



Ralph G. Snow, P.E., *Commissioner*

EMD

TO: Eileen Donoghue, City Manager

FROM: Ralph Snow, P.E., Commissioner

DATE: September 11, 2019

RE: 1/22/2019 Motion C. Leahy - Req. City Mgr. Report to City Council Regarding a Plan to Reorganize the DPW and the Parks Department

3/26/2019 Motion C. Leahy - Req. City Mgr. Update City Council Regarding Reorganization of the DPW and the Parks Department

In October of 2017, the City commissioned an Organizational Study of Facilities Maintenance that was done by the Edward J. Collins Center for Public Management at UMASS Boston. The final report, issued in July of 2018, identified several challenges/areas for improvement which are listed below and made specific recommendations for improvement which are summarized in Enclosure (1).

Challenges/Areas for Improvement:

1. Significant understaffing in facilities maintenance based upon the inventory to be maintained.
2. Lack of a work order system to manage facilities needs at city buildings and limited utilization of electronic system in place for school buildings.
3. Need for organizational structure and management team equipped to oversee several hundred million dollars in capital investment needed in next 5-10 years.
4. Potential loss of millions of dollars in Massachusetts School Building Authority (MSBA) reimbursement for eligible projects if not pursued in a strategic and timely manner.
5. Lack of information available regarding current and future capital needs in city buildings.
6. Existing multi-step procurement process (even for relatively small parts and supplies) contributes to delays in work order completion.

The study also references a Management Assessment of the Public Works Department that was completed by the Collins Center in 2012. While the focus of the 2012 assessment was slightly different than that of the 2018 study, several recommendations from the 2012 report were mirrored in the 2018 study, particularly those that identified the need to increase resources and those that identified the need for a computerized systems including a maintenance management system, a work order system and an asset management system.



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While the challenges listed above and the recommendations made in Enclosure (1) highlight the more significant areas that need attention, there are a few smaller changes that have been made and more that could be made in the short term that will enhance performance and improve the efficiency of the DPW that require the issuance of tablets or laptops that have access to the internet, MUNIS and Civic Plus.

Below are a list of programs and activities Wastewater and Water are using iPads for and examples of how they are using technology in the day-to-day operations of both Utilities.

Programs:

1. DoForms: Data management systems for reoccurring checklists. Custom created checklists are used at a certain interval to create a digital log. The software has the ability to tie into other data management software to ease data entry.
2. GIS Utility Viewer: Provides online view access to the City's GIS data. Users can turn on and off layers and look at relevant information for their needs.
3. GIS Collector/Survey 123: Provides online editing to the City's GIS data. Users can add data points and change the metadata for an attribute. (I.e. change a Sewer line material from clay to concrete after field investigations.) Users also have the ability to go through a checklist that is tied to a horizontal asset.
4. Supervisory Controls and Data Acquisition (SCADA): Provides real time access to controls and data regarding all instrumentation and equipment at the Treatment Plant as well as all our remote stations.

Activities:

1. Maintenance:
 - a. DoForms: The structures crew utilizes DoForms to perform daily and weekly checklists at all the remote pump and diversion stations in the city. They also perform fire extinguisher checklists on a monthly and quarterly basis.
 - b. GIS Utility Viewer: Collection System Superintendent utilizes the Utility Viewer to locate sewer and drain lines when in the collection system.
 - c. Administration: View and respond to emails.
 - d. GIS Collector/Survey 123: In the future, mechanics on the VacCon will utilize these GIS applications to identify and record lines and manholes they have cleaned and inspected.
2. Engineering:
 - a. GIS Collector/Survey 123: Staff collects information for the clean stream initiative, I/I, and IDDE programs.



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- b. DoForms: Staff engineer performs daily construction updates for the remote projects.
 - c. GIS Utility Viewer: Field staff uses the Utility Viewer to help assist in field tasks associated with IDDE, I/I, catch basin mapping, and field investigations.
 - d. Administration: View and respond to emails.
 - e. SCADA: In the near future, this will provide the ability to view the SCADA system remotely. This will lead to greater operational flexibility and the opportunity to troubleshoot issues quickly.
3. Operations:
- a. DoForms: In the near future, will be able to perform daily checklists and data entry. This data will automatically sync to HACH WIMS data management system to streamline data entry and reduce errors.
 - b. SCADA: In the near future, will be able to view the SCADA system remotely. This will lead to greater operational flexibility and the opportunity to troubleshoot issues quickly.
4. Water Distribution:
- a. DoForms: Field staff record information regarding street inspections.
 - b. GIS Collector: Field staff using the Collector during gate turning activities to record location and metadata regarding the valve.
 - c. GIS Utility Viewer: An iPad is available for Field staff to take in the field to view water lines and gates.

Similar to Wastewater and Water, the City Engineer is working with MIS to customize forms that can be used by mobile devices such as smartphones and iPads. The City Engineer plans to utilize DoForms to complete inspections and site visits. DoForms allows notes and checklists to be filled out on a smart phone or on an iPad and then the completed inspection form is emailed back to be saved in the City's computer system. This will help to standardize inspections as well. The current process involves taking notes in books and then scanning the notes to the City's computer system.

DoForms also allows photos to be attached to forms to support inspection forms. The photos can be Geotagged, which allows photos to be identified to specific locations within the City. The ability to imbed photos in the form using DoForm is very helpful to Engineering because the current process involves taking photos on phones or cameras, and then having to download them to desktop computers at a later date. Once downloaded, the photos then have to manually be labeled.

Other examples of areas where the use of smart technology could enhance efficiency within the DPW include Solid Waste & Recycling where inspectors could use mobile devices in the field to



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enter data, confirm records and issue violations; and Lands and Buildings where technicians could use them to close out work orders in School Dude, check manufacturer's data and troubleshoot equipment. In order to move forward with DoForms and other smart initiatives, mobile devices such as smart phones, Ipads, etc. will have to be purchased and provided to employees to use in the field.

Despite the initiatives taken and those planned to be taken to improve efficiency, the current demand for Public Works services, including Engineering services and Parks maintenance services, far exceeds the City's ability to provide them with current resources. This gap will grow wider as the City continues to undertake more projects that require more engineering support and add more square footage, such as the new high school, that will require more sophisticated maintenance, and projects that add more green space. The bottom line is that in order to maintain the City's 50 buildings comprised of 2.87 million square feet located at 48 different sites* and over 500 acres of greenspace at the City's 92 parks and playgrounds, it is going to take more resources (people, money and capital assets).

Please feel free to contact me if you have any questions regarding this motion response.

* Note this does not include assets managed by enterprise funded activities or the new high school.

Enclosure (1)

| SUMMARY OF RECOMMENDATIONS | | | | |
|---|--|-------------------|---------------------------------------|---|
| <i>Operational Assessment of Lowell Facilities Maintenance and Custodial Services</i> | | | | |
| Page | Finding/Recommendation | Time Frame | Cost Impact | Status |
| 43 | Finding 1: The Land & Buildings Division is understaffed when taking into account the total square footage for which it is responsible. | | | |
| | Recommendation 1.1: Over the next two fiscal years, add 3-4 FTE technicians to LBD. | FY2019- FY2020 | \$297,000 | No change. |
| | Recommendation 1.2: At the earliest feasible date, discontinue in house painting services and create a budget line item for outside painting services. | TBD | | No change. |
| | Recommendation 1.3: Consider dividing staff into at least two geographic teams to increase workers' in-depth knowledge of a smaller portfolio of buildings, and to provide management with greater flexibility in making assignments. | Spring 2019 | | No change. Not recommended till numbers increase. |
| | Recommendation 1.4: Perform a salary survey to determine if Lowell salaries are competitive, and take steps to make sure salaries and benefits are competitive. | Fall 2018 | ~\$9,000 for pay & class study | No Change. |
| | Recommendation 1.5: Reconsider LBD's role in holiday lighting and other special events. | Spring 2019 | | No change. |
| 47 | Finding 2: The Land & Buildings Division operates predominantly in a response mode, as opposed to a proactive preventative maintenance mode. | | | |
| | Recommendation 2.1: Hire an outside firm to develop multi-year preventative maintenance plans for all city and school buildings and prepare a calendar of activities to be undertaken each month and week. | Summer 2019 | \$175,000 (includes Rec 3.4 below) | PM Plan for schools complete. |
| | Recommendation 2.2: Determine which preventative maintenance work should be done in-house and which should be contracted at the start of each fiscal year. | Fall 2019 | | No change. |
| | Recommendation 2.3: In the summer of 2018, perform a comprehensive assessment of all school interior and exterior doors and associated locking mechanisms. | Summer 2019 | TBD | No change. |
| | Recommendation 2.4: Prior to the close of each school year, develop a punch list of work to be performed at school sites over the summer and determine if additional staff resources will be needed to complete the work. | Annually | | Partially complete. |
| | Recommendation 2.5: Protect facilities maintenance operating budgets from further cuts until an evaluation can be performed regarding the appropriate level of funding needed. | FY2019 | | Complete. |
| 51 | Finding 3: City and school facilities management is not adequately staffed or structured to oversee the hundreds of millions of dollars in capital investment needed in the next five to ten years. | | | |
| | Recommendation 3.1: Create a new facilities management department reporting to the Assistant City Manager for Operations. | Spring 2019 | | No change. |
| | Recommendation 3.2: Create a new Director of Land & Buildings position responsible for managing capital projects and strategically moving LBD from a response mode into a proactive preventative maintenance mode, among other duties. | Spring 2019 | \$115,000 | No change. |
| | Recommendation 3.3: Consider transferring the Energy Manager position into the new department. | Spring 2019 | | No change. |
| | Recommendation 3.4: Hire a firm to conduct a comprehensive assessment of all City facilities and to update the 2014 Capital Needs Assessment for the schools, as needed. | | See Rec 2.1 above | Schools complete. City buildings not done. |
| 55 | Finding 4: More than \$140 million in capital investment will be needed in Lowell schools over the next ten years (excluding the high school project). However, other than the high school project, the School District has not pursued MSBA grant funding in recent years. | | | |
| | Recommendation 4.1: Contact the MSBA and ask for a formal meeting to familiarize them with the Lowell school building needs identified in the 2104 study, discuss the types of assistance the MSBA can provide, and consider a potential schedule of projects for submission. | Spring 2019 | | Complete. |
| | Recommendation 4.2: Assign responsibility for coordinating the MSBA application process to the Assistant Superintendent of Finance/School Business Manager along with the administrative oversight of approved projects | Fall 2018 | | Not done. Assigned to Assistant to City Manager. |

Enclosure (1)

| SUMMARY OF RECOMMENDATIONS | | | | |
|---|--|-------------------|---|--|
| <i>Operational Assessment of Lowell Facilities Maintenance and Custodial Services</i> | | | | |
| Page | Finding/Recommendation | Time Frame | Cost Impact | Status |
| | <u>Recommendation 4.3:</u> Identify those projects that qualify for MSBA reimbursement and establish a multi-year schedule of applications to be submitted each year. | Spring 2019 | Significant savings anticipated | In progress. |
| 59 | Finding 5: In recent months, periods of low temperatures have produced catastrophic building failures which in turn have resulted in extensive damage and building closures. | | | |
| | <u>Recommendation 5.1:</u> Ensure that multiple staff are trained on the remote monitoring systems (EMS) in addition to the LBD Deputy Commissioner. | Fall 2018 | | In progress. |
| | <u>Recommendation 5.2:</u> Develop written protocols that identify specific areas of at risk city and school buildings to be visually checked during extreme weather conditions, and the process by which the overtime assignment(s) are to be made. | Fall 2018 | | In progress. |
| | <u>Recommendation 5.3:</u> Utilize the vast experience of the current workforce to train newer employees on the specific vulnerabilities of each building so that this knowledgebase continues when experienced employees cease working for the City. | Ongoing | | In progress. |
| 61 | Finding 6: The Land & Buildings Division lacks an electronic tracking system for work needed and performed at City buildings. | | | |
| | <u>Recommendation 6.1:</u> Procure and implement a work order system for City facilities. | Fall 2018 | Start-up TBD, ongoing ~\$7,000 | No change. |
| | <u>Recommendation 6.2:</u> Ensure that the chosen system allows work orders to be delegated electronically from the LBD Deputy Commissioner to assigned tradesmen as a first step to having staff work directly on the electronic system instead of receiving paper copies of work orders. | Fall 2018 | | No change. Staff will need expanded computer access. |
| | <u>Recommendation 6.3:</u> Prepare and distribute regular reports on work order backlog including location, type of work, trade(s) needed, etc. | FY2020 | | No change. |
| 63 | Finding 7: Vehicle shortages have required technicians to double up even when jobs do not require two people. Inefficiencies are exacerbated when vehicles are out of service for preventative maintenance or are otherwise inoperable. | | | |
| | <u>Recommendation 7.1:</u> Maintain a fleet that is approximately 60% of the size of the workforce that is deployed every morning. | FY2020- FY2022 | \$340,000 (incl. replacing aged veh) | No change. |
| | <u>Recommendation 7.2:</u> Engage in regular preventative maintenance of vehicles and replace vehicles on a consistent schedule to ensure a higher level of operability. | Ongoing | | No change. |
| 65 | Finding 8: The inventory of stocked repair parts has been reduced over time to be almost non-existent, increasing the time needed to close out work orders as tradesmen have to process a requisition and pick up individual parts, irrespective of the cost of the specific item needed. | | | |
| | <u>Recommendation 8.1:</u> Create a master list of parts that are required by the trades, and track how many are used each month throughout the year. | Spring 2019 | | No change. |
| | <u>Recommendation 8.2:</u> Create a written procedure to ensure accountability for the parts inventory. | Spring 2019 | | No change. |
| | <u>Recommendation 8.3:</u> Re-evaluate how repair items are purchased, looking for ways to expedite purchases, especially for lower cost items (<\$50). | Fall 2018 | | No change. |
| | <u>Recommendation 8.4:</u> Issue blanket purchase orders with competitive local supply stores in amounts that would sustain the resupply for a few months at a time. | Spring 2019 | | No change. |
| | <u>Recommendation 8.5:</u> Have the Chief Financial Officer and Chief Procurement Officer schedule an educational session with tradesmen who are expected to make purchases, inform them of the procurement process, gather feedback, and make adjustments where possible to ensure the procurement process is as efficient as possible. | Fall 2018 | | No change. |
| | <u>Recommendation 8.6:</u> Ensure that the SchoolDude software system is updated with the status of work orders so that authorized School Department officials can check on status, perhaps through the custodians, and get an approximate repair date based on notes posted. | Winter 2019 | | No change. |
| 69 | Finding 9: School custodial staffing is somewhat higher than industry standards for public schools. | | | |

Enclosure (1)

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| <i>Operational Assessment of Lowell Facilities Maintenance and Custodial Services</i> | | | | |
| Page | Finding/Recommendation | Time Frame | Cost Impact | Status |
| | <u>Recommendation 9.1:</u> Revise relevant bargaining agreements and job descriptions to increase the amount of maintenance work that can be performed by school custodians to include, at a minimum, the replacement of missing or damaged (non-structural) ceiling tiles. | FY2020 | | No change. |
| | <u>Recommendation 9.2:</u> Consider adding a full time custodian at Rogers Elementary and a half-time custodian at Washington Elementary, and ensure that the custodial vacancy at Moody Elementary is filled promptly. | FY2020 | \$69,500 | No change. |
| 71 | Finding 10: Often, custodians are the first to identify a building issue. The information they input into the work order system is vitally important to ensuring an appropriate response. | | | |
| | <u>Recommendation 10.1:</u> Conduct annual training with custodians to ensure they are comfortable and competent with the electronic submission process. | Summer 2018 | | No change. |
| | <u>Recommendation 10.2:</u> Establish a protocol between the School Facilities Director and LBD Deputy Commissioner regarding how to triage work order requests, so that both parties clearly understand which are the highest priority from the schools' perspective. | Summer 2018 | | In progress. |
| 73 | Finding 11: The breadth of responsibility for the Commissioner of Public Works is exceptional for a city the size of Lowell. Municipalities of this size and complexity often have separate parks, facilities, and public works departments to effectively manage the scope of responsibilities. | | | |
| | <u>Recommendation 11.1:</u> The new DPW Commissioner should re-visit the 2012 Collins Center report to determine which recommendations have been implemented and which remain relevant, but not yet implemented. | Fall 2018 | | In progress. |