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# Public Works Department Organizational and Operational Analysis: Town of Saugus, Massachusetts

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# Public Works Department Organizational and Operational Analysis

## TOWN OF SAUGUS, MASSACHUSETTS

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UMASS BOSTON

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# A. INTRODUCTION AND EXECUTIVE SUMMARY

This report presents the results of the management assessment of the Saugus 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, as well as Town management, current and former Town employees, and the former auditor. 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

and towns to compare the Public Works Department programs and practices to these municipalities.

- 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.

## 1. THE PUBLIC WORKS DEPARTMENT DISPLAYS A NUMBER OF STRENGTHS.

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 Department generally does a good job of leveraging the use of contractors to allow in-house staff to focus on its repetitive, non-specialized work.
- Departmental employees work well together, and have an admirable sense of responsibility to "pitch in" to work in the areas of greatest need. This has been especially important within the past year, as there have been workforce reductions in certain divisions.

These strengths provide a sound basis for further enhancements.

## 2. THERE ARE SIGNIFICANT IMPROVEMENT OPPORTUNITIES FOR THE DEPARTMENT GOING FORWARD.

The Department was forced to eliminate one administrative position, and five field operations positions in the past year due to the findings of an audit that determined that non-enterprise fund employees were being paid from the Water and Sewer Funds. Further, interviews indicate that the Department was staffed at even higher levels in years prior to the audit. So, although the descriptive profile of the Department (included as Appendix A to this report) reflects a total authorized contingent of 17 positions (16 of which were filled at the time of the project team's on-site activities) for the current, there were 23 positions in FY 2012, and this number was reportedly even much higher in earlier years. However, reducing staffing levels has been a common theme in local governments generally, and certainly in public works departments specifically, during this time period, so this, in itself, does not place Saugus's Public Works Department in a unique position. Although the mantra in local government has been to "do more with less" for some time now, this would have been an expected result of the cumulative effect of implementing new technologies and a more prudent use of contractors for specialized

services in any case. Therefore, although it is tempting on the parts of Public Works personnel to assume that increases in staff would solve most operational issues, the reality is that there are limits on local government's ability to fund increases in permanent staff. It is, however, true that the Saugus Department of Public Works has been impacted more than most, and, as the following pages will describe in some greater detail, staffing shortages are acute and will soon have a noticeable effect on the condition of its infrastructure.

With these considerations in mind, the project team has, in the following pages, made recommendations to enhance the operations of the Saugus Public Works Department. Although some of these recommendations do, in fact, address current staffing shortages where necessary, the over-arching themes for enhanced operations fall into the following categories:

- Enhanced use of information systems and technologies
- Enhanced preventive maintenance of Town infrastructure
- Enhanced management and planning efforts

## 1. Enhanced Management and Planning Efforts

The Public Works Department currently has no guiding structure in place to enable it to analyze, anticipate, plan or manage its work. Further, the Department lacks any asset management plan that identifies its infrastructure, its worth, its maintenance requirements, or the service levels and staffing resources required to maintain it. This is, in some respects, due to the lack of funding for such efforts, but is also related to the lack of managerial focus on these efforts.

Another element of management and planning efforts that should be a part of a well-functioning department is the establishment of performance measures, and a reporting structure to ensure the accountability for the attainment of agreed-upon levels of service. This is absent in the Saugus Public Works Department. The Department does issue an annual report that reflects certain workload metrics such as the numbers of water main breaks repaired, numbers of hydrants replaced, manholes sealed, catch basins cleaned, etc. However, these are simple reflections of the work performed, and without proper context, have no meaning to the reader. The real objective of performance measurement should be to report on the efficient and effective use of the resources utilized in attaining service level goals, and this is a lacking element of management and planning in the Department of Public Works currently.

## 2. Enhanced Use of Information Systems and Technology

Public Works Departments across the country are characterized by their focus on performing the tasks at hand. This is true of the Saugus Public Works Department as much as any other in the project team's experience. However, well-managed organizations, in order to plan, manage, control and adjust to changing environments, need to analyze their activities and to report to their constituencies on the efficiency of use of the resources that are allocated to them.

The inclination of public works managers is to focus on the accomplishment of work. However, this has also historically meant that the work that is accomplished is not documented or reported. This lack of workload reporting characterizes the Saugus Public Works Department, as it lacks not only the orientation toward workload reporting, but also the information systems and other technology to do so. The Department does utilize two work order systems that create open work orders for requested work, but this system is not utilized for any meaningful management purpose. The Department also lacks access to geographical information systems (GIS), handheld reference and reporting tools in the field, permit and plan review tracking software, and other management tools that define well-managed public works operations.

### 3. Preventive Maintenance of Infrastructure

Saugus taxpayers have a significant investment in buildings, parks equipment, streets, sidewalks, traffic signals, water distribution systems, sewer systems, as well as stormwater collection systems. Preserving these assets prolongs their useful lives 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 to preventively maintain the Town's fleet, 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.

## 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 B – Management Systems and Accountability** | | | | | | |
| 10 | The Department should design a work activity form for use by all field employees. The form should be completed after each activity is performed | Nov, 2014 | NA | NA | NA | NA |
| 11 | The Department should immediately begin the development of a comprehensive set of work activities performed by each division. | Immediate | NA | NA | NA | NA |
| 13 | The Department should invest in a computerized maintenance management system to develop an annual work program and scheduling plan. | 12-18 months | NA | NA | NA | $15,000 to $30,000 |
| 16 | The Department should commit to the development of an asset inventory. | 12-18 months | NA | NA | NA | NA |
| 17 | The Department, in conjunction with theTown Manager, should define the service levels that are appropriate to be accomplished. | 12-18 months | NA | NA | NA | NA |
| 18 | The Department should 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. | January – July 2014 | NA | NA | NA | NA |
| 22 | The Department should develop a formal work planning and scheduling system. This formal work system should be standard across each division of the Department. | January – July 2014 | NA | NA | NA | NA |
| 24 | The Department should generate a monthly performance report comparing planned versus actual performance and costs. | Begin FY15 | NA | NA | NA | NA |

| Page | Recommendation | Time Frame | Revenue Increase | Cost Increase | Cost Reduction | Capital Outlay |
|---|---|---|---|---|---|---|
| 26 | The Department should establish a policies and procedures committee from all divisions to identify the appropriate topics for coverage in a policies and procedures manual. Then, the committee should develop standard policies and procedures for these topics. | July 2014 – July 2015 | NA | NA | NA | NA |
| **Section C – Organizational Structure** | | | | | | |
| 28 | The project team makes no recommended changes in the support staffing levels in the Department currently. | NA | NA | NA | NA | NA |
| 31 | The Town should add the duties of Town Engineer to the position of Department Director. The Town should also create the position of Assistant Town Engineer | 12 months | NA | $71,500 | NA | NA |
| 32 | The Town should consolidate the Cemetery and Public Works departments. | March, 2014 | NA | NA | NA | NA |
| 33 | The Town should merge the operations of the Recycling Department with the Public Works Department. | March, 2014 | NA | NA | NA | NA |
| 34 | The Department should enhance its use of the Town's GIS to enable analysis of work performed on infrastructure, trends in calls for service, as well as many other facets of work. | Begin after hiring of Director/ Engineer | NA | NA | NA | NA |
| **Section D - Operations** | | | | | | |

| Page | Recommendation | Time Frame | Revenue Increase | Cost Increase | Cost Reduction | Capital Outlay |
|---|---|---|---|---|---|---|
| 36 | The Town should ensure that it allocates a sufficient level of funding for vehicle and equipment replacement, as further aging of the current fleet will result in both safety concerns as well as unnecessary expenditures on maintenance and repairs. | Ongoing | NA | NA | None immediately, however this will result in lower maintenance costs | TBD |
| 42 | The Department should acquire and implement a formal pavement management software system. | FY15 | NA | $0.09 to $0.12 per yard of pavement in the first year | NA | NA |
| 44 | The Department should hire two additional Equipment Operators in the Highway Division. These employees should be assigned to do some of the more routine work that is currently outsourced, such as sidewalk repair, and to enhance the Division's capabilities in other routine work of the Division such as the repair of storm drains, manholes, removal of debris from roadways, drainage maintenance, and other routine work of the Department. | Immediate | NA | $121,000 | NA | NA |
| 46 | The Department should investigate the cost of contracting out the mowing of the Town's parks and athletic fields. | 12-18 months | NA | NA | TBD | NA |

| Page | Recommendation | Time Frame | Revenue Increase | Cost Increase | Cost Reduction | Capital Outlay |
|---|---|---|---|---|---|---|
| 47 | The Department should certify at least one Parks Division employee as a Certified Playground Safety Inspector (CPSI). | FY15 | NA | Minimal | NA | NA |
| 48 | The Department should hire two Equipment Operators to perform critically-needed preventive maintenance on the distribution and collection systems. | Jan, 2014 | NA | $118,000 | NA | NA |
| 52 | The Department should enhance the functionality of its web site by, first, providing each of its component divisions its own page, and secondly, by enhancing the information provided. | FY15 | NA | NA | NA | NA |
| 53 | The Department should eliminate the requirement for two workers to be present for routine checks of substations each weekend. The project team also recommends that the Town investigate the costs and benefits of purchasing and installing a SCADA system at its ten substations in order to gather a greater degree of operating information that may allow the elimination of routine checks of the substations. | Immediate | NA | NA | $10,000 | NA |
| 54 | The Department should institute a structured approach to the evaluation of the feasibility of outsourcing. | Immediate | NA | NA | NA | NA |
| 55 | The Department should establish goals, objectives, and performance measures for its employee safety program. | FY15 | NA | NA | NA | NA |

# B. MANAGEMENT SYSTEMS AND ACCOUNTABILITY

Management accountability is the expectation that managers are responsible for the quality and timeliness of program performance, for 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 reporting.

## 1. THE PUBLIC WORKS DEPARTMENT SHOULD IMMEDIATELY BEGIN TO DOCUMENT AND REPORT THE WORK THAT ITS CREWS ACCOMPLISH.

The Public Works Department documents little of the work it accomplishes on a daily basis. The support staff in the office utilize a work request system that records reports of problems (e.g., flooding, potholes, pipe blockages, etc.) and turn these over to the appropriate foreman for investigation and, if appropriate, abatement. However, the project team's observation of this process indicates that the work requests are not consistently closed out. Further, there is no record of the number of field workers used in completing the work, and no record of the time expended by these workers.

Taking these calls, recording the reported problems, and tracking their completion consumes a significant amount of time of one of the Administrative Clerks in the office, yet the usefulness of the data recorded is minimal beyond the recording of the locations of the work and the fact that it was completed on a particular date. As it is currently designed, the work request process functions simply as a repository of work that was requested and accomplished, and does not foster an analysis of the productivity of staff or the efficiency with which the work was accomplished.

The managers and employees in the Department, like many public works departments, are not accustomed to reporting the work in any manner other than reporting the work they accomplish to the Administrative Clerk. However, most well-managed departments now place the responsibility on the field staff to report not only the locations and descriptions of work performed, but also the time, equipment and materials expended in its accomplishment.

The project team recognizes that the Saugus Public Works Department does not possess a computerized maintenance management system (CMMS), and this will be addressed in a later section of the report. However, automated systems, while extremely useful in performing analysis, are not necessary for the institution of a more robust work order system than is in place currently. The project team recommends that the Department immediately institute a

work reporting system that is, in the near term, based on a manual work activity form. The elements of the work reporting form should include the following:

- Date
- Location
- Name of Crew Member(s)
- Description of Work to be Performed (filled out by Foreman)
- Description of Work Performed (filled out by crew members)
- Equipment Used
- Quantities of Materials Used
- Hours Expended in Repair/Maintenance

There are other important elements of a work activity form, such as activity codes for the major elements of work, and a section in which supervisors and foremen project the time, equipment and materials expected in the task. However, the project team believes that these should be instituted at later points in the process, as employees of the Department should not attempt to incorporate more than the basics of work reporting at this time.

The work activity form should be signed by the foreman authorizing the work and should be transmitted to the Administrative Clerk. In the period until a formal CMMS is installed, the Clerk should enter this information into an electronic spreadsheet, such as Excel. This will allow at least the summation of hours by employee, and by type of repair (e.g., drainage, pothole repair, water main repair, etc.). The data collected in this electronic spreadsheet should be transferrable to an automated CMMS at a later date, but the process of collecting data should begin immediately.

**Recommendation: Design a work activity form for use by all field employees. The form should be completed after each activity is performed by each crew member or crew leader and turned in to the Administrative Clerk for input into an electronic spreadsheet.**

## 2. THE DEPARTMENT SHOULD DEVELOP AN INVENTORY OF WORK ACTIVITIES IT PERFORMS IN THE MAINTENANCE OF ITS INFRASTRUCTURE.

This should be viewed as a process of training supervisors and workers in the mechanics of recording work, and more importantly, in educating them in the importance of doing so. Ultimately, however, the Director and supervisors in the Public Works Department should define the work activities performed by their crews, including those that consume the majority of staff work hours and 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, so that the same activity is recorded the same way, and in the same category, each time it is performed. 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 |
| Catch basin cleaning | Number of catch basins |
| Sewer televising | Linear feet |
| Vehicle Maintenance | Preventive labor hours, unscheduled labor hours |

The Department should ensure that the work activities used are comprehensive and meaningful in terms of their usefulness in management decision-making. The data should, at first, be recorded by crew members on manual sheets, and transferred by administrative staff into the CMMS.

**Recommendation: First, the Department should engage in a process of educating the work force as to the importance of the work activity data that should be reported on each task. Depending upon the work force, this may be a weeks-long process, as workers have been trained over a period of years to simply "get the work done" and go on to the next task. However, the Department should immediately begin the development of a comprehensive set of work activities performed by each division in the Public Works Department so that these may be used to populate the CMMS, described in the next section.**

## 3. THE PUBLIC WORKS DEPARTMENT SHOULD INVEST IN A COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM (CMMS).

The Saugus Public Works Department has never had an automated work management system in which crew members were required to play major roles in formally reporting their work activities. Therefore, it is unrealistic to expect that any CMMS, simply by virtue of being purchased and installed, will immediately result in meaningful data coming from the system. The project team has recommended the institution of a manual work order process in previous sections of this report as a preliminary step toward full automation of the work performance, tracking and reporting system.

There are many benefits of a CMMS once employees are fully trained in both the mechanics of how and what to report, and the importance of doing so. The benefits include not just the obvious ones of tracking and justifying the dates, employees, locations and descriptions of work performed, but they also can be used to define appropriate service levels that are achievable with a given number of labor hours, and at a defined level of productivity. 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 Public Works Department should utilize the maintenance management system to enable the identification of the services provided (e.g., gate valve exercising), the levels of service (e.g., gates are exercised biannually), the outputs of each of these services (e.g., the number of gate valves exercised and the percentage of the total system that this represents), and the cost of those services in terms of the total cost and the cost per unit of output. One of the severe deficiencies of the Department currently is that it lacks sufficient data to detail the probable impact of the large reduction in staff it sustained last year. Had a well-functioning CMMS been in place, it would have been possible to define the precise impacts on service levels.

This maintenance management system should be a standard one, and one that is 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 show 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 Director to the Council and to the Town 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 Town 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 in order to maximize the utility of a CMMS are described in the following sub-sections.

**Recommendation: The Department should invest in a computerized maintenance management system 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. An added benefit of the system would be its compatibility with the Town's payroll system, which will, in the future, potentially allow for the direct entry of tasks and labor hours directly into the system in order to monitor and report the tasks in which the Department is expending its time.**

## 4. THE PUBLIC WORKS DEPARTMENT SHOULD ESTABLISH AN ASSET MANAGEMENT PLAN.

The Public Works Department is responsible for the maintenance and repair of an infrastructure in which the Town has made a significant investment. And like most cities and towns across the Commonwealth and, in fact, the country, the Saugus Public Works Department has seen operational and capital funding decrease over the past several years.

With few prospects that the levels of funding seen in prior years will return in the immediate future, the Public Works Department is faced with decisions regarding the optimum manner in which it maintains the Town's streets, sidewalks, plant and equipment, facilities, grounds, distribution and collection systems, fleet, and other assets. Increases in fees for service are typically viable options, especially in instances in which fee levels have not been adjusted for some time, or are substantially lower than in other comparable municipalities. However, in the current environment, even this may be difficult. Further, given that non-enterprise fees currently represent only a small fraction of the total expenses of the Department, even a substantial increase in fee levels would have a small impact on total revenues.

Therefore, the options for the Public Works Department are to either decrease services and service levels, or to enhance the efficiency and effectiveness of current operations. There are options for both, however the Department 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 Town's infrastructure assets, their performance, their preservation, and their anticipated longevity. Effective asset management is important for at least two reasons, including:

- The Town'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 Town should be replacing or rehabilitating an average of 1% to 2% of this infrastructure each year, and in fact is using Local Pipeline Assistance funding to replace some of this aging infrastructure. The project team does not possess data on the precise number of miles replaced using this funding source, but there were 47 main breaks in 2012. This corresponds to one break per 2.6 miles, which is well in excess of the norm for a system that has been regularly replaced and rehabilitated[1].

- Develop a long-term rehabilitation and replacement plan for the street system. Again, the project team does not possess data indicating the exact number of linear miles replaced in the recent past, but visual observation of Town-owned streets indicates that many streets have not been replaced or rehabilitated in many years. Further, the Public Works Department does not utilize a formal and systematic methodology for assessing the pavement condition of all street segments on a routine basis. The project team addresses this in a later section of this report.

- Commit to a five-year replacement plan to address deferred replacement requirements of the Town's vehicles and equipment. As the project team will show in a later section of

[1] Main breaks can occur for reasons other than insufficient replacement cycles and maintenance. However, unless there are unusual circumstances related to disasters, seismic activity, etc., the project team typically experiences about one break per 8-10 linear miles.

this report, it is clear from the age of the fleet that there has been a significant deferral of expenditures on this important element of operations. The project team recognizes the significant financial restrictions of the Town, and does not recommend the establishment of a five-year plan as a method of determining the funding required to immediately replace vehicles and equipment that are past their economic lives, as this would not be possible without significant borrowing. The project team does, though, recommend the establishment of a five-year replacement plan as a tool for identifying priorities in a more limited program of fleet replacement.

The Department needs to address these challenges in the rehabilitation and replacement of the Town's assets. In many cases, public works departments are able to allocate staff more efficiently in order to document asset locations and conditions, and load these into a geographical information system (GIS). However, as will be noted later in the report, the Saugus Public Works Department's staffing shortages will prohibit this in the near term, as will its lack of access to, and expertise with, a GIS. But with the hiring of an Engineer in the Department, as well as staff in other key areas, this initiative should begin within the next 12-18 months, and should incorporate the answers to the following 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).

Before beginning the initial asset inventory, the DPW, under the direction of the Town Engineer, should install and familiarize all personnel who will be involved in data entry with the 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.

Further, the DPW should conduct a pilot program to ensure 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.

**Recommendation: Commit to the development of an asset inventory. This inventory should define the asset, its value, its location, its maintenance frequency, its maintenance services, and the individual or division that is responsible and accountable for its maintenance and repair.**

## 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 the DPW appear to be performed almost solely in reaction to requests for services, largely with no orientation toward proactive maintenance of the infrastructure.

- The Director and supervisors have not actively sought information that would enable them to anticipate workloads, location and timing of services, and staffing needs for the various crews under their supervision.

Although each 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. 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 parks maintenance might include the following:

- Turf area to be mowed weekly during dry season – grass height 2".

- Fertilization of the turf area should be completed with a balanced fertilizer such as 16-6-8 annually once during the summer.

- Turf aeration should be completed during the spring while the grounds are still soft from winter moisture.

- Swings and play equipment shall be inspected on a weekly basis and serviced if required.

Some judgment will be needed in applying the standards, but they should 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 quantitatively as well.

**Recommendation: The Department, in conjunction with the Town Manager, should define the service levels that are appropriate to be accomplished.**

## 6. THE DEPARTMENT SHOULD DEVELOP PERFORMANCE STANDARDS.

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 should 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." Examples will depend on the specific work types of the Department, but may include seldom-performed activities such as fence installation or repair, transporting items between buildings, etc.

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; however, best practices in the industry can be utilized as guides as well. 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. With a total of 17 authorized employees, Saugus'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 crack sealing 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 HIGHWAY DIVISION

| **Activity No.:** | **Activity Name:** |
|---|---|
| S-001 | Crack Sealing |
| **Description and Purpose:**<br>Cleaning, filling and sealing cracks in paved surfaces to prevent the passage of water into the base or sub-base of the road. Not designed for use on areas of alligator cracking or where surface shows signs of base failure. | |
| **Schedule**<br><br>Perform work to prevent water from penetrating and damaging the roadway surface. Sand seal after application. | |
| **Authorized by:**<br><br>Assistant Director | **Level of Service:**<br><br>Ensure smooth transportation over paved roads. . Performed on cracks greater than 1/4" wide. Perform when temperature is above 50 F and dry. |
| **Crew Sizes:**<br><br>2 MEO<br>1 Laborer<br><br>**Equipment:**<br><br>1 Grader<br>1 Pickup<br>3 Dump Truck<br>1 Street Roller<br>1 Water Truck<br>1 Loader | **Work Method:**<br><br>1. Place safety signs and devices<br>2. Clean cracks as necessary<br>3. Fill cracks with seal material<br>4. Cover crack filler lightly with sand<br>5. Remove safety signs and devices |
| **Material:**<br><br>100 gallons liquid crack filler<br>Sand | **Average Daily Production**<br><br>100-200 gallons of crack filler per day |

Note that the sample form has an activity number in the upper left corner. The project team referred to this concept in an earlier section of the report in discussing the elements of a

manual work activity sheet that is completed by each crew or crew member. This activity number (S-001, in this example) should be filled in by employees in accordance with an established set of activity codes that define the full list of activities in which the Department typically engages. The use of an activity number, or code, facilitates the analysis of work productivity and efficiency by enabling the Department to sort all work hours expended against a numeric value rather than a text string, such as culver cleaning, gate repair, pothole patching, etc. Numeric values are shorter and encompass an agreed-upon set of activities, whereas text strings are longer and may be reported in different ways by different employees. For example, culvert cleaning may be reported variously as "cleaned culverts", "culverts cleaned", or many other variations.

## 5. DEVELOP A FORMAL WORK PLANNING AND SCHEDULING SYSTEM.

The real work of management on a daily level begins at this point in the process. The previous elements of management systems described above deal with establishment of systems and accountability; once implemented, the Director should be able to safely rely on foremen and support staff to implement them.

This task involves the development of a formal work scheduling system, the objective of which is to ensure that the planned amount of work is done. This element of the process requires that the Department Director analyze the work, establish the service levels that can and should be met, anticipate probable interruptions to the smooth flow of work, and to work with foremen in scheduling the work to be performed. In other words, the successful implementation of a well-functioning management and planning system relies on the Director, with cooperation and input from subordinates, to proactively plan and manage the work, rather than simply reacting to the work requests that are in the day's in-box.

After the annual work program is approved by the Director, division supervisors 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. This, though, is one of the values of the CMMS, as it will allow the Director to quantify the impact of these interruptions within specified boundaries of probability.

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

## Exhibit

## Sample Annual Work Program for the Highway Division

| | Labor Days | | Amount of Work | | Total Cost | | Productivity | |
|---|---|---|---|---|---|---|---|---|
| **Work Activity** | **Plan** | **Actual** | **Plan** | **Actual** | **Plan** | **Actual** | **Plan** | **Actual** |
| Gravel Replacement | 55 | 61 | 8,250 cubic yards | 9,113 cubic yards | $1,230,000 | $1,333,440 | 150 cubic yards per day | 149.3 cubic yards 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 Town.

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 Highway Division on the next page. This sample is not intended to be a full listing of the activities performed by the Highway 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 tracking system such as is present in the Public Works Department currently is a helpful step in listing the types of work performed in the Department, 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. This formal work system should be standard across each division of the Department.**

## Exhibit

### LIST OF MAINTENANCE ACTIVITIES FOR HIGHWAY 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 |

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

This next step of the planning and work programming initiative involves the development of a work reporting system. The Director and division managers and supervisors 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 Director should be required to provide a monthly status report to the Town Manager and Town Council, which should be more than a simple statement of the work that was accomplished. It should reflect not only this, but also 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 Director's monthly performance reports to the Town Manager.**

## 7. POLICIES AND PROCEDURES FOR THE DEPARTMENT SHOULD BE CLEARLY DOCUMENTED.

The Public Department is operating without formal policies and procedures to guide their managers and supervisors in areas such as personnel rules, risk assessment, rate setting, budgetary analysis, media contact, snow removal, and more.

In developing policies and procedures for the Department, the following approach should be utilized.

- Minimize. The policies and procedures should be kept to a minimum.

- Best Methods. Make certain the procedure represents the "best method". This means the procedure has undergone detailed analysis and is continually challenged.

- Review and Revise. All policies and procedures should be reviewed annually.

- Keep Current. The problem with many policies and procedures is that they have long ago outlived their usefulness. No one remembers why the policies and procedures were created in the first place. Sometimes they contradict each other and create even more confusion. Responsibility for updating these policies and procedures should be clear.

- Short is better than long. It is not the quantity, but the quality of information that is the essential problem of the information age.

- Be ready to change. The key to organizational effectiveness and efficiency is finding a better way. The Department must always be ready to challenge current policy or change it.

- The policies should be readily available to employees, supervisors, support staff and managers.

The project team has provided below the broad general topics that should be considered in a policies and procedures manual that are based on the American Public Works Association's (APWA) Management Practices Manual. These should be adapted for applicability to the working environment in Saugus.

- Organization and Strategic Planning
- Human Resource Management
- Occupied Facilities (Security, Risk Assessment, Environmental Controls, etc.)

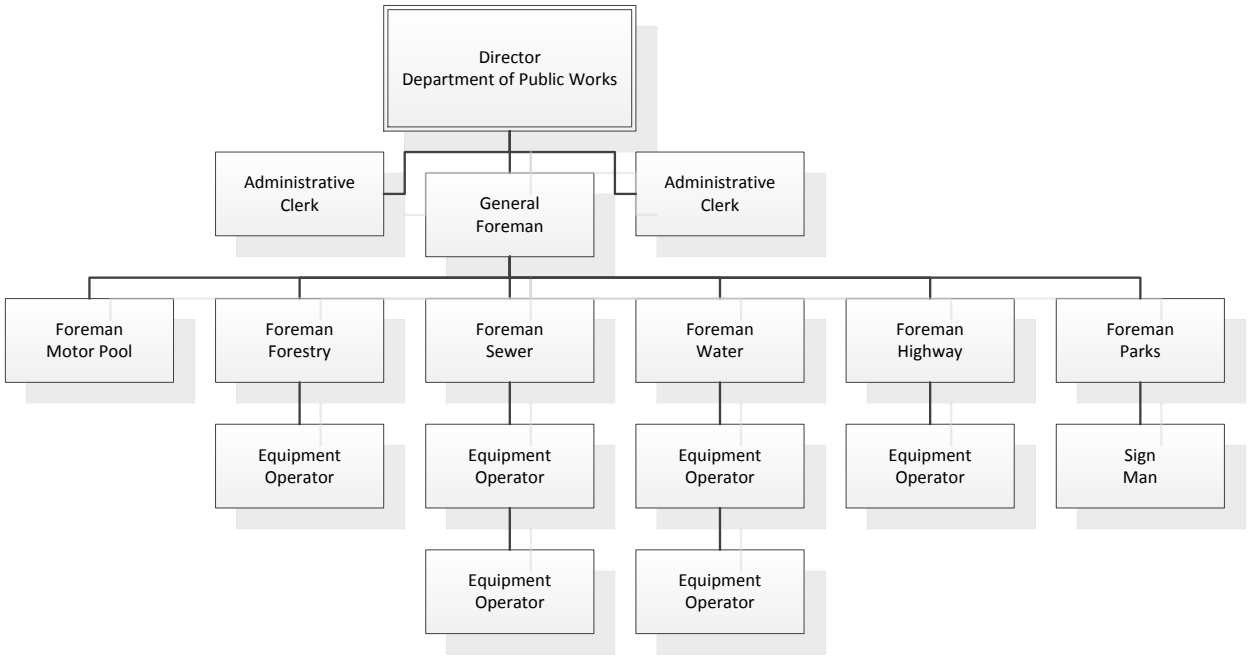
- Finance
- Risk Management
- Communications
- Information Technology and Telecommunications
- Emergency Management
- Safety
- Planning and Development
- Engineering Design
- Bid Process
- Project Management
- Right-of-Way Management
- Utility Coordination
- Facilities Management
- Equipment and Fleet Management
- Parks, Grounds and Forestry
- Solid Waste Management
- Solid Waste Collection
- Solid Waste Recycling and Reuse
- Solid Waste Disposal
- Street Maintenance
- Street Cleaning Management
- Environmental Compliance
- Snow Removal and Ice Control
- Storm Water and Flood Management Service Levels
- Vector Control
- Potable Water
- Wastewater Collection and Conveyance
- Traffic Operations
- Parking
- Cemeteries

**Recommendation: The Public Works Department should establish a policies and procedures committee from all divisions to identify the appropriate topics for coverage in a policies and procedures manual. Then, the committee should develop standard policies and procedures for these topics. Sample policies and procedures may be purchased through APWA or other providers. Other policies may be borrowed from other cities and towns either within or outside Massachusetts, and may be modified to suit the particular operating environment in Saugus. The project team has provided a sample policy related to Snow and Ice Control in Appendix C of this report. This is intended to be a template for modification to suit the particular circumstances of the Town of Saugus.**

# C. 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 structure.

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, in Appendix A.

## 1. THE ADMINISTRATION DIVISION IS ADEQUATELY STAFFED WITH SUPPORT PERSONNEL AT THE CURRENT TIME.

The Department's support staff includes two Administrative Clerk positions, and the position of Department Director. The two Administrative Clerks currently support a total of 15 positions, two of which are being filled by a single incumbent.

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" ratio of support staff to technical and operational staff varies between 1:9 to 1:25 or more for small to medium sized infrastructure maintenance organizations. With two administrative positions supporting 15 authorized positions in the Department, this equates to a ratio of one support position for every 7.5 operating positions, and places the Saugus Public Works Department below the typical range. However, it is also true that the administrative staff do not utilize automated systems to any significant degree, which tends to increase the requirement for support personnel. The project team's observations of the work methods in the Department indicate a very high level of reliance on manual systems and processes. It is unlikely that any single one of these is, in itself, responsible for the relatively high number of clerical and administrative staff; however, the cumulative effect is, in all probability, very large. Time and attendance data are transmitted manually from the field staff, are manually totaled, and are manually transmitted to Town Hall. As has been noted above, to the extent that work activities are recorded at all, they too utilize manual systems. Even purchase requests and purchase orders are manual processes.

The project team finds that the number of support staff in the Department currently is sufficient in terms of overall numbers to support the technical and field staff, and likely has excess capacity to handle an even greater volume of activity. The project team also notes, however, that the Department is under-staffed in certain operational areas, and with the recommended additions to staff over a period of time, as will be discussed later in the report, the two current Administrative Clerk positions will be more fully-utilized than is the case currently.

**Recommendation: The project team makes no recommended changes in the support staffing levels in the Department currently.**

**2. THE TOWN SHOULD REQUIRE THAT THE DEPARTMENT DIRECTOR ALSO SERVE AS THE TOWN ENGINEER. FURTHER, THE DEPARTMENT SHOULD HIRE AN ASSISTANT ENGINEER TO HANDLE THE DAILY ENGINEERING DUTIES OF THE DEPARTMENT.**

The position of Town Engineer has been vacant for approximately two years, when the employee vacated the position. At that time, the Town elected not to fill the position, but rather perform the duties with a contract employee who spends four hours per week in the Department. Through interviews, the project team discerned that this employee's focus is primarily to build streets to Town standards in order that they may be accepted. The employee has little time to properly file plans, manage construction projects, assess facility and pavement conditions, maintain infrastructure layers in the Town's GIS, develop and enforce engineering standards, and many other duties.

The Department contracts out all design work, so it is not strictly necessary to require the Town Engineer to possess a Professional Engineer (P.E.) license, and therefore the Department Director may function in the dual roles of Director and Town Engineer. It is, however, necessary that the incumbent possess sufficient experience to be able to understand engineering principles, to read and understand plans, and to be able to challenge design and construction contractors on deliverable documents.

It is unreasonable to expect the Director/Engineer to function as the only engineering position in the Department. This is especially true given the many other initiatives that the project team recommends that the Department implement over the next 18 to 36 months. Therefore, the project team recommends that the Town create the position of Assistant Town Engineer. This position should be made responsible for the daily engineering activities of the Department, both from an administrative and operational standpoint. The duties of the Director/Town Engineer and the Assistant Town Engineer may include the following:

- Plan Review – The Assistant Town Engineer, in conjunction with the Director, would be responsible for review of project plans for compliance with Town codes and standards, and could provide pre-application input in coordination with the Town's Planning Director, which will ensure that plans are submitted in compliance with requirements. This role would need to be performed in coordination with the General Foreman so that operational insights and input could be incorporated in the plan review.

- Permit Issuance - The Assistant Town Engineer would be responsible for the issuance of associated permits such as street opening, curb cuts, etc. The position would also be responsible for facilitating the issuance of street addresses for new development. Again, collaboration with the General Foreman will be needed to ensure that permits being issued do not conflict with other departmental efforts, such as allowing a street opening permit shortly after a street has been repaved.

- Capital Planning – the Director and the Assistant Town Engineer would contribute to the identification of proposed projects to be considered by the Town Manager, the Board of Selectmen and Finance Committee, and would be the lead staff member responsible for implementation. Specifically, the Assistant Town Engineer would, in conjunction with the Director, prepare design specifications for inclusion in a request for proposals (RFP), or oversee the work of an outside engineering firm tasked with doing so. The Assistant Town Engineer would also participate in the review of proposals submitted in response to the RFP in coordination with the Director and the Procurement Office. Lastly, the position would be tasked with monitoring the work being performed to ensure that it is on time, within budget, and conforms to quality standards.

- Policies, Procedures, and Specifications – the Director would be responsible for updating developing new engineering specifications, policies and procedures, as needed. However, the Assistant Town Engineer should be given responsibility for updating, maintaining and disseminating these on a periodic basis. Having a clear set of specifications, particularly for private developers who will be tapping into or otherwise building public infrastructure as part of their conditions of approval, will save time for all involved.

- Technology – The Assistant Town Engineer should be responsible for updating the layers of the GIS system related to public works and would be charged with using the system to meet the Department's data needs. Since the work of the Department is inherently geographic in nature, GIS data could be invaluable in streamlining work efforts, analyzing the patterns of complaints and needed repairs, and starting the process to prepare a proactive maintenance plan for Town infrastructure.

- Maintenance Program – in collaboration with the Director and the General Foreman. the Assistant Town Engineer would be responsible for drafting a proactive maintenance plan that would ensure that the Town maximizes the utility of its infrastructure.

- Pavement Management Assessment – The Assistant Town Engineer should be given the responsibility for formally assessing the condition of paved surfaces in the Town, resulting in a prioritized listing of roads that require rehabilitation, resurfacing or reconstruction. This will be described in more detail in a following section of the report.

The current position description for the Department Director should be revised to include duties of the Town Engineer. Further, the Town should create the position of Assistant Town Engineer, emphasizing the responsibilities listed above. Further, the project team recommends that the position of General Foreman be eliminated and replaced with the position of Assistant Town Engineer, assuming the duties of the General Foreman as well as the additional engineering duties outlined above. The span of control of the Foremen in the Department does not warrant a dedicated General Foreman, but rather an employee with diverse skills who can both plan and manage field work as well as assist the Director in an engineering role in the office.

The Project Team finds that anyone selected for the position need not have a PE license as they will not be required to stamp plans. Instead, the Town could elect to recruit for the position with the requirement of a degree in engineering and substantial work experience in the field. The Town could additional seek someone who has passed the PE exam, but may not currently be licensed.

**Recommendation: The Town should add the duties of Town Engineer to the position of Department Director. The Town should also create the position of Assistant Town Engineer and hire an incumbent within the next 12 months. Although the position of Assistant Town Engineer does not currently exist in the Town's listing of employee classifications, the project team estimates that, based on other positions with potentially similar job complexities in the Town, the position would be compensated at an annual rate of about $55,000. Assuming a benefits rate of 35%, the total cost of the position would be approximately $71,500.**

## 3. THE TOWN SHOULD MERGE THE OPERATIONS OF THE CEMETERY WITH THE DEPARTMENT OF PUBLIC WORKS.

The Town of Saugus operates the 17-acre Riverside Cemetery and the First Parish Cemetery, which is a small 0.75 acre veteran's lot. The cemeteries are maintained by a Superintendent, a Foreman and a Laborer. This equates to about six acres per worker, which is considered sufficient staffing to result in a very high level of care. Additionally, Essex County inmates are used to mow the cemeteries, which should allow for an exceptional degree of care provided by the three available workers in the Department. The Cemetery Department reports directly to the Town Manager.

The work of the Cemetery Department is similar in many ways to the work performed by the Public Works Department. Each department is responsible for mowing, weeding and beautification efforts in their respective areas, and both rely on unskilled labor to accomplish their duties. Further, both departments utilize mowers, string trimmers and a variety of similar hand tools. These similarities mitigate in favor of a consolidation of the two departments. The consolidation would offer a single department director the flexibility of allocating a larger pool of workers to areas of greatest need, which, given the current staffing shortages in the Public Works Department, would be of great benefit.

The project team recently conducted a survey of similarly-sized municipalities and found that it is common for the cemeteries to be organizationally-placed under the Public Works Department. The following table provides the results of this survey.

| Town | 2010 Population | Organizational Placement | No. Cemeteries |
|---|---|---|---|
| Winchester | 21,374 | DPW | One |
| Canton | 21,561 | DPW | One |
| Stoneham | 21,437 | DPW | One |
| Belmont | 24,729 | DPW | Two |
| Dedham | 24,729 | DPW | One active, one historical, one infant |
| **Saugus** | **26,628** | **Separate Dept.** | **One active, one historical** |
| Watertown | 31,915 | DPW | One active, one inactive |

As can be seen in the table, Saugus is the only one of the seven towns surveyed in which the maintenance of the cemeteries is under the direction of a department separate from the Public Works Department.[2]

The project team recommends that the Town consolidate the Cemetery Department with the Public Works Department. There are several benefits to this consolidation, which include the following:

- The functions performed in the two departments are similar, as is the equipment utilized
- There is a high reliance upon unskilled labor in both departments
- Consolidation offers the flexibility of allocating personnel resources to areas of greatest need, under a single management structure
- The three maintenance personnel in the Cemetery Department maintain only about 18 acres, which is a very "rich" ratio. This is in contrast to the relatively low staffing levels for the infrastructure being maintained in Public Works.
- It is very common for the cemetery function to be organizationally-placed under the Public Works Department, as the project team's survey shows.

**Recommendation: Consolidate the Cemetery and Public Works departments.**

## 4. THE TOWN SHOULD MERGE RECYCLING OPERATIONS INTO THE DEPARTMENT OF PUBLIC WORKS.

Until 2001, the operation of solid waste and recycling were responsibilities of the Department of Public Works. From 2001 till 2007, these services were the responsibilities of the Inspectional Services Department. From 2007 till the present, a single employee, the Recycling Coordinator, has overseen these functions and reports directly to the Town Manager.

The Recycling Coordinator's functions include overseeing contracts, issuing bids for services, applying for and managing State grants, coordinating Hazardous Waste and E-Waste days, and other related services. These activities are relatively self-contained and do not require

[2] The towns of Arlington and Belmont, and the City of Newton were also included in the survey, however, as their populations are much larger than Saugus', they are not included in the table. For reference, however, the cemetery functions are parts of the Public Works Departments in Arlington and Belmont, and a separate department in Newton

substantial interactions with other Town departments. However, the Recycling Coordinator relies upon Public Works Department personnel to remove illegal dumps (old boilers, televisions, mattresses, etc.) when they are found. Further, the drop off center operated by the Recycling Coordinator, is located at the compost site on the Public Works Yard.

The existence of a one-employee Recycling Department reporting to the Town Manager argues strongly in favor of consolidation with an existing Town department. The fact that there is some degree of dependence upon, and interaction with, the Public Works Department indicates that the Recycling Department's optimal placement is within the DPW.

**Recommendation: Merge the operations of the Recycling Department with the Public Works Department.**

## 5. THE DEPARTMENT SHOULD ENHANCE THE USE OF THE TOWN'S GEOGRAPHICAL INFORMATION SYSTEM.

As mentioned above, the Town of Saugus has a Geographic Information System (GIS), however the Public Works Department has no access to this GIS, and does not possess the requisite skills to populate or maintain the layers that would apply to the Department. A GIS would ideally contain spatial records and allow viewing on maps in varying levels of detail, from town-wide down to individual parcels, and everything in between. These layers would include, for example, the size and location of the Town's many water and sewer lines, the direction of flow in the sewer system, the points at which the public infrastructure connects to private property, manholes, etc. The system also can be used to store and access many different types of data that apply to specific locations such site photographs and scanned historic documents. Collectively, the information in the GIS can be mapped and analyzed whether this is at the level of a specific parcel or in discerning trends in the types and numbers of complaints received. The GIS could also potentially be tied into the Department's work order system to organize each day's work most efficiently or to look at the patterns of water main breaks to start investigation on whether particular lines are in need of wholesale replacement.

However, unless it the GIS data is regularly updated, it can quickly become obsolete. Replacements of water lines or sewer lines should be noted in the system, and major capital investments that change roadway or sidewalk width should be acknowledged as they may result in modification to the street layer. This effort should be accomplished by the Assistant Town Engineer, with assistance from support staff who could be trained in data entry and the use of spreadsheets, as technical GIS expertise may not be needed for much of the updating effort.

Further, as noted above the Assistant Town Engineer should take on a leadership role within the Department to manage the data stored within the GIS system, identify new data that

should be added, and using the data to help the Director and General Foreman guide work efforts of the Department in the short term and plan for the future, in the form of a proactive maintenance plan and capital improvement plan.

**Recommendation: The Department should enhance its use of the Town's GIS to enable analysis of work performed on infrastructure, trends in calls for service, as well as many other facets of work. The Town Engineer should take a lead role in updating and managing the information in the GIS from a Public Works perspective.**

# D. OPERATIONS

This section of the report analyzes the operations of the Department of Public Works.

## 1. THE TOWN SHOULD INCREASE REPLACEMENT FUNDING FOR THE PUBLIC WORKS FLEET.

The project team analyzed the age of the vehicles and equipment maintained by the Department's Maintenance Mechanic and determined that he maintains a relatively old fleet. The project team placed all 53 vehicles and pieces of equipment maintained by the Department's Motor Pool Division 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 | Heavy Van, Pickup | 20 | 9.0 |
| 2 | Heavy Equipment | 14 | 10.5 |
| 3 | Trailers | 8 | 15.3 |
| 4 | Pumps, Generators | 4[3] | |
| 5 | Mowers, Small Engine | 7 | 8.8 |
| **Total** | **N/A** | **53** | **10.4** |

As the table shows, the weighted average[4] age of the vehicles and equipment maintained by the mechanics at the shop is 10.4 years, suggesting a replacement cycle of about 20.8 years for the "average" unit in the fleet. Clearly, though, not all units in the fleet require the same replacement cycle. The economic life cycle of a 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 10 years is 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. Saugus's average age of this class of unit is 9.0 years.

[3] Although the fleet contains three pumps and a sign board, there were no model years for these pieces of equipment in the fleet listing provided to the project team.

[4] The weighted average takes into account the numbers of units in each class. Therefore, the age of the 20 vans/pickups in category 1 account for 37.7% (20/53) of the total average, and so on.

The project team does not possess adequate data to determine the current value of the fleet. However, given that there are 53 vehicles and pieces of equipment being maintained by the Public Works Department, it is likely that the current replacement value is close to $2,000,000. As has been noted above, the economic life cycles of each category of equipment vary widely, but if we can make an assumption, for illustrative purposes, that the optimum overall average economic life cycle of the fleet is 10 years, then the Town should be making an investment of about $200,000 per year in the fleet being maintained by Public Works. The project team does not possess data to enable a determination of whether this amount is being allocated each year, but the calculated age of the fleet indicates that this is unlikely.

Many cities and towns have created Vehicle Replacement Funds that ensure the availability of sufficient funding for vehicle and equipment replacement by identifying economic life cycles for each piece of equipment in the fleet, and allocating sufficient funding for their replacement on an annual basis to coincide with their individual retirements from the fleet. So, for example, since a pick- up truck has a predicted economic life of seven years, if we can assume that at the end of this seven-year period, the replacement cost would be $42,000, the Vehicle Replacement Fund would receive an amount of $6,000 each year for seven years in order to ensure the availability of sufficient funding for the replacement of this piece of equipment.

The calculation of precise economic life cycles is dependent upon many factors, including initial purchase costs, maintenance and repair costs (which are themselves dependent upon external factors such as terrain, driver care, in-town mileage versus highway mileage, etc.), predicted salvage values, and cost of money. These precise calculations, while valuable, require historical data that are unavailable to the Public Works Department currently, as it does not capture all of these data to enable a reliable analysis. However, the project team has provided a listing of typical economic life cycles for vehicles and equipment in the following pages. These economic life cycles may or may not reflect the optimum cycles for Saugus, since they are composites of the project team's experience in multiple jurisdictions that may be dissimilar in certain ways to Saugus. However, given that the current average age of the fleet is roughly twice that of a fleet that has been replaced on a consistent cycle, the variations between the cycles provided in the exhibit and the exact economic life cycles for Saugus are considered to be relatively insignificant, and will suffice until more accurate data are accumulated by the Motor Pool over a period of several years.

**Recommendation: The Town should ensure that it allocates a sufficient level of funding for vehicle and equipment replacement, as further aging of the current fleet will result in both safety concerns as well as unnecessary expenditures on maintenance and repairs. The project team further recommends the establishment of a Vehicle Replacement Fund that serves as a repository of funds for vehicles and equipment that would ensure their replacement at the ends of their economic lives.**

**The financial realities in Saugus are such that a simple determination of the oldest vehicles and pieces of equipment will not suffice as a plan for which units should be prioritized for replacement. The project team's observation of the fleet, both on the road and in the garage, indicates that there are transport units, such as pickups, that are in critical need of repair. However, there may be other pieces of equipment that have a greater utility to the Department. These may include equipment that enables the Department to reduce or eliminate reliance upon private contractors for, for example, brush cutting, snow plowing, etc.**

**EXHIBIT**
**Economic Life Cycles for Various Fleet Categories**

| Equipment Type | Years | Mileage |
|---|---|---|
| *Automobiles* | | |
| Administrative | 7 | 125,000 |
| Emergency | 4 | 125,000 |
| Pursuit | 4 | 110,000 |
| *Buses* | | |
| Buses | 15 | NA |
| **MOTORCYCLES** | | |
| Motorcycle | 5 | 50,000 |
| *Non-Motorized* | | |
| Trailer, Cargo | 10 | NA |
| Trailer, Equipment Transport | 15 | |
| *Trucks* | | |
| Animal Control | 7 | 150,000 |
| Bucket, under 45’ | 7 | 110,000 |
| Bucket, over 45’ | 10 | 110,000 |
| Crane | 10 | 175,000 |
| Dump, under 15 ton | 8 | 175,000 |
| Dump, over 15 ton | 10 | 175,000 |
| Pumper | 15 | NA |
| Ladder | 15 | NA |
| Flatbed/Stake Body | 8 | 150,000 |
| Pole Digger | 12 | 150,000 |
| Pickup, under 1 ton | 6 | 150,000 |
| Pickup, 1 ton and over | 7 | 150,000 |
| Tractor | 10 | 250,000 |
| Packer | 7 | 150,000 |
| Sewer Cleaner and Rodder | 7 | 150,000 |
| Utility Body | 7 | 150,000 |
| *Vans* | | |
| Cargo and Passenger | 6 | 150,000 |
| Law Enforcement | 5 | 125,000 |

**EXHIBIT**
**Economic Life Cycles for Various Fleet Categories (2)**

| | | |
|---|---|---|
| *Non-Rolling Stock* | | |
| Compressor, Air | 8 | NA |
| Boat | 10 | NA |
| Boat Motor | 7 | NA |
| Bulldozer | 12 | NA |
| Chipper | 7 | NA |
| Excavator | 12 | NA |
| Forklift | 12 | NA |
| Generator | 10 | NA |
| Grader | 12 | NA |
| Loader, Backhoe | 10 | NA |
| Loader, Front End | 10 | NA |
| Mower, Riding | 7 | NA |
| Mower, Self-Propelled | 4 | NA |
| Mower, Towed, Rotary | 7 | NA |
| Mower, Towed, Flail | 7 | NA |
| Pumps | 5 | NA |
| Roller, under 8 ton | 6 | NA |
| Roller, over 8 ton | 8 | NA |
| Scraper | 10 | NA |
| Sweeper, Street | 6 | NA |
| Tractor, Agricultural | 10 | NA |
| Tractor, Side Arm Mower | 10 | NA |
| Tractor, Flail Mower | 10 | NA |
| Trencher | 7 | NA |
| Utility Cart | 6 | NA |

## 2. THE PUBLIC WORKS DEPARTMENT SHOULD ESTABLISH A PAVEMENT MANAGEMENT PROGRAM.

Streets represent one of the largest capital investments for the Town of Saugus. The Town has approximately 120 centerline miles of streets. Maintaining and operating these streets typically involves complex decisions about how and when to overlay or apply surface treatments such as seal coats to keep the street performing and operating costs at a reasonable level. In fiscal year 2012, the Department reported that it resurfaced five streets with Chapter 90 funds, and an additional five streets with Local Pipeline Assistance funds after the installation of new water mains the previous year.

The project team does not possess data to enable a calculation of the numbers of linear miles of streets resurfaced over the past several years, however it is unlikely that it is replacing the APWA[5]-recommended 5% to 8% annually.

The Department of Public Works does not utilize a formal pavement management software system, as streets are reportedly visually inspected annually. The Public Works Department and the Town of Saugus should take a number of steps to address the challenge of ensuring that the most critical streets are resurfaced on a regular schedule. There are many advantages to implementing a formal pavement management program over those of visually inspecting Town roadways. These include:

- Definition of pavement inventory and calculation of the Pavement Condition Index (PCI) and other distress indices.
- Accommodation of user-defined fields for customizing programs
- Modeling of pavement condition deterioration
- Analysis of pavement condition (past, present, and future)
- Estimation of funding needed to maintain pavements at a given condition level
- Estimation of funding needed to eliminate the backlog of maintenance and repair in a specified number of years
- Projection of consequences of pavement condition and a maintenance and repair backlog for a specified annual budget

[5] American Public Works Association

- Formulation of pavement maintenance and repair projects
- Incorporation of graphics
- Capability of storing photos and other images in the database
- Incorporation of GIS

The project team understands the pressures of a limited budget in the Department, however, the advantages and relatively low cost of the software combine to make this acquisition cost effective.

The Metropolitan Area Planning Council (MAPC) has completed a pavement management manual that should serve as a guide in the development of this systematic approach. This approach should be designed to enable the Town to utilize a systematic, objective, and consistent approach to evaluate existing and future pavement condition of the Town's streets, and a means to help it manage its pavement maintenance expenditures cost-effectively.
A pavement management system consists of three major components:

- A system to regularly collect pavement condition data;
- A computer database to sort and store the collected data; and
- An analysis of repair or preservation strategies and suggestions of cost-effective approaches to maintain pavement conditions.

Implementation of the pavement management software will require the Town of Saugus to take the following steps:

- **Data collection and pavement network definition**. This data collection would include the construction records for the street system. These data include the age, surface thicknesses, and surfacing types for all sections. Good age data are essential to the performance of computerized pavement management models that generally rely on age as the basis for performance prediction curves.
- **Pavement condition assessment.** This step involves visually inspecting the pavement based on set procedures to establish the pavement condition index for the pavement. This should be done once every three years, with 33% of the streets being evaluated each year.

- **Pavement condition prediction**. This step involves utilizing the pavement management software to calculate the current pavement condition as well as predicting what the future pavement condition will be through the use of a family of performance prediction curves.

- **Formulation of maintenance policies**. This step involves the development of treatment alternatives (i.e., chip seal, microsurfacing, overlay, etc.), and the development of "trigger scores" for each surface treatment alternative. A "trigger score" is the set of conditions as defined by the condition indices, the performance curves, and any other pertinent data items under which a particular treatment would be feasible. For example, streets with a pavement condition index of 40 or less (out of a possible 100) would be a "trigger score" for reconstruction.

- **Budget formulation and scenario development**. In this step, multiple budget and maintenance scenarios would be developed that would model the amount of money that can be spent in any particular year of the analysis and its impact on the pavement condition index. The model uses the allocated money to "optimize" the pavement condition index. That is, a single strategy is selected for each of the analysis sections based on the overall benefit to the street system as a whole and on the available money.

The output from the pavement management software is a list of candidate streets with the appropriate surface treatment based on the input parameters, the input condition data, and the input budget. These candidate streets can be provided to the Finance Department as input to the five-year capital improvement program.

The pavement management system needs continual updating and improvement in the form of adjustments to the performance curves, updated treatment costs, and changes in the condition indices. In addition to the list of recommended candidate streets, recommendations must be made as to overall funding levels required to meet the pavement preservation goals of the Town. Running the model with a variety of budget scenarios would accomplish this.

The cost of publicly developed software approximates $0.09 to $0.12 per yard of pavement in the first year, with the cost dropping to about $0.07 to $0.10 in subsequent years.

**Recommendation: The Public Works Department should acquire and implement a formal pavement management software system. The Assistant Town Engineer should be responsible for the implementation of the software system and the accumulation of data. The data accumulation effort should be accomplished both by the Town Engineer and field employees trained in the use of the software.**

## 3. THE DEPARTMENT SHOULD IMMEDIATELY HIRE TWO POSITIONS IN THE HIGHWAY DIVISION.

The Department's Highway Division is responsible for the maintenance and repair of 120 center line miles, with an authorized contingent of the two positions of Highway Foreman and Equipment Operator. This equates to a ratio of one worker per 60 linear miles of paved surfaces. The Division also is responsible for maintenance and repair of the Town's sidewalks, repairing storm drains and manholes, as well as for snow removal. The Division receives significant assistance from other divisions of the Department, however, this assistance comes from divisions that are, themselves, under-staffed to varying degrees.

Like most functions under the broad "umbrella" of public works, there is no "right" ratio of paved surface mileage to FTEs, however in the absence of meaningful documentation regarding actual crew activities and the time spent on them, the project team typically compares this ratio (60 to 1 in the case of Saugus's Highway Division) to a benchmark that reflects an average staffing level found in other municipalities across the country. This benchmark is typically in the range of 8 to 12 miles of paved surfaces per FTE dedicated to the maintenance of these surfaces. Clearly, Saugus's Highway Division staffing is well above this benchmark, indicating a severe staffing shortage.

The project team also conducted a survey of similar Massachusetts cities and towns, and found that these municipalities have a far greater staffing ratio to paved surfaces than does Saugus. A summary of these survey results is provided in the table below.

| Municipality | Center Line Miles | Highway FTE | Ratio |
|---|---|---|---|
| Arlington | 100 | 15 | 6.7 to 1 |
| Belmont | 83 | 6.1 | 13.6 to 1 |
| Canton | 103 | 10 | 10.3 to 1 |
| Dedham | 117 | 20 | 5.9 to 1 |
| Newton | 275 | 69 | 4.0 to 1 |
| **Saugus** | **120** | **2** | **60.0 to 1** |
| Waltham | 162 | 19 | 8.5 to 1 |
| Watertown | 74 | 6 | 12.3 to 1[6] |
| Winchester | 93 | 13 | 7.2 to 1 |

Note that the project team cannot definitively state that the data are correct for any municipality other than Saugus and Watertown, as the data were accepted as reported. However, the data do tend to corroborate both the validity of the benchmark of 8 to 12 center

[6] Includes three currently-vacant, but authorized, Highway Division employees.

line miles per FTE, and the assertion that the staffing level in the Saugus Highway Division is relatively low.

The relatively low level of available staff in the Division is resulting in an inability to proactively manage and maintain the Town's infrastructure, and with a ratio of 60 linear miles of roadway per worker, the Division is likely spending well over 90% of its available time on corrective and emergency repairs, as opposed to scheduled maintenance activities such as vegetation management, asphalt surface treatment, drainage maintenance, sidewalk inspections, etc. Well-managed and properly-staffed Highway divisions should strive for a scheduled-to-unscheduled ratio of about five to one, meaning that corrective and emergency work orders should account for about 15% to 20% of all hours expended. Clearly, this is not the case in Saugus's Highway Division.

In order for the Saugus Public Works Department to be staffed at the mid-point of the average ratio of 8 to 12 miles per worker, it would require the hiring of an additional 10 employees in the Division. As this is not financially feasible, the Department will clearly need to rely on private contractors, as well as continue to transfer employees in from other divisions of the Department. However, the project team recommends the hiring of at least two additional employees to replace those eliminated last year. Even with the hiring of these two employees, the Division will be required to rely on private contractors for many services. However, the project team recommends a more structured approach to the outsourcing of services, which will be described in a later section of this report.

**Recommendation: Immediately hire two additional Equipment Operators in the Highway Division. The salaries of these two employees are expected to be approximately $45,000 each. Assuming a benefits rate of 35%, this equates to a total annual expenditure of $121,500. These employees should be assigned to do some of the more routine work that is currently outsourced, such as sidewalk repair, and to enhance the Division's capabilities in other routine work of the Division such as the repair of storm drains, manholes, removal of debris from roadways, drainage maintenance, and other routine work of the Department.**

### 4. THE PARKS DIVISION SHOULD HIRE A TEMPORARY OR PART TIME EMPLOYEE TO MOW THE TOWN'S PARKS.

The Parks Division is responsible for mowing 126 developed acres at 13 different parks, playgrounds and schools in the Town. 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.

Since the Parks Division has only two available employees, one of whom serves as the only employee in the Department who is proficient in sign-making, the 126 acres of parks for which the Division has responsibility requires a greater level of staffing than is available to the Division. This is in addition to the other responsibilities of the Division, such as lining fields, emptying trash, beautifying natural areas, irrigating fields and maintaining and repairing playground equipment.

The mowing of the parks is a low-skilled activity, but one which, if not performed in a timely manner, can have a negative effect on residents' perceptions of their park system, generally. The use of a Foreman, whose salary exceeds $50,000 annually, to mow the parks is more costly than it needs to be.

The Department has several options in addressing mowing needs in the parks. These include:

- Issuing a Request for Proposal from a private contractor
- Hiring another full time employee in the Parks Division
- Hiring a part time employee during the growing season

Investigating the cost of a private contractor to perform the mowing in the 13 locations is an advisable alternative in any case. The project team does not possess information on the costs that contractors may charge, however if it can be assumed that each mowing cycle takes 50 hours of labor, and that the labor costs $50 per hour, this equates to a likely costs of about $2,500 per mowing cycle. Assuming there are 20 mowing cycles in the growing season, this would equate to about $50,000. If the cost obtained from a private company is found to be significantly lower than this amount, then it may be feasible to outsource the service. There are other factors to consider in this decision, however. These include the following:

- Although hiring a full time Laborer/Truck Driver may be marginally more costly than the projected contract cost for mowing, it is also true that the full time employee is available for re-assignment within the Department, depending upon the greatest need.

- Contracting for the service would allow the Town to cease purchasing mowing equipment on a routine cycle, as the contractor would be responsible for the provision of equipment. This also reduces the amount of time the Mechanic spends each year in equipment maintenance for the mowers.

Another option is to hire a full time employee to accomplish the mowing of the 13 locations. A review of the Town's budget document indicates that the likely cost of a Laborer/Truck Driver is about $44,000. With fringe benefits of 35%, this equates to a total cost of approximately $59,400 annually, which is somewhat more than the calculated probable cost of a mowing contract, but, to re-state a previous point made above, the Department has the flexibility of

directing this employee to perform work in the location of greatest need, and can even be interrupted during mowing activities to do so. This would not be possible with a contractor's employee.

A third option is to hire a temporary employee to mow the parks and schools. This option may offer some advantages over contracting or hiring a full time employee. The project team earlier made the recommendation to merge the Cemetery Department with the Public Works Department, and noted that the staffing ratio in the Cemetery Department was relatively high, indicating that the three staff members likely have some excess capacity to perform work outside the cemeteries. If it can be assumed that at least one of these employees is able to mow half of the Town's park acreage each mowing cycle, then this lessens the reliance on a temporary employee for this service. Therefore, if the Department pays a temporary employee $25 per hour for 25 hours each mowing cycle, this equates to $625. If there are 20 mowing cycles, this equates to $12,500.

**Recommendation: Investigate the cost of contracting out the mowing of the Town's parks and athletic fields. If this cost is well above the cost of hiring a temporary employee for mowing, then the project team recommends that the Department hire a temporary employee for this purpose.**

### 5. THE DEPARTMENT SHOULD CERTIFY AT LEAST ONE EMPLOYEE IN THE PARKS DIVISION AS A CERTIFIED PLAYGROUND INSPECTOR

Interviews with Parks Division personnel indicate that neither of the two employees, a Working Foreman and a Sign Man, are conducting inspections of playground equipment. The potential for harm to children, and the possible resulting litigation, mitigate in favor of certifying Town employees to perform these inspections, and be certified to do so.

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 Division employee as a Certified Playground Safety Inspector (CPSI). The cost is minimal, and would result in more comprehensive inspections, and could avoid harm to children using the equipment, and any resulting litigation as well.**

## 6. THE TOWN SHOULD INCREASE STAFFING IN THE WATER AND SEWER DIVISIONS IN ORDER TO ACCOMPLISH A GREATER LEVEL OF PREVENTIVE MAINTENANCE.

The project team does not possess data indicating the number of miles of the Town's distribution and collection system that have been replaced in recent years. However, there were 47 main breaks last year in its 125-mile distribution system. This equates to one break per 2.7 miles, which is a far higher incidence than systems with which the project team has experience. This is at least circumstantial evidence that the Town has not replaced its distribution network in a systematic manner, and that the Public Works Department has not performed a sufficient amount of preventive maintenance on the system over a period of years.

The project team's typical experience is that field maintenance staffing approximates one FTE per 10 to 15 linear miles of distribution and collection system line. The Saugus Water and Sewer Divisions are responsible for the maintenance of about 250 miles of water and sewer line, and does so with six field maintenance crew members. This equates to 46.7 miles per field maintenance FTE. Although the comparative survey that the Center's project team conducted does not corroborate the benchmark of 10 to 15 miles per field maintenance staff member typically found in well-managed organizations, the data in the table below show that the municipalities in the survey are much closer to this benchmark than is the Town of Saugus.

| Municipality | Linear Miles of Water and Sewer Line | No. Field Maintenance Staff | Ratio |
|---|---|---|---|
| Belmont | 169 | 11.14 | 15.2 to 1 |
| Canton | 187.7 | 9 | 20.8 to 1 |
| Newton | 560 | 50 | 11.2 to 1 |
| Watertown | 162 | 9 | 16 to 1 |
| Winchester | 110[7] | 14 | 7.9 to 1 |
| Stoneham | 140 | 8 | 17.5 to 1 |
| **Saugus** | **250** | **6** | **46.7 to 1** |

Both data and circumstantial evidence indicate that the Water and Sewer Divisions are under-staffed to perform a significant amount of preventive maintenance, and are likely only

[7] Distribution line only

responding to emergency repair needs in the systems. Repair of water main break alone are likely consuming over 7% of the total available hours of the two divisions.[8] In addition to these emergency repairs, the divisions are maintaining water and sewer plants, pump and lift stations, sampling of water at eight points, flushing problem drainage areas, inspecting new water services and sewer laterals, and other activities. The divisions are currently not flushing the 900 hydrants in the system. Further, they are not flushing the full system on a routine cycle, and are not exercising gate valves. These are important preventive activities to ensure that the Town is getting the maximum useful lives of its water and sewer infrastructure.

The primary deficiencies in preventive maintenance in the Water and Sewer Divisions relate to hydrant flushing, exercising of gate valves and flushing of the distribution and collection systems. If conducted on typical cycles, these activities would likely result in the need for four to five additional employees, and even this assumes that the divisions would continue to contract out leak detection and the televising of lines. Further, it assumes that the inspection of backflow devices would continue to be performed by the Town's Plumbing Inspector.[9] Current fiscal realities prevent the immediate hiring of this number of employees in the Water and Sewer divisions without an impact on utility fees. However, the severity of need for a greater level of preventive maintenance leads the project team to make the strong recommendation that the Town hire two Equipment Operators to perform at least minimal preventive maintenance on the distribution and collection systems. With only two additional staff members, the "targeted" preventive maintenance levels will be less than those that are needed, however the recommended two-person crew should serve to extend the lives of the distribution and collection systems. Further, over time, their efforts should result in fewer system emergencies and the ability of other staff members on more critical service needs.

**Recommendation: Hire two Equipment Operators to perform critically-needed preventive maintenance on the distribution and collection systems. Assuming a salary of $44,000 per position, this equates to $88,000 in salary costs. Adding 35% for fringe benefits, the total cost is expected to be approximately $118,800.**

## 7. THE DEPARTMENT SHOULD ENHANCE THE FUNCTIONALITY OF ITS WEBSITE TO CONFORM TO BEST PRACTICES IN THE INDUSTRY, AND SHOULD INCORPORATE PERFORMANCE MEASURES IN THE DIVISIONAL WEB PAGES AS WELL.

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

[8] This assumes that each of the 47 breaks takes a 3-person crew 5 hours to repair. It also assumes each of the 6 FTEs in the two divisions is available for 1,650 hours per year.

[9] Interviews indicate the Plumbing Inspector is conducting these inspections. The project team did not verify that these inspections were being performed.

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 Saugus 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.

The Saugus Public Works website is little more than a simple "billboard" of information, and 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 and Forestry | There is no information on the Town's parks on the web site. There should be a listing of each of the 13 parks, playgrounds and school athletic fields. Many municipalities are including photographs of the sites as well. The Parks Division should also list the features (basketball courts, ponds, playgrounds, tennis courts, etc.) and amenities (e.g., picnic tables, fire pits, etc.) at each park.<br><br>The DPW site has no reference to protocols for tree pruning and removal. Nor are there any regulations regarding permissible trees.<br><br>The web site should describe the basic duties and responsibilities of the Parks Division and the Forestry Division, with names and contact numbers for each division. |
| Highway | The Department web page provides no information on the Highway Division's duties and |

| Division | Comments on Web Page |
|---|---|
| | responsibilities. The only Highway topic referenced on the site is for snow plowing application and rates. The basic duties and responsibilities of the Division should be provided, with a contact name and number as well.<br><br>Highways are some of the most visible characteristics of a town, and the web page should describe not only the current projects, but future projects as well. The site should inform residents of future community input forums in the areas of planned construction and rehabilitation efforts.<br><br>Many public works departments have posted snow removal and sanding policies on line, as well as plowing routes. |
| Vehicle Maintenance | Although the Vehicle Maintenance Division does not perform a function that directly interacts with the public, residents are interested in knowing the number and types of equipment maintained. This should be provided, perhaps in a downloadable link, and updated as the fleet profile changes. The web page should include photographs of the garage, and as well as a statement regarding its commitment to preventively maintaining the fleet, and to maximizing the useful lives of each vehicle and piece of equipment. The Division should also list any green initiatives related to energy-efficient vehicles purchased. |
| Water and Sewer | The web site could be significantly enhanced through the provision of simplified descriptions of the water and sewer treatment processes, 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 similar process for wastewater treatment, provided by Lynn, should also be described at a high level.<br><br>The site could also benefit from the inclusion of information on capital improvements (both recently completed, as well as planned, and the |

| Division | Comments on Web Page |
|---|---|
| | 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, as well as others.<br><br>There is virtually no useful information on the Water or Sewer sections of the Department's web site beyond the provision of the latest water quality report, a water supply map and a meter ordering form. There is also a description of a sewer system project in the Golden Hills area. |

The web site does not contain separate web pages for its component divisions. This should be done as soon as is practical. Once completed, each of the divisional web pages should ultimately include summary performance measures that provide enough information for readers to determine the efficiency and effectiveness of the use of the resources allocated to the respective divisions. The project team has provided many potential performance measures in the comparison of Saugus's practices to those of best management practices, in Appendix B. However, there may be others that the Department and the Town desire to implement. The Center would only caution that the number of performance measures for any division should be manageable, and the measures themselves should be reflective of the actual workloads of the divisions. Further, the measures should reflect the efficiency and effectiveness of the work performed, rather than simple statements of the work that was accomplished. So, for instance, in Vehicle Maintenance, the workload measures should potentially include the following:

- Percent of vehicles scheduled for preventive maintenance that actually received services within two days of schedule.

- Turnaround times for repair (expressed as percent of units that were returned to user divisions within 24, 48 and 72 hours.)

- Vehicle downtime (expressed as the number of hours vehicles and equipment were out of service as a percent of their normal business hours.)

- Mechanic downtime awaiting parts for repair

- Vehicle "comebacks" (a measure of the percent of vehicles that are returned for the same service within one week of repair.)

There are many other potential performance measures to consider, not only for Central Motors, but in the other operating divisions of DPW as well. Note, though, that each of the above suggested performance measures is a reflection of efficiency and effectiveness, and not of absolute workload. It is not helpful for either the reader of the measures, or the Department itself, to list, for example, the number of vehicles scheduled for preventive maintenance in a particular month, quarter or year, as this is meaningless in the absence of other context. However, the expression of the degree to which the units arrive in the garage for service on schedule is a reflection of both the effectiveness of the preventive maintenance program, and the attentiveness of management to servicing the equipment. Similarly, vehicle downtime is a reflection of the expertise of the mechanics and the management of the workflow.

**Recommendation: Each of the divisions of the Department of Public Works should be provided its own page within the Department of Public Works web site. These divisional web pages should incorporate description of the infrastructure and equipment for which they are each responsible, and also should incorporate performance measures that focus, not on simple workload metrics, but rather the efficiency and effectiveness with which the divisions are utilizing their resources.**

## 8. THE DEPARTMENT SHOULD DISCONTINUE THE PRACTICE OF UTILIZING TWO SEWER DIVISION EMPLOYEES TO PERFORM CHECKS ON LIFT STATIONS.

The Sewer Division checks ten substations on a daily basis using two Division employees at east station. Although there are instances in which two employees are necessary in the performance of repairs that may result from these routine checks of the substations, the routine checks themselves do not warrant the allocation of this degree of scarce labor to the task.

The Division is expending a disproportionate amount on the weekends in performing this activity, as two employees check each of the ten stations on both Saturday and Sunday mornings from 5:00 am till 9:00 am. These 16 hours of work are all paid at overtime rates each weekend. The Laborer Truck Drivers are compensated at an average of $46,150 annually. At an assumed fringe benefits rate of 30%, this equates to about $60,000, equating to an hourly rate of $28.85, assuming that each works 2,080 hours per year. The overtime rate, at 150% of the base rate, is about $43.28 per hour.

The Division Foreman works eight of the 16 hours each weekend, and is compensated at an annual rate of $53,900. With an assumed benefits rate of 30% of salary, this equates to $70,070 per year. Assuming the position works 2,080 hours per year, this equates to an hourly rate of $33.69. The overtime rate for this position, at 150% of the base, is $50.54.

Given that there are 104 weekend days per year, the following table calculates the probable overtime paid for checking the Town's ten substations on an annual basis.

| Position | Annual Hours | Overtime Rate | Total |
|---|---|---|---|
| Foreman | 208 | $50.54 | $10,512.32 |
| Laborer Driver | 208 | $43.28 | $9,002.24 |
| **Total** | **416** | **NA** | **$19,514.56** |

As the table shows, the probable amount of overtime paid to the Sewer Division for routine checks of the ten substations is about $19,514 annually. The Division budget for overtime on the sewer stations is $35,000, however, this includes an amount that anticipates needed repairs over and above the routine checks of the stations.

Making the transition to a single-employee performing routine checks of the substations would likely result in a reduction of about $10,000 annually, however it is also true that routine checks identify required corrective actions that would necessitate call-backs of a second employee.

The Town may wish to investigate the feasibility of upgrading its current cellular technology to SCADA (Supervisory Control and Data Acquisition) in order to remotely gather a greater degree of information from its substations, and thereby eliminate the need for routine checks of the system. SCADA technology, although more costly, can be programmed to alert monitors to specified conditions that may require varying degrees of need for human response. Remote Terminal Units (RTUs) located at the substations could interface with monitors in the system and alert employees as to the specific anomalies at a substation, and the monitor may remotely make decisions regarding the severity of the problem, perhaps resulting in the deferral of repair until a later time.

The project team has no firm cost data on a SCADA for the Town of Saugus, however the feasibility of the decision to install SCADA becomes a simple matter of a calculation of the feasibility of the payback period once the current overtime costs are known. For example, if a SCADA costs approximately $200,000 to install, and the current overtime costs are about $20,000, the payback period would be about ten years. This payback period, of course, does not incorporate either the maintenance of the system or any intervening upgrades that may be necessary or desired, however these should be estimated before the Town makes such a decision.

**Recommendation: Eliminate the requirement for two workers to be present for routine checks of substations each weekend. This change in procedure may result in an annual cost savings of as much as $10,000. The project team also recommends that the Town investigate the costs and benefits of purchasing and installing a SCADA system at its ten substations in**

**order to gather a greater degree of operating information that may allow the elimination of routine checks of the substations.**

## 9. THE DEPARTMENT SHOULD CONSIDER OPPORTUNITIES TO OUTSOURCE CERTAIN SERVICES.

Despite the relatively severe staffing reductions sustained in recent years, the Department of Public Works performs many of its services with departmental personnel. The Department does outsource certain services, such as brush cutting, sidewalk repair, some snow removal as well as others. However, the decision to outsource services appears to be made episodically rather than in accordance with a structured approach.

The project team does believe that outsourcing certain services makes financial and operational sense under several conditions. Almost any departmental service may be outsourced, or privatized; however, the DPW should be judicious in the decision-making process to do this. The project team has provided a sample scoring methodology in Appendix D to help in the determination as to whether a specific service is a good candidate for outsourcing. Ultimately, however, the decision should rest with the Director, in concert with division foremen as well as the Town Manager.

Generally, functions that are good candidates for outsourcing are those that are either performed infrequently enough by internal staff to attain a sufficient degree of skill, or are provided by multiple contractors in the area, creating price competition that reduces the cost to the Town.

The Department generally utilizes private contractors in a prudent manner, however all functions should be periodically re-evaluated for either the potential for outsourcing or, for those functions currently outsourced, for potentially performing with Department personnel.

**Recommendation: Institute a structured approach to the evaluation of the feasibility of outsourcing. The Department should use, or modify, the scoring methodology provided in Appendix D for all functions performed by the divisions in order to maximize the utilization of internal staff.**

## 10. A FORMAL SAFETY MANAGEMENT PROGRAM SHOULD BE ESTABLISHED AND IMPLEMENTED.

The Public Works Department does not have a comprehensive employee safety program, and this could contribute to cases of worker's compensation. With a lean staff, it is imperative that the Department strive to maximize attendance of all employees, and ensure that safety practices are taught and observed in the workplace will not only assure this, but will minimize

costs to the Town as well.

There are a number of elements, essential to effective employee safety program that are absent, including the following:

- The Department has not established goals, objectives, and performance measures for employee safety. These could, for example, include such objectives as the total number of recordable injuries and illness cases per 100 full-time employees shall be less than the average for local governments in Massachusetts.

- The Town does not provide a "core" safety training program for employees.

- The Public Works Department does not have a designated Safety Coordinator.

- The Department does not have an active safety committee.

- An employee safety handbook has not been developed.

There are clearly a number of opportunities for the Public Works Department to improve its employee safety program, and the elements above should be implemented as soon as possible to potentially avoid a higher incidence of worker's compensation claims.

**Recommendation: The Public Works Department should establish goals, objectives, and performance measures for its employee safety program.**

# APPENDIX A
# DESCRIPTIVE PROFILE OF THE PUBLIC WORKS DEPARTMENT

# DESCRIPTIVE PROFILE OF THE PUBLIC WORKS DEPARTMENT

The following pages 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, Town Manager, the former Public Works Director, former Auditor, and Treasurer/Collector.
- 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 budgets for FY13 for each division.
- Summaries of key indices of workloads and service levels provided by each division.

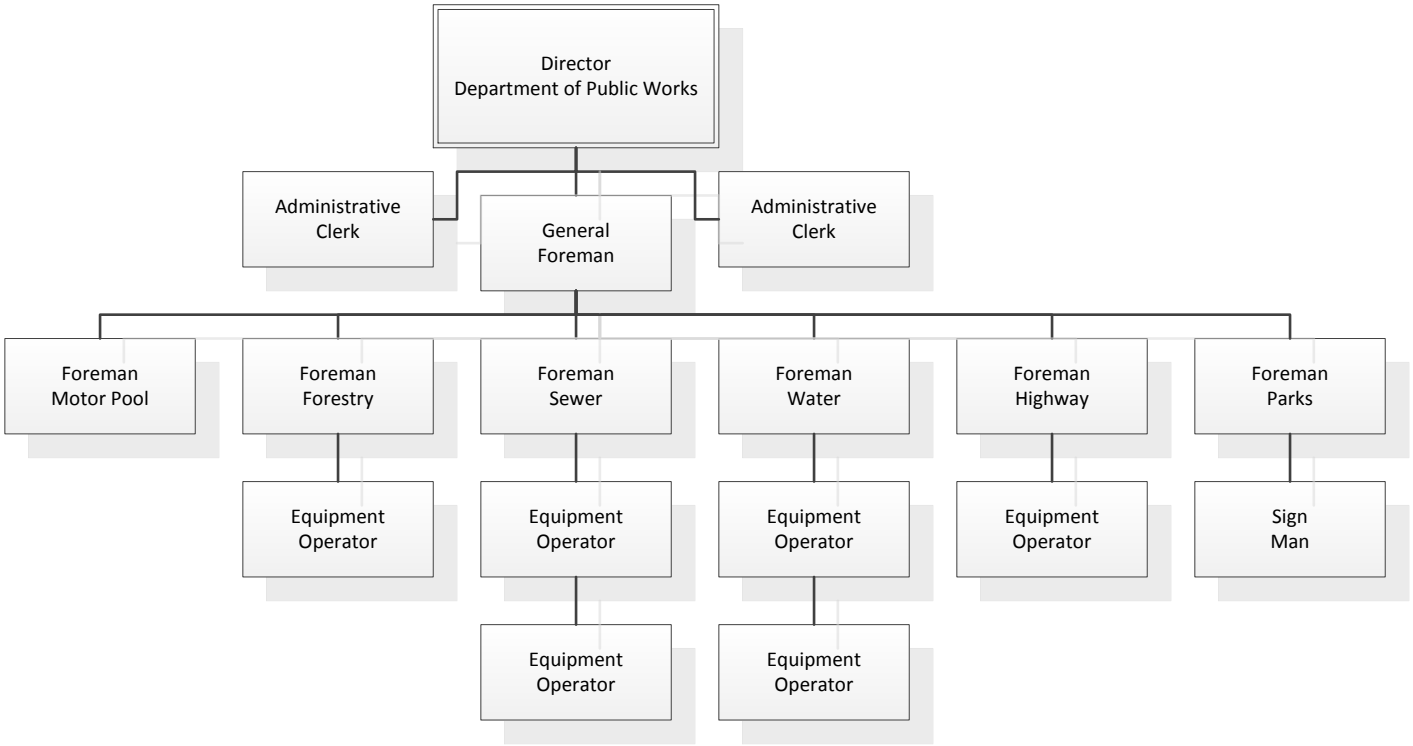
# 1. INTRODUCTION

The Department of Public Works (DPW) has broad responsibilities in the Town. Included are divisions responsible for water testing and infrastructure maintenance; collection system infrastructure maintenance; road maintenance and repair; parks maintenance; tree maintenance, planting and removal; and equipment maintenance and repair. In addition, there are two Administrative Assistants responsible for work order processing, DEP and EPA reporting, purchase requisitions, payroll, customer service, budget monitoring, and general correspondence.

The Department of Public Works has a total staffing contingent of 17 authorized positions, of which 16 are currently filled, as the Director's position is currently being filled on an interim basis by the General Foreman).

| | FY 2011 | | FY 2012 | | FY 2013 | |
|---|---|---|---|---|---|---|
| **Division** | **Auth.** | **Filled** | **Auth.** | **Filled** | **Auth.** | **Filled** |
| Administration | | | 5 | 5 | 4 | 3 |
| Highway | | | 5 | 5 | 2 | 2 |
| Water | | | 3 | 3 | 3 | 3 |
| Sewer | | | 3 | 3 | 3 | 3 |
| Motor Pool | | | 1 | 1 | 1 | 1 |
| Forestry | | | 2 | 2 | 2 | 2 |
| Parks | | | 4 | 4 | 2 | 2 |
| **Total DPW** | | | **23** | **23** | **17** | **16** |

The organizational structure of the Department is presented in the chart below.


Director
Department of Public Works
Administrative
Clerk
General
Foreman
Administrative
Clerk
Foreman
Motor Pool
Foreman
Forestry
Foreman
Sewer
Foreman
Water
Foreman
Highway
Foreman
Parks
Equipment
Operator
Equipment
Operator
Equipment
Operator
Equipment
Operator
Sign
Man
Equipment
Operator
Equipment
Operator

# 2. STAFFING

The following table presents a summary of Public Works Department staffing and key elements of responsibilities.

| Division | Staffing by Classification | | Key Elements of Staffing and Scheduling |
|---|---|---|---|
| Public Works Administration | Public Works Director | 1 (vac.) | • Provides the overall executive management and administration of divisions within the DPW.<br>• Responsible for developing the overall priorities of the DPW, including the development of policies and procedures, performance goals and objectives, monitoring of budget, etc.<br>• Prepares the operating budget and confers with Town Manager on formulating the capital improvement program, and meets with division managers on a regular basis to discuss operations, issues, performance, etc.<br>• Ensures that department operations conform to local, state, and federal government regulations, and other applicable rules and policies.<br>• Meets with the public to discern needs, answer questions, receive comments and complaints, and to direct DPW resources to abate these concerns and complaints. |
| | General Foreman | 1 | • In conjunction with the Director, determines priorities of work for the Department.<br>• Allocates work to crews and observes work being performed to ensure compliance with directions and specifications.<br>• Meets with contractors on infrastructure repairs and improvements to ensure that work is performed according to specifications. |
| | Administrative Clerk | 2 | • Develops correspondence on behalf of Director<br>• Orders supplies for the office<br>• Processes weekly payroll for the Department<br>• Handles inquiries from contractors on, e.g., bond renewals, other questions. Forwards technical questions to the appropriate supervisor or to the Director<br>• Receives work order requests from the public, both in person and on line. Forwards requests to appropriate division, and closes out once completed.<br>• Assists in development of part of budget |

| Division | Staffing by Classification | | Key Elements of Staffing and Scheduling |
|---|---|---|---|
| | | | • Processes purchase requests for supplies, parts, materials and services. |
| Motor Pool | Foreman | 1 | • Repairs and maintains vehicles, equipment and small engines for Public Works, Town Hall Departments, Building Department and Cemeteries Department<br>• Assures that repairs and maintenance are performed appropriately and in accordance with safety requirements and customer needs<br>• Completes reports of work performed on each piece of equipment and maintains manual files of work histories.<br>• Obtains necessary parts for repairs and maintenance<br>• Diagnoses vehicle and equipment malfunctions using diagnostic equipment and experience in similar repairs. |
| Water | Foreman | 1 | • Incumbent possesses a D2 license<br>• Assigns work to members of crews and oversees the quality of work, ensuring that it is compliant with directions and specifications. Oversees the repair of emergency breaks and works as member of crew repairing these breaks<br>• Uses heavy equipment to excavate<br>• Performs excavations and repairs on distribution system<br>• Samples water at 8 sites in Town and drives samples to MWRA lab in Chelsea<br>• Inspects new installations of sewer laterals and new water services |
| Water | Equipment Operator (EO) | 2 | • Performs water shut-offs<br>• Performs water mark-outs<br>• As member of crew, repairs trench cuts with hot top<br>• As member of crew, installs and repairs gates and valves<br>• Uses high velocity jetter to flush water lines<br>• Performs excavations and repairs on distribution system<br>• One Equipment Operator places antifreeze on hydrants once annually. This activity reportedly is conducted in the months of September and October<br>• Neither EO is licensed |
| Sewer | Foreman | 1 | • Incumbent possesses an M1 license<br>• Serves as the station Foreman (located at 24 Lincoln Ave.), skimming flotable solids, hosing tanks, cleaning grit chamber, bleeding pumps.<br>• Checks stations daily<br>• Performs excavations and repairs on collection system<br>• Performs dye tests in system |

| Division | Staffing by Classification | | Key Elements of Staffing and Scheduling |
|---|---|---|---|
| | | | • Allocates work to crew members and ensures work is performed according to directions and specifications<br>• Removes snow at the 10 substations<br>• Incumbent works regular hours from M-F 7:00 am to 3:30 pm, and on Sat from 5:00 am to 9:00 am to check main and substations<br>• As working Foreman, cuts brush on easements, uses high velocity jetter to flush lines |
| Sewer | Equipment Operator | 2 | • One EO possesses M2 license<br>• Check stations daily<br>• Removes snow at the 10 substations<br>• Performs excavations and repairs on collection system<br>• Performs dye tests in system<br>• Both EOs work regular hours from M-F 7:00 am to 3:30 pm, and one works Sat from 5:00 am to 9:00 am, and both work Sun from 5:00 am to 9:00 am checking main and substations<br>• As members of crew, cut brush on easements, use high velocity jetter to flush lines |
| Parks | Foreman | 1 | • Allocates work to crew members and ensures work is performed according to directions and specifications<br>• Mows and trims 13 locations, including ball fields, playgrounds and passive and natural areas.<br>• Repairs playground equipment<br>• Empties trash barrels<br>• Beautifies park areas by removing leaves and debris, mulching, etc.<br>• Lines ballfields, rakes and drags infields and mounds |
| Parks | Sign Man | 1 | • Creates, installs and repairs signs in the Town<br>• Lines fields<br>• Mows grass at 13 locations<br>• Empties trash barrels |
| Forestry | Foreman | 1 | • Operates aerial lift to trim trees in Town rights of way and publicly-owned grounds<br>• Uses saws and chippers to trim and dispose of limbs, stumps and other vegetative debris<br>• Serves as crew leader on site for tree removals, prunings, and beautifications<br>• Plants trees<br>• Makes determinations relating to tree removals |

| Division | Staffing by Classification | | Key Elements of Staffing and Scheduling |
|---|---|---|---|
| | | | • The Tree Committee, consisting of five volunteers and a Selectman assists the Tree Warden in obtaining required materials, supplies, etc, and offers guidance on tree policy and requests help in carrying our tree policy<br>• Runs the compost site on weekends |
| Forestry | Equipment Operator | 1 | • Operates aerial lift to trim trees<br>• Uses saws and chippers to dispose of limbs and other vegetative debris<br>• Runs the compost site on weekends<br>• Fills sand barrels as required during snow and ice events |
| Highway | Foreman | 1 | • Receives work requests and determines priorities.<br>• Sets up work sites, determines materials and equipment required for work.<br>• Coordinates snow storm response, allocating work to contractors and internal staff<br>• As part of crew, repairs potholes<br>• Completes asphalt and concrete sidewalk repair and replacement<br>• As member of crew, paints 172 Town cross-walks<br>• Hauls away debris left on roadsides<br>• Ensures that water is flowing in brooks and culverts |
| Highway | Equipment Operator | 1 | • As part of crew, repairs potholes<br>• Completes asphalt and concrete sidewalk repair and replacement<br>• As member of crew, paints 172 Town cross-walks<br>• Hauls away debris left on roadsides<br>• Ensures that water is flowing in brooks and culverts |

# 3. FINANCIAL

The following table provides the proposed budget for Fiscal Year 2013, for the divisions and the Public Works Department as a whole.

| Division | Personal Services | Operational Expenses | FY13 Budget |
|---|---|---|---|
| DPW Administration | $278,617 | $6,100 | $284,717 |
| Engineering | $ - | $24,600 | $24,600 |
| Highway | $197,765 | $573,227 | $770,992 |
| Electrical Service | $ - | $605,000 | $605,000 |
| Motor Pool | $52,800 | $6,000 | $58,800 |
| Motor Vehicle Maintenance | $ - | $38,500 | $38,500 |
| Parks | $98,750 | $37,900 | $136,650 |
| Forestry | $115,000 | $48,200 | $163,200 |
| General Fund Divisions | $742,932 | $1,339,527 | $2,082,459 |
| | | | |
| Water Enterprise | $291,703 | $4,651,431 | $5,355,403 |
| Sewer Enterprise | $349,514 | $3,378,071 | $4,203,118 |
| | | | |
| **Total Public Works** | **$1,384,149** | **$9,369,029** | **$11,640,980** |

# 4. WORKLOAD

The following table provides selected workload information for the component divisions of the Department.

| Service | Workload |
|---|---|
| Payroll | • Once weekly for 17 staff members (includes Admin., Highway, Motor Pool, Parks, Forestry and Water and Sewer. |
| Budget | • Department Director oversees and is responsible for a total DPW budget of $2.1 million, a water enterprise budget of $5.4 million, and a sewer enterprise budget of $4.2 million |
| Highway | • Responsible for the maintenance and repair of approximately 120 center line miles of roadway.<br>• Highway Division gets asphalt from Reading.<br>• Responsible for the maintenance and repair of approximately XXXX miles of sidewalk, which consists of both concrete and asphalt.<br>• Responsible for the painting of 172 crosswalks in the Town.<br>• Catch basin cleaning is contracted out for XXXX catch basins in the Town. |
| Forestry | • Responsible for all Town trees in the rights of way and on public lands. The number of trees for which the division is responsible is unknown, as there is no tree inventory.<br>• The division has a 55 foot bucket truck which it uses to trim and cut trees. Trees requiring work above this height are contracted out.<br>• The Town is a Tree City USA member. |
| Motor Pool | • Maintain a fleet of 53 units, which includes the following:<br>– 20 Pickups<br>– 14 Heavy Equipment (backhoe, loader, etc.)<br>– 8 trailers<br>– 4 pumps, compressors, etc.<br>– 7 mowers, other small engines<br>• Average ages: |

| Service | Workload |
|---|---|
| | - Pickups = 9.0 years<br>- Heavy Equipment = 10.5 years<br>- Mowers, small engines = 8.8 years |
| Water | • Responsible for maintaining 125 linear miles of water line<br>• Responsible for 9,000 services<br>• Meters are read bi-annually by Treasurer/Collector's office<br>• Responsible for approximately 900 hydrants in Town, which are reportedly flushed annually<br>• Number of gate valves is unknown<br>• Cross-connection inspections are performed by the Plumbing Inspector (not in DPW).<br>• Water samples are taken once weekly at 8 sites and driven to MWRA lab in Chelsea. Lead and copper sampling is conducted annually at 15 homes and 2 schools.<br>• There were 47 water line breaks in CY 2012 |
| Sewer | • Responsible for maintaining 125 linear miles of sewer line<br>• Responsible for 9,000 services<br>• Check 10 substations on daily basis<br>• Station at 24 Lincoln Ave. serves as preliminary treatment plant, removing grit and bacteria. Sewerage is pumped to Lynn from here. |

# APPENDIX B

# COMPARISON TO PUBLIC WORKS BEST MANAGEMENT PRACTICES

# DRAFT DIAGNOSTIC ASSESSMENT OF THE DEPARTMENT OF PUBLIC WORKS

## Town of Saugus, Massachusetts

While the management study for the Town of Saugus'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 meets the performance targets.

- A brief description of potential alternatives to current practice.

# 1. PARKS & TREES

| 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. | | This is far from being the case as there are a reported 126.5 developed acres maintained by a Foreman and a Sign Man, who is not available on a full time basis to the Parks Division. If it is assumed that ¾ of the Sign Man's available time is dedicated to parks maintenance activities, this equates to a ratio of over 84 acres per FTE, which is far in excess of the 8-10 per FTE required to maintain parks at a "B level" standard. This is viewed by the project team as a significant deficiency, and will likely be unsustainable as the growing season approaches. |
| Tree trimming schedule exists for trees- 3 to 5 year cycle. | | Current staffing levels do not allow for a proactive trimming program, which is accomplished only on an as-needed basis. |
| Existence of an inventory of all trees for which the Town is responsible, which includes location, age, type of tree and the maintenance cycle for each. | | Although the Forestry Foreman reports that there was a tree inventory completed in 1995, this is too dated to be of any significant use today. In any case, the inventory is not referred-to by the Foreman on a regular basis. |
| Maintenance activities are documented in sufficient detail to allow managers the ability to analyze workloads and productivity of crew members. | | Maintenance activities are only documented on manual log sheets, and only for reactive work requests (i.e., not for any internally-directed activities). The absence of an accounting of work hours, activities, materials and equipment used prohibits any analysis of crew productivity other than visual observation. |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| Parks are being maintained in good condition. | The project team's site visits have occurred during snow season. This prohibits any meaning inferences from the observations | |
| Maintenance standards are documented for athletic field conditions, pavilions and shelters, parks amenities (tables, grills, trash receptacles, etc.), hard-surface courts, lights, ponds, etc. | | There are no documented standards against which performance can be objectively measured. Well-managed parks maintenance organizations should develop and publicly publish maintenance standards for such areas as athletic fields (grass height, mowing and trimming frequency, drainage adequacy, etc.), fencing, restrooms, playgrounds, pavilions/shelters, tennis and basketball courts, sand courts, and other assets. |
| A formal infrastructure preservation plan has been developed for parks. | | Again, staffing is an issue in the division's ability to accomplish more than reactive work and emergencies, however the Divisions of Parks and Forestry should strive to develop a preservation plan for each of its major assets. |
| The Town's tree ordinance is available on line. | The Town has within its bylaws addressed tree-related issues such as required permits for maintenance and planting, prohibited species, marking of shade trees prior to issuance of driveway permits, trimming, removal of trees and stumps, clearing of obstructions, prohibited acts, penalties for non-compliance and violation, etc. | Although useful information has been promulgated by the Town regarding trees, shrubs and other plantings, this information is only available through a relatively complex search on the Town's web site. The information should be readily available on the DPW web site. |
| Residents can request a tree removal application on line. | | The project team observed no ability to accomplish this on the DPW web site. |
| Web site provides residents with helpful information in user-friendly format | | The Town's parks and trees are not mentioned on the DPW web site in any manner. At a minimum, |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| | | the site should note the locations, size and amenities of the parks. The fields are listed on the Youth and Recreation Department's site, however there is no listing of amenities at that site either. |

# 2. FLEET MAINTENANCE AND MANAGEMENT

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| Existence of centralized fleet management program for the Town. | The DPW Mechanic has responsibility for all DPW units, as well as for Building, Cemetery, Town Hall departments. | Police, Fire and School departments maintain their own vehicles and equipment.<br><br>The lack of centralization does not capitalize on opportunities to standardize maintenance frequencies, monitor vehicle and equipment utilization, and, importantly, maximize the utilization of available mechanics. |
| Existence of funded vehicle replacement program? | | There is no replacement fund for vehicles in the Town. This fund, if available, would receive funding from the Town on a unit-by-unit basis sufficient to ensure the timely replacement of vehicles and equipment at the pre-defined end of the economic life cycle of each unit. This funding mechanism has the effect of evening out the peaks and valleys associated with funding replacement units. |
| Centralized and standardized system of identifying vehicles and equipment for replacement. | | The DPW reports that it determines which pieces of equipment need to be replaced on an annual basis, however the units are not replaced in a timely manner. This is evidenced by the relatively advanced age of the fleet. The DPW is now in a position of needing to replace many units, however it may be unreasonable to do so on a wholesale basis in the near term. This may necessitate making replacement decisions based only partially on strictly functional needs, but rather on a return-on-investment basis. |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| Existence of fleet management information system to monitor vehicle repair history, mechanic utilization, etc.? | The Department reports that it now has access to fleet records through a program that was purchased many years ago. | Although the Fleet Maintenance Division now has access to the program, it has not been updated in almost two years. This likely means that the program will need to be populated with maintenance and repair records that occurred during that time. |
| Existence of automated fuel dispensing system. | The Town has recently purchased an automated fuel dispensing system (Fuel Master) that tracks fuel usage by unit and by employee, by department. | The system has not yet been in existence long enough to have yielded benefits beyond the factual information related to fuel usage, however there are other benefits that should accrue as the system matures, such as the ability to monitor vehicle utilization and the ability to schedule preventive maintenance based on miles traveled (or hours of use, depending upon the type of equipment) by each unit. |
| Fleet Maintenance is organized and established as in Internal Service Fund, charging user departments for parts and services. | | This is not the case. Although departments are billed for fuel usage, maintenance and repair expenses are absorbed by the DPW. |
| An effective preventive maintenance program is in place. | The project team does not possess information at this time to evaluate the content of the PM program. | |
| An effective facility is available for mechanics that enhances their productivity. | The DPW mechanic and the Police mechanic are co-located. The facility appears adequate to accommodate the number of units in each of the fleets. | |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| The size of the fleet and the vehicle equivalency units are balanced with the number of authorized staff. | The Saugus fleet for which the DPW mechanic is responsible includes 53 units, with a vehicle equivalency of 73.3 units. The project team typically recommends that each mechanic be responsible for between 90 and 110 VEU (vehicle equivalent units), indicating that there is some excess capacity in the garage. | |
| Fleet maintenance staff are ASE certified. | | The DPW mechanic is not ASE certified. |

# 3. HIGHWAY

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| Existence of formal work planning and scheduling system. | | There is no formal work planning and scheduling system in existence in the Highway 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 Highway Division that captures labor and materials usage by crew member and by category of activity. There are two separate work order systems in the Department, however neither of these captures adequate data to determine the actual or planned utilization of personnel resources, rather they simply report the accomplishment of a particular requested 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. | | This is far from being the case. There are a reported 120 center line miles of paved surfaces in the Town, and with a Foreman and one Equipment Operator in the Highway Division, this equates to about 60 center line miles per FTE.<br><br>It should be noted that the Highway Division recently experienced a reduction in staff of an Equipment Operator and two (2) Truck Drivers. This full contingent would have equated to 24 center line miles per FTE, which is still well above the best practice of 10 to 12 miles per FTE. It should also be noted that there is significant cross-over of personnel from one division to the other as conditions warrant. However, it is also true that, as these conditions occur, the critical work of the divisions from which these cross-utilized workers is not being accomplished, thereby creating a maintenance deficit in one or more other divisions of the Department. |
| Potholes are patched promptly. | This is reportedly the case when potholes of an emergency nature are found or reported. | |
| Formal pavement management system in place. | | There is no formal pavement management assessment performed in the Department. Road segments in need of repair are identified through visual observation and prioritized on this basis. |
| The Department resurfaces 5% to 8% of paved surfaces annually. | Unknown at this time. | |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| Sidewalks are checked regularly for tripping hazards and the hazards eliminated. | | The Division reports that it repairs tripping hazards as they are identified, and only if they are of an emergency nature. There is no proactive inspection program in place, however. |
| Major road repairs and reconstruction contracted out. | This is the case in the DPW. | |
| Periodic inspection of sign reflectivity. | | The Division has no sign inventory that shows locations of signs, last date of replacement, last date of reflectivity check, and history of maintenance. Reflectivity is accomplished only through visual inspection. |
| 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 annually by internal staff on overtime. | Previous internal studies have indicated that it is less expensive to continue to perform these activities with internal staff. Were all cost considerations included in these analyses? For instance, were the costs of materials, maintenance and depreciation included in the comparison to private sector quotes? |
| Web site provides residents with helpful information in user-friendly format | | The web site is not informative or interactive, other than providing a reader with the ability to submit a work request. It does not provide information to residents, or other visitors, relating to street closures, or street resurfacing projects. It also does not provide a FAQ section. |
| Sweepers accomplish 28-32 curb miles swept per day on average. | This is accomplished via contract. The project team does not possess data to determine the number of curb miles swept per day, although the cost of the contract is approximately $35,400 annually. | |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| Catch basins are cleaned on a 2-year cycle. | This is accomplished via contract. The latest DPW annual report indicates that the Department cleaned 950 catch basins in FY 2012. The contract is worth approximately $100,000, excluding the cost of debris removal, equating to about $100 per catch basin. | |

# 4. WATER & SEWER

| 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 Superintendent, Town Manager and Board, and define what resources ought to be allocated to what utility services. | | Although the Division does report certain workload measures, they do not reflect the efficiency with which the work was performed. For instance, the FY 2012 Annual Report states that there were 47 water main break repaired, however there is no context provided for the number, nor is there any indication of the personnel and material resources utilized in repairing these leaks. |
| Managers provide regular progress reports (e.g. monthly or quarterly) relative to individualized performance objectives. | | There are no performance objectives established, however, as noted above, the Division does provide annual statistics on certain elements of work, such as water main breaks repaired, hydrants replaced, water leaks repaired, etc. |
| A formal safety program is in place that includes training, guidance documents and operational procedures, all of which are prominently posted. | The Division reports that whenever MWRA provides safety training, they attempt to send employees. | There are no regular safety and training meetings of staff. These meetings should occur at least periodically, and have established agendas to address topical issues that have been observed in the field. |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| An effective asset management system has been installed that includes an inventory of the infrastructure 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 pump stations. | | The Interim Director states that there may have been a previous initiative to develop a drain layer in the GIS, however it is unknown whether this initiative was pursued. The DPW does not have access to any GIS data that the Town may have, however. |
| An effective cross connection inspection program is in place. | This is accomplished by the Town's Plumbing Inspector. The DPW is not involved in this activity. | |
| 1% TO 2% OF WATER AND SEWER MAINS ARE REPLACED ANNUALLY. THIS FORMAL PROGRAM IS LINKED DIRECTLY TO A LONG-TERM CAPITAL AND FINANCIAL PLANNING PROGRAM TO ASSURE ADEQUATE FUNDING. | | |
| Distribution valves are exercised routinely. | | Valves are turned only as needed. |
| Water meter replacement is within 15 to 20 years and larger commercial meters are tested for registration accuracy in accordance with AWWA recommendations. | The Town has replaced all meters with AMCO radio read meters. The DPW is not involved in reading meters, however, as this is accomplished by the Collector/Treasurer. | |
| Fire hydrants are flushed annually. | | The Department reportedly attempted to institute a hydrant flushing program in previous years, however it is now reported that the program was discontinued due to lack of staff to conduct flushing exercises. |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| An automated maintenance management system is utilized to track and report work output, service levels and productivity. | | Neither the Water Division, nor the DPW generally, have mapped the locations of its infrastructure in GIS. The Division has not defined the schedules and procedures for maintaining each asset, captured historic workloads for their maintenance, and defined the impacts on its infrastructure at various levels of staffing or capital dollar infusions. |
| Periodically evaluate the feasibility of outsourcing certain functions. | The Division does contract out major water line installations | |
| 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 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), and transmission to the consumer.<br><br>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, water rates, conservation measures, typical consumption rates for various family sizes, as well as others.<br><br>There is virtually no useful information on the Water or Sewer sections of the Department's web site. |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| Wastewater mains are cleaned on a three-year cycle. | The Division utilizes a sewer jet to clean trouble spots on a monthly basis. | There are no summarized records indicating either the number of linear miles cleaned, or the manpower used. |
| There is a wastewater main televising program (CCTV) based upon condition assessment information. | A contractor (Green Mountain) is under contract to line certain pipes in Town, and to concurrently flush and televise lines. | It is unknown how many linear miles have been, or will be, televised under this contract. However, as this is being accomplished under a contract to perform the lining of specific pipe segments, it is likely that there has been little televising of the Towns collection system in recent years, and the televising that is occurring under this contract will be limited to those specific pipe segments. |
| An automated maintenance management system is utilized to track and report work output, service levels and productivity. | | There is little documentation to enable an analysis of the time expended in the Sewer Division regarding its workloads, crew sizes, etc., however much of the work other than pump station inspection appears to be reactive, and therefore unplanned. |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| 15% to 20% of the manholes are inspected annually | | This is likely not accomplished. The Division reports that it does not know how many manholes are in the Town, and therefore has no records of their locations or any previous routine inspection or maintenance on them. However, the latest annual report does note that cement lining was installed on 1,041 vertical feet, 65 brick corbels were repaired. And pavement was sealed at 15 manholes.<br><br>A comprehensive manhole inspection program should consist of three phases:<br><br>1. Regular inspections of sewer lines and manhole structures to identify specific deterioration. Odor complaints should be immediately investigated.<br>2. Evaluate manholes in need of repair on a case by case basis to determine the best method of repair and rehab.<br>3. Coat all new manholes with an epoxy or other protective polymer covering to prevent corrosion. |

# 5. ENGINEERING

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| Policies and procedures for the Engineering Division are well documented. | | No policies and procedures exist. |
| GIS is used as a tool to keep up-to-date records on Town infrastructure including repairs/replacements, capital improvements, technical studies. GIS is used as a tool to manage and prioritize work | | Neither the Engineering Division nor DPW generally has any access to GIS for such items as locations of distribution and collection lines (along with thicknesses, dates of replacement and repair, etc.), service lines, paved surfaces, buildings, etc. |
| A five-year capital improvement program has been by the Board of Selectmen. | Unknown at this time. | |
| An appropriate mix of in-house staff and consulting engineers are utilized for the design and inspection of capital improvement projects based upon the expertise required and the continuity of the workload. | Almost all design work is conducted on contract. The part time (4 hours per week) Engineer conducts some inspections, however this is an insufficient amount of time to dedicate for some of the more complex developments in the Town currently. | |
| Project managers are responsible for capital improvement projects from “cradle to grave”, with responsibility for project development, design, construction inspection, construction management, and closeout. | | There are no in-house capabilities for this function, and project management is necessarily provided by contractors. |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| Staff respond to inspection requests within one workday of the receipt of the request. | | There are no internal staff members in the Engineering function to be able to respond to inspection requests of any kind. |
| Turnaround times for first plan check are responsive. | | No data exist to verify this metric. It is unlikely, however, that with a single Engineer who is available for four hours per week is capable of adequate responsiveness for significantly large developments. |

# 6. ADMINISTRATION

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| Clerical and administrative functions are centralized in the Department, and workloads are balanced by a central authority | Both of the administrative employees in the office answer phones and wait on the public as their individual availability dictates. | |
| The payroll process is automated | | |
| Personnel and payroll systems are integrated. | | There are no automated personnel or payroll systems. |
| There is one accounts payable clerk for every 9,000 annual transactions. | | |
| 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 | | Currently, there are 16 filled technical positions (including the Interim Director.) and two filled administrative/clerical positions, equating to a ratio of 1:8. However, there is one vacant technical position, and there have been five other positions in the DPW prior to the recent layoffs, which would have the effect of increasing this ratio. Further, the ratio would be far higher with only one administrative employee, and therefore this area cannot be reasonably viewed as one for improvement opportunities. |
| The Division maintains a vendor file which reflects | | Although files are maintained of all contracts, |

| Performance Target | Strengths | Potential Improvements |
|---|---|---|
| vendor histories. | | both current and historical, there is no separate vendor file that contains the performance histories of any single vendor. The maintenance of these files is considered a best practice both because the files provide substantiation for any justifiable deviation from stated award criteria such as low-bid, but also for purposes of transferring information to new administrative staff. |
| Regular, ongoing financial reports are provided to divisional management and supervisors. | | This is not the case, however it is also true that division managers have not been made responsible for budgetary compliance. |
| Clerical and administrative staff receive ongoing training in the use of necessary tools such as word processing, financial spreadsheets, customer service, etc. | Unknown at this time | |

# APPENDIX C

# SAMPLE SNOW AND ICE CONTROL POLICY

## Section 1

## OVERVIEW

The Department of Public Works provides snow and ice control for the Town under policy XXXX. The policy was developed to provide residents with a reasonable level of mobility during adverse weather conditions. The snow and ice control program recognizes that resources must be balanced by the
value of snow and ice control in relationship to the entire street maintenance program. The Town does not provide snow and ice control for sidewalks or other public walkways. Snow and ice control for these areas are the sole responsibility of the abutting property owner.

The snow and ice control program includes various pieces of equipment, manpower assignments, appropriate materials, and a procedure for implementation. Each component of the plan will be addressed in the following sections.

The Public Works has implemented an anti-icing program to augment its traditional snow and ice control practices. Anti-icing is the practice of preventing the formation of bonded snow and ice through timely applications of a chemical freezing-point depressant. Anti-icing is well suited to routes requiring a higher level of service. The preventive nature of anti-icing can also support higher service level objectives such as maintaining bare pavement throughout a storm or returning to bare pavement as soon as possible following snow pack formation. As a positive consequence, anti-icing has the potential to increase traffic safety at a low cost, and expeditiously as weather improves. Public Works has observed improved driving surfaces in areas where the chemical was applied. Public Works will continue to evaluate emerging anti-icing alternatives with the primary objective of improving driving conditions to the maximum extent practical during storm events while attempting to use environmentally preferable products.

## Section 2

## EQUIPMENT

Table XXX contains a list of equipment, appurtenances, and their primary use.

### Sanding – Town Wide

The Town maintains XXX truck mounted sand spreaders for use in snow and ice control. All sanders are stored on stands to expedite installation into the dump body of the trucks, an approximately 15 minute operation. Smaller trucks serve as back up sanding equipment and improve sanding service to residential streets and arterial intersections which do not normally receive immediate attention.

### Sanding – Saugus River Watershed

The Town is dedicated to reducing phosphorus loading to the Saugus River. Consistent with this priority, only a minimal amount of sanding (if any) occurs on streets within the watershed. The Town will primarily use anti-icing and de-icing agents to reduce and remove snow and ice accumulation on roads. Additional information about the specific products can be found in the Materials section on pages 6 and

**Plowing**
When conditions warrant, plows are installed on the three larger trucks to move snow from the traveled roadway. Average time to install a plow is approximately 15 minutes.

**Anti-icing and De-icing**
(Describe the equipment available to the Department in its de-icing activities, potentially including the benefits of de-icing.)

**Table 1**
**Ice Control and Snow Removal Equipment**

| Equipment No. | Make | Description | Attachments | Primary Use |
|---|---|---|---|---|
| **XXXX** | **2010 International 7400** | **10 yard dump** | **Ex., 7-yard sand/salt spreader** | **Ex., sanding, plowing arterials, bus routes, emergency needs** |

## Section 3

**PERSONNEL**
The entire manpower resources of the Department, including staff from the Divisions of Water and Sewer, are available for snow and ice control. The 2013 authorized manpower level for the Department is XXXX full time equivalent employees (FTE's). Normal operating procedures for the Department assign one person to a shift that begins at XXX p.m. and ends at XXX a.m. During freezing fog, frost, or
snow conditions, the night shift staff will operate a sander or anti-icing equipment as necessary and make recommendations regarding additional manpower or equipment needs based on weather and driving conditions. During major events, manpower is reassigned to provide 24-hour coverage, seven days a week, as needed.

## Section 4

**MATERIALS**

Three major materials are used in snow and ice control: coarse sand, salt brine, and anti-icing/de-icing agents. Salt and anti-icing materials are effective de-icing agents in the typical temperature range. The coarse sand used as a traction aid is a 1/4" fractured rock, which tends to stay in place, and provides better traction. Sand is an effective traction aid, but is quickly blown to the side of the road by traffic, reducing its value. When sand is mixed with salt into a blend of 90% sand and 10% salt by volume, the traction aid of the sand and the deicing ability of the salt enhance the breakup of bonded ice and accelerate snow melt. Anti-icing agents are stored in XXXX-gallon tanks located at the (fill in location).
Anti-icing products are applied directly to the roadway surface prior to accumulation of snow to prevent
compacted snow from bonding to the roadway surface, and as a liquid de-icing agent in pre-wetting of the sand/salt mixture. This pre-wetting allows the sand/salt mixture to more readily stick to existing icy surfaces preventing it from being cast aside by traffic.

## Section 5

**PROCEDURES**
The standard operating procedures for snow and ice control are as follows:

**OPERATING PROCEDURE - ICE:**
**a) Anti-Icing:** In order to successfully and efficiently prevent the formation of an ice/pavement bond, the
Highway Division Supervisor must ensure the proper timing of the application of anti-icing agents. This
requires foresight in decision making, methodical use of available information sources and anticipation of events, or, at least, prompt reaction to them. In short, it requires a systematic approach utilizing all available resources to determine the most effective time for applying the anti-icing material.
Anti-icing has been found to be effective when applied to major hills, bus routes, and bridges within the Town limits. The Highway Supervisor will determine when and where to apply anti-icing agents directly to the pavement surface to prevent formation of an ice/pavement bond and when to use anti-icing agents to pre-wet the sand/salt mixture.

**b) Sanding:** During the winter season, icing normally occurs during the early morning hours. The Supervisor will inspect the situation and determine if and when additional employees should be
called to begin sanding, salting or anti-icing. Priority routes include major arterials and transit routes. These routes are laid out in advance, and will be followed unless an emergency situation arises. Emergency situations will be determined by Fire, Ambulance, or Police Supervisors, in conjunction with the Highway Supervisor. As time and/or conditions permit, other areas may be sanded.

**OPERATING PROCEDURE - SNOW:**
**a) De-icing**: When snow conditions are expected, the Highway Supervisor will decide when to start 24-hour operations as listed above. The Street Supervisor will decide when and where de-icing agents are to be applied. Priorities for de-icing operations are major arterials, transit routes, and bridges.

**b) Sanding**: When snow conditions exist, the Highway Supervisor will be notified by XXXX. The Supervisor will decide when crews will be called in to begin sanding, and determine if 24-hour operations are necessary. If 24-hour operations are necessary, the assigned crews will be divided into three, 8-hour shifts, and will operate accordingly until the storm event passes. Other Public Works personnel may be called to operate additional equipment and/or sand by hand, as needed. Any 24-hour operation will be considered an emergency and all appropriate policies will be followed.
Priority routes include major arterials and transit bus routes. Established routes will be followed unless an emergency situation arises. Emergency situations will be determined by Fire, Ambulance, or Police Supervisors, in conjunction with the Highway Supervisor. As time and/or conditions permit, other areas will be sanded.

**c) Plowing**: When snow has accumulated to a depth of approximately four inches at Town Hall, the
and snow is forecasted to continue falling, snow plows will be placed on four of the sanding trucks
and plowing will begin. The Highway Supervisor may elect to start plowing operations prior to four inches of accumulation if existing and forecasted conditions warrant it and in the event of drifting snow which normally occurs in the XXXXX region of the Town. Snow will be plowed to the edges of the roadways. Four-lane roads will initially have only one lane plowed in each direction. When the route is completed, additional lanes may be opened. Public Works crews will not open up sidewalks or driveways. Side street entrances will be opened only after the priority routes are completely plowed.
Initial priority routes consist of major arterials and transit bus routes. These routes are laid out in
advance, and will be followed unless an emergency situation arises. Emergency situations will be
determined by Fire, Ambulance, or Police Supervisors, in conjunction with the Highway Supervisor. As time and/or conditions permit, other areas may be plowed.

**d) Snow Removal**: Snow removal will be addressed when snowfall has accumulated to a depth that seriously and unreasonably hinders traffic for prolonged periods on major transportation routes. Snow removal will mainly occur in XXXX where curbside parking and pedestrian movement makes plowing to the edge of the street undesirable. To remove snow, the snow is

pushed to the center of the street, removed by frontend loader to a dump truck, and transported to a disposal site. This activity will require equipment and possibly manpower from non-Town sources. A declaration of emergency is anticipated in order to implement snow removal. Difficulty is not anticipated in obtaining the necessary equipment since deep snow would likely reduce private contractor operations, making their equipment available.

(Include sanding route maP)

(Include anti-icing priority listing)

# APPENDIX D

# SAMPLE PRIVATIZATION SCORING METHODOLOGY

# Scoring for Potential for Privatization for Public Works

**TOWN OF SAUGUS**

Note: The higher the score, the greater the potential for privatization; however, there is no threshold scoring at which privatization becomes a definitive opportunity.

**Department:**
**Division:**
**Service:**
**Or Cross-Organizational Service**:

| Issue | Response | Points |
|---|---|---|
| Is this a core Town service? | | Yes=0 points<br>No=10 points |
| Is this a core Departmental service? | | Yes=0<br>No=10 |
| Is this service available in the private sector? | | Yes=20<br>No=0 |
| ▪ How many vendors provide this service? | | Many =10<br>Some=5 |
| ▪ How would the Town replace a vendor, if performance required replacing the vendor? | | Easily=10<br>With difficulty=0 |
| ▪ How much specialized professional or technical expertise would be required of vendors? | | A lot=0<br>Some=5<br>None=10 |
| What is the expected level of political opposition to any privatization effort? | | High=0<br>Medium=10<br>Low=20 |
| ▪ Has this service been successfully privatized by other cities? | | Yes=10<br>No=0 |
| ▪ Has this service been privatized by the Town in the past and then brought back in-house? | | Yes=0<br>No=10 |
| ▪ Have other cities in the area privatized this service and then resumed providing the service themselves? | | Yes=0<br>No=10 |
| Are there legal barriers to privatization? | | Yes=0<br>No=10 |

| Issue | Response | Points |
|---|---|---|
| ▪ What is the assessed difficulty of changing these legal barriers? | | If yes, could add 5 if not difficult to change |
| Does this service have quantifiable and measurable performance measures? | | Yes=10<br>No=0 |
| ▪ How difficult will it be to assess a contractor's performance? | | Very=0<br>Somewhat=5<br>Not=10 |
| ▪ Would the Town be able to reward or penalize a contractor based on performance? | | Yes=10<br>No=0 |
| ▪ What level of risk would be involved if a vendor did not perform? | | Low to none=10<br>Some=5<br>High=0 |
| ▪ Is the Town able to transfer liability to the vendor for poor performance? | | Yes=10<br>Maybe=5<br>No=0 |
| What are the current costs of providing this service? | | High=10<br>Medium=5<br>Low=0 |
| ▪ What percentage of these costs are fixed? | | High=0<br>Medium=5<br>Low=10 |
| ▪ What percentage of these costs are variable? | | High=10<br>Medium=5<br>Low=0 |
| ▪ How does Town cost compare with available information from possible vendors? | | High=10<br>Approx Same=5<br>Low=0 |
| ▪ How difficult would contract monitoring be, if this service were to be privatized? | | Difficult=0<br>Somewhat=5<br>Not Diff=10 |

| Issue | Response | Points |
|---|---|---|
| ▪ How difficult would constructing a performance contract be, if this service were to be privatized? | | Difficult=0<br>Somewhat=5<br>Not Diff=10 |
| ▪ What are the estimated costs of contract development? | | High=0<br>Medium=5<br>Low=10 |
| ▪ What are the estimated costs of contract monitoring? | | High=0<br>Medium=5<br>Low=10 |
| ▪ What are the estimated costs of employee pay-offs, if this service were to be privatized? | | High=0<br>Medium=5<br>Low=10 |
| What are the potential impacts on Town employees? | | |
| ▪ How many employees are involved? | | <10=10<br>10-50=5<br>>50+0 |
| ▪ Would/could the vendor be required to employ Town's staff? | | Yes=10<br>No=0 |
| ▪ Would there by any cost impact for requiring the vendor to hire Town employees? | | Yes=0<br>No=10 |
| ▪ How many jobs face possible elimination? | | <10=10<br>10-50=5<br>>50=0 |
| ▪ What requirements will the Town pass on to the vendor, in the way of labor laws? | | None=10<br>Some=5<br>All=0 |
| ▪ What is the financial impact of these labor law requirements? | | High=0<br>Medium=5<br>Low=10 |
| Are there unique capital or operating issues involved? | | |
| ▪ Are there unmet maintenance problems which | | Yes=10 |

| Issue | Response | Points |
|---|---|---|
| contracting allows the Town to avoid? | | No=0 |
| ▪ Are there unmet maintenance problems which the contractor would be required to resolve? | | Yes=0<br>No=10 |
| ▪ Are there specialized equipment or supply needs which can be provided more economically by a vendor (due to economies of scale, large-scale procurement, etc.)? | | Yes=0<br>No=10 |
| Are there confidentiality issues involved? | | |
| ▪ Would the contractor need access to confidential information? | | Yes=0<br>No=10 |
| ▪ Would the Town feel comfortable with contractor having such access? | | Yes=10<br>No=0 |
| Are other Town Departments paying for part of this service? | | Yes=0<br>No=10 |
| ▪ If yes, would other departments be able to buy services from another vendor for the same or less than from the current Town department? | | Yes=10<br>No=0 |
| ▪ Does a current Town department have excess Capacity? | | Yes=10<br>No=0 |
| ▪ If yes, could that excess capacity be sold within the Town or to another governmental entity? | | Yes=0<br>No=10 |
| How comfortable does the Town feel about contracting this service? | | Very=20<br>Somewhat=10<br>Not=0 |

**FINAL SCORE:_____**

Are there other issues which cannot be scored but which need to be considered in assessing this service for privatization potential?

**RECOMMENDED ACTIONS:**