laborer	1	• Maintains sidewalks and gutters in downtown area • Utilizes vacuum machine to perform work • Works in conjunction with Downtown Manager. Divide downtown areas by routes.
	Stockroom MEO1 Maintenance	1	• Makes deliveries of stock • Cleans shop where inventory is stored • Inventories stock (tools, supplies) and issues stock on approval of Supervisors
	Working Foreman MEO3 Specialist	6	• One Working Foreman MEO3 Specialist is on long term leave • Work individually in the 91 parks • Empty trash barrels • Mow, weed and landscape in parks

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
			• Deliver necessary materials and supplies to parks for work, such as loam, clay and other. • Repair fixtures such as tennis nets, basketball hoops, etc. • One of the positions is responsible for working with backhoe to stockpile fill dirt, clay, rocks, etc.
	Groundskeeper MEO1 Laborer Working Foreman Laborer MEO3 Laborer Working Foreman MEO1 MEO Laborer	1 1 2 1 1	• Work individually in the 91 parks • Empty trash barrels • Mow, weed and landscape in parks • Deliver necessary materials and supplies to parks for work, such as loam, clay and other. • Repair fixtures such as tennis nets, basketball hoops, etc. • One of the positions is responsible for working with backhoe to stockpile fill dirt, clay, rocks, etc.
	Working Foreman Welder	1	• Rehabilitates equipment such as trailers, plow blades, etc. through use of welder and related equipment • Welds bolts back in place on street lights • Repairs fences, gates, basketball hoops, etc, by welding
	Stadium Manager	1	• Position currently vacant • Oversees all high school, Pop Warner, Lacrosse, etc., event maintenance at Cawley Stadium • Maintains stands, facilities • Maintains grounds by weeding, mowing • Oversees the activities of assigned Parks Maintenance MEO1
	Parks Maintenance	1	• Maintains stands, facilities at Cawley Stadium

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
	MEO1		• Maintains grounds by weeding, mowing
Recreation	Recreation Program Planner/Director	1	• Works with Not-for-profits and schools to coordinate programmatic offerings, times and locations. • Applies for grants to provide programs • Develops and monitors budgets for programs • Develops and inputs purchase and service orders through Munis • Manages staff payrolls • Teaches life guarding, CPR classes • Interviews applicants for part time staff, teachers • Oversees night program activities • Develops newsletters and flyers notifying interested participants of programmatic offerings, times, locations, etc. Also posts these on division web site • Works M-Th and Saturday. Works on flex time schedule in order to accommodate evening and night program needs.
	Associate Planner	1	• Develops staff payroll • Rents parks to interested parties • Issues permits for the use of parks (these are given at no charge to private entities running programs for youth such as basketball, baseball, football, soccer)
	Youth Coordinator	1	• Assists in interviews of part time staff applicants • Runs National Night Out program (Police runs this to bring residents out into their communities). • Coordinates Monster Bash program • Develops newsletters and flyers • Works with Not-for-Profits in City to determine which programs to offer
Cemeteries	Cemetery Manager	1	• Coordinates the activities of Laborers loaned from DPW Streets Division in preparing for funerals. • Uses backhoe to dig graves • Sets up boards for burials • Sets up propane heaters to warm grounds in preparation for digging graves • Plows snow from grave sites, parking lots

Division/Unit	Staffing by Classification		Key Elements of Staffing and Scheduling
			• Installs flat markers • Marks out foundations • Cleans trash from cemeteries • Keeps dumpster area clear • Assists visitors in finding flat markers that may have been covered • Clears branches that have fallen into cemeteries • Applies loam to needed areas

4. Financial

The following table provides the actual budget for FY10, and the approved budgets for FY11 and FY12 for the Parks, Recreation and Cemeteries Division of Public Works.

Personnel	**FY 10 Actual**	**FY11 Approved**	**FY12 Approved**
Salaries & Wages-Permanent	$ 1,177,115	$ 1,229,587	$ 1,324,999
Salaries & Wages-Temp.	$ 59,719	$ 73,500	$ 73,500
Overtime	$ 93,816	$ 75,000	$ 67,500
Dedications, Special Events	$ 2,331	$ 2,500	$ 2,500
Longevity	$ 1,020	$ 1,020	$ 1,020
Total Personnel	**$ 1,334,001**	**$ 1,381,607**	**$ 1,469,519**
Expenses	**FY 10 Actual**	**FY11 Approved**	**FY12 Approved**
Utility Electricity	$ 118,987	$ 140,000	$ 125,000
Utility Heating/Gas	$ 49,452	$ 65,000	$ 60,000
Repair & Maintenance Equip.	$ 92,881	$ 100,000	$ 90,000
Gateway Cities Program	$ -	$ 5,000	$ 5,000
Pool Maintenance	$ 3,468	$ 3,500	$ 3,500
Leasing Equipment & Svcs	$ -	$ -	$ -
Professional Services	$ 10,145	$ 27,500	$ 27,500
Training/Evaluation Program	$ 410	$ 750	$ 750
Botanical Gardens	$ 5,000	$ 5,000	$ 5,000
Advertising	$ -	$ -	$ -

Personnel	FY 10 Actual	FY11 Approved	FY12 Approved
Parks Supplies-Other	$ 38,494	$ 39,500	$ 42,500
Gas & Motor Oil-Supplies	$ 38,032	$ 65,000	$ 70,000
Office Supplies	$ 1,749	$ 1,750	$ 1,750
Misc. Supplies-Other	$ 19,604	$ 19,500	$ 19,500
Trans. Reimburs. & Seminars	$ 316	$ 1,875	$ 1,875
Licenses	$ 2,157	$ 3,500	$ 3,500
Parks Board-Misc. Expenses	$ -	$ -	$ -
Misc. Equip. Parks Dept.	$ 8,479	$ 10,000	$ 10,000
Fences	$ 12,500	$ 12,500	$ 15,000
Trimmers, Mowers, Etc.	$ 749	$ 750	$ 750
Communications Equip/Expense	$ 872	$ 1,250	$ 1,250
Field Maintenance/Other	$ 3,143	$ 5,000	$ 5,000
Pool Renovations	$ 1,012	$ 3,500	$ 3,500
Improves.-Parks & Playgrds.	$ 107,409	$ 119,350	$ 120,000
Building Supplies	$ 3,749	$ 4,000	$ 4,000
Field Maint./Other	$ -	$ 13,750	$ 13,750
Total Expenses	**$ 518,608**	**$ 647,975**	**$ 629,125**
Total Division	**$ 1,852,609**	**$ 2,029,582**	**$ 2,098,644**

5. WORKLOAD

The following table provides selected workload information for the Division of Parks, Recreation and Cemeteries.

Service	Workload
Parks, Ballfield and Court Maintenance	• 500 acres of parks and open space. The space is maintained by 14 staff members, for a ratio of 35.7 acres per maintenance employee. (Note that the Parks Division does receive assistance from groups such as Lions, Exchange Club, ROTC, Historical Board, etc. in maintaining the acreage.) • Maintain 11.8 acres of soccer fields • Maintain 36 baseball/softball fields

Service	Workload
	• Maintain 23 tennis courts (72,435 square feet) • Maintain 116,473 square feet of basketball courts (28 courts) • Maintain 7 Volleyball courts • Maintain 4 skate parks • Maintain 3 pools, one splash pad and one beach • Maintain 43 playgrounds • Maintain 138 memorial squares and 59 park island green spaces • Planted, installed and replaced 117 trees in FY11 • Maintain and install flagpoles (100 currently in inventory) • Maintain Cawley Stadium complex which includes the following: – 13.92 acre football complex, with seating capacity of 5,137 – 665 car capacity parking lot – 15 acre practice field – 2.19 acre soccer field – 1.25 acre softball field – 5.48 acre baseball field – 7 acre girls field hockey field. – The complex is opened and staffed from April 1 through November 30, seven (7) days per week. On weekdays, the complex is open from 7:00 am to 10:00 pm. On weekends, the complex is open from 8:00 am to 8:00 pm
Cemeteries Maintenance	• Maintain 6 cemeteries covering 77 acres • Performed 219 burials in FY11 and in FY10, with revenues of $180,555 for grave openings and $63,776 in lot sales (FY10)
Recreation	• Issued 9,412 permits to 200 individual permit holders in FY11

APPENDIX B

COMPARISON OF LOWELL PUBLIC WORKS OPERATIONS TO BEST MANAGEMENT PRACTICES

DIAGNOSTIC ASSESSMENT OF THE DEPARTMENT OF PUBLIC WORKS

City of Lowell, Massachusetts

While the Management Analysis for the City of Lowell's Department of Public Works is designed to provide an analysis of operations, organizational structure, and staffing, a comparison to 'best practices' represents an important step for the project team to report its preliminary findings and issues. In order to make the assessments of operational strengths and improvement opportunities, the project team developed a set of performance measures which we call "best management practices" against which to evaluate the Department and its component divisions. These performance measures comprise the main thrust of this diagnostic assessment.

The measures utilized have been derived from the project team's experience and represent the following ways to identify departmental strengths as well as improvement opportunities:

- Statements of "effective practices" based on the study team's experience in evaluating operations in other agencies or "industry standards" from other research organizations.

- Identification of whether and how the Department meet the performance targets.

- A brief description of potential alternatives to current practice.

1. PARKS, RECREATION AND CEMETERIES

1. A. CEMETERY

Performance Target	Strengths	Potential Improvements
Existence of regulations regarding unsightly decorations.	The Cemetery has issued comprehensive regulations regarding unsightly decorations as well as restrictions related to placement of candles, fencing, borders, monuments and other decorations.	
Existence of regulations regarding length of time live decorations may remain at gravesites.	The regulations address the length of time potted plants and decorations may remain after Memorial Day, and the length of time floral frames maybe kept from the day of interment.	
Searches for grave sites may be accomplished through the Cemetery web site.		The Division's web site is rudimentary and non-interactive. The site only provides a listing of the six cemeteries, a contact number for locating graves, directions to Edson Cemetery, and directions to Jack Kerouac's grave site. There are no descriptions or histories of the cemeteries themselves, rules and regulations for the cemeteries, fee schedules and services, nor any sketches of the cemeteries.
The Cemetery utilizes GIS to enter land information and spatial data for all grave sites.		The Division does not utilize GIS at the Cemetery. Although the staff at Edson Cemetery inputs burial and ownership records into an electronic database as time allows, the vast majority of burial records exist in card form only. Staff will assist individuals wishing to locate graves as they come into the office at Edson Cemetery, or over the phone.

Performance Target	Strengths	Potential Improvements
Staffing at the level of one FTE per 8 – 10 acres of developed turf at a B level of maintenance.	The Cemetery has outsourced the maintenance of grounds at the six cemeteries.	
Formal maintenance management system in place for cemetery.	The Cemetery has outsourced the maintenance of grounds at the six cemeteries.	
Privatization potential evaluated for: - Mowing - Tree Trimming - Spraying - Pest Control	The Cemetery has outsourced the maintenance of grounds at the six cemeteries.	
Maintenance activities are documented in sufficient detail to allow managers the ability to analyze workloads and productivity of crew members.	The Cemetery has outsourced the maintenance of grounds at the six cemeteries.	
Web site provides residents with helpful information in user-friendly format	The website does provide directions to the offices at Edson Cemetery, as well as directions to Jack Kerouac's grave site, which is an attraction for many.	The web site would benefit from the posting of Cemetery Rules and Regulations, an aerial map (or sketch) of the Cemeteries, and a list of fees for services. Although the Cemetery is limited in the amount of electronic data available for each grave, it should be a longer-term objective to provide an interactive site at which users may input the name of the deceased, and determine the exact location of the grave site.

1. B. PARKS

Performance Target	Strengths	Potential Improvements
Staffing at the level of one FTE per 8 – 10 acres of developed acreage.	The Division has been successful in recruiting groups such as the Lions, Exchange Club, ROTC and the Historical Board to assist in maintaining parks, green spaces, etc.	With over 500 maintainable acres being maintained by 14 full time maintenance staff members, plus 12 temporary workers from April through September, this equates to a ratio of 19.2 acres per worker in the summer, and an annualized ratio of 25 acres to one FTE, which is well above the standards required to achieve a "B" level of maintenance. However, as is noted at left, the Division has recruited citizen groups to assist in the maintenance of the parks, thereby effectively lowering this very high ratio to some unquantifiable degree.
Parks are being maintained in good condition.	The study is being conducted in the winter months, so there is little opportunity to observe the typical parks conditions during the prime growing season.	

Performance Target	Strengths	Potential Improvements
Formal maintenance management system in place for parks.		There is no formal maintenance management system in place in the Parks system. Routine work such as emptying barrels from parks locations is accomplished on a planned cycle, and others, such as mowing, is predicted based on historical patterns. However, much of the maintenance activities are reactive due to minimal staffing. A proactive approach to maintenance would involve a detailed listing of all parks and infrastructure, with all maintenance activities outlined, with crew sizes, frequencies of performance, materials needed, etc. Further, although crews do report their activities on a manual "Parks Division Daily Work Location Record" this is not summarized in any meaningful way in order to assist managers and supervisors in determining what has been accomplished, how much time was spent (workers typically simply record 8 hours of work on the sheets that apply to multiple tasks), time spent in transit, etc.

Performance Target	Strengths	Potential Improvements
A formal infrastructure preservation plan has been developed for parks.		There is no infrastructure maintenance plan in place that outlines frequencies for such major activities such as for Trees and Shrubs (with seasonal frequencies related to planting, fertilization, mulching, pest control, etc.); Ground covers (with planting, weed control, pest control, trimming frequencies identified); Ornamental Grasses; Lawn Care (with mowing, aeration frequencies, de-thatching frequencies, etc., identified). The Parks Division has limited staff resources to accomplish most of these tasks. However, the Division has also not developed a formalized plan to identify the tasks and frequencies of sub-tasks that need to be accomplished. This would assist in determining not only the longer-term activities required, but would also assist in quantifying the levels of service that are achievable with varying levels of staff members.
Privatization potential evaluated for the delivery of parks and facilities maintenance.		

Web site provides residents with helpful information in user-friendly format		There is little information provided on the web site about the City's parks and swimming pools. The site does note that there are 75+ parks in the system, however the website should be significantly enhanced to provide a link to forms that provide locations, sizes, facilities and amenities available at each, facilities that may be rented (as well as fees), hours of operation, etc. One of the centerpieces of the City's recreational provisions is Cawley Stadium, about which there is no information on the site.

1. C. RECREATION

Performance Target	Strengths	Potential Improvements
Registration is made as easy as possible so as to encourage participation	Registration is relatively simple for programs, with interested participants instructed to call or come in to the Recreation office.	Participants cannot register for programs and classes on line, nor download registration forms to manually fill out. Further, there is no electronic record of participants in the system. This not only has the disadvantage of failing to capture previous participants in the system, along with their programmatic preferences, but it also forces the Recreation Division to re-capture information such as parent/guardian, age, phone number, address, etc., each time a participant registers for the program.
Planning, coordination and feedback on services provided by the Department.		There are no formal mechanisms to relate satisfaction levels of participants, nor to accumulate and analyze them to refine programmatic offerings.
The City provides parks and open space in the range of 6.25 to 10.5 acres per 1,000 population?		The 2010 census indicates that the population of Lowell is 106,519. With approximately 500 acres of park space in the City, this equates to about 4.7 acres per 1,000.
Cost recovery objectives have been set on a programmatic basis		The project team is unaware of any cost recovery objectives for any of its programs, with most being provided free of charge.
Effective promotional techniques for programs and services.		

Targeted specific populations (e.g., senior citizens, disadvantaged youth, handicapped).	The primary targeted population served by the City's Recreation Division is at-risk youth, which is the primary reason for the provision of many of its offerings free of charge.	The City's Recreation Division does not target seniors or handicapped populations, however it is true that the Schools provide certain recreational services, as do several non-profits, and these may, in fact, provide these services.
Joint use agreements with the City's schools for use of fields and gym space are currently in effect	There is a joint use program for school facilities.	The joint use program for school facilities provides only for the City's use of these after school, and requires that the City pay for the Custodian if programs are provided on weekends.

2. STREETS

2.A VEHICLE MAINTENANCE

Performance Target	Strengths	Potential Improvements
Existence of centralized fleet management program for the City.		There is no centralized vehicle maintenance or management of the City's fleet. Additionally, the maintenance of the fleet is not centralized even within the Department of Public Works, as the Divisions of Streets, Water and Wastewater each maintain their own assigned vehicles with their own mechanic staffs.
Existence of funded vehicle replacement program?		The City does allocate funding for vehicle replacements, however this is done on an annual as-needed basis, and is not the product of a planned model that assures the availability of funding at predicted replacement cycles for each unit in the City.
Centralized and standardized system of identifying vehicles and equipment for replacement.		Although the City has funded vehicle and equipment replacements on an as needed basis, the Public Works Department has not developed a multi-year replacement plan that identifies specific units that will reach their useful economic lives over a period of time, along with probable salvage values and replacement expenditures.

Performance Target	Strengths	Potential Improvements
Existence of fleet management information system to monitor vehicle repair history, mechanic utilization, etc.?		None of the DPW Divisions utilizes an automated information system that captures labor, materials, fuel, tire costs and outside repair costs per vehicle.
Existence of automated fuel dispensing system?	The City has two automated fueling stations. One is at the Water Utility, and one at the JFK Civic Center. The system is key-activated and identifies the piece of equipment. Users must input their City ID to receive fuel.	There is currently no requirement to input the unit's odometer reading prior to receiving fuel. This limits the usefulness of the system, as it will not allow the analysis of fuel efficiency of specific vehicles or drivers, and also does not allow an analysis of specific vehicle utilization levels.
Fleet Maintenance is organized and established as in Internal Service Fund, charging user departments for parts and services.		The maintenance and repair of the DPW fleet is decentralized, as is that of the City generally. The DPW does not account for labor, parts, and outside service costs by unit.
An effective preventive maintenance program is in place.		There is no preventive maintenance plan for the DPW fleet, other than routine oil changes for most vehicles.
An effective facility is available for Fleet Services that enhances their productivity.		

Performance Target	Strengths	Potential Improvements
The size of the fleet and the vehicle equivalency units are balanced with the number of authorized staff.	There are 130 vehicles and piece of equipment maintained by the mechanic staff at the Streets Division. A listing was provided, and based on this detail, the project team assigned a total of 388.1 "vehicle equivalent units" (VEU) to this fleet. Based on an average of 15 hours of maintenance required per VEU, the project team estimates that the maintenance and repair of this fleet requires a total of 4.2 (or 5 FTE) mechanics. The Streets Division is staffed currently with a Working Foreman, an MEO3 Welder/Repairman, and 3 MEO3 Repairmen, for a total of 5. One of these positions is vacant, however, with the result that the garage is somewhat understaffed.	
Fleet maintenance staff are ASE certified.		Mechanics were reportedly ASE certified in prior years, however these certifications have lapsed, as it is reported that the City no longer requires the certification.

2.B STREETS AND HIGHWAY MAINTENANCE

Performance Target	Strengths	Potential Improvements
Existence of formal work planning and scheduling system.		There is no work planning and scheduling system in the Streets Division. An effective work planning system would identify all structures for which the Division is responsible by major category (e.g., drainage systems, sidewalks, alley ways, paved streets, pavement markings, etc.), with the planned renewal or replacement cycles identified for each. Ideally, this would be posted on the Department's web site, and would allow residents to determine when and how infrastructure in which they have an interest will be maintained or replaced.
An automated maintenance management system is utilized to track and report work output, service levels and productivity.		No automated, computerized maintenance management system exists in the Streets Division that captures labor and materials usage by crew member and by category of activity.

Performance Target	Strengths	Potential Improvements
Staffing in the Division's street maintenance function approximates 10 to 12 center line miles of asphalt surfaces per Street maintenance worker.		The calculation of the Division's performance against this metric is complicated by a number of factors. There are 253 center line miles for which the Division has responsibility, and it has three (3) Working Foremen and nine (9) MEOs in the street maintenance unit. However, two of these MEOs are routinely loaned out to the Cemetery for burials, and two are routinely loaned to the Tree Unit within the Streets Division. In analyzing the actual days on which street maintenance employees were loaned to the Tree crew, this appears to average about 1.7 to 1.8 per day since September, 2011. In the Cemetery, this is closer to about 1.5 per day. Therefore, the total of 12 street maintenance employees actually performing street maintenance functions is routinely closer to nine (9), which equates to about 28 center line miles per street maintenance employee, which is well above the benchmark norm. Another complicating factor is that the Water Utility dedicates some of its resources to the patching of utility cuts during both construction and repair of breaks. This would tend to lower the calculated figure of 28 center line miles per employee somewhat, however, as no records exist to determine the number of hours expended in this function by Water Utility crews, the project team can only make subjective qualifications as to the degree to which this figure is reduced.

Performance Target	Strengths	Potential Improvements
Potholes are patched promptly.	Although no data exist to document the mean time between receipt of any pothole complaints and their repair, anecdotally, the Streets Division is responding relatively quickly. There is one Maintenance Man who reportedly exclusively fills potholes each day, and places 3 tons per day in their repair.	The project team did not observe the patching process to ensure that potholes are square cut, blown, and tamped properly to ensure a durable patch.
Formal pavement management system in place.	This is conducted by an outside firm, under the oversight of the Engineering Division. The firm (VHM) reportedly conducts a formal assessment of 25% of the City's paved surfaces annually.	
The Department resurfaces 5% to 8% of paved surfaces annually.		There are 253 center line miles in the City. The Engineering Division reports that in 2011, 2.6 center line miles were resurfaced; in 2010, there were 1.62 miles; and in 2009, there were 1.33. In total, this is 5.55 center line miles for the three years, or 1.85 annually. This equates to an average of less than 1% annually. (It must be noted that 46% of road segments in the City are non-accepted, and thus are ineligible for resurfacing using Chapter 90 funds.)
Sidewalks are checked regularly for tripping hazards and the hazards eliminated.	Street and Tree crews visually inspect and report any tripping hazards in asphalt and concrete sidewalks. Many of the sidewalk tripping hazards are reported through E-Gov.	There is no planned cycle for inspecting sidewalks to ensure that all are visually observed and rated. A visual scan by the project team noted many sidewalks throughout the City that have been damaged and displaced by tree root penetration.

Performance Target	Strengths	Potential Improvements
Major road repairs and reconstruction contracted out.	All major road repairs are contracted out.	The Division now has a road resurfacing machine and performs some of this work in house, however the machine is new and as the crews are in learning mode currently, the higher profile roads are all resurfaced by contractors.
Evaluation of contracting conducted in street maintenance.	As noted above, all major road resurfacing work is conducted on contract.	
Periodic inspection of sign reflectivity.	This is accomplished within the Planning and Development Department in the City of Lowell	
Annual painting of school cross walks, bi-annual painting of other cross walks. Legends painted on arterials every year, collectors at 18 mos., and residential at 2 years.	This is accomplished within the Police Department in the City of Lowell	
Tree trimming schedule exists for trees- 3 to 5 year cycle.		Tree trimming is reportedly done on a "triage" basis, with no routine trimming cycle.
Existence of an inventory of all trees for which the City is responsible, which includes location, age, type of tree and the maintenance cycle for each.		There is no tree inventory maintained by the Tree Section of the Streets Division

Performance Target	Strengths	Potential Improvements
Web site provides residents with helpful information in user-friendly format	The DPW website does provide relatively comprehensive information to residents about the City's winter operations program, including how conditions are monitored, what happens once a storm begins, parking bans, resident responsibilities and how to make a complaint.	There is no information on the website relating to the primary activities of the Streets Division. Many residents may not know all the services that may be available, or to whom they should be reported. These may include relatively simple services such as pothole reporting and repair (as well as the time the citizen can expect to receive a response), dead animal pickup, paving and resurfacing plans and schedules, leaf disposal, tree planting, pruning and removal, graffiti removal, and other services. Further, even though the website does provide relatively good winter operations information, best practices of well-managed Public Works operations are to provide snow removal routes, and explanations of when the City plows snow, and when it may only apply sand.

2.C RECYCLING

Performance Target	Strengths	Potential Improvements
An aggressive recycling rate goal has been set, with specific time frames for accomplishment of the goal.	As noted at right, the recycling rate is 14.5%, however this is likely to improve significantly in the near future, as the Unit has a Mass DEP two-year grant that is funding a position of "Mandatory Recycling Enforcement Coordinator", who is responsible for monitoring the conformance of residences with recycling mandates.	The total recycling rate is only 14.5% as measured by total tonnage. The project team is unaware of any specific goals set by the Unit, however it is suggested that 30% be set as an objective within 3 to 5 years.
Waste reduction efforts have been focused on programs that educate businesses and residents.	The Solid Waste Manager/Recycling Coordinator has initiated many educational offerings including a quarterly newsletter, writing of a newspaper column twice monthly ("Waste Lines"), as well as the educational materials available on the website.	
On-site waste assessments and technical assistance are offered to businesses to provide a service-oriented approach to waste reduction.		The project team is unaware of any initiatives to involve the Lowell business community in increasing its recycling objectives.
The Division has instituted a program to manage certain household hazardous wastes (HHW) and problem materials through recycling, diversion, reusing, reduction or proper disposal methods.	Yes. This is well explained in the Unit's website.	

Performance Target	Strengths	Potential Improvements
Web site provides residents with helpful information in user-friendly format	This is a strength of the unit, as all of the pertinent information for the curbside recycling program is included in the web site. This includes FAQs, schedules, guidelines for materials that can and cannot be placed at the curb, hazardous waste and electronics recycling, composting, as well as ways to report illegal dumping.	Some of the most helpful information on the site is not prominently displayed, but rather is simply referred to under "Quick Links" in a side bar panel.

3. FACILITIES MANAGEMENT AND CUSTODIAL SERVICES

Performance Target	Strengths	Potential Improvements
One trades staff position per 50,000 sq. ft. of building space (for "B" level of service.)		Although there are 24 positions allocated to the Lands and Buildings Division, 2 of these are on long term leaves and are therefore unavailable to the Division. The Lands and Buildings Division provided a listing of facilities, with areas expressed in square feet for each. This totals 2,715,270 square feet. Therefore, the average area maintained by the 22 Lands and Buildings trades mechanics (excluding painters and chemical applications personnel) is 123,421 square feet per maintenance mechanic/trades helper, which is well over twice the benchmark level of responsibility.
Custodial services in range of $1.50 - $1.75 per square foot, per 2008 IFMA survey.	The four Lands and Buildings custodians are responsible for the maintenance of four floors of City Hall, and the second floor of the JFK Civic Center. One Custodian also maintains the DPW and Health buildings. The total areas maintained in these locations is approximately 127,381 square feet. The four Custodians' total salaries are $140,466. With fringe benefits calculated at 40% of salaries, the total compensation is about $196,652, equating to a cost of $1.54 per square foot.	

Performance Target	Strengths	Potential Improvements
Custodians clean 27,000 square feet per custodial employee, per 2008 IFMA survey.	The four Lands and Buildings custodians are responsible for the maintenance of four floors of City Hall, the second floor of the JFK Civic Center, the DPW building and the Health building. The total areas maintained in these locations is 127,381 square feet, which equates to 31,845 square feet per Custodian, which is somewhat above the survey benchmark, however the addition of a Custodian would place the figure at 25,476 square feet per Custodian, which is somewhat below the benchmark.	

Performance Target	Strengths	Potential Improvements
Existence of a preventive maintenance program.		No preventive maintenance program exists for the schools or City buildings. An effective PM program would identify and document all systems and components (Foundational, Substructural, exterior wall systems, roof systems, interior construction, specialty fixtures, such as toilet partitions, lockers, flagpoles, etc., conveying systems, heating systems, etc.), establish the levels and frequencies of maintenance, and prepare the work items in the plan. The Division's staffing levels are likely one factor that inhibits the implementation of an effective PM plan, however it is also true that it has not taken the steps to inventory all of the systems for which it is responsible, and record and summarize all labor and other expenditures on the infrastructure for which it is responsible. The lack of a computerized maintenance management system (CMMS) is undoubtedly also a factor in the absence of the development and reporting on preventive maintenance activities. Once implemented, the Division should strive for a 1:1 ratio of preventive and reactive work activity.

Performance Target	Strengths	Potential Improvements
Existence of an energy management plan.	The City has initiated many energy saving measures in its schools. These include lighting system improvements, lighting controls, pipe insulation, demand control ventilation, variable frequency drives on pumps and fans, replacement of air handling units, window replacements, and many others.	
Periodic evaluation of feasibility of contracting and/or "in sourcing".	This is done on a case-by-case basis. Recently, major roof repairs were performed on contract at the Civic Center, and similar repairs will be made on contract at the Moody School and Washington School in the coming months.	

4. WATER UTILITY

Performance Target	Strengths	Potential Improvements
Goals, objectives, and performance measures have been developed to provide a guide for decision-making, link actions to the broad goals of the Department Director, City Manager and Council, and define what resources ought to be allocated to what utility services.	The Water Utility reports various performance measures for the LowellStat program. Some of these include water main breaks repaired, water services repaired, number of hydrants replaced and repaired, water meters installed, and others. Others not reported include the number of State Revolving Fund (SRF) projects (i.e., capital projects) that are on time and under budget, change orders as percent of capital project budgets (reportedly less than 1%), and optimizing the utility operations in terms of chemical and electrical usage.	Although there are some exceptions, most of the measures reported in LowellStat are reflections of workloads, and do not necessarily provide an indication of the efficiency with which work was accomplished. For example, in CY09 there were 72 main breaks repaired, and in CY10 there were 57. If the decrease of 15 main breaks represents an overall downward trend, this might be an indication of the effectiveness of a capital replacement program, or even the effectiveness of a preventive maintenance program. However, there are no other performance measures reported that would indicate that either of these programs had occurred. Further, there is no indication of the efficiency with which the breaks were repaired, which might include the number of hours and material cost per break, with the breaks segmented according to the size of main lines.
Managers provide regular progress reports (e.g. monthly or quarterly) relative to individualized performance objectives.	The Utility provides its performance measures for the purposes of LowellStat. The Utility also provides copies of its internal weekly staff meetings to the City Manager and DPW Director.	

Performance Target	Strengths	Potential Improvements
The department maintains and publishes a clearly written, multi-year (five years at a minimum) strategic plan to provide vision and direction for the department's effort. The plan clearly delineates the department's goals, and objectives and strategies for achieving them.		The Water Utility has no formal strategic plan. Although capital projects and other longer-range objectives, such as energy and chemical consumption, are identified by the Utility, it has not engaged in a SWOT analysis that may identify and address key issues (future water capacity needed, staffing levels to meet these requirements, regulatory compliance, etc.), develop a mission and long-term vision, develop strategies to address the vision, develop action plans for implementation, etc.
A formal safety program is in place that includes training, guidance documents and operational procedures, all of which are prominently posted.		The Utility has appointed a Safety Coordinator, however there is no formal safety training or regular safety meetings.
An effective asset management system has been installed that includes an inventory of the plant to be maintained with details (e.g., size) about components to be maintained and where the components are located, a computerized maintenance management system, condition assessments, maintenance and rehabilitation strategies, and sustainable funding levels for maintenance and rehabilitation for the plant.	The Water Utility has mapped all hydrant locations as well as all underground infrastructure in GIS (although it is unclear as to whether gate valves have been identified in the system). Further, it has a hydraulic modeling program that allows for the determination of impacts of line closures on fire flows and specific homes/businesses.	Although the mapping of locations of all inventory for which the Utility has responsibility is a large, and fundamental, element of an asset management system, it is only a part of the total. The Utility has not, for instance, defined the schedules and procedures for maintaining each asset, captured historic workloads for their maintenance, and defined the impacts on the Utility's infrastructure at various levels of staffing or capital dollar infusions.

Performance Target	Strengths	Potential Improvements
An effective cross connection inspection program is in place.	The Utility dedicates two staff members to the inspection of 1,146 commercial and industrial cross connections, approximately 850 of which are inspected twice annually.	Businesses are to be billed for these cross connection inspections, however observations of the administrative processes indicate that there may be a significant backlog of inspections that have occurred but have not yet been billed.
Quality assurance and validation procedures for water sampling and testing have been installed and are utilized.	The lab follows strict protocols for water sampling QA/QC. In 2009, the lab documented chain of custody procedures, and sample collection procedures.	
1% to 2% of water mains are replaced annually. This formal program is linked directly to a long-term capital and financial planning program to assure adequate funding.		The City has replaced about 8.5 miles of distribution mains in the past 10 years. Given that there are 213 miles of distribution lines in the City, this equates to less than one half of 1% per year. Further, the Utility reports that in the 10 years preceding the most recent 10-year period, there was little, if any, replacement of the infrastructure.
The extent of unaccounted for water falls within AWWA guidelines	AWWA guidelines establish a maximum tolerance of about 15% for unaccounted for water. The Water Utility in Lowell reports an approximate 10% annual figure, which is under the tolerance range. The Utility recently completed a correlation leak detection survey of all 213 miles of the distribution system.	

Performance Target	Strengths	Potential Improvements
Distribution valves are exercised routinely.		The Utility does not have a gate valve exercising program. There are an unknown number of gate valves in the system. Being able to locate and turn valves is critical, especially during instances of main breaks, of which there have historically been between 60 and 70 in the system annually. Quick location and ease of closure will result in minimizing water loss, easier repairs and less property damage.
Water meter replacement is within 15 to 20 years and larger commercial meters are tested for registration accuracy in accordance with AWWA recommendations.	The Utility recently completed an Industrial and Commercial water meter replacement project in which approximately 900 meters were replaced through State Revolving Fund (SRF) funding. A new residential program for the replacement of about 1,000 water meters has been approved through the use of SRF funding as well.	On an annual basis, the General Fund replaces about 300 meters. Were this the only funding source for meter replacement, this would equate to a cycle of replacement of once per 86 years.
Water pump stations are checked weekly. Detailed PM of the pump stations is conducted in accordance with mfg. recommendations.	Pump stations are monitored via SCADA, but are routinely physically checked.	
Water storage tanks are inspected and cleaned no less than once every five years.	The Utility has installed two new tanks recently and they have not yet reached the cycle for cleaning.	

Performance Target	Strengths	Potential Improvements
Fire hydrants are flushed annually.	. Hydrants are flushed as needed, as main breaks rusty water issues, etc., dictate. The Utility implemented a corrosion control program in 1998 by adding Zinc Orthophosphate and Sodium Bicarbonate to the finish water supply to form a protective barrier lining of the water mains to prevent corrosion, resulting in a very low content of THMs	
Water treatment staff hold appropriate certification.	All Water Treatment staff hold appropriate certifications. There is a Head Operator on each shift, each of which holds a minimum of a Grade 3.	
The water treatment plant meets state water quality standards.	The Utility meets all state and federal water quality standards. There were no violations related to regulated or unregulated contaminants, volatile organic contaminants, disinfection by-product contaminants in the latest calendar year for which data were reported.	
The water treatment plant is preventively maintained in accordance with mfg. recommendations.	The Maintenance Unit reports that all of the plant inventory is bar coded and entered and tracked through the MP2 CMMS.	The Unit does not enter the number of hours expended in maintaining the equipment, nor the nature of the maintenance (i.e., scheduled, unscheduled, emergency, etc.)

Performance Target	Strengths	Potential Improvements
Existence of a formal maintenance management work planning and scheduling system.	As noted above, the Utility's Maintenance Division utilizes the MP2 CMMS to program and track maintenance on plant equipment. The Meter Reading Unit also has a programmed schedule it uses to ensure that all meters are read once per quarter that segments the City into three sections, with four sub-sections in each.	There is little documentation to enable an analysis of the time expended in the Distribution Unit regarding its workloads, crew sizes, etc., however much of the work appears to be reactive, and therefore unplanned. For example, there were 1,278 calls for service through E-Gov in 2011, equating to about 3.5 per day. Some of these likely involved the reporting of the 60 main breaks and the 144 service leaks that were repaired. In the experience of the project team, these types of repairs require between 4 and 5 crew members, and will require 4 to 5 hours each to repair. This equates to over 4,100 hours of labor annually, which is the equivalent of about 2.5 FTEs, which is about 30% of all available hours in the Unit. This is in addition to the other reactive work generated by E-Gov requests, mark outs and other services. Relatively few of the workload measures reported by this Unit relate to planned and scheduled work.
An automated maintenance management system is utilized to track and report work output, service levels and productivity.	MP2 is used in the Maintenance Division, although it is not being used to report hours expended on repair and maintenance, crew sizes, nature of repair, etc.	Most maintenance reporting is manual in the Utility and is not summarized for analysis.
The Utility has automated meter reading (AMR) technology	Large accounts (approximately 500) are on radio read.	The large majority of the City's 26,000 accounts are read manually by ARB unit or touch pad.

Performance Target	Strengths	Potential Improvements
For manual read systems, meter reading staff read between 4,500 and 5,000 meters per month.		Of the approximately 26,000 accounts in the system, about 25,500 are read manually once per quarter. With four Meter Readers, this equates to about 2,125 meters read monthly by each Meter Reader.
Periodically evaluates the feasibility of outsourcing certain functions.	The Utility investigated the feasibility of outsourcing at least some of the cross connection inspections workload, however it reportedly was not deemed financially beneficial.	The Water Utility outsources its engineering function to a private firm, and has done so for many years. The contract has been awarded to the same engineering firm for many years.

Performance Target	Strengths	Potential Improvements
Web site provides residents with helpful information in user-friendly format	The web site does provide information related to the water quality report, which is a very important element for inclusion in any well-designed site.	The web site could be significantly enhanced through the provision of a simplified description of the water treatment process, perhaps even including a schematic that describes, at a very high level, the raw water intake (and a description of the source), addition of coagulants (and their utility), transmission to the coagulation/flocculation process, movement to sedimentation (and what happens in this process), polymerization (and what is used), filtration, disinfection, corrosion control, storage, and finally, consumption. The site could also benefit from the inclusion of information on capital improvements (both recently completed, as well as planned, and the costs of each), backflow prevention program description (as well as types of devices and how installed, and what to expect in an inspection), water rates, conservation measures, typical consumption rates for various family sizes, information on treatment plant tours, as well as others.

5. WASTEWATER UTILITY

Performance Target	Strengths	Potential Improvements
Goals, objectives, and performance measures have been developed to provide a guide for decision-making, link actions to the broad goals of the Department Director, City Manager and Council, and define what resources ought to be allocated to what utility services.	Like all divisions in the Department, the Utility reports certain performance measures for LowellStat. These include the numbers of catch basin, sewer backup and street flooding requests resolved, numbers of catch basins cleaned, tons of biosolids processed, numbers of collection system calls responded to, numbers of industrial permits issued, and others. One element of the Wastewater utility's performance management program that bears note is its use of three primary measures that have been determined to reflect the most important dimensions of its operations. These are (1) the number of accident days and time off work, (2) the numbers of permit violations, and (3) the numbers of odor complaints. Although the project team recommends that the Utility focus to a greater degree on efficiency measures (as opposed to simple workload volume measures) it is commendable that the utility has actively attempted to distill its primary measures down to a manageable number that are communicated to all staff and are understandable to both the staff and outside observers.	Like other divisions, the Wastewater Utility reports a variety of measures for LowellStat, and like other divisions, the workload measures are mainly a reflection of the amount of workload accomplished, as opposed to the efficiency with which it utilized the resources required for their accomplishment.

Performance Target	Strengths	Potential Improvements
Managers provide regular progress reports (e.g. monthly or quarterly) relative to individualized performance objectives.	The Utility holds weekly staff meetings in which each unit manager reports on workload accomplishments such as numbers of work orders completed, miles of sewer line televised, industrial violations of pretreatment processes, amount of sludge processed, etc. These are also reported by the Executive Director at Departmental staff meetings.	
The department maintains and publishes a clearly written, multi-year (five years at a minimum) strategic plan to provide vision and direction for the department's effort. The plan clearly delineates the department's goals, and objectives and strategies for achieving them.		
A formal safety program is in place that includes training, guidance documents and operational procedures, all of which are prominently posted.	The active safety program is a relative strength of the Wastewater Utility, with eight formal training sessions held annually, including such topics as lock-out/tag-out; lifts, slips, falls; PPE, etc. The Utility publishes the numbers of lost time accidents and days lost due to accidents within the plant.	
An effective asset management system has been installed that includes an inventory of the plant to be maintained with details (e.g., size) about components to be maintained and where the components are located, a computerized maintenance management system, condition assessments, maintenance and rehabilitation strategies, and sustainable funding levels for maintenance and rehabilitation for the plant.	The Utility has mapped in GIS the catch basins (approximately 5,000), manholes (approximately 4,500), and sewer lines. The Utility is also in the process of running video of all of its collection system, and assigning grades to each segment relating to the severity of problems founds.	Although the mapping of locations of all inventory for which the Utility has responsibility is a large, and fundamental, element of an asset management system, it is only a part of the total. The Utility has not, for instance, captured historic workloads for the maintenance of each piece of underground infrastructure, and defined the impacts on the Utility's infrastructure at various levels of staffing or capital dollar infusions.

Performance Target	Strengths	Potential Improvements
An effective industrial pretreatment program is in place.	The Engineering section of the Utility is responsible for this program that regulates significant discharge industries by sampling, inspecting, permitting and billing of the approximately 45 industries in the region. The program is administered by the Pretreatment Coordinator, who is assisted in the sampling function by a Staff Engineer. The Engineering section also administers an Intermunicipal sampling program in which it samples 8 to 10 intake stations that feed the regional utility.	
1% to 2% of sewer mains are replaced annually. This formal program is linked directly to a long-term capital and financial planning program to assure adequate funding	The Utility provided data that indicated that 22,080 feet (4.18 miles) of sewer rehabilitation occurred in 2011. This equates to 1.8% of the 230 miles of sewer line in the system.	
Wastewater pump stations are checked weekly. Detailed PM of the stations is conducted in accordance with mfg. recommendations.	Pump, siphon, metering and diversion stations are monitored via SCADA, but are routinely physically checked.	
Wastewater mains are cleaned on a three-year cycle.	The Utility has embarked on a significant main televising program to identify the primary problem segments in order to focus attention on the areas of most concern.	In the latest fiscal year, the Utility reports cleaning and rodding about 3.6 of the approximately 230 miles of the sewer system. If this were considered a typical year, it equates to cleaning the system on a 64 year cycle, which is far longer than the 3 year cycle benchmark.

Performance Target	Strengths	Potential Improvements
There is a wastewater main televising program (CCTV) based upon condition assessment information (preferred).	This is another relative strength of the Utility, as it has purchased a camera and dedicates a truck and a 2-person crew each day to the televising of the system to identify structural defects and blockages. Further, grades are assigned by the crew which correspond to the severity of problems discovered, and videos are archived to establish baseline characteristics of each sewer segment.	
An automated maintenance management system is utilized to track and report work output, service levels and productivity.	The Wastewater Utility recently lost the position of CMMS Administrator, however the position is open currently. This position is responsible for the input of all plant and non-plant infrastructure for which the Utility has responsibility, and schedules preventive maintenance for each piece. Further, the position inputs all work accomplished on repairs and preventive maintenance, and works with the Maintenance Supervisor to discuss upcoming PM and the staff required to perform the PM, ensuring all parts are available and charged to the work orders. The Utility is in the process of evaluating a replacement for the current MP2 CMMS.	
15% to 20% of the manholes are inspected annually	The Utility conducts an active sewer line televising program. Video crews note the specific manholes that require work.	
Sweepers accomplish 28-32 curb miles swept per day on average.	This is performed by a contractor. The number of curb miles swept on a daily basis by each sweeper is unknown.	

Performance Target	Strengths	Potential Improvements
Catch basins are cleaned on a 2-year cycle.	The Utility discovered that a private contractor could accomplish the cleaning of many more catch basins per day than the internal crews were accomplishing, and thus this function was outsourced.	
Periodically evaluates the feasibility of outsourcing certain functions.	A particular strength of the Wastewater Utility is its ongoing evaluation of the feasibility of outsourcing. Most emergency repairs are performed by contractors, as the Utility has determined that its most efficient use of internal staff is in the recurring preventive maintenance work. However, even some of the preventive maintenance work, such as street sweeping and catch basin cleaning, have been outsourced after making time and cost comparisons to private contractors. The Utility has also outsourced much of its industrial testing.	

Performance Target	Strengths	Potential Improvements
Web site provides residents with helpful information in user-friendly format		The web site could be significantly enhanced through the provision of a simplified description of the wastewater treatment process, perhaps even including a schematic that describes, at a very high level, the intake, screening and grit removal, aeration, sludge removal and processing, clarification, disinfection and return to the waterway. The site could also benefit from the inclusion of information on capital improvements (both recently completed, as well as planned, and the costs of each), the sewer televising program and its benefits, street sweeping schedules (as well as the associated benefits to the treatment process), the industrial pretreatment program (and its benefits), as well as other descriptive information.

6. ENGINEERING

Performance Target	Strengths	Potential Improvements
A five-year capital improvement program has been developed and adopted by the City Council.		The project team does not possess a five year capital plan. A request for the Plan indicate that the Engineering Division also does not possess the Plan.
Responsibility for project management of capital improvement projects has been centralized within the Engineering Division.		This is not the case. The Engineering Division of DPW manages paving projects, as well as special projects such as the Hamilton Canal project that is ongoing. However, both the Water and Wastewater Utilities manage capital improvements as well. The Water Utility typically outsources design, construction and project management to a contract engineering firm. The Wastewater Utility outsources design and construction, but performs design review and project management during construction.
Full-time staff are dedicated to the issuance and inspection of street closure, excavation, and encroachment permits.		This is not the case, as the Division does not typically inspect the 700+ such permits it issues each year.
Contractors are required to submit proof that their first level supervisors have been trained in work zone safety.		The Division does not require this safety measure.
A traffic control plan must be submitted for the issuance of street closure permits.	For projects requiring the shutting off of traffic, the Division requires a traffic control plan. No such plan is required if no lane closure is involved.	
Fees are charged for the issuance and inspection of street closure, excavation, and	The Engineering Division charges $75 for a street opening permit.	These fees have not been re-visited in at least 5-6 years.

Performance Target	Strengths	Potential Improvements
encroachment permits to fully recover the cost of administration		The comparative survey conducted by the project team indicate that, although not all cities charge such a fee, those that do tend to charge somewhat more than the City of Lowell. For example, Chelsea, Revere and Lynn charge $200, Fitchburg charges $250 plus $100 for all inspections.
Requests for street closure, excavation, or encroachment permits may be submitted by customers on-line or by fax.	Customers may download the form and bring it with them to the Engineering Office, along with plans.	
Requirements for issuance of street closure, excavation, or encroachment permits are available at the Engineering Division's web site.	These are available on the web site.	
Design and inspection staffing requirements have been identified for the all of the capital projects in the first year of the five-year capital improvement program.		The Engineering Division does not have a five year capital plan, and staffing requirements for project management staffing, inspections, etc., have not been projected for individual project or for the aggregate staffing requirements of the capital plan.
Staffing for design and inspection of capital projects is based upon cost of construction guidelines.		The Engineering Division is not projecting capital project staffing requirements. The ASCE has developed staffing requirements for survey, inspection and project management and administration based on the projected cost of construction and complexities of these projects. These can serve as valuable planning tools in the estimation of costs for individual projects.
A Gantt chart schedule been developed for capital improvement projects for the next two		These have not been developed for each project.

Performance Target	Strengths	Potential Improvements
to three year period.		
A project cost accounting system is utilized to enable comparisons of planned versus actual staff hours for the design and inspection of capital projects.		The project team is unaware of any such comparisons of planned versus actual expenses on an individual project basis.

7. FINANCE AND ADMINISTRATION

Performance Target	Strengths	Potential Improvements
Clerical and administrative functions are centralized in the Department, and workloads are balanced by a central authority		Administration is distributed throughout four divisions, with the Streets, Lands and Buildings, Electrical and Solid Waste Recycling functions served at the primary DPW location on Middlesex St. The Parks Division on Stedman St. has an administrative clerk, there are clerical personnel at the Cemetery, as well as at the Water Utility and the Wastewater Utility. There is no central coordination of workloads and schedules for these staff.
The payroll process is automated		The payroll system is not automated. The process by which payroll is completed and submitted to the Town Auditor relies almost exclusively on manual processes, involves many different clerical staff members, and is done weekly. To a large extent, the manual nature of the payroll process is dictated by the lack of a centralized and automated payroll system in the City, however it is also true that the process is fragmented internally, with many different Clerks involved.
Audits of time and attendance data indicate error rates under 1%.	The project team does not have access to information that would allow a determination of this metric.	
Personnel and payroll systems are integrated.		This is not the case, as neither system is automated.

Performance Target	Strengths	Potential Improvements
There is one accounts payable clerk for every 9,000 annual transactions.	The central DPW staff report that they process about 5,000 payables annually, however it is not known how many FTEs are utilized for this function, as all clerical staff perform multiple functions.	
Standardized forms are utilized for payroll input		This is not the case, as the Clerk receive employee time on five different payroll input forms and cards.
Support staff as a ratio to technical staff is in the range of 1:9 to 1:25, depending upon the degree of automated systems in use	There is a total of 14.7 FTE administrative and clerical staff in the DPW as a whole, who support 176 technical staff members. This equates to a ratio of 1:12, which is within the expected range, if at the low end. It must be noted, however that the Department generally utilizes manual processes in documenting services, payroll, record retention and retrieval, purchase orders, etc.	On an overall basis, the ratio of 1:12 is in the expected range, however this ratio is not uniform across divisions. In Engineering, for example, there is one Clerk supporting five technical staff. In the Wastewater Utility, there is an Office Manager and one Head Clerk, supporting 46 technical staff, for a ratio of 1:23. And in Parks, Rec. and Cemeteries, there are 3.7 clerical and administrative staff (one staff member works 2 days per week, and one works 3 days per week at 3.5 hours per day) supporting 28 technical staff, for a ratio of about 1:7.6.
The Division maintains a vendor file which reflects vendor histories,		The DPW administrative staff retains contract files, however there are no files that centrally accumulate the Department's performance histories.

Performance Target	Strengths	Potential Improvements
Regular, ongoing financial reports are provided to divisional management and supervisors.		The project team is unaware of any ongoing budget reports provided to divisional managers that show actual expenditures vs. budgets. Typically, these will highlight line items that are severely over or under-expended on a monthly basis.
Clerical and administrative staff receive ongoing training in the use of necessary tools such as word processing, financial spreadsheets, customer service, etc.		There is no ongoing training provided to clerical and administrative staff.

APPENDIX C

Summary Results of the Comparative Survey of Similar Public Works Departments in Massachusetts

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
General and Administrative			
Does your Public Works Department utilize an automated information system to create work orders?	Yes	Yes	The system has been purchased and is currently being installed
If so, what automated system do you use?	Developed in house	Developed in house	Cartegraph
When work is complete, what information do you record? (e.g., labor hours, crew members, work/labor category, etc.)	No response	Work completion date, work category, and who did the work	In the Highway Division, will start with tracking calls and creating work orders. Will expand later into costs.
What divisions comprise your Public Works Department?	Streets & Sidewalks and Buildings & Grounds	Admin, Highway/Forestry, Sanitation/Recycling, Engineering, Water, Wastewater Treatment/Industrial Pretreatment, Sewer Collection Systems, Flood Control, Park Maintenance, Vehicle Maintenance.	Administration Engineering & Planning Streets, Parks, Cemeteries Water Wastewater
How many administrative/clerical staff members are in your Public Works Department?	1	Admin—4 Parks—2 Water –5 Wastewater---3 Vehicle Maint----1	8

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
Please list these positions (non-managerial and non-supervisory), by division.	DPW Clerk	No response	Program Mgt Asst. Business Manager Clerk Office Manager (Wstwtr) Office Manager (Water) Clerk (Water) Dispatcher (Streets) Cemetery Clerk
Parks & Recreation			
How many full time staff are in your Recreational Services organization? How many seasonal and part time staff?	None	Recreational Services not part of DPW	1 Recreation Director. 35 seasonal helpers in summer and 6 in winter.
Are parks maintenance services provided within the same organization/department as recreational services?	Park maintenance is provided by Buildings & Grounds Dept. Lawn mowing & treatments are out sourced.	No, DPW only has responsibility for park maintenance work.	No. Recreation is part of DPW, but parks maintenance is located in Streets, Cemeteries, Parks Division
Does your recreational services organization have established targets for cost recovery for adult programs? Youth programs? If so, what are these targets?	No	NA	None provided in response. The City targets organizations in the community for sponsorships and donations.

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
When providing programmatic services through contract instructors, what are the percentages of class/program revenues for the instructor and your municipality?	NA	NA	Varies- municipality gets 5% - 10%. Outside groups provide instructors and pay them.
Does the Recreational Services Department charge organizations such as Pop Warner, Little League, etc, for field maintenance or other services?	No	NA	No, but they provide volunteer labor to maintain the fields.
Engineering			
Please provide the number of Staff (FTEs) by position title in Engineering, if applicable.	1 – Asst. Director of Public Works	City Engineer Asst City Engineer Senior Engineer Junior Engineer Construction Inspector Water Engineer	1 Civil Engineer 1 Asst. City Engineer 1 Junior Engineer 1 Planner 1 2 Planner 2
If not specifically identified above, please indicate the number of Inspectors in the Division.	None	Everyone does inspections as needed	We have no full time inspectors. Our engineers do it as needed.
How many of these inspect street opening permits and/or paving conditions?	Inspections are done by Director and Asst. Director	All	Two of the engineers do this work as needed.
How many street opening permits were issued last year (or recent 12-month period)?	295	318	150

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
What are your fees for street opening permits?	$200	No fee	$250 application fee; $100 inspection fee includes all inspections. $75 trench safety permit
Does the City have an automated pavement management system that indexes the condition of paved surfaces in your town?	Yes	No	Engineering Division rates the paved surfaces and inputs the data into Excel spreadsheet and into GIS system.
Is this administered by Engineering? If not, is it contracted out? Accomplished by another division in the City?	It is administered by our Project Manager	NA	This is done by Engineering Division.
How many bridges are in your town? Are inspections accomplished by your Engineering staff? Contracted? Please explain.	3 Inspected by MassDOT	7 Inspected by MassDOT	73 bridges: 31 are city owned and 42 are state owned. Inspected by MassDOT
If not specifically identified above, please indicate the number of Surveyors in the Division.	None	Existing engineering staff does survey work as needed	None
Do you have a list of approved contractors (drainlayers list)?	Yes	Yes	No
Do you have a list of approved paving companies?	No	Yes	No

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
Facilities Management			
Please provide the number of Staff (FTEs) by position title in your facilities/building maintenance division	Superintendent 3 - Building Craftsman 1 – Building Craftsman/Plumber	Not provided by DPW. Each department provides its own facilities maintenance	We have a facilities manager position that is not funded.
Total Area (square feet) maintained by Facilities Maintenance staff	182,500		No response
Is Facilities Management responsible for providing custodial services to all municipal facilities?	Yes		Police, fire and library/senior center have their own custodians.
If Facilities Management oversees custodial services, is it provided by municipal staff or outsourced? Is this service provided for the schools as well as Town buildings?	Outsourced No		DPW Commissioner oversees outside cleaning service at City Hall. Other departments have their own. Schools are responsible for their buildings.
Total Area (square feet) maintained by custodial staff	Approx. 155,000 sq ft		No response
Streets / Highways			
Please provide the number of Staff (FTEs) by position title in your streets/highways division	1 – Operations Manager 1 – Supervisor 2 - Foreman 12 -	Ops Supervisor---1 (Working) Foremen—4 Equipment Operators-4 Sweeper/Special Operators—3 Craftsmen ---4 Maintenance Men---9	1 Superintendent 1 Dispatcher 1 Cemetery Clerk 3 Equipment Operators 1 Head Mechanic 2 Mtr. Equip. Repairmen 3 Foremen 14 Mtr Equip Operators 1 Parks Foreman 3 Operator/Laborers 1 Animal Ctrl Officer 1 PT Asst. ACO

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
Number of center line miles of streets maintained by staff	44	225	238
Do you repair sidewalks within-house personnel?	Yes	Yes	Yes
If so, what percentage is repaired using hot top (as compared to concrete)?	No response	40%	50%
Does the division maintain culverts?	No	Yes	Yes
Does the division pick up dead animals in streets?	Yes	No---Health Dept responsibility	Yes- we share with Animal Control.
In removing snow, how much salt do you use per lane mile?	No response	Not tracked	13 tons per lane mile per year
Do you use a mix of sand and salt in snow removal?	No	Yes, for secondary streets	Yes. 3 part sand and 1 parts salt
Does your streets/highways division repair utility cuts and excavations? If not, which division is responsible for this?	Yes, they are repaired by Streets and Highways Division	Yes, for any sewer or water repairs	Yes, except Water Division does its own repairs and private gas utility does theirs.
Trees			
Does your department have a separate tree or arbor division?	No	Yes	No
If so, how many personnel are in this division/function?	NA	2	NA
If not, does the department outsource tree maintenance and management or does it accomplish this with internal staff?	Both (depends on the situation)	Also have private company under contract for work that cannot be handled internally	Most is outsourced, but we do small jobs internally.
How many tree-related calls for service do you receive in a typical year?	30	Approx 200-250	About 100.

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
Grounds Maintenance			
What department maintains parks grounds in your municipality?	Buildings and Grounds (within DPW)	DPW/Parks Maintenance	Parks Division of DPW
What department maintains all other public grounds in your municipality?	Streets and Sidewalks (within DPW)	Grounds maintained separately by various City departments	Cemetery Division, Water Division, School Dept
How many developed acres are maintained by the staff dedicated to maintenance of these grounds?	23	Approx 200	479 total acres; 300 acres developed
How many staff members perform grounds maintenance?	Varies	20	4 workers in Parks Division
Fleet			
How many vehicles and pieces of equipment are maintained by staff in your vehicle maintenance function?	31 vehicles & equipment which are maintained by on-site contractor	Approx 270	80
Number of Staff (FTEs) by position title	2 Mechanics	Maintenance supervisor—1 (administrative only) Mechanics---8	Head Mechanic 2 Mtr Equip Repairmen
For which City departments and/or divisions does your vehicle maintenance division provide maintenance and repair?	DPW, Police, Fire (non apparatus) & ISD	All DPW, Police, Schools, Senior Center	DPW- Streets, Parks and Cemeteries
Are there other vehicle maintenance and repair providers in other departments or divisions in your town? If so, which ones?	No response	Yes, Fire Dept	Police have one mechanic
Do you have a software package that you use to track preventive maintenance, mechanic utilization, fleet utilization, etc?	Contractor provides the software	No	No, but it is being considered
If you have a software package, what software do you use?	NA	NA	Hope to expand Cartegraph use into this function

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
Wastewater Treatment			
Do you operate a wastewater treatment plant? If so, does the utility treat wastewater for other municipalities in addition to your own?	No	Yes No	Yes The plant also treats flow from the towns of Lunenburg and Westminster
What is the rated capacity of the plant (in MGD)? Is it staffed 24 hours per day?	NA	15.5 MGD No	12.4 average daily MGD Yes
Number of Operational Staff (FTEs) by position title in the plant	NA	Chief Operator --- 1 Asst Chief Oper---- 1 Env Compl. Officer – 1 Sr WWTP Operator --- 1 WWTP Operators --- 4 Maintenance Supvr. ---1 Head Mechanic --- 1 Mechanic --- 1 Mechanic/Electrician --- 1 WWTP Repairman --- 5 WWTP Maintenance –2 Pump Station Opers ---4 Pretreat/Lab Staff ---3	5 - Sr. Wastewater Operators 7 – Wastewater Operators 1 – Sr. Maint Mechanic 3 – Maint Mechanics 1 – Assistant Mechanic 1 – Electrician 2 – Instrumentation techs – One is Lead Tech
Is your wastewater utility responsible for the maintenance and repair of the collection system?	Yes	Yes	Yes
If so, how many miles of sewer lines are there in the system?	44	Approx 220	130 (14 are combined sewer)
How many miles of drain lines?	22	Approx 125	140

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
Number of staff in field maintenance by position title	Outsourced	Sr Coll Sys Operator – 1 Head Operator – 1 Special Motor Equip Operators –5 Maintenance Men -- 2	1 – Sr. Collection System Operator 5 – Collection System Operators
Number of administrative employees in the Wastewater Utility by position title	NA	Project Supervisor –1 Principal Clerk --- 1 Senior Account Clerk –1 Clerk ----1	1 Office Manager
Does the utility have its own engineering staff? If so, how many, and what are the job titles? If not, are engineering services contracted out, or are they provided by City staff located in another organization? Which one(s)?	No response	No NA Contracted out	Yes 1 Chief Engineer Except for small projects, outside consultants are hired for construction projects.
Does the wastewater utility televise its collection lines?	Only in conjunction with planned capital improvements, I/I investigations, and complaints.	Yes	Yes
If so, approximately how many miles were televised last year (or any recent defined time period)	3	14	New program being implemented. No data yet available. Goal is to televise entire City (130 miles) within 5 years or less
How many CSO, sewerage and pumping stations are in your system?	4 CSO 1 drain pump No sanitary	22	26 CSO outfalls, 3 pump stations

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
How many vehicles are assigned to the Wastewater utility?	Outsourced	13	12 – 4 assigned to collection system and 8 assigned to plant
Is the wastewater utility responsible for street sweeping? Is the wastewater utility responsible for catch basin cleaning? If so, are these performed contractually or by in-house staff?	No Yes Contractually	No Yes In house	No No Done by Streets Division
Is the wastewater utility responsible for ensuring compliance with Stormwater regulations? If not, in which organization is this performed?	Shared responsibility between DPW & contractor.	Shared responsibility with DPW/Engineering staff	No, this is currently the responsibility of the Streets division of DPW
Is the wastewater utility responsible for the flood control system? If not, in which organization is this performed?	No response	Flood Control system is not funded through the wastewater user fees and is its own division within the DPW. However, wastewater admin staff oversees flood control operations and employees are cross-trained and shared as needed	No, this is currently the responsibility of the of DPW (flood control of storm water)
Water Utility			
Do you operate a water treatment plant? If so, does the utility treat water for other municipalities in addition to your own?	No	Yes No	Yes (2) Yes

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
What is the rated capacity of the plant (in MGD)? Is it staffed 24 hours per day?	NA	20 MGD No	Two plants rated at 6 MGD and 12 MGD. No
Number of Operational Staff (FTEs) by position title in the plant	NA	Senior Treatment Plant Operator—1 Bacteriologist ---1 Lab Tech ---1	1 Deputy Commissioner 1 Chief Operator 3 Primary Operator 3 Secondary Operator
Number of staff in field maintenance by position title	Outsourced	General Foreman –1 Working Foremen --2 Equipment Operator –2 Special Operator –1 Water Maint Crftsmn - 1 Inventory Coord –1 Water System Maintenance Man --- 5 Water Meter repair ---2 Cross-connect Ctrl --- 2	1 Distribution Manager 2 CADD and Inspector 5 Distribution crew 3 Meter Room
Number of administrative employees in the Water Utility by position title	Outsourced	Superintendent –1 Asst Supt/ Engineer ---1 Junior engineer --1 Clerical ---5 Meter Readers --4	1 Office Manager 1 Clerk
How many miles of distribution lines are in the system?	61	275	197

QUESTION	CHELSEA	CHICOPEE	FITCHBURG
Does the utility have its own engineering staff? If so, how many, and what are the job titles? If not, are engineering services contracted out, or are they provided by town staff located in another organization? Which one(s)?	No response	Yes; water engr staff Asst Supt/ Engineer ---1 Junior engineer --1 Most Engineering services are contracted out	Yes
Does the water utility routinely contract out any services (e.g., backflow prevention, distribution, cleaning services, etc.)? If so, which ones?	Yes. Water division is completely outsourced.	Yes – Water system design and construction, leak detection	Yes, dam inspection
Does the water utility have a valve exercising program? Hydrant flushing program?	Yes Yes	Yes, but not consistent Yes	No Yes

QUESTION	HAVERHILL	LAWRENCE	LYNN
General and Administrative			
Does your Public Works Department utilize an automated information system to create work orders?	Yes	No, but investigating	Yes
If so, what automated system do you use?	We currently use an in-house Microsoft Access program to record work orders. However, through the MVPC collaborative process, we hope to select a more robust CMMS software package to perform this task.	NA	GeoTMS
When work is complete, what information do you record? (e.g., labor hours, crew members, work/labor category, etc.)	Currently we collect info on labor hours.	NA	It assigns by type of work, only enter complaint/completion date, and comments. No labor hours, etc.
What divisions comprise your Public Works Department?	Highway Parking Area Street Marking Vehicle Maintenance Park Maintenance Snow & Ice Removal Street Lighting Solid Waste/Recycling Building Maintenance	Engineering, Water, Sewer, Buildings, Streets, Parks, Recreation & Inspectional Services	Street, Cemetery, Maintenance of Equipment, Parks, Recreation, and Solid Waste

QUESTION	HAVERHILL	LAWRENCE	LYNN
How many administrative/clerical staff members are in your Public Works Department?	2	8	4
Please list these positions (non-managerial and non-supervisory), by division.	Head Admin Clerk Account Clerk/Dispatcher	1 Office Supervisor 1 Admin. Assistant 2 Senior Clerk 2 Principal Account Clerk 2 Sr. Account Clerk	1 Admin. Assistant 2 Head Clerk 1 Head Clerk/Timekeeper
Parks & Recreation			
How many full time staff are in your Recreational Services organization? How many seasonal and part time staff?		1	1 Fulltime 50 part time (Seasonal depends on what programs are being offered). Tennis, Ski Program, lifeguards, clinics all have 2 instructors.
Are parks maintenance services provided within the same organization/department as recreational services?	No Grounds maintenance is in DPW, and Recreation is in Human Services)	No	Yes. The park maintenance department is responsible for the up keep of park equipment, fields as well as volunteers from the trial court
Does your recreational services organization have established targets for cost recovery for adult programs? Youth programs? If so, what are these targets?	Recreation is not a part of DPW	No	When planning events, all costs are covered through ticket sales, clinics, special events such as field trips.

QUESTION	HAVERHILL	LAWRENCE	LYNN
When providing programmatic services through contract instructors, what are the percentages of class/program revenues for the instructor and your municipality?	NA	No response	No response
Does the Recreational Services Department charge organizations such as Pop Warner, Little League, etc, for field maintenance or other services?	NA	Youth Groups – No Adult Groups - Yes	No response
Engineering			
Please provide the number of Staff (FTEs) by position title in Engineering, if applicable.	4 City Engineer Asst. Civil Engineer Sr. Engineering Aide Jr. Engineering Aide	1 City Engineer	1
If not specifically identified above, please indicate the number of Inspectors in the Division.	No response	Engineer performs inspections	1
How many of these inspect street opening permits and/or paving conditions?	No response	Engineer	1
How many street opening permits were issued last year (or recent 12-month period)?	No response	270	745

QUESTION	HAVERHILL	LAWRENCE	LYNN
What are your fees for street opening permits?	No response	$30	$75 for small holes and borings and obstruction $200 for opening street
Does the City have an automated pavement management system that indexes the condition of paved surfaces in your town?	Yes, subcontract this work out to the Beta Engineering Group. It is administered by the Highway Division	No	No
Is this administered by Engineering? If not, is it contracted out? Accomplished by another division in the City?	No, Highway Division	NA	No response
How many bridges are in your town? Are inspections accomplished by your Engineering staff? Contracted? Please explain.	13 Inspections contracted out	13 Inspections performed by the State	4 (plus RR) Inspections performed by the State
If not specifically identified above, please indicate the number of Surveyors in the Division.	No response	No response	0
Do you have a list of approved contractors (drainlayers list)?	Yes, list is approved by the Haverhill City Council.	Yes	Lynn Water & Sewer Commission
Do you have a list of approved paving companies?	We go out annually to solicit bids for paving companies.	No	No

QUESTION	HAVERHILL	LAWRENCE	LYNN
Facilities Management			
Please provide the number of Staff (FTEs) by position title in your facilities/building maintenance division	Building Maintenance Department is part of the School Department. Water & Wastewater facility maintenance is the responsibility of the respective department.	16 1 Bldg Facils. Supv. 1 Storekeeper 2 Work. Foreman Crpntr. 1 Work. Foreman Painter 2 Painters 3 Carpenters 2 Electricians 1 Plumber 1 Mason 2 Custodians	(This is under the Inspectional Services Department, which is not a division of DPW, however the responses for this division are provided below) 105 FTE: 1 Administration 3 Supervisors 10 Maintenance 92 Custodians
Total Area (square feet) maintained by Facilities Maintenance staff	No response	No response	2,200,000 sf
Is Facilities Management responsible for providing custodial services to all municipal facilities?	No response	Yes	No, the fire stations do not receive custodial service
If Facilities Management oversees custodial services, is it provided by municipal staff or outsourced? Is this service provided for the schools as well as Town buildings?	No response	Municipal staff Schools have their own Custodians	A combination: police station outsourced, municipal staff in other buildings.
Total Area (square feet) maintained by custodial staff	No response	No response	2,000,000

QUESTION	HAVERHILL	LAWRENCE	LYNN
Streets / Highways			
Please provide the number of Staff (FTEs) by position title in your streets/highways division	10 1 General Foreman 3 Working Foreman 2 MEO LHS Laborer/B&G 1 MEO LHS Craftsman 3 MEO LHS PW Laborer	11 1 Street San. Supv. 1 Dispatcher 1 HSHMEO 4 SHMEO 1 HMEO 1 MEO 1 Sign Painter 1 MEO Laborer	18 1 Superintendent 1 Genl. Foreman 3 Work. Foremen 3 First Class 10 Trk Driver/Laborers
Number of center line miles of streets maintained by staff	240	No response	Approximately 330
Do you repair sidewalks within-house personnel? If so, what percentage is repaired using hot top (as compared to concrete)?	No (contracted out) No response	No response No response	Yes 80% asphalt
Does the division maintain culverts?	No (contracted out)	No response	No (Water & Sewer Commission)
Does the division pick up dead animals in streets?	No. Handled by Police Department Animal Control	No response	We will if the Dog Officer is not available
In removing snow, how much salt do you use per lane mile?	No response	No response	Approximately 300 pounds
Do you use a mix of sand and salt in snow removal?	Yes	No response	Only if Temps fall below 10 degrees
Does your streets/highways division repair utility cuts and excavations? If not, which division is responsible for this?	No (contracted out)	No response	Yes

QUESTION	HAVERHILL	LAWRENCE	LYNN
Trees			
Does your department have a separate tree or arbor division? If so, how many personnel are in this division/function?	Yes 2	No NA	Yes 2
If not, does the department outsource tree maintenance and management or does it accomplish this with internal staff?	NA	NA	NA
How many tree-related calls for service do you receive in a typical year?	800	NA	Approximately 300
Grounds Maintenance			
What department maintains parks grounds in your municipality?	Parks and Trees Division of Public Works	Streets/Parks Division of Public Works	Parks Division of DPW
What department maintains all other public grounds in your municipality?	No response	NA	None
How many developed acres are maintained by the staff dedicated to maintenance of these grounds?	No response	35	332
How many staff members perform grounds maintenance?	7	3	2
Fleet			
How many vehicles and pieces of equipment are maintained by staff in your vehicle maintenance function?	No response	125	300
Number of Staff (FTEs) by position title	1 Working Foreman 1 Welder/Mechanic 2 ME Repairmen	1 Work. Foreman Mech. 3 Mechanics 1 Gas Attendant	5 Mechanics 1 Foreman/Storekeeper 1 Supervisor

QUESTION	HAVERHILL	LAWRENCE	LYNN
For which City departments and/or divisions does your vehicle maintenance division provide maintenance and repair?	No response	DPW, Sewer, Water, Police	Police, Fire, DPW, Cemetery, Parks, Parking, Inspectional Services
Are there other vehicle maintenance and repair providers in other departments or divisions in your town? If so, which ones?	No response	Yes. Fire Department	No
Do you have a software package that you use to track preventive maintenance, mechanic utilization, fleet utilization, etc?	Yes	No response	Yes
If you have a software package, what software do you use?	RTA	NA	Mitchell
Wastewater Treatment			
Do you operate a wastewater treatment plant? If so, does the utility treat wastewater for other municipalities in addition to your own?	Yes Yes	No NA	Not in DPW
What is the rated capacity of the plant (in MGD)? Is it staffed 24 hours per day?	18 MGD Yes	NA	
Number of Operational Staff (FTEs) by position title in the plant	5 Senior Operators 3 Operators 2 Mechanics 2 Mechanics Helpers 1 Electrician 1 Lab Technician 1 Storekeeper	NA	

QUESTION	HAVERHILL	LAWRENCE	LYNN
Is your wastewater utility responsible for the maintenance and repair of the collection system?	Small Maintenance and repairs are done with Highway and Wastewater staff, larger work is out sourced. Pump Station Maintenance/Repair – Wastewater staff and outsourced.	No response (although org chart indicates the Sewer Division of DPW maintains collection system).	
If so, how many miles of sewer lines are there in the system?	233	No response	
How many miles of drain lines?	Approx. 100	No response	
Number of staff in field maintenance by position title	5 1 – Senior Collection System Operator 4 - Collection System Operator	10 1 Sewer Foreman 1 Working Foreman 1 SHMEO 2 HMEO 4 MEO 1 Laborer	
Number of administrative employees in the Wastewater Utility by position title	1- Executive Administrative Assistant 1- Financial Assistant	0	
Does the utility have its own engineering staff? If so, how many, and what are the job titles? If not, are engineering services contracted out, or are they provided by City staff located in another organization? Which one(s)?	No NA Some City Engineer – most out sourced	No NA No response	

QUESTION	HAVERHILL	LAWRENCE	LYNN
Does the wastewater utility televise its collection lines?	Yes, via contractor	No response	
If so, approximately how many miles were televised last year (or any recent defined time period)	4	No response	
How many CSO, sewerage and pumping stations are in your system?	36	No response	
How many vehicles are assigned to the Wastewater utility?	11	No response	
Is the wastewater utility responsible for street sweeping? Is the wastewater utility responsible for catch basin cleaning? If so, are these performed contractually or by in-house staff?	No. Highway Division does Yes In house and out sourced	No response No response No response	
Is the wastewater utility responsible for ensuring compliance with Stormwater regulations? If not, in which organization is this performed?	Yes some components.	No response	
Is the wastewater utility responsible for the flood control system? If not, in which organization is this performed?	Wastewater is responsible for the pump station. City is responsible for floodwall and Little River Conduit.	No response	

QUESTION	HAVERHILL	LAWRENCE	LYNN
Water Utility			
Do you operate a water treatment plant? If so, does the utility treat water for other municipalities in addition to your own?	Yes Yes, limited number of retail customers in Groveland, MA & Plaistow, NH. We do not wholesale to other communities.	Yes No	Not in DPW
What is the rated capacity of the plant (in MGD)? Is it staffed 24 hours per day?	12 MGD No. 16 hours	No response Yes	
Number of Operational Staff (FTEs) by position title in the plant	10 1 Plant Manager 1 Chemist 1 Lab Tech 1 Electrician 1 Senior Operator 5 Shift Operators	16 1 Water Plant Supv. 1 Chemist 1 Master Mechanic 1 Repair Mechanic 4 Pump Operators 5 Filter Operators 3 Cross Connect, Inspects.	

QUESTION	HAVERHILL	LAWRENCE	LYNN
Number of staff in field maintenance by position title	13 1-Water Maint Supervisor 1-Distribution Foreman 1-Backflow Craftsman 1-Plumber Craftsman 2- Mech Equip Operator 2-Meter Installer/Laborer 3-Meter Installer/Reader 1-Sr. Meter Reader 1-Water Service Inspector	17 1 Water Foreman 1 Work. Foreman Crftmn. 2 Hyd & Valve 1 Craftsman 1 Gardner MEO 1 SP MEO 10 MEO Laborers	
Number of administrative employees in the Water Utility by position title	1-Head Account Clerk	0	
How many miles of distribution lines are in the system?	275	No response	
Does the utility have its own engineering staff? If so, how many, and what are the job titles? If not, are engineering services contracted out, or are they provided by town staff located in another organization? Which one(s)?	No. The utility funds and uses a portion of the City Engineering Department. Most engineering is performed by private engineering firms.	No NA Contracted out	
Does the water utility routinely contract out any services (e.g., backflow prevention, distribution, cleaning services, etc.)? If so, which ones?	Engineering services. Backflow survey/testing, distribution maintenance, main pipe installation and water service installation are all performed "in-house."	No	

QUESTION	HAVERHILL	LAWRENCE	LYNN
Does the water utility have a valve exercising program? Hydrant flushing program?	The utility is in the planning stage of a uni-directional flushing program that will encompass valve exercising and hydrant flushing. Currently both tasks are done simultaneous with scheduled and emergency system shut-downs when feasible.	Yes Yes	

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
General and Administrative			
Does your Public Works Department utilize an automated information system to create work orders?	No, but considering one	Yes	Yes
If so, what automated system do you use?	Perhaps CityWorks	Cartegraph	The Department utilizes E-Gov to enter work requests. This software is used throughout the City. The DPW both creates work orders in E-Gov, and responds to these requests which may originate from the public or from internal City departments.
When work is complete, what information do you record? (e.g., labor hours, crew members, work/labor category, etc.)	No response	Resolution only	Date Work description Crew size Hours These are generally recorded for facilities maintenance work, however they are not consistently recorded by other divisions.

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
What divisions comprise your Public Works Department?	Water/ Sewer Sanitation Highway Parks/Forestry Water/Sewer Billing Janitorial Administrative	Administration, Operations, Flood Control, Snow & Ice, Sewer, and Water	Streets (includes Sol. Waste and Recycling) Lands and Buildings Parks, Rec., Cemeteries Engineering Water Utility Wastewater Utility
How many administrative/clerical staff members are in your Public Works Department?	4	5	14.5

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
Please list these positions (non-managerial and non-supervisory), by division.	Water/Billing analyst Administrative assistant to the superintendent 2 Secretarial staff in water sewer billing department	Administrative: Fiscal Assistant -3 Water: Fiscal Assistant - 1	1 Office Manager 1 Admin. Assistant 1 Principal Clerk 1 Head Clerk 1 Accountant 1 Clerk (Engineering) 1 Office Mgr (WWTP) 1 Head Clerk (WWTP) 1 Office Mgr. (Water) 1 Admin. Asst. (Water) 1 Head Clerk (Water) 1 Admin. Asst. (Parks) 0.4 Office Admin. (Cmtry) 1 Head Clerk (Cemetery) 0.9 Clk-Seasonal (Cmtry) 0.2 Clerk-Temp (Cmtry)
Parks & Recreation			
How many full time staff are in your Recreational Services organization? How many seasonal and part time staff?	1 full time 2 part-time 100 seasonal parks instructors hired for the months of July and August They work from 12 to 20 hours per week	Currently 3 full time and 1 part time Over 250 seasonal employees	3 Rec. Prog. Planner/Dir. Youth Coordinator Associate Planner Up to 75 PT/Seasonal staff in summer
Are parks maintenance services provided within the same organization/department as recreational services?	Parks maintenance is done by the Public Works dept.	No	Yes, although athletic field maintenance is generally provided by the Schools

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
Does your recreational services organization have established targets for cost recovery for adult programs? Youth programs? If so, what are these targets?	No Adult programs are offered. Youth classes are offered at the youth center and there is a minimal cost to participate (art class, cooking class etc.) to defray the cost	Yes – Adult programs are all self-supporting – 100% cost recovery. Some youth programs receive funding from the Town between 10% - 30% of programs funded by Town, remainder funded through user fees.	No
When providing programmatic services through contract instructors, what are the percentages of class/program revenues for the instructor and your municipality?	No response	Depends on program. Instructor: 60% Recreation: 40%	No target. Most programming provided free of charge to participants
Does the Recreational Services Department charge organizations such as Pop Warner, Little League, etc, for field maintenance or other services?	The only cost is rental of our one artificial turf field. The cost is reduced for youth organizations. There is a permitting process but the permits are free	No	No
Engineering			
Please provide the number of Staff (FTEs) by position title in Engineering, if applicable.	1 City Engineer (not in Public Works)	Town Engineer 2 – Senior Project Managers	1 Chief Engineer 1 Grade 5 Engineer 2 Grade 4 Engineer 1 Grade 3 Engineer

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
If not specifically identified above, please indicate the number of Inspectors in the Division.	The Engineering department is not part of public works. Street opening permits are issued by the PWD and monitoring of these is done by the Superintendent of Public Works	One Senior Project Manager is a construction inspector.	None
How many of these inspect street opening permits and/or paving conditions?	No response	The Sr. Project Inspector inspects street opening permits as part of his duties.	None
How many street opening permits were issued last year (or recent 12-month period)?	Utilities 183 Drainlayer other 87	340	737
What are your fees for street opening permits?	$200	No charge	$75 for street opening $50 for trench
Does the City have an automated pavement management system that indexes the condition of paved surfaces in your town?	No	The town uses Pavementview and Pavementview Plus (Cartegraph).	Contracted
Is this administered by Engineering? If not, is it contracted out? Accomplished by another division in the City?	NA	This is administered by Engineering. Pioneer Valley Planning Commission does pavement condition evaluation.	Contracted (accomplish 25% of road segments annually)

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
How many bridges are in your town? Are inspections accomplished by your Engineering staff? Contracted? Please explain.	None under the City's management. All bridges administered under Mass Highway	11 Bridges are inspected by Mass DOT	114 The state coordinates most of the inspections. The privately owned bridges are inspected by consultants hired by the owner. Not every bridge is inspected regularly.
If not specifically identified above, please indicate the number of Surveyors in the Division.	0	0	0
Do you have a list of approved contractors (drainlayers list)?	Yes	Yes	No. Contractors supply us with a $25,000 bond and proof of insurance and they can work in the city.
Do you have a list of approved paving companies?	No	No	No

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
Facilities Management			
Please provide the number of Staff (FTEs) by position title in your facilities/building maintenance division	1Building Maintenance supervisor 3 Custodians(full time) 3 part-time	1 (Position title not provided)	1 City Electrician 1 WF/Fire Alarm/Traffic 1 Fire Alarm Technician 1 Grade B Journeyman 2 Master Electrician 2 Helper 1 Foreman HVAC 1 MEO Laborer 1 WF Carpenter/Crftsmn 5 Carpenter/Craftsman 1 WF HVAC Craftsman 2 HVAC/Craftsman 1 WF Mason/Craftsman 1 Mason/Craftsman 1 WF Painter/Glazier 1 WF Plumber/Irrig. Spec 2 Plumber/Irrig. Spec 1 WF Roofer/Craftsman 1 Chemical Applic. Spec. 1 Senior Custodian 3 Custodian 31 Total
Total Area (square feet) maintained by Facilities Maintenance staff	Unknown	88,000 sq ft., Mob, 19,000 sq. ft., Library	2,715,270
Is Facilities Management responsible for providing custodial services to all municipal facilities?	All but Schools	No	No. Schools and Police Department provide their own custodial services
If Facilities Management oversees custodial services, is it provided by municipal staff or outsourced? Is this service provided for the schools as well as Town buildings?	Municipal building maintained by municipal staff . Police headquarters and schools outsourced	Outsourced No	City staff No

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
Total Area (square feet) maintained by custodial staff	Unknown	88,000 sq ft., Mob, 19,000 sq. ft., Library	127,381
Streets / Highways			
Please provide the number of Staff (FTEs) by position title in your streets/highways division	1 Highway supervisor 3 craftsman	26	1 General Foreman 3 MEO3 Laborer/Wtchmn 1 WF MEO3 Tree Clmbr 3 WF MEO3 Laborer 8 MEO3 Laborer 1 WF Maintenance Man 1 Maintenance Man 1 Garage Foreman 1 MEO3 Repairman/Wldr 3 MEO3 Repairman 1 Motor Equip Repairman 1 Recyc/Sol Waste Coord 1 Recyc Enforcemt Coord 26 Total
Number of center line miles of streets maintained by staff	110	134	253
Do you repair sidewalks within-house personnel? If so, what percentage is repaired using hot top (as compared to concrete)?	Yes 80% Asphalt 20% concrete	Yes 90% asphalt 10% concrete	Yes
Does the division maintain culverts?	Culverts maintained by water sewer division with help from Essex County mosquito control	Yes	Yes

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
Does the division pick up dead animals in streets?	Yes	No. Health Department does this	Yes
In removing snow, how much salt do you use per lane mile?	Unknown	350 lbs.	300 to 400 lbs. depending on temperature and other factors like flat roads or hills.
Do you use a mix of sand and salt in snow removal?	Salt only	Yes – 50%/50%	No, salt only
Does your streets/highways division repair utility cuts and excavations? If not, which division is responsible for this?	Yes for our own water sewer repairs. Drainlayers are responsible for their own work	Only Town cuts, i.e. water, sewer, drain	Streets Division repairs its own. Water Utility repairs its own with in-house staff. Wastewater Utility repairs its own through contracts
Trees			
Does your department have a separate tree or arbor division? If so, how many personnel are in this division/function?	This is included in the Parks division 2	Yes 3 (trimming and removal)	No. Included in Streets Division 1 (with borrowed staff from Streets)
If not, does the department outsource tree maintenance and management or does it accomplish this with internal staff?	We take care of small removals and calls for downed branches. Majority of work is outsourced	Occasionally outsource	Occasionally outsource, particularly for large removals
How many tree-related calls for service do you receive in a typical year?	Approximately 150	300-500	Received 83 in Dec., 2011. Annualized, this equates to approx.. 1,000.
Grounds Maintenance			
What department maintains parks grounds in your municipality?	Parks division of DPW	Operations Division	Parks unit of the Parks, Recreation and Cemeteries Division

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
What department maintains all other public grounds in your municipality?	Parks division maintains all grounds around public buildings, schools, and parks/ playground.	School Department staff	Streets Division maintains some traffic islands
How many developed acres are maintained by the staff dedicated to maintenance of these grounds?	Unknown	218.75	500+
How many staff members perform grounds maintenance?	2 full time 35 part-time (April-November)	11	14
Fleet			
How many vehicles and pieces of equipment are maintained by staff in your vehicle maintenance function?	52	94	130 in non-Utility Divisions 27 in Wastewater <u>23 in Water</u> 180 total
Number of Staff (FTEs) by position title	1 Garage Maintenance Supervisor	1 - Fleet Maintenance Foreman 3 - Motor Equipment Repairman	1 Garage Foreman/Mech. 1 MEO3 Repairman/Wldr 3 MEO3 Repairman 1 Motor Equip Repairman 0.5 Skilled Mech. (Water)
For which City departments and/or divisions does your vehicle maintenance division provide maintenance and repair?	Only DPW vehicles and equipment	All DPW as well as Park & Recreation, Council on Aging and Health Department	DPW only
Are there other vehicle maintenance and repair providers in other departments or divisions in your town? If so, which ones?	Fire and Police have their own	Not to our knowledge	Yes. Police and Fire Departments have separate vehicle maintenance functions

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
Do you have a software package that you use to track preventive maintenance, mechanic utilization, fleet utilization, etc?	No	No	No
If you have a software package, what software do you use?	NA	Deputy Director of Operations designed his own utilizing Excel worksheets for each piece of equipment	NA
Wastewater Utility			
Do you operate a wastewater treatment plant? If so, does the utility treat wastewater for other municipalities in addition to your own?	No NA	No West Springfield utilizes the Springfield Regional Wastewater Treatment Plant at Bondi's Island in Agawam, MA	Yes Yes. The Regional facility treats wastewater for the surrounding towns of Dracut, Tewksbury, Chelmsford and Tyngsboro.
What is the rated capacity of the plant (in MGD)? Is it staffed 24 hours per day?	NA	Regional facility is rated at 65MGD	32 MGD Yes
Number of Operational Staff (FTEs) by position title in the plant	NA	NA	1 Operations Supt. 1 Head Oper/Asst. Supt. 4 Head Operators <u>7 Operators</u> 13 total
Is your wastewater utility responsible for the maintenance and repair of the collection system?	The City maintains its own water/sewer/drain lines	The Town of West Springfield is responsible for its own sewers and storm drains, not the utility.	Yes
If so, how many miles of sewer lines are there in the system?	Approximately 120	135	230
How many miles of drain lines?	Approximately 130	134	

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
Number of staff in field maintenance by position title	1 water/sewer director 1 supervisor 2 foreman 2 craftsman	8 – Sewer 5 – Flood Control	1 Maintenance Supv. 1 Parts Equip. Mgr. 1 Head Collect. Syst. Oper. 2 TV Truck Operators 3 Maint. Mechanics III 2 Maint. Mechanics II 7 Maintenance Mechanics 17 total
Number of administrative employees in the Wastewater Utility by position title	0	West Springfield has 2 employees who handle sewer bills along with various other duties: Fiscal Assistant & Office Manager	1 Office Manager 1 Head Clerk
Does the utility have its own engineering staff? If so, how many, and what are the job titles? If not, are engineering services contracted out, or are they provided by City staff located in another organization? Which one(s)?	Engineering work is outsourced	No NA West Springfield contracts with engineering firms for major sewer projects in Town.	Yes. 1 Engineering Manager 1 Engineering Supv. 1 Pretreatment Coord. 4 Staff Engineers 1 Intern Major capital project design is contracted out
Does the wastewater utility televise its collection lines?	We televise our lines when we have suspected problems. This work is outsourced	Yes – on occasion when paving	Yes
If so, approximately how many miles were televised last year (or any recent defined time period)	No response	Approximately 2,640 feet (0.5 miles)	Approximately 19,000 feet (3.6 miles)

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
How many CSO, sewerage and pumping stations are in your system?	21 stations for either sewer or drain	West Springfield has 7 sewer pumping stations – no CSO's	9 diversion stations 11 pump stations 3 metering stations 1 Syphon station
How many vehicles are assigned to the Wastewater utility?	7 Vehicles are assigned to the water sewer division	5 units: 2 pickups, 1 crane truck, 1 vacuum truck (Flood Control) and 1 jet truck (Sewer)	27
Is the wastewater utility responsible for street sweeping? Is the wastewater utility responsible for catch basin cleaning? If so, are these performed contractually or by in-house staff?	Street sweeping is done by DPW sanitation division and is contacted out Catch basin cleaning done by water/sewer division and is contracted out	Performed by WS DPW Performed by WS DPW In-house	Yes (contracted) Yes (In house)
Is the wastewater utility responsible for ensuring compliance with Stormwater regulations? If not, in which organization is this performed?	Superintendent of Public works is responsible for storm water regulations	West Springfield DPW is responsible for storm water regulations.	Yes, in coordination with the Engineering Division of the DPW
Is the wastewater utility responsible for the flood control system? If not, in which organization is this performed?	Our water and sewer division is responsible for flood control	West Springfield DPW is responsible for a major flood control system.	Yes

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
Water Utility			
Do you operate a water treatment plant? If so, does the utility treat water for other municipalities in addition to your own?	No NA	Yes No	Yes Yes, for several of the neighboring communities
What is the rated capacity of the plant (in MGD)? Is it staffed 24 hours per day?	NA NA	5.5 MGD No	36 MGD
Number of Operational Staff (FTEs) by position title in the plant	NA	1 – Water Treatment Foreman 2 – Pumping Station Operators	1 Operations Supt. 4 Head Operators 4 Operators 9 total
Number of staff in field maintenance by position title	Same as answer for wastewater question same crew handles both	1 – Water Distribution Foreman 1 – Working Foreman 1 – Special Motor Equipment Operator 2 – Water Meter Repairman 3 – Skilled Laborers 2 – Laborers 1 – Motor Equipment Repairman	2 Water Foreman 6 Water Syst,. Maint. Mech 2 Backflow Inspectors 10 total
Number of administrative employees in the Water Utility by position title	0	1 Fiscal Assistant	1 Office Manager 1 Admin. Asst. 1 Head Clerk
How many miles of distribution lines are in the system?	Approximately 108	146	213

QUESTION	REVERE	WEST SPRINGFIELD	LOWELL
Does the utility have its own engineering staff? If so, how many, and what are the job titles? If not, are engineering services contracted out, or are they provided by town staff located in another organization? Which one(s)?	No NA No response	Yes – utilizes DPW engineering staff for project management and inspections. Various projects are contracted out – i.e. Dam Inspection, Large Water Meter Replacement, New Construction of Water Mains, Water Tank Inspections, Special Reports for DEP	No NA Contracted out
Does the water utility routinely contract out any services (e.g., backflow prevention, distribution, cleaning services, etc.)? If so, which ones?	Yes. Catch basin cleaning , relining of water and sewer lines. Sewer station cleaning.	Yes – Backflow Testing, Forestry Consultant, Carbon Exchange, Filter Bed Sand, Water Sampling, Cathodic Protection, Tank Inspection	Most field work completed in house, with occasional street cuts repaired by contractors, as well as larger water main breaks.
Does the water utility have a valve exercising program? Hydrant flushing program?	No response Hydrant flushing program is done once a year	Yes – Just starting – equipment in place Yes – Unidirectional flushing 1/3 of the Town per year	No No (done as needed)

APPENDIX D

Square Footage of City Facilities

CITY OF LOWELL FACILITIES

Address	Occupancy	Yr Built	Square Feet
Chelmsford St	Abraham Lincoln School	1993	59,001
Merrimack St	Adult Education Center	1930	12,612
E. Merrimack St	Auditorium	1927	72,810
Pawtucket St	Auditorium	1901	18,638
Wannalancit Rd	Bartlett School	1994	121,000
Carter St	Cardinal O'Connell School	1880	18,171
Douglas Road	Cawley Stadium	1937	6,566
Boston Road	Cemetery	1978	5,100
Gorham St	Cemetery Department	1840	2,850
Merrimack St	City Hall	1893	58,716
Flemming St	Daley Jr High School	1994	113,914
Middlesex St	DPW Admin & Garage	1995	30,000
W. Meadow St	Dr. Ann Wang School	1992	88,697
Aiken St	Edward Lelacheur Baseball Stadium	1998	
Favor St	Eliott School	1890	10,919
Lawrence St	Fire Station	1891	9,566
High St	Fire Station	1889	11,538
Branch St	Fire Station-Renovated	1877 & 1994	7,375
Rogers St.	Fire Training Center	1924	5,670
Gorham St	Firehouse	1875	8,467
Mammoth Rd	Firehouse	1891	10,904
Old Ferry Road	Firehouse		
Stevens St	Firehouse	1922	4,344
W Sixth St	Firehouse	1900	7,822
Canal St	Freudenberg Bldg/Heavy Industrial	1890	58,450
Cambell Dr.	Gertrude Bailey School	1992	78,102
Ennell St	Greenhalge School	1994	78,435
Beacon St	Head House & Stg Tanks (Incl. Elec/Comm Equip)	1890	676
Pine St	Health Department	1895	13,200
Mt Vernon St	Industrial Bldg	1870	8,958
Mt Vernon St	Industrial Bldg	1979	14,673
Boylston St (Off of)	J.G. Pyne School	1965	25484
Draper St	James Sullivan Mid Schl	1992	123,840
Arcand Dr	JFK Civic Ctr, Office, Main Police Station, Fire House, W/4 Bays	1973	76,395
Powell St	Laura Lee School	1900	18,344
Sycamore St	Leblanc School	1935	23,765
Fr. Morrisette Blvd	LHS & Gymnasium	1980	134,439
Smith St	LHS Alternative School (Molloy)	1915	22,199
French St	LHS Steam Plant	1920	3,328
Kirk St	LHS Coburn Hall	1920	300,336
French St	LHS Freshmen Academy	1920 & 1939	46,410
Paige St (incl above)	LHS Freshmen Academy (McDonough)	1939	

Merrimack St	Library	1894	47,552
Farnham St	Light Industrial	1920	15,148
Beacon St	Mcauliffe School	1993	74,050
Fourth Avenue	Mcavinnue School	1994	79,572
Woburn St	McHugh Alternative (Riverside Sch)	1891	16,820
Rogers St.	Moody Jr. High	1888	40,296
Pine St	Morey School	2009	70,283
Fletcher St	Murkland School	1993	70,444
Fr Morrissette Blvd	Parking Garage (George Ayotte)		
John St	Parking Garage (John St + store)	1991	
Market St	Parking Garage (Leo A Roy)	1979	
Warren St	Parking Garage (Lower Locks)	1984	141,559
Pawtucket St	Parks & Conservation	1880	8,881
Hildreth St	Parks Department		
Stedman St.	Parks Department	1985	19,554
W. Meadow Rd.	Pawtucket Memorial	1965	36,054
Stedman St #2	Police Precinct	1988	2,173
Douglas Rd	Reilly School	1959	78308
June St	Robinson School	1989	68,585
Highland St	Rogers School	1994	92,458
Gorham St	School Department (Old Butler School)	1882	43,756
River Place	Sewer		
Gorham St (#1170)	Shaughnessy & Butler School	1991	92,458
Merrimack St	Smith Baker Sr. Ctr.	1910	17,882
Broadway St	Stoklosa School	2006	168,114
Sixth St	Vamum School	1950	35,584
Pawtucket Blvd.	W/W Diversion Structure		
First St Bl	W/W Treatment Plant	1980	16,811
First St Bl	W/W Treatment Plant	1980	38,400
First St Bl	W/W Treatment Plant	1980	15,448
First St Bl	W/W Treatment Plant	1980	55,050
First St Bl	W/W Treatment Plant	1980	18,128
First St Bl	W/W Treatment Plant	1980	11,020
First St Bl	W/W Treatment Plant	1980	1,849
River Place	Warehouse	1968	58,628
Wilder St	Washington School	1910	30,916
Wilder St	Washington School	Modular	
Pawtucket Blvd.	Water Dept - Generator		974,000
Pawtucket Blvd	Water Dept-Maintenance Garage	1960	9600
Pawtucket Blvd	Water Intake Station	1999	4,643
Beacon St	Water Reserve Tank		
Wedge St	Water Tower	new/2008	46,800
Pawtucket Blvd	Water Treatment Plant	1979	52,875
Total			**2,715,270**

APPENDIX E

Best Practices in Web Design

BEST PRACTICES IN WEB SITE DESIGN

General Site Features	**Yes**	**No**
Is your home page clean? Is it easy for your citizens to find what they need?		
Is there always up-to-date and relevant information on your home page?		
Is there a link to your home page from every page on your site?		
Is your website design consistent on every page?		
Are the font styles, colors, and sizes consistent throughout your website?		
Are there headers on every page in FONT styles consistent throughout the site?		
Is your link text relevant to what the specific link is? Do you avoid using the phrase "click here"?		
Is your active link color different from your visited link color?		
Wherever possible, have you used available tools to help ensure accessibility for those with disabilities?		
Navigation	**Yes**	**No**
Is the main navigation on your site consistent from page to page?		
Is your secondary navigation found in the same place on every page of your site?		
Do the major sections of your website have navigation that makes sense?		
Do you provide easy access to forms through your navigation?		
Do you provide easy access to publications through your navigation?		
Do you provide easy access to regulations through your navigation?		
Do you provide easy access to services through your navigation?		
Do you provide easy access to agenda/minutes through your navigation?		
Images	**Yes**	**No**
Do your images enhance your site?		
Do your images load quickly?		
Do you use thumbnails for faster page loads and the option of viewing larger versions of your images, if necessary?		
Are your images bright, clear, and sharp?		
Is your site free of animated graphics?		
Have you entered alternate text for accessibility requirements?		
Content	**Yes**	**No**
Is your content driven by your audience? Are you providing your citizens what they want and need?		
Are your website's major sections tailored to your various audiences?		
Is your content written in common language, without acronyms or jargon that your citizens won't understand?		
Is your content written in plain English and to a sixth grade reading level so that your citizens will understand?		
Do you have meta data for every page and every file for effective searching?		
Do you monitor/remove obsolete content so there is no misleading or confusing information?		
Do you review the content on your site's major entry points so they are always up-to-date with the most relevant information?		
Is your content timely possible? Is the responsible party and most recent posting date visible per page?		
Is there a language translation option on your site?		
Do you have department pages that include addresses, contact information, staff, missions, responsibilities, and key links?		
Do you have services pages that include addresses, contact information, staff, missions, responsibilities, and key links?		
Do you have agency pages that include addresses, contact information, staff,		

missions, responsibilities, and key links?		
If you content is available in file forms, do your provide links for your citizens to download the necessary readers?		
If information is available in other file formats, do you also offer an HTML version of that content, or at least a synopsis of the content?		
Is information available in other file formats accessible in small chapter files as well as a complete file?		
Is your site free of information of use only to staff, meant for an intranet?		
Interactive Features	**Yes**	**No**
Does your site feature Content (RSS) Feeds to which your citizens can subscribe to receive syndicated content?		
Does your site include subscription access to electronic newsletters? Are your electronic newsletters available on your site for those who don't subscribe?		
Do you allow citizens to pay for services online?		
Are there online registration options available for programs/events?		
Does your site feature GEO Content (interactive maps) for key points of interest?		
Does your site have an interactive FAQ area for citizen self-service? Can citizens submit inquiries/service requests if information they seek is not available		
Does your site include live e-mail links to various administrative and departmental staff?		
Policy Features	**Yes**	**No**
Does your site have disclaimers regarding information on external links?		
Does your site have a linking policy for sites to which it will/won't link?		
Does your site have a privacy policy about what information you collect and use?		
Does your site, or do your departments, feature a responsiveness policy for following up on citizen contact?		
Does your site have a security policy for financial transactions made online?		
Web Management	**Yes**	**No**
Do you have regular content manager meetings to enable teamwork and discussions regarding the website?		
Do you have a style guide in place as a reference for your content managers?		
Do you provide options for continuous training for your content managers?		
Do you have a plan in place for how your website will operate in a time of emergency or crisis?		
Are your content managers aware of their roles in emergency or crisis situations?		
Do you have a schedule or priority list for changing and updating content on key pages?		
Do you have a schedule for conducting site reviews to be sure your site matches the needs of your audiences?		
Do you have internal site security that allows your content managers access to their specific areas?		
Do you have publishing workflows in place that allow webmasters to ensure consistency and quality throughout the site?		

APPENDIX F

Sample Safety Meeting Minutes

Days worked without a lost time accident

OWELL, MASSACHUSETTS
ent Assessment of the Public Works Depa

Safety Chairpersons: ***Fred Hamel, John Pugh***

New members are always welcome to join the meetings!

Next Training Session:

Safety Group Meeting Minutes

Last Meeting Date: December 14, 2011 @ 8AM **Next Meeting Date: December 14, 2011 @ 8AM**

Attendees: John Pugh, Fred Hamel, Mike Stuer, Steve Faxon, and Keith Murray.

Next Training Class: HAZWOPER Training: **Hazard Communication Standard** - The Occupational Safety & Health Administration (OSHA) mandate (29 CFR 1910.1200) states that any organization that produces or uses hazardous materials must provide its employees with information and training on the proper handling and use of these materials.

Old Business as of November 9, 2011

1. The need for a written confined space entry (CSE) program has been identified. *Action: A facility-wide assessment of all confined spaces has been conducted to identify those which require CSE permit for entry. Six portable gas meters have been purchased to support this program. Follow-Up: LRWWU is performing a hazardous gas monitoring program for targeted areas (e.g. Gravity Thickeners) to establish baseline conditions for entry into such spaces. Further research is needed in determining the importance of ventilation and restricted means of entry and exit.*

   12-29-11: No further information is available at this time. The Safety Group is in the process of obtaining information required to complete the task.
2. The Safety Group has identified the need for more safety communication, including safety signage. *Action: A bulletin board has been hung in the hallway adjacent to the Lab; safety materials have been posted on the bulletin board. Additional communication media (posters, brochures, etc.) will be evaluated for future distribution.*

12-29-11: The Safety Group is in the process of obtaining information for the next meeting regarding signage/mats. At this time, no signage is to be added with the exception of major and/or obvious deficiencies, i.e. Confined Space signage is faded and should be replaced/modified with either generic Confined Space or PERMIT Required Space as soon as practicable. In addition, slips and falls are of major concern and signage/mats should be utilized to address this issue. An audit of the storage of materials and labeling should be conducted and reported to the Safety Group.

On 12-30-11 a brief site inspection was conducted and the following conditions were noted.

Containers in the chemical room were un-labeled. Additionally, the containers are in proximity to the floor drain which discharges to the plant. Is that SOP?

Chemical room doors should have signage as to the contents stored.

Thickened sludge area doors need signage including requirement for Gas Meter.

Bar racks should have signage for moving parts (belts) and indicate Authorized Personnel only.

Influent screw area should have signage for Authorized Personnel only and Confined Space for the stairs with Gas Meter requirement. Further signage should be noted accessing screws for Confined Space Permit Required for maintenance.

Mechanical room for influent should have signage to require Ear Plugs, Moving Parts, and authorized Personnel Only. Please note that ear plug container should be re-filled.

3. The need to update LRWWU's Material Safety Data Sheets (MSDS) has been identified. *Action: MSDSs are being collected so that the MSDS binders may be updated with the most recent MSDS information.*

12-29-11: Jin is collecting for the lab.

4. With winter nearly here, the need to reduce slippery surfaces by removing snow and ice was identified. *Action: Containers with salt (Calcium Chloride) will be placed in strategic locations throughout the Duck Island facility. Salt should be applied to slippery surfaces in order to reduce winter slip-and-fall hazards.*

12-29-11: This task has been completed as Fred and John spearheaded distribution of the salt to the engineering building, effluent building, as well as all other facilities. No further action necessary with the exception of replenishing supplies as necessary.

5. The Safety Group has identified the need for a fire drill to test the new fire protection equipment in the Main Building. *Action: a fire drill was November 21, 2011. All LRWWU personnel who were on site (Duck Island WWTF) reported to their assigned rally points.*

The fire protection equipment in the Main Building operated correctly and the drill was a success.

12-14-11: The Safety Group discussed the possibility of providing automatic paging to all departments at the Utility in the event that the fire alarm is triggered to ensure all personnel is accounted for at the rally point.

12-29-11: The Safety Group should obtain further research regarding a paging system for the fire alarm and commence installation/coordination with necessary utilities after approval by the Safety Group and LRWWU.

New Business as of December 14, 2011

1. The Safety Group is in process of obtaining the report for scrubber balancing to ensure proper operation. In addition, the Group is inquiring into the gas leak at the main shutoff for the administration building.

   Further information will be relayed to the group it becomes available.

2. At the request of a bordering town under an emergency basis, the LRWWU leant an unmarked Sodium Hypochlorite drum. The drum was later returned by the town to LRWWU and evidently had the possibility of rupturing, creating a potentially dangerous situation. The Group agreed that if the Utility lends emergency supplies to other facilities/communities, etc., the supplies must be labeled indicating the contents and that it originated from LRWWU. Furthermore, all chemical storage containers located within the Utility shall be labeled with appropriate signage as well. The goal is to avoid the possibility of products leant under such circumstances to avoid hazardous situations and allow for suitable safety measures to be taken in the event a dangerous condition occurs.

APPENDIX G

Sample E-Gov Work Order Summary

FISCAL YR 2011
JULY

CARPENTERS	COMPLETED	DATE	Men	HRS	TOT	
City Hall	Continue demo and cleanup	7/6/10	2	8	16	MS/DC
City Hall	Continue demo	7/8/10	1	8	8	DC
City Hall	Demo 2 rooms	7/2/10	2	8	16	RP/MS
Fort Hill Park	Finish siding	7/1/10	2	8	16	RB/DC
Shop	Make stakes cut up 2x4	7/1/01	1	1	1	MS
City Hall	Install public notice sign and looked at work at City Hall & Lowell High	7/2/10	1	4	4	RB
DPD	Removed spindle on door handle, drill new hole, adjusted overhead closer	7/7/10	2	3	6	RP/RB
City Hall	Removed ceiling and wall paneling	7/1/10	2	8	16	RP/MS
City Hall	Removed ceiling and wall paneling	7/1/10	1	4	4	RB
City Hall	Mud walls	7/21/10	1	3	3	DC
City Hall	Repair walls & ceilings	7/19/10	1	5	5	RB
City Hall	Move partitions to Smith Baker	7/19/10	2	4	8	JE/MS
City Hall	Continue work on walls & ceilings	7/15/10	2	8	16	DC/RB
Cemetery	Install door stop	7/15/10	1	1	1	RP
City Hall	Finish demo and clean up	7/9/10	2	6	12	DC/RB
City Hall	Trim and mudd walls	7/13/10	2	8	16	RB/DC
Alumni Stadium	Installed floor tile & plywood in stalls	7/13/10	1	3	3	RP
Aiken St Bridge	Make brace to hold in pen on bridge	7/15/10	1	3	3	RB
Oakland St Training Center	Straighten out sign	7/20/10	1	2	2	JE
Murkland School	3rd coat of mudd	7/20/10	1	1	1	DC
Pollard Library	Replaced exit device, reajusted overhead door closer and added new screws	7/13/10	1	3	3	RP
Alumni Stadium	Installed plywood on floor and luan	7/15/10	1	7	7	RP
Cemetary	Cut trim baseboard, install door stops	7/12/10	1	3	3	RP
West Sixth St	Board up 3 door and 2 windows	7/16/10	3	4	12	RB/MS/JE
Branch St Firehouse	Board up and bring old window to garage	7/21/10	2	2	4	RB/MS
Market St & Civic Center	Installed stages	7/21/10	3	5	15	RB/MS/DC
Rogers School	Installed A/C units	7/20/10	1	6	6	JE
City Hall	Continue plaster repair	7/29/10	1	8	8	DC
Martin Sports Complex	Finish door & wall replacement	7/28/10	2	8	16	JE/MS
City Hall	Continue plaster repair	7/28/10	1	8	8	DC
City Hall	Remove carpet	7/27/10	1	8	8	DC
City Hall	Remove carpet	7/27/10	1	4	4	RB
City Hall	Remove carpet	7/27/10	1	4	4	MS
City Hall	Remove and Reinstall shelves	7/27/10	2	4	8	RB/MS
Branch St Firehouse	Pick up and install window	7/25/10	2	2	4	RB/BL
Cawley Stadium	Frame walls for new doors	7/26/10	3	8	24	MS/RB/JE

CARPENTERS (Cond't)	COMPLETED	DATE	Men	HRS	TOT	
City Hall	Empty Offices	7/22/10	3	6	18	RB/JE/RB
Cawley Stadium	Build 2 walls, install doors	7/27/10	2	8	16	JE/RB
Misting Stations	Install misting stations for folk festival	7/23/10	2	6	12	RB/EZ
Auditiorium	Helped with tables for folk fesitval	7/21/10	1	3	3	BT
City Hall	Mud and tape walls	7/26/10	1	8	8	DC
Dutton St	Install stages	7/22/10	5	2	10	RB/DC/RB/RP/MS
Lee St	Install stage	7/23/10	2	5	10	MS/JE
Lee St	Install stage	7/23/10	1	1	1	DC
Dutton St/City Hall	Install stages for Folk Festival	7/23/10	2	6	12	RB/BL
Dutton St/City Hall	Install stages for Folk Festival	7/23/10	1	5	5	BM
City Hall	Remove AC brought back to shop	7/21/10	2	1	2	RB/MS
City Hall	Continue wall repair	7/14/10	2	8	16	RB/DC

HVAC	COMPLETED	DATE	Men	HRS	TOT	
Library	Reset A/C, added water to system	7/7/10	1	1	1	TC
City Hall	Removed old A/C and install new unit	7/7/10	1	1	1	TC
Civic Center	Reset pumps and chiller	7/7/10	1	2	2	TC
Civic Center	Unclogged drain & treated pan with tablets	7/8/10	1	4	4	MR
Library	Charged both sides of chiller, opened CW value in mech room	7/8/10	2	8	16	BT/TC
Civic Center & City Hall	Cleaned out condensate pump, checked various A/C's	7/5/10	1	8	8	TC
Parks Dept	Adjusted charge on condenser	7/7/10	1	2	2	TC
Fire Dept	Begin repair to A/C unit coil	7/8/10	1	4	4	MR
Pollard Library	Reset chiller both compressors	7/16/10	1	2	2	TC
Pollard Library	Reset chiller, checked pumps, checked air handlers added water to system	7/15/10	1	3	3	TC
Library	Reset compressor, changed filters	7/20/10	1	3	3	TC
Civic Center	Finish boiler breakdown repairs	7/21/10	2	4	8	MR/TC
Civic Center	Repaired coil, drained compressors and assembled wall unit	7/9/10	1	8	8	MR
Pollard Library	Checked chiller, tightened belt, and changed filter	7/9/10	2	4	8	TC/BT
DPD	Snaked out tray and checked units	7/9/10	1	1	1	TC
Civic Center	Repiped condensate drain, restarted A/C unit	7/13/10	2	4	8	TC/MR
DPD	Repaired leak in hallway	7/13/10	1	1	1	TC
DPD	Repaired A/C unit	7/13/10	1	1	1	TC
Civic Center	Installed new motor tray, cut off water value, opened junction box	7/13/10	1	2	2	TC
Police Dept	Repaired condensate tray, pumped out & cleaned return duct	7/13/10	1	4	4	MR
Smith Baker	Removed pipe from boiler, repiped all, installed new gate value	7/20/10	1	5	5	TC
Civic Center	Repaired A/C units	7/12/10	2	8	16	TC/MR
Civic Center	Charged and checked for leak at connections	7/19/10	1	5	5	BT
Civic Center	Clean out scale from boiler	7/28/10	1	8	8	MR
Civic Center	Clean out pit	7/30/10	2	8	16	MR/BM
Smith Baker	Boiler inspection	7/19/10	1	1	1	TC

APPENDIX H

Sample Parks Work Record

PARKS DIVISION DAILY WORK LOCATION RECORD			**Special Attention: Do not leave job site till 2:30pm		
Wednesday			Take breaks in area you are working.	**Return all tools to	
DATE: 1-18-12			All equipment must be cleaned out daily	stockroom -end of day	
	Equip.	Job	Description Of	Man Hours	Percentage
PERSONNEL UTILIZED;	Vehicle #	Location	Duties	Worked	Completed
Parks Worker Name	P-11	DeGweers ✓			
		Clem Shop		8	
		Inventory	(Still working on it)		
Damage or Breakdowns					

******DO NOT THROW YARD WASTE, WOOD, OR DEBRIS IN BARREL'S. TRASH ONLY***