REPORT OF THE MANAGEMENT AUDIT OF THE PUBLIC WORKS DEPARTMENT

CITY OF WHITE PLAINS, NEW YORK

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1. INTRODUCTION AND EXECUTIVE SUMMARY

The report, which follows, presents the results of the Management Audit of the Public Works Department conducted by the Matrix Consulting Group for the City of White Plains. This introductory chapter outlines a summary of the methodology utilized in conducting this engagement, and a table of recommendations summarizing the key recommendations contained in the report.

1. AUDIT SCOPE AND OBJECTIVES.

This management audit was undertaken to evaluate and assess the overall operations of the City of White Plains Public Works Department and the services provided by each of the major Bureaus. The approach of the project team in meeting this scope is summarized in the following points.

- **Develop an in-depth understanding of the key issues impacting the Department of Public Works.** To evaluate the Department of Public Works, Matrix Consulting Group conducted interviews with Department of Public Works staff. Interviews focused on goals and objectives, management systems, the use of technology, the levels of service provided by the Department, the resources available to provide those services, etc.

- **Develop a Profile of the Department of Public Works.** The Matrix Consulting Group conducted interviews with departmental staff and other key City staff in the City of White Plains to document current organization of services, the structure and functions of the department, budgets, workload data, management systems, inventory of the infrastructure, level and effectiveness of communication within the Department and with other Departments, etc.

- **Conduct a comparison of the Department of Public Works programs and practices to best management practices.** The best management practices included comparisons to best practices utilized by other municipalities, professional associations (such as the American Public Works Association *Public Works Management Practices Manual*, standards developed by the American Water Works Association, etc.), and the experience of the project team. Additionally, the project team utilized the Matrix Consulting Group's library of best practices developed by the firm while conducting hundreds of management studies throughout the Country.

- **Provide an opportunity for employee input.** An anonymous survey was conducted to provide all employees within the Department the opportunity to provide feedback and input directly to the project team regarding operations and issues faced by them and the Department of Public Works.

- **Evaluate the staffing, organization structure, and service levels in the Department of Public Works.** 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 and economic efficiency of the Department and practicable opportunities for enhancing the quality of its product and services.

The key findings and recommendations can be summarized in the following general themes:

- Administrative re-organization of the Department,
- Use of management systems throughout the Department,
- Improved communications within the department and with other departments.

The following section provides a summary of the key findings and recommendations contained in this report.

3. TABLE OF RECOMMENDATION.

Presented in the table on the following pages are the key findings and recommendations contained in this report. For each recommendation, we have provided a proposed implementation approach including a priority of the recommendation, a suggested timeframe for implementation, and an estimate of the cost or cost savings from implementation.

Rec. #	Page Number	Recommendation	Priority	Suggested Timeframe	Cost / (Savings)
BUREAU OF ADMINISTRATION					
1	Pg. 16	The Commissioner of Public Works should hire a City Engineer and delegate the responsibilities for daily operations of the individual bureaus to the Deputy Commissioners and to the Bureau superintendents. The Commissioner's role should transition to a more strategic orientation, establishing and communicating Department policies and priorities, monitoring individual Bureaus' performances against established measures, and ensuring that each Bureau has sufficient staffing, materials and resources to complete their assigned objectives	High	Immediate and ongoing	$25,000 to $30,000
2	Pg. 18	The Department should transfer the Code Enforcement functions from the Bureau of Administration to the Second Deputy Commissioner	High	Immediate	NA
3	Pg. 20	The Department Commissioner should establish budgetary policies and priorities for the establishment of the Department budget, and individual Bureau superintendents should be held accountable for establishing their individual budgets, for providing substantiation for budget request, and for adhering to the budget allocations. Further, the Bureau superintendents should be held accountable for monitoring expenditures against their budgets, and for alerting the appropriate Deputy Commissioner of any issues in adhering to the budget allocations as the fiscal year progresses.	High	FY16	NA
MANAGEMENT SYSTEMS AND ACCOUNTABILITY					
4	Pg. 23	Design a work activity form for use by all field employees. The form should be completed after each activity is performed by each crewmember or crew leader and turned in to the Administrative Clerk for input into an electronic spreadsheet.	Medium	Summer 2015	NA

Rec. #	Page Number	Recommendation	Priority	Suggested Timeframe	Cost / (Savings)
5	Pg. 24	Each bureau in the Department should develop an inventory of the work activities they perform.	Medium	Summer 2015	NA
6	Pg. 27	Procure and install a computerized maintenance management system for recording the work performed by Department crews.	Medium	Summer 2016	$40,000 plus annual licensing fees
7	Pg. 30	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 bureau that is responsible and accountable for its maintenance and repair.	High	Spring 2016	NA
8	Pg. 32	The Department should define the service levels that are appropriate to be accomplished.	High	Spring 2016	NA
9	Pg. 34	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.	Medium	Winter 2015	NA
10	Pg. 37	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.	Medium	Summer 2016	NA
11	Pg. 39	The Public Works Department should generate a monthly performance report comparing planned versus actual performance and costs. The intent of the monthly performance report is to report actual accomplishments against the annual work plan. This report should provide the basis for the Commissioner's monthly performance reports to the Mayor.	Medium	Summer 2016	NA

Rec. #	Page Number	Recommendation	Priority	Suggested Timeframe	Cost / (Savings)
12	Pg. 40	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.	Medium	Fall 2016	NA
BUREAU OF ENGINEERING					
13	Pg. 47	The professional-level classification series used in the Public Works Department should be simplified. The classification series should include a Deputy Commissioner of Public Works/City Engineer and two Associate Engineers. The functions of the City Engineer currently performed by the Public Works Commissioner should be assigned to this position, enabling the Commissioner to implement other recommendations in this report related to the administration of the Department.	High	Fall 2015	NA (cost of City Engineer addressed in Rec. #1 above)
14	Pg. 48	The Deputy Commissioner of Public Works/City Engineer should review and sign off on plans and specifications prior to a project being let for bid. The Deputy Commissioner must be a Professional Engineer ideally in Civil Engineering with substantial experience. The Deputy Commissioner should review and update the Commissioner of Public Works on critical projects, changes in schedule and contract amounts.	High	Fall 2015	NA
15	Pg. 48	The City should strive as the opportunity arises to have two Registered Professional Engineers in the position of Associate Engineer to permit them to serve as City Engineer when necessary.	Low	Fall 2016	NA
16	Pg. 48	The Drafter III job positions and functions should be reviewed and positions changed to reflect the duties performed.	Low	Fall 2015	NA

Rec. #	Page Number	Recommendation	Priority	Suggested Timeframe	Cost / (Savings)
17	Pg. 48	The Bureau of Engineering should work to develop the skills of the Senior Engineers so that they have the capability to manage projects with one having a strong background in water and sewer and the other civil. These Engineers should be able to manage a team of individuals on an as needed basis.	Medium	FY16	NA
18	Pg. 50	The City Engineer should delegate responsibility to the Associate Engineers and Construction Coordinator to supervise the capital program, with authority to plan, supervise, train, and review the work of an assigned section in the Engineering Bureau, as well as sign and approve capital project plans and specifications.	Medium	FY16	NA
19	Pg. 50	A training program needs to be developed for the Bureau of Engineering staff. The program should be focused on enhancing project management, designs skills and capacity.	Medium	FY16	NA
20	Pg. 53	The Bureau of Engineering should discontinue its reliance on manual project status updates, which are time-consuming to prepare, and are not currently developed in a timely manner in any case. Rather, the Bureau should enhance its knowledge of the capabilities of the Munis financial system and begin utilizing this system to provide updated financial status of each of its projects.	Medium	Immediate and ongoing	NA
21	Pg. 55	The Bureau of Engineering should enhance and expand its Capital Improvement Projects Development and Management Policies.	Medium	FY16	NA
22	Pg. 55	The Bureau of Engineering should develop an on-line version of its Capital Improvement Projects Development and Management Policies/Handbook and publish it on the Bureau's Intranet.	Low	FY16	NA

Rec. #	Page Number	Recommendation	Priority	Suggested Timeframe	Cost / (Savings)
23	Pg. 58	The Bureau of Engineering should utilize a rigorous process to properly estimate how long it will take to perform each phase of the design and the construction of each capital project, from planning and studies up front, through close out of the construction contract and the overall project, and utilize a scheduling package for each capital project.	High	Immediate and ongoing	$9,500 (software purchase and training). Annual maintenance would cost about $750.
24	Pg. 58	The Bureau of Engineering project manager should update the schedule monthly, but the baseline (original) schedule should not be modified to enable a comparison to the actual to the baseline (original) schedule.	High	Immediate and ongoing	NA
25	Pg. 58	The Bureau of Engineering should utilize the electronic scheduling package to generate various schedule reports, including a Master Summary Report, Construction Phase Only, Design Look-Ahead, Construction Look-Ahead, Project Plan Check, Future Work Advertise dates, and ad hoc reports.	High	Immediate and ongoing	NA
26	Pg. 58	The Bureau of Engineering should load the costs of each project into the electronic scheduling system. The project managers should also track actual total cost against the original project budget and the prior month's forecast. The variance between the baseline and latest forecast budget should be used as a key performance indicator.	High	Immediate and ongoing	NA
27	Pg. 58	The Bureau should conduct a project planning status meeting for each project that includes the City Engineer, the Associate Engineers, the appropriate project manager, the Chief Construction Coordinator and the City Traffic Engineer.	Medium	Fall 2015	NA

Rec. #	Page Number	Recommendation	Priority	Suggested Timeframe	Cost / (Savings)
28	Pg. 61	The Bureau of Engineering should expand its project work plans in order to ensure that sufficient project pre-planning has occurred. This includes the development of project descriptions, measures of success, communication plans, risk assessments and other facets of project management.	High	Immediate and ongoing	NA
29	Pg. 64	The Bureau of Engineering should utilize cost of construction guidelines to determine the staffing requirements for each capital improvement program project in terms of person hours required for design and construction inspection.	Medium	Fall 2015	NA
30	Pg. 65	"Billability" targets should be established for staff of the Engineering Bureau.	Low	FY16	NA
31	Pg. 65	As part of the development of these "billability" targets, principles should be developed by the City's Finance Department and the Bureau of Engineering for what is chargeable to capital projects and what is to be included in the hourly rates charged to capital projects. The Munis project accounting system should be utilized to monitor the performance of the staff of the Engineering Bureau against these targets.	Low	FY16	NA
32	Pg. 65	The Bureau should work with the Finance Department to create the necessary management reports for projects and train the Contracts Clerk and one backup person on the use of Munis so the Bureau can glean the necessary information.	Low	FY16	NA
33	Pg. 66	Costs for professional fees by staff should be charged against the appropriate project.	Low	FY16	NA
34	Pg. 67	The Bureau of Engineering should prepare a bi-monthly capital improvement program project status report, and should be updated and posted to the Public Works Department web site.	Low	FY16	NA

Rec. #	Page Number	Recommendation	Priority	Suggested Timeframe	Cost / (Savings)
35	Pg. 69	The Bureau of Engineering should routinely and consistently conduct 30% / 60% / 90% design plan and specification reviews with Construction Management and Inspection and the Asset Manager.	High	Immediate and ongoing	NA
36	Pg. 69	The Bureau of Engineering should develop a policy and procedure for the conduct of the 30% / 60% / 90% design plan and specification reviews with Construction Management and Inspection and the Asset Manager.	High	Immediate and ongoing	NA
37	Pg. 70	A final report should be prepared for capital projects by the project manager upon completion of construction and acceptance of the improvements.	High	Immediate and ongoing	NA
BUREAU OF HIGHWAY AND GROUNDS					
38	Pg. 74	Allocate a full time employee to the proactive inspection of the City's sidewalks during the spring, summer and fall seasons. Establish a 48-hour response time to serious tripping hazards, and a one-week response time for all other sidewalk repairs.	Low	Fall 2015	NA
39	Pg. 74	Cross-train all Maintenance Workers in the maintenance of streetlights. The Street Light repair and maintenance function should operate daily with a fully proficient two-person crew that is able to provide a level of service that allows the two-person crew to respond to outages within 24 hours of the report.	Low	Summer 2016	NA
40	Pg. 75	The Bureau should eliminate two Semi-Skilled Laborer positions. There are currently five vacant positions in the Semi-Skilled Laborer classification, and the project team recommends reducing the authorized contingent by two positions.	Medium	Fall 2015	Cost avoidance of $141,259
41	Pg. 76	The Bureau should adopt and adhere to optimum crew sizes for each of its major maintenance and repair activities in order to maximize the productivity of all staff of the Bureau.	Medium	Fall 2015	NA

Rec. #	Page Number	Recommendation	Priority	Suggested Timeframe	Cost / (Savings)
42	Pg. 79	The City should adopt and implement a formal pavement management system that assesses the City's paved surfaces in an objective manner to ensure that there is a systematic process by which paved surfaces do not deteriorate to the point of requiring complete reconstruction, which is by far the most costly alternative.	Medium	Winter 2015	$0.09 to $0.12 per yard of pavement
43	Pg. 82	The Parks Section of the Bureau should develop formal service level standards for parks and grounds it maintains. A specific level of service should be designated for each site.	Low	Winter 2015	NA
44	Pg. 84	The Parks Section of the Bureau should develop quality standards for the maintenance of City parks.	Low	Winter 2015	NA
45	Pg. 85	Certify at least one Parks employee as a Certified Playground Safety Inspector (CPSI).	Low	Winter 2015	$340 for a single certification
BUREAU OF SANITATION					
46	Pg. 89	The Bureau of Sanitation should redesign collection routes to ensure that between 750 and 900 stops are made daily by its crews.	High	FY16	($1,232,436)
47	Pg. 92	The City should transition from twice-weekly garbage collection to once per week.	Medium	FY16	(2,464,873)
48	Pg. 94	The Bureau of Sanitation should analyze the efficiency of current routes to ensure that drivers are minimizing the amount of time taken in trash collection.	Medium	Spring 2016	$8,000 to $10,000
49	Pg. 95	Enhance the functionality of the Bureau's web site by adding information that will both inform and educate residents, and will serve to reduce the call volume in the Sanitation Bureau office.	Low	Fall 2015	NA
BUREAU OF GARAGE AND SHOP					
50	Pg. 100	Eliminate one Mechanic position in the Bureau of Garage and Shop.	Low	Fall 2015	($110,345)

Rec. #	Page Number	Recommendation	Priority	Suggested Timeframe	Cost / (Savings)
51	Pg. 102	The Bureau of Garage and Shop should institute a process of continuous parts inventory counts and reconcile any differences between the physical inventory and that which is reported in the CFA parts module.	Medium	Immediate and continuous	NA
52	Pg. 103	The Bureau of Garage and Shop should hire a second Stock Clerk to ensure a greater level of customer service, parts room security and parts control.	Low	Fall 2015	$92,869
53	Pg. 105	The Bureau of Garage and Shop should meet with its primary customers to develop a Service Level Agreement that defines the levels of service it commits to providing, and also defines customer responsibilities as well.	Low	Immediate and continuous	NA
54	Pg. 110	The project team recommends the development of standard economic life cycles for vehicles and equipment. Furthermore, the project team 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.	Medium	Winter 2015	NA
BUREAU OF WATER AND WASTEWATER					
55	Pg. 112	Identify one or more current Water and Wastewater Bureau employees to obtain a 1A license from the State of New York, and begin training under the current Senior Water Treatment Plant Operator.	High	Immediate	NA
56	Pg. 115	The implementation of a CMMS would allow the Bureau to plan, schedule and manage its preventive work, and to record its reactive, or emergency, workload in a more effective manner.	High	Summer 2016	NA (cost of system identified elsewhere in the report)
BUREAU OF FACILITIES MANAGEMENT					
57	Pg. 118	The Bureau of Public Facilities should investigate the feasibility of outsourcing services.	Low	Spring 2016	($190,000)

Rec. #	Page Number	Recommendation	Priority	Suggested Timeframe	Cost / (Savings)
58	Pg. 120	The Bureau of Public Facilities should continue utilizing a mix of internal and contracted services to accomplish facilities maintenance and repair at municipal facilities.	Low	NA	NA

More detailed narrative and description of each of the recommendations is contained in the following chapters.

2. ANALYSIS OF THE BUREAU OF ADMINISTRATION

This section of the report analyzes the operations of the Bureau of Administration.

1. THERE ARE A NUMBER OF POSITIVE ASPECTS OF THE BUREAU OF ADMINISTRATION'S OPERATIONS.

Although there are opportunities for improvement, there are also several positive aspects of the Bureau of Administration's current operations that are highlighted below.

- The administrative staff accomplishes a great deal of work, especially in the development and monitoring of the Department budget, which is accomplished almost entirely by a lean staffing contingent in the Administrative Bureau.
- The installation of the Gradient software system has resulted in an almost error-free payroll being submitted to the City's Finance Department on a bi-weekly basis.

These positive aspects provide a basis for the improvement of the Bureau of Administration.

1. THE DEPARTMENT COMMISSIONER SHOULD PLACE A GREATER EMPHASIZE ON THE OVERALL MANAGERIAL RESPONSIBILITIES OF THE POSITION.

The project team discusses in more detail in the Engineering Chapter of the report that the Public Works Commissioner has historically functioned as the City Engineer, approving projects, making engineering decisions regarding construction and change orders, approving payments, and many other duties. The project team has further recommended that these roles be fulfilled by a City Engineer who would have day-to-day responsibilities for operational, financial and organizational operations of the Engineering Bureau. It is estimated that the cost to implement the City Engineer position will have an increased cost of $25,000 to $30,000 in salary and benefit costs.

As the Commissioner has performed these functions for many years, the transition from effectively functioning as the City Engineer to assuming a greater overall role in all Department operations may initially be a difficult one. However, the City has transitioned from a small municipality to one in which the Public Works Department now plays a large and complex role in the lives of its residents, and the position of Commissioner now needs to make this transition as well, which will require a more strategic orientation than has been the case historically.

A common theme heard in both internal and external interviews was that of a greater need for communication of critical information from the Commissioner, both in terms of substance and timeliness. This need for substantive and timely communication extends to many facets of the organization, including:

- The need to transmit vital project-related information to all Bureau Superintendents and Deputy Commissioners. Decisions made on many projects may not only impact multiple bureaus in the Department, but may benefit from their input before they are made. Substantive information such as which roads will be resurfaced, and when, have impacts not only on the Highway Section of the Highways and Grounds Bureau, but on the Bureau of Utilities as well. Further, contractors need to plan for the use of personnel and equipment well in advance of the actual need for their services.

- The need to inform stakeholders, including the Mayor and residents, of work performed, and the efficiency and effectiveness with which Department resources have been expended in their accomplishment. The project team has made recommendations within this report's Management Systems and Accountability chapter to establish performance measures within the Department, and will not duplicate that discussion here. It should be reiterated here, however, that the Commissioner should assume a lead role in both the establishment of these measures, and the monitoring of performance against them as well.

- The need to develop and communicate Department policy regarding priorities related to operational and capital budgets, service levels provided by the various bureaus, equipment, facilities, energy consumption, financial controls, and many other elements of effective operations.

Currently, Bureau Superintendents and Deputy Commissioners either make decisions without clear direction on Department policy, or defer to the Commissioner who may not make these decisions in a timely manner. One of the fundamental responsibilities of a Department Commissioner is not to make all decisions, but to provide a framework within which Bureau Superintendents can make these decisions on their own. Again, the common theme during on site interviews was that there is no such policy framework communicated from the upper level of Department management.

Once the Department identifies and hires a suitable candidate for the position of City Engineer, which has been recommended above, the Department Commissioner's position should fundamentally change to a more strategic role in the organization. The duties should be altered from daily responsibilities for a bureau's operations to the overall strategic performance of the Department as a whole. Specifically, the roles and responsibilities of the Commissioners should encompass the following:

- **Overall departmental operations.** The role of the Commissioner is not to operate all, or any, bureaus, but rather to outline and clearly communicate the Department's policies, procedures, goals, priorities and objectives. Then, once these have been effectively communicated, the Commissioner's role transitions to the monitoring and evaluation of performance against these policies, procedures, goals, priorities and objectives. It is appropriate for the Commissioner to play a role in the development and approval of major infrastructure projects, setting priorities, establishing cost parameters, and monitoring accomplishments against major milestones. The daily monitoring of project status, however, should be delegated to bureau superintendents.

- **Supervising employees.** The Commissioner should play a role in ensuring that the Department has the appropriate staffing contingent, materials and equipment to accomplish their various work requirements at the service levels defined in individual meetings with each Bureau Superintendent. Once this role is accomplished, the Commissioner's responsibilities transition to one of training and motivating Superintendents, and to ensure that they are not only meeting expectations, but that they are holding their own employees accountable for

meeting their expectations. If there are deficits in staffing, materials, equipment, training or any other aspect critical to the performance of the assigned objectives of each bureau, the Department Commissioner's role is to be the Department's advocate for additional resources.

- **Managing the Department's Finances.** One of the most critical roles of any Commissioner in the City is to establish budgetary policies and priorities, and to work within the budgets allocated to their departments. Moreover, the Commissioner should ensure that Bureau Superintendents take an active role in developing, and owning, their individual budgets, and to be responsible for adhering to these budgets. As will be discussed below, this is not the case currently as the Department's Administrative Officer is developing the Department's budget at the individual Bureau level, and sometimes at the line item level of detail.

In summary, the Department's Bureau superintendents should be delegated the roles of ensuring the efficient operations of their individual organizations, under the overall direction of the Department Commissioner, who should provide the policy framework within which these superintendents work. The Commissioner should be a technical resource and advocate for the superintendents, and should clearly communicate information that impacts each bureau. Further, the Commissioner should provide an open forum within which Bureau superintendents communicate with each other as well as with the Commissioner. This latter point is one that the project team should underscore, as it was clear in interviews that these forums for communication have not occurred in a number of years.

The Commissioner should be the advocate for the Department, and should also be its "voice" to both the Mayor and to the City's residents, communicating its actions, its performance against established measures of success, and its needs for additional resources.

Recommendation #1: The Commissioner of Public Works should hire a City Engineer and delegate the responsibilities for daily operations of the individual bureaus to the Deputy Commissioners and to the Bureau superintendents. The

Commissioner's role should transition to a more strategic orientation, establishing and communicating Department policies and priorities, monitoring individual Bureaus' performances against established measures, and ensuring that each Bureau has sufficient staffing, materials and resources to complete their assigned objectives.

2. THE DEPARTMENT SHOULD PLACE THE FUNCTION OF CODE ENFORCEMENT UNDER THE SUPERVISION OF THE SECOND DEPUTY COMMISSIONER.

During the initial phases of the project, the project team interviewed the incumbent in the position of Operations Supervisor in the Bureau of Administration. Among this position's responsibilities, as related by the incumbent, was the oversight of the Department's code enforcement activities as they relate to sidewalk issues, vegetation overgrowth, etc. Other responsibilities of the section relate to issuance of permits, inspections for compliance with the permit requirements, managing sidewalk cafes and issuing licenses for the cafes, and other related duties.

Shortly after the project team's interview of the Operations Supervisor, the incumbent terminated employment with the City, and the City has elected to eliminate the position. Further, the City has chosen not to fill the position on an out-of-class basis, which effectively leaves the code enforcement function unsupervised, as the only other supervisory position in the Bureau of Administration, the Administrative Officer, has no experience or background in code enforcement.

The project team recommends that the Department transfer the code enforcement function out of the Bureau of Administration, and under the direct supervision of the Second Deputy Commissioner, who has responsibilities for Engineering and Utilities. The Engineering Bureau has an inspectional function that, although dissimilar in terms of the specifications examined, has some similarity in

terms of the field inspections element. This will ensure that the code enforcement officers in the field are provided with directions and an avenue to pursue if additional resources are needed.

The project team believes that a longer-term solution should be pursued for the organizational placement of the code enforcement function of the Department, however the organization has an immediate need to provide supervision and direction to this function, and the placement under the Second Deputy Commissioner should be viewed as temporary. Typically code enforcement is a consolidated function within a city, with all rights of way, zoning and structural code enforcement being under a single organizational structure. This is not the case in White Plains, as all rights of way codes (sidewalk tripping hazards, street obstructions, recycling and garbage violations, vegetation, etc.) are enforced by Public Works, with structural and zoning codes (set back distances, use of residences for a business, etc.) being enforced by the Building Department. The project team's scope of services did not include an examination of the feasibility of this organizational transfer, however given the current circumstances in the Public Works Code Enforcement function, the City may wish to examine this as a potential longer-term solution.

Recommendation #2: The Department should transfer the Code Enforcement functions from the Bureau of Administration to the Second Deputy Commissioner.

3. BUREAU SUPERINTENDENTS SHOULD TAKE AN ACTIVE ROLE IN THE DEVELOPMENT AND MONITORING OF THEIR INDIVIDUAL BUDGETS.

In interviews with the Department's Administrative Officer, as well as with each of the Bureau Superintendents, it was clear that the Public Works Department

develops its budgets in a "top down" manner, in which Bureau Superintendents are not active participants in the development or monitoring of their individual budgets.

In the current budget development process, the Administrative Officer issues a memorandum to all Bureau Superintendents requesting input on their expected levels of overtime needs, expenses, equipment needs and any other budgetary needs they may have. Generally, these are not completed properly or comprehensively, and do not have proper justification for any requests. In some cases, Bureau superintendents do not respond to the requests in any fashion, leaving the Administrative Officer with the task of developing these forecasts for the superintendents.

There are at least two problems with this approach to the development of budgets. These include the following:

- The Administrative Officer is not in a position to know or anticipate the operational needs of any of the bureaus, and may fail to account for events that should be anticipated and accounted for by the superintendents.
- The Bureau superintendents cannot reasonably be held accountable for adherence to budgets that they did not develop.

Bureau superintendents have not historically been held accountable for the development or adherence to their individual budgets. However, these are basic and fundamental responsibilities for any Bureau head, and the Department Commissioner should ensure that the superintendents not only respond to requests for budgetary input, but that these requests are fully supported with documentation that provides substantiation for new budgetary requests, or those that deviate substantially from those of previous years. Bureau superintendents should take ownership in the budgets that are approved, and should be held accountable for variations. In this report's chapter on Management Systems and Accountability, the project team outlines process

by which each Bureau superintendent, in conjunction with the Department Commissioner, should develop service levels for each of their major functions. In much the same manner, Bureau superintendents should develop budgets that mirror these service levels in the identification of appropriate expenditures for staffing, overtime requirements, materials, equipment and capital improvements.

Recommendation #3: The Department Commissioner should establish budgetary policies and priorities for the establishment of the Department budget, and individual Bureau superintendents should be held accountable for establishing their individual budgets, for providing substantiation for budget request, and for adhering to the budget allocations. Further, the Bureau superintendents should be held accountable for monitoring expenditures against their budgets, and for alerting the appropriate Deputy Commissioner of any issues in adhering to the budget allocations as the fiscal year progresses.

3. 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. Several of the bureaus that perform fieldwork record work activities on manual work sheets, however these are not summarized in any meaningful way that facilitates analysis. 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 the Dispatcher in the Highways and Grounds 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. Other bureaus in the Department do not capture any meaningful information.

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. 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 White Plains Public Works Department does not possess a computerized maintenance management system (CMMS), and this will be addressed in a later section. 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, other than for the Sanitation and Fleet Management Bureaus[1], 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

[1] The Sanitation Bureau performs routine work that follows a route, and does not vary substantially. The Fleet Management Bureau possesses and utilizes its own CMMS.

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. Until such time that 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 #4: Design a work activity form for use by all field employees. The form should be completed after each activity is performed by each crewmember 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 Commissioner, managers 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
Sewer televising	Linear feel
Vehicle maintenance	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 crewmembers on manual sheets, and transferred by administrative staff into the CMMS.

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.

Recommendation #5: Each bureau in the Department should develop an inventory of the work activities they perform.

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

The White Plains Public Works Department has never had an automated work management system in which crewmembers were required to play active 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 in 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 Commissioner to the Mayor.

- Linking a database and geographic information systems (GIS) provides more

options to analyze asset information.

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

- Asset information can be shared in a visual format that is often better understood by others, including the City Council and the public.

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

The 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 City's payroll system, which should, in the future, 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.

The cost of this system can vary depending upon the functionality desired; however a basic system that is adequate for the needs of the Department can be purchased for $40,000 or less. Annual licensing fees would apply as well.

The steps that need to be accomplished in order to maximize the utility of a CMMS are described in the following sub-sections.

Recommendation #6: Procure and install a computerized maintenance management system for recording the work performed by Department crews.

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 City has made a significant investment. Given that the

Department of Public Works does not have unlimited access to resources, it is faced with decisions regarding the optimum manner in which it maintains the City'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 both 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 City's infrastructure assets, their performance, their preservation, and their anticipated longevity. Effective asset management is important for at least two reasons, including:

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

Effective asset management relies upon accurate asset information to facilitate

decision-making regarding the condition and performance of those assets with a long-term view of their preservation and renewal.

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

- Update the long-term plan for the water distribution and sewer collection systems. The City should be replacing or rehabilitating an average of 1% to 2% of this infrastructure each year. Over the past five years, the City has replaced an average of 0.86 miles of sewer line, and an average of 0.30 miles of water line, equating to far less than 1% of the total inventory on an annual basis.

- Develop a long-term rehabilitation and replacement plan for the street system. The City has resurfaced about 5.1 lane miles per year over the past five years using private contractors, with an unknown number of miles resurfaced by in-house crews during this time period. There are 134 centerline miles in the City's inventory, so although 5.1 lane miles equates to about 3.7% of the total centerline miles, the percentage of the centerline total is less than the 3.7%. The City should be resurfacing or replacing 5% to 8% of its paved surfaces each year. 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 City's vehicles and equipment. As the project team will show in a later section of this report, it is clear from the age of the fleet that there has been a deferral of expenditures on this important element of operations.

The Department needs to address these challenges in the rehabilitation and replacement of the City's assets. 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), and the White Plains DPW should establish this as a goal once it has instituted a functioning computerized maintenance management system. 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 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 should be provided to all team members. Since the initial inventory will involve manual data collection, the Department should 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 should be reviewed and quality controlled. Based upon the findings of the pilot project, the Department should revisit the timeframe for collecting the asset inventory data.

Recommendation #7: 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 bureau 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, 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 outside the Water and Sewer, Fleet and Sanitation bureaus, the activities performed by 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 Commissioner and bureau managers 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 purpose 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 #8: The Department 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 standards 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 or filter changes on HVAC units, etc.

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. Whatever output basis is selected, each standard should include at least six components:

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

A sample performance standard for crack sealing is presented in the table following this paragraph. 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. The activity number (HG-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” etc.

SAMPLE PERFORMANCE STANDARD
FOR THE HIGHWAY AND GROUNDS BUREAU

<table>
<tr><td>Activity No.:
HG-001</td><td colspan="2">Activity Name:
Crack Sealing</td></tr>
<tr><td colspan="3">Description and Purpose:

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.</td></tr>
<tr><td colspan="3">Schedule:

Perform work to prevent water from penetrating and damaging the roadway surface. Sand seal after application.</td></tr>
<tr><td>Authorized by:

Assistant Commissioner</td><td colspan="2">Level of Service:

Ensure smooth transportation over paved roads. . Performed on cracks greater than 1/4" wide. Perform when temperature is above 50 F and dry.</td></tr>
<tr><td>Crew Sizes:

2 - MEO
1 - Laborer

Equipment:

1 Grader
3 Dump Truck
1 Water Truck
1 Pickup
1 Street Roller
1 Loader</td><td colspan="2">Work Method:

1. Place safety signs and devices
2. Clean cracks as necessary
3. Fill cracks with seal material
4. Cover crack filler lightly with sand
5. Remove safety signs and devices</td></tr>
<tr><td>Material:

100 gallons liquid crack filler
Sand</td><td colspan="2">Average Daily Production

100-200 gallons of crack filler per day</td></tr>
</table>

Recommendation #9: 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.

7. 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 Commissioner should be able to safely rely on bureau managers, 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 completed within an agreed-upon time frame. This element of the process requires that the Department Commissioner 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 bureau managers and 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 Commissioner, 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 Commissioner approves the annual work program, bureau managers and 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., require more personnel resources 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 Commissioner to quantify the impact of these interruptions within specified boundaries of probability.

A sample annual work program for the Highway and Grounds Bureau is presented in the following table:

Sample Annual Work Program
for the Highway and Grounds Bureau

Work Activity	Labor Days		Amount of Work		Total Cost		Productivity	
	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

Note: This chart is only an example and is not based on actual data from the City.

Each bureau 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 and Grounds Bureau on the next page. This sample is not intended to be a full listing of the activities performed by the Bureau, but rather is provided in order to facilitate the process of determining the types of activities each bureau should be developing, and at what level of detail.

Exhibit of Maintenance Activities for Highway and Grounds Bureau

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

Although the presence of a manual work tracking system, such as is present in some parts of DPW is a helpful step in listing the types of work performed, the data is not being used to define the desired levels of service that *should* be provided.

Recommendation #10: 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.

8. 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 Commissioner and Bureau 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 Commissioner should be required to provide a monthly status report to the Mayor, 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 #11: The Public Works Department should generate a monthly performance report comparing planned versus actual performance and costs. The intent of the monthly performance report is to report actual accomplishments against the annual work plan. This report should provide the basis for the Commissioner's monthly performance reports to the Mayor.

9. POLICIES AND PROCEDURES FOR THE DEPARTMENT SHOULD BE CLEARLY DOCUMENTED.

The Public Works 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, and snow removal. 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 to ensure they remain current, applicable and match current practices. 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.
- **Widely Distributed.** 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 White Plains.

- 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
- Traffic Operations
- Parking

Sample policies and procedures may be purchased through APWA or other providers to serve as a base. Additionally, policies may be borrowed from other cities and towns either within or outside New York, and modified to suit the particular operating environment in White Plains.

Recommendation #12: The Public Works Department should establish a policies and procedures committee from all bureaus to identify the appropriate topics for coverage in a policies and procedures manual. Then, the committee should develop standard policies and procedures for the Department.

4. ANALYSIS OF THE BUREAU OF ENGINEERING

This chapter presents an analysis of the Bureau of Engineering. This includes an analysis of staffing, project management practices, and other aspects of the Bureau.

1. THERE ARE A NUMBER OF POSITIVE ASPECTS TO THE BUREAU OF ENGINEERING.

Operations reviews of any department will focus on the opportunities for improvement. However, it is important to recognize that the Bureau of Engineering already has a number of positive aspects. Examples of these positive aspects are presented below.

- A six-year capital improvement program has been developed and adopted by the City Council and integrated into the City's annual operating budget.
- The Bureau has developed a Design Handbook/Policy.
- The stormwater permitting process is well defined and administered.
- Sufficient staffing is available within the Bureau.

The positive aspects provide a basis for the improvement of the Bureau of Engineering.

2. OVER THE NEXT SEVERAL YEARS, THE BUREAU OF ENGINEERING WILL ADMINISTER ABOUT THE SAME DOLLAR VOLUME ANNUALLY OF PROJECTS WITH A SPIKE OCCURRING IN FY 2016-17 DUE TO AN INCREASE IN THE WATER FUND PROJECTS.

The estimates of capital projects, including rolling stock for years indicated, from the Capital Improvement Plan, are presented in the table below. Note that $32,000,000 in capital projects are proposed in FY 2016-2017 in the Water fund. While water fund projects have an impact on workload, except for line related projects,

these are largely contracted out, as are most large, major engineering or specialty projects. Hence the impact is lessened significantly.

Fiscal Year	Estimated Annual Funding
FY 2013 – 2014	$ 19,054,000
FY 2014 – 2015	$ 16,997,550
FY 2015 – 2016	$ 18,679,900
FY 2016 – 2017	$ 36,166,100
FY 2017 – 2018	$ 16,769,500
FY 2018 – 2019	$ 15,143,500
FY 2019 – 2020	$ 10,644,500

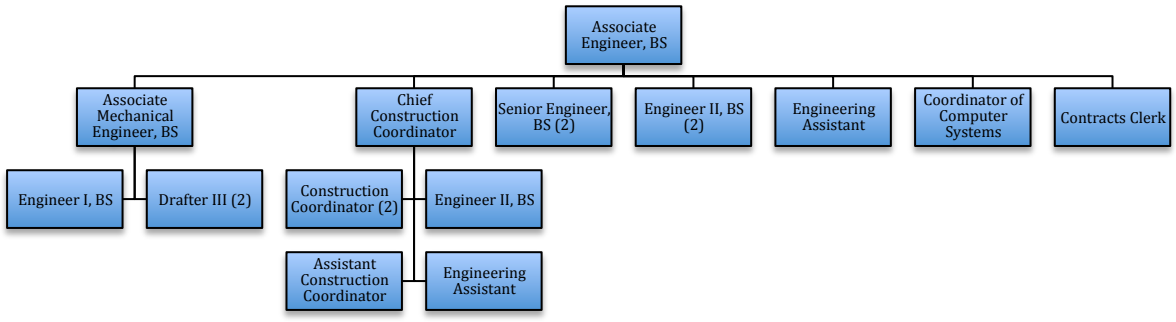
The City's capital budget for the next five years, as shown in the FY 2015 adopted budget, for Buildings, Streets, Storm Water Drains, Other, Downtown Improvements, Sanitary Sewer Improvements, Information Systems. Parking, Public Safety, Recreation & Parks, Library Fund, Cable TV, Sewer Rent Fund and Water Fund is presented in the table below.

Capital – Infrastructure	FY 2013-2014	FY 2014-2015	FY 2015-2016	FY 2016-2017	FY 2017-2018
Public Works					
Buildings	$1,335,000	$1,500,000	$ 900,000	$1,200,000	$ 500,000
Streets	$2,000,000	$2,000,000	$2,500,000	$2,500.000	$ 2 500,000
Storm Water Drains	$ 250,000	$ 500,000	$ 750,000	$ 500,000	$ 500,000
Other	$ 0	$2,050,000	$ 650,000	$ 0	$ 0
Total Public Works	**$ 3,585,000**	**$ 6,050,000**	**$ 4,800,000**	**$4,200,000**	**$3,500,000**
Information System	**$ 0**	**$ 125,000**	**$ 100,000**	**$ 125,000**	**$ 500,000**
Parking	**$ 790,000**	**$980,000**	**$ 2,660,000**	**$3,845,000**	**$3,523,000**
Public Safety	**$ 200,000**	**$155,250**	**$100,000**	**$ 100,000**	**$100,000**
Recreation & Parks	**$2,800,000**	**$100,000**	**$1,500,000**	**$2,000,000**	**$2,200,000**
Total General Fund	**$7,375,000**	**$7,410,250**	**$9,160,000**	**$10,270,000**	**$9823,000**
Library Fund	**900,000**	**150,000**	**875,000**	**1,230,000**	**$250,000**
Cable TV			**$300,000**		
Sewer Rent		**$ 950,000**	**$ 1,250,000**	**$ 1,000,000**	**$500,000**
Water Fund	**10,600,000**	**$ 5,500,000**	**$ 3,400,000**	**$19,500,000**	**$ 2,400,000**
Total Projects	**$18,875,000**	**$14,010,250**	**$14,985,000**	**$32,000,000**	**$12,973,000**

As can be seen in the table, the amount of funds to be expended on capital projects over the five-year period is substantial, and will require rigorous and intensive project management by the engineering bureau. The following sections of the report provide refinements and enhancements to the current method of capital project management utilized by the bureau that will, if properly implemented, result in projects that are delivered on schedule and on budget, and will provide city management with the information needed to stay apprised of project progress throughout the entire process.

3. ORGANIZATIONAL AND PERSONNEL ISSUES ARE CREATING UNNECESSARY DELAYS IN THE COMPLETION OF PROJECTS.

The classification structure for the professional-level engineering positions in the Bureau of Engineering does not appropriately reflect the tasks performed. It also includes positions of essentially the same title (Associate Mechanical Engineer, B.S.) reporting to a position of the same title (Associate Engineer, B.S.). This is illustrated in the current organizational chart and the table below.



These positions are recapitulated in the table below.

Position Title	No. of Authorized Positions
Associate Engineer, B.S.	1
Associate Mechanical Engineer BS	1
Chief Construction Coordinator	1
Engineer I, BS	1
Engineer II, BS	3
Senior Engineer	2
Construction Coordinator	2
Assistant Construction Coordinator	1
Engineering Assistant	2
Coordinator of Computer Systems	1
Contracts Clerk	1
Drafter III	2
Total	**18**

There are a number of issues with the existing organization, the allocation of positions and the classification structure as noted below.

- The Associate Engineer effectively serves as the City Engineer, however the incumbent lacks the necessary professional designation to serve in that position. The Commissioner of Public Works serves as the City Engineer and reviews and signs off on all plans, specifications and WS4 permits prior to issuance. This causes a delay in the issuance of projects for bid.

- The Commissioner of Public Works, a Professional Engineer, reviews and signs off on all projects going to bid, however the Associate Engineer reports through the Deputy Commissioner of Public Works.

- There are two Associate Engineers. While one is designated Mechanical, that position reports to the other Associate Engineer who manages the engineering design function.

- There are two Registered Professional Engineers in the Bureau of Engineering and three in the Public Works Department, including the Commissioner.

- The City has overlapping engineering classifications with Senior Engineers not necessarily more qualified to manage a design project than other engineering personnel. An Engineer II, for example, supervises stormwater reviews of other Engineers when necessary.

- The philosophy of the Bureau of Engineering is that all Engineers should be equally capable of designing and providing all types of engineering services (e.g. road, drainage, water and sewer). Consequently Engineers have little specialization.

- Most Engineers perform their own drafting. Additionally, at least one of the Drafter III positions performs project management and inspection services.

The combination of the above factors has resulted in "bottlenecks" in completing projects in a timely manner, as the large majority of reviews and approvals go through the Associate Engineer and then the Commissioner. This, in turn, is creating a reliance on overtime for completing routine tasks. An analysis of overtime for the Engineering Bureau for the period January 1, 2013 through September 30, 2014 shows that the Associate Engineer, BS and the Construction Coordinator accounted for 67% of the overtime in the Bureau, with the Associate Engineer accounting for over 40% of the entire overtime in the Bureau. The overtime for the Chief Construction Coordinator is largely due to the fact that contractors typically work at least eight hours per day and the City's standard workday is 7.5 hours. Hence, there is a minimum of one-half hour of overtime built-in for every day the contractor works. The overtime for the Associate Engineer is due to one or more of the following factors: (1) the lack of reliance on staff and staff training; (2) the need for the Associate Engineer to review all documents with the Commissioner prior to final authorization and (3) the maintenance of a manual system to track project costs.

While the project team recognizes that delays are sometimes inevitable due to size, complexity and potential litigation, the number and frequency of the delays within the Public Works Department is significantly greater than should be expected. Examples are as follows:

- A problem was identified with the Library Plaza in 2011. Design funds were awarded July 2012. A first payment was made to the design firm December 20, 2013 and a second February 28, 2014. Public Works has recently hired a new design firm to address the issue. This information had not been communicated internally within the organization nor the options offered by the original consultant.

- The City experienced a failure of a traffic signal downtown, caused by the collapse of the mast arm. This caused the loss of traffic control at an intersection in November 2012. Traffic signals are critical assets for the safety of residents and visitors in the City. While temporary signals were installed on several occasions, there appeared to be no urgency to complete the permanent repair, which was completed in November 2014 by replacement of the mast arm two years after the initial signal failure.

- The City authorized the Tibbetts Park project on September 3, 2013, however as of February, 2015, the Public Works Department had not expended any funds on this capital project.

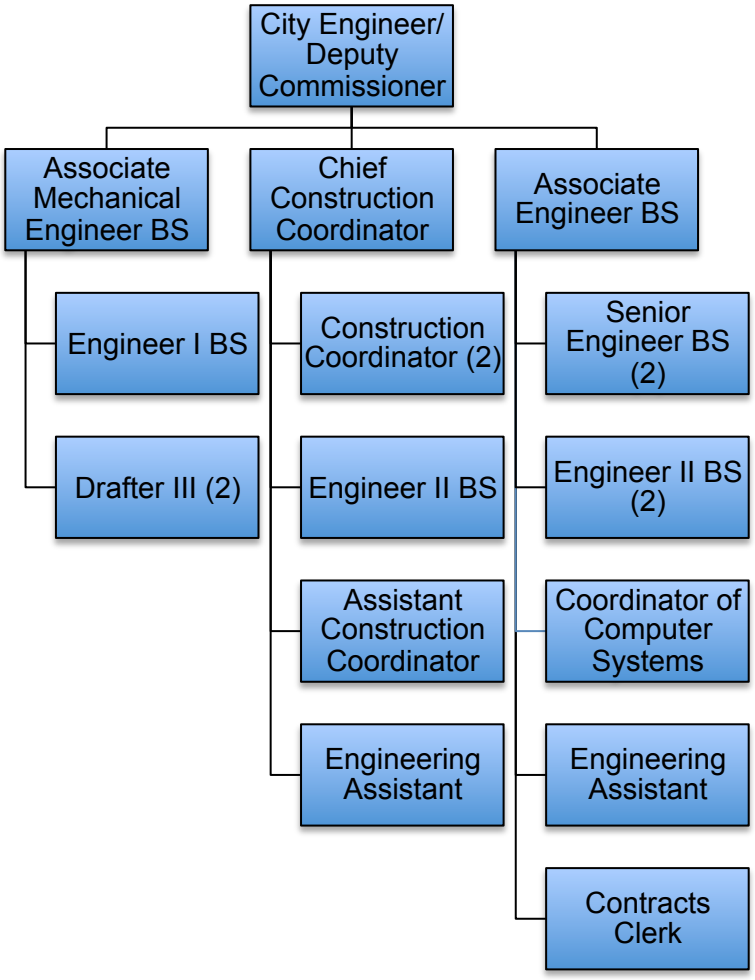
- The City authorized the Garage Membrane project on December 2, 2013, however as of February, 2015, the Public Works Department had not expended any funds on this capital project.

- The City authorized the Cable TV Studio Relocation project on July 1, 2013, however as of February, 2015, the Public Works Department had not expended any funds on this capital project.

The Engineer handling WS4 permitting has implemented those requirements effectively with a strong presentation on the web and solid application process. The position reports to the Associate Engineer who reports through the Deputy Commissioner with the Commissioner of Public Works signing off on all stormwater permits. The Engineer responsible for permitting clearly has the best understanding of the stormwater requirements by State and federal government. Consequently, signoff authority needs to be delegated on projects within agreed upon limits, with unnecessary reporting relationships eliminated.

The issues identified call for making reporting relationships more direct, enhancing accountability and providing better career paths and some degree of

specialization. The classification series should include a Deputy Commissioner of Public Works/City Engineer and two Supervising/Associate Engineers, in addition to the Chief Construction Coordinator (as shown in the proposed organizational chart below). It is estimated that the cost to implement the City Engineer position will have an increased cost of $25,000 to $30,000 in salary and benefit costs.



Recommendation #13: The professional-level classification series used in the Public Works Department should be simplified. The classification series should include a Deputy Commissioner of Public Works/City Engineer and two Associate Engineers. The functions of the City Engineer currently performed by the Public Works Commissioner should be assigned to this position, enabling the Commissioner to implement other recommendations in this report related to the administration of the Department.

Recommendation #14: The Deputy Commissioner of Public Works/City Engineer should review and sign off on plans and specifications prior to a project being let for bid. The Deputy Commissioner must be a Professional Engineer ideally in Civil Engineering with substantial experience. The Deputy Commissioner should review and update the Commissioner of Public Works on critical projects, changes in schedule and contract amounts.

Recommendation #15: The City should strive as the opportunity arises to have two Registered Professional Engineers in the position of Associate Engineer to permit them to serve as City Engineer when necessary.

Recommendation #16: The Drafter III job positions and functions should be reviewed and positions changed to reflect the duties performed.

Recommendation #17: The Bureau of Engineering should work to develop the skills of the Senior Engineers so that they have the capability to manage projects with one having a strong background in water and sewer and the other civil. These Engineers should be able to manage a team of individuals on an as needed basis.

4. THE CITY ENGINEER SHOULD DELEGATE AUTHORITY TO THE ASSOCIATE ENGINEERS TO SUPERVISE THE CAPITAL PROGRAM.

The plan of organization of the Bureau of Engineering is flat, with the result that the spans of control for the Engineering Manager and Commissioner of Public Works too broad. With the adoption of the recommended plan of organization for the Public Works Department and the recommended classification structure for the Engineering Bureau, the spans of control for the City Engineer, Associate Engineers and Construction Coordinator will be practical.

With these practical spans of control, the City Engineer should delegate responsibility to the Associate Engineers to supervise the capital program. This will result in the Associate Engineers having a greater impact on the performance of the Engineering Bureau than any other part of the Public Works Department. Certainly executive management plays a significant role in setting the overall direction of the Department, however executive managers do not play a large role in deciding how

capital projects are executed, in deciding how resources are allocated among projects, and in developing project plans. For many knowledge-based industries such as engineering, middle managers such as the Associate Engineers play a disproportionately large role in the overall performance of the organization.

The Associate Engineers should be given the authority to:

- Plan, supervise, train, and review the work of an assigned section in the Engineering Bureau;
- Plan, direct, and review the work of subordinate engineers;
- Assume responsibility for a variety of personnel actions for their subordinate engineers including selection, promotion, performance evaluation, disciplinary action, and dismissal;
- Perform quality control on preliminary and final design plans, specifications, and estimates, and provide guidance to subordinate engineers and consulting engineers;
- Serve as the project manager in charge of larger, more complex, capital improvement projects;
- Coordinate design work with various consultants and agencies to assure an orderly design process and obtain necessary approval and permits from other agencies;
- Negotiate and authorize change orders and extra work orders for construction projects;
- Prepare staff reports and make presentations to the City Council; and
- Serve as the City Engineer in his or her absence.

The Associate Engineers should receive general direction from the City Engineer. In fact, the Associate Engineers should sign and approve the capital project plans and specifications, not the Public Works Commissioner or the City Engineer, when deemed capable and appropriate. The Public Works Commissioner or City

Engineer should not be reviewing all plans, specifications, and estimates for capital projects.

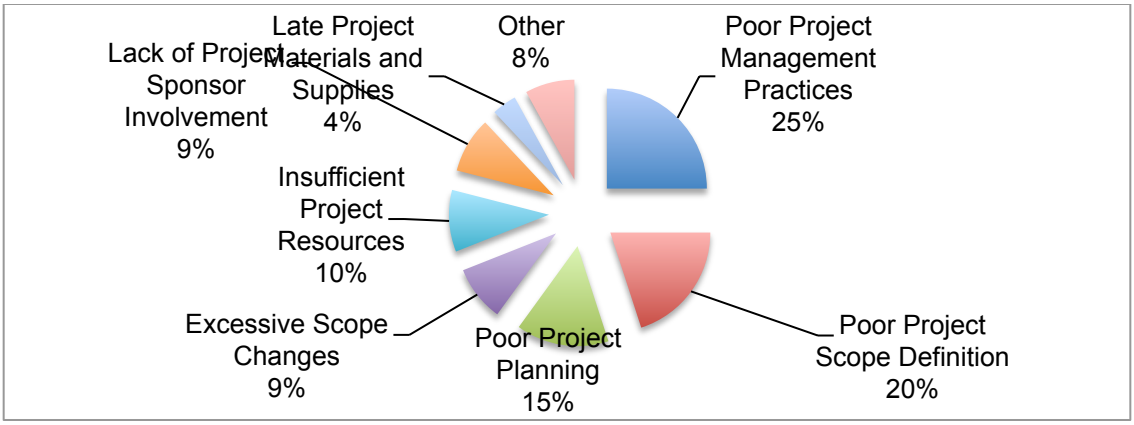
This organizational change will represent a relatively large variation from current practice, as the Bureau, and the Department in general, has operated in a very centralized manner, and project management skills have not been developed at lower levels of the organization. Thus, it is highly recommended that the Department, in concert with the City's Human Resources Department, develop a project management curriculum for Associate Engineers and others in the Bureau who may be given project management responsibilities.

Recommendation #18: The City Engineer should delegate responsibility to the Associate Engineers and Construction Coordinator to supervise the capital program, with authority to plan, supervise, train, and review the work of an assigned section in the Engineering Bureau, as well as sign and approve capital project plans and specifications.

Recommendation #19: A training program needs to be developed for the Engineering Bureau staff. The program should be focused on enhancing project management, designs skills and capacity.

5. THE PROJECT MANAGEMENT PRACTICES OF THE BUREAU OF ENGINEERING SHOULD BE IMPROVED.

Typical management critiques of project management results for a wide variety of project types indicate the following sources for project failures as noted in the chart below taken from the Construction Industry Institute. This chart represents typical problems found in cities, not just White Plains.



Overall, the process for managing capital projects is the cause of 69% of project failures. This includes such processes as ineffective project planning, ineffective project management, and other related factors.

In evaluating the project management practices used by the Engineering Bureau, the Matrix Consulting Group used a system approach as depicted below.

Project Step	Elements
Development	• Development of the initial project scope • Management of scope additions • Development of the project execution plan • Development a project work breakdown structure • Development and monitoring of a project readiness measurement process or tool
Design	• Complete detailed project designs • Order long lead-time materials • Track project plan implementation activities • Develop project risk points and mitigation plans • Develop project QA / QC program
Scheduling	• Build resource loaded project schedule • Integrate project schedule with other concurrent activities • Develop earned value or other cost and schedule metrics • Complete development of work packages • Integrate schedule activities into work management process
Execution	• Monitor project mobilization activities • Monitor work performance

Project Step	Elements
	• Monitor actual schedule and cost versus plan • Conduct progress status meetings and develop progress status reports • Monitor project scope changes • Monitor project risk mitigation triggers
Closure	• Monitor project demobilization activities • Monitor punch-list items close-out progress • Monitor progress in design drawings updates with as-built field changes • Documentation closed-out

Some of the elements of project management noted in the chart are not present in White Plains. The Matrix Consulting Group recommends a number of enhancements in the project management practices utilized by the Engineering Bureau. These enhancements are discussed below.

(1) The Bureau of Engineering Should Transition from Manual Project Financial Status Updates and Instead Utilize the Functionality of the City's Munis Financial System.

The Associate Engineer, BS produces an Engineering Projects Monthly Status Report, however, the last report available to the project team in November, 2104 was dated July 31, 2014. The report lists the designer, the project, the Department or Bureau, Consultant if applicable, Completion Percent, Project Bid Date and Comments.

The information provided is insufficient to provide a comprehensive overview of the status of the project. The report provides no project milestone dates (e.g., estimated and actual completion dates, as applicable for design completion, let for bid, bid award, project start and completion date) and no financial data. Additionally the Associate Engineer maintains hand-written financial ledgers of project costs and payments. This is time consuming and unnecessary in light of the capabilities of the City's Munis financial software.

Recommendation #20: The Bureau of Engineering should discontinue its reliance on manual project status updates, which are time-consuming to prepare, and are not currently developed in a timely manner in any case. Rather, the Bureau should enhance its knowledge of the capabilities of the Munis financial system and begin utilizing this system to provide updated financial status of each of its projects.

(2) The Bureau of Engineering Should Enhance Its Capital Improvement Projects Development and Management Policies.

The American Public Works Association has developed a Public Works Management Practices Manual that includes recommended practices identified by "nationally recognized experts in the field of public works." Practice 1.4 states "the organization's policies, practices, and procedures are periodically reviewed and / or updated to reflect actual practices. Definitive guidelines are provided to employees to accomplish their assigned tasks."[2]

The Bureau of Engineering should enhance its Capital Improvement Projects Development and Management Handbook to address the process to be utilized for managing projects, and the technical aspects of project and construction management. The procedural aspects that should be included in the policies and procedures manual are presented below.

- **Initiating and aligning the project team that will be utilized for project delivery**. This includes developing a clear understanding of the purpose and goals of the project, developing a project description, identifying the members of the team, the major milestones, the boundaries of the project (scope control), the team roles and responsibilities, the measures of success for the project, and operating guidelines. The deliverable would be a project initiation and alignment worksheet.

- **Planning the work of the project.** This would involve the development of the project plan. The project plan should include a work breakdown structure based upon a master deliverable list developed for the City's project delivery (i.e., project definition, consultant request for proposals, project finance plan,

construction cost estimate, project management plan, design development, value engineering, etc.), development of a risk management plan (deciding how to approach, plan, and execute risk management activities), developing a communication plan, developing a change management plan (for scope control), developing a quality plan, and developing a transition and control plan. The project plan should be scalable based upon the size of the project.

- **Endorsing the plan**. This involves gaining the commitment to the project management plan by the project team, and City management.

- **Working the plan**. This involves actively managing the execution of the project in terms of design, construction management, and construction inspection. It includes managing the scope, the schedule, and the budget, the risks associated with the project, change, and communicating progress with the project.

- **Transition and closure**. This involves acceptance of the work, demobilization, financial closure, development of a written "lessons learned," and development of "as built" drawings and archiving.

While it is important for the policies and procedures manual to describe the process of managing a capital project, the manual also needs to address the technical aspects of managing a project. This should include such aspects as noted below.

- Design consultant selection.
- Design consultant contract administration;
- Design coordination and review;
- Developing construction cost estimates;
- Advertising and award of construction projects;
- Constructability review of designs by Construction Management and Inspection;
- Initial guidance to the construction contractor (i.e., pre-construction meeting, submittals, pay requests, etc.);
- Public relations during construction;
- The Construction Inspectors daily report;
- Construction quality control;
- Materials testing;
- Project files;
- Project acceptance; and
- Project warranty procedures.

By including these policies and procedures within the Capital Improvement Projects Development and Management Handbook, it creates a reference tool for the

training of City staff.

The Bureau of Engineering should expand its capital improvement program project management manual to assure that capital projects are managed efficiently, the necessary resources to accomplish the projects' objectives are allocated, and the potential for cost or schedule overruns is minimized. Further, in order to ensure that all Bureau staff has access to this manual, and any updates made to it over time, the Bureau should make this manual available electronically on its Intranet.

Recommendation #21: The Bureau of Engineering should enhance and expand its Capital Improvement Projects Development and Management Policies.

Recommendation #22: The Bureau of Engineering should develop an on-line version of its Capital Improvement Projects Development and Management Policies/Handbook and publish it on the Bureau's Intranet.

(3) The Bureau Should Enhance the Scheduling of Its Capital Projects for Both Design and Construction Using an Electronic Scheduling Software Package.

The City should develop a project schedule for capital projects, and the Bureau of Engineering should develop a policy and procedure that provides specifics regarding the development of a schedule for each capital project. The cost of procuring this scheduling software package can vary depending upon functionality, however the project team estimates an initial cost of $5,000 with another $4,500 in initial training costs. In addition, there would be annual maintenance costs of about $750.

The Bureau should utilize a rigorous process to properly estimate how long it will take to perform each phase of the design and the construction of each capital project, from initial planning and studies through closeout of construction contract and the overall project. These schedules should be developed using an electronic scheduling software package, such as Microsoft Project, Primavera or other similar system.

The Bureau should develop a template for the scheduling of each capital project, and each project manager should use the template in developing the schedule for each project. To develop a new project, the project manager (the employee to whom project management responsibility has been assigned) should open the electronic scheduling template, and customize it to the new project by imposing a new start date and adjusting activity durations. The template should follow distinct phases including design, bid, and construction. Project phases should be further broken down into specific milestones and deliverables, as follows:

- Design
  - Master Planning (if required)
  - Project Initiation
  - Feasibility/Pre-design
  - Design 15% / 50% / 100% / Final
  - Bid
- Bid and Award
- Construct
  - Construction
  - Project Closure
  - Warranty / Maintenance

The scheduling software file should then be utilized to “roll up” the detail to a summary bar for each project with color coding that represents various phases of work. The schedule should be configured to color code to the Bureau’s organization (Real Estate, Design, Construction Management and Inspection, etc.).

The project manager should update the schedule monthly, however the baseline should not be modified so that a comparison can be made to the original (baseline) schedule. To update the schedule, the project manager should meet with appropriate staff (design, real estate, construction management, etc.) to obtain input on the actual

start and finish dates and percentages complete. Once the update is complete, the project manager then should overwrite the previous month's schedule data, but save the original, or baseline. This update should not adversely impact the ability of the Bureau to conduct a historical comparison of the current schedule, or to report on schedule variances.

Once the monthly status update is complete, various schedule reports should be produced directly from the electronic scheduling package, including a Master Summary Report, Construction Phase Only, Design Look-Ahead, Construction Look-Ahead, Project Plan Check, Future Work Advertise dates, and ad hoc reports.

The project schedules should be loaded by the project managers with cost information. Microsoft Project, for example, has this capacity as do other software packages. The costs should include City staff, consultants and construction contracts. The cost-loading of the schedule should occur at the phase level and use the dates to produce cash flow curves that are automatically updated each month as schedule dates change. This technique should be utilized to avoid under- or over-budgeting of the annual capital plan. The project managers should also track actual total cost against the original project budget as well as the prior month's forecast. The variance between original (or baseline) and latest forecast budget should be used as a key performance indicator.

The Engineering Bureau should conduct a monthly project status workshop for each project that includes the City Engineer, the Associate Engineers, appropriate project personnel, the Chief Construction Coordinator and the City Traffic Engineer. This should be a collaborative scheduling session, with the schedule attached to the

wall for review. The meeting should adjust the schedule and the budget as the discussion is ongoing and display it on a wall so participants can see the results of their statements, make adjustments, and perform what-if analyses.

Recommendation #23: The Bureau of Engineering should utilize a rigorous process to properly estimate how long it will take to perform each phase of the design and the construction of each capital project, from planning and studies up front, through close out of the construction contract and the overall project, and utilize an electronic scheduling package for each capital project.

Recommendation #24: The Bureau of Engineering project manager should update the schedule monthly, but the baseline (original) schedule should not be modified to enable a comparison to the actual to the baseline (original) schedule.

Recommendation #25: The Bureau of Engineering should utilize the electronic scheduling package to generate various schedule reports, including a Master Summary Report, Construction Phase Only, Design Look-Ahead, Construction Look-Ahead, Project Plan Check, Future Work Advertise dates, and ad hoc reports.

Recommendation #26: The Bureau of Engineering should load the costs of each project into the electronic scheduling system. The project managers should also track actual total cost against the original project budget and the prior month's forecast. The variance between the baseline and latest forecast budget should be used as a key performance indicator.

Recommendation #27: The Bureau should conduct a project planning status meeting for each project that includes the City Engineer, the Associate Engineers, the appropriate project manager, the Chief Construction Coordinator and the City Traffic Engineer.

(4) The Engineering Bureau Should Expand Its Project Work Plans.

The Construction Industry Institute has defined a number of best practices for managing capital improvement programs.[3] Among these best practices is pre-project planning.

[3] CII Best Practice Guide: Improving Project Performance, Version 3.1, Construction Industry Institute, 2011.

The Bureau of Engineering should prepare a project work plan, known as a CIP Statement Form. This is utilized for pre-project planning, and should include a number of features including:

- CIP number;
- CIP project title / summary description;
- An expanded project description, including a narrative summary description of the project, specific physical improvements included, the location of the project including a GIS map, and the relationship to master plans.
- Project Budget
- Financing, including the source of funds and appropriate status.
- Project goal;
- Types of work (e.g., asphalt paving, bridge replacement, sanitary sewer, etc.);
- A task breakdown with task – start month and task – end month;
- Right-of-way acquisition requirements; and
- Environmental impacts.
- A budget covering the project broken down by design staffing, construction inspection staffing, right of way staffing, etc.), appropriate consultants, utility relocation, etc., by major expenditure component. The budget should identify the staff hour requirements by work breakdown structure and the costs (staff-related, consulting, permits, planting, etc.).
- The responsibility for completing the various components of the capital project including the following:
  - Design by in-house staff or by consulting engineer;
  - Construction inspection by in-house staff or by consulting engineer;
  - Design survey and construction staking by staff or consulting engineer;
  - Environmental evaluation required;
  - Right-of-way acquisition required and, if so, the number of parcels and their locations and assessor parcel numbers;
  - Utilities that need to be relocated, problems with relocation and timing issues; and
  - Other key responsibilities that need to be assigned and/or accomplished.

- The extent of coordination necessary with external agencies such as the State Department of Transportation or and/other Agencies, identifying who the coordination will be required of during the planning, design and construction of the capital project, the nature of the coordination, and the key contacts.

- The preliminary schedule for completing the planning, design and construction of the capital project including the schedule for planning, design, bid package preparation, advertise / award, right-of-way acquisition, and construction and including the dates of important events such as approval of the award of construction contract by the City Council. This preliminary schedule should be prepared using a work breakdown structure via electronic schedule software package.

- The measures of success for the project in terms of what the project manager must accomplish, and the measures of success for the team (e.g., bringing the project in on schedule and on budget).

- A risk assessment to identify the risks or threats associated with the execution of the project, the response strategy, and how risk would be monitored.

- A communication plan for external and internal communication regarding the project including the responsibilities and mechanisms for the communication and when the communication should occur.

- How the quality of the project will be achieved including the standards, methods of verification that standards are met during construction, constructability reviews during design, etc.

- Communication plan for external and internal communication.

The Bureau of Engineering has historically been behind schedule on both project start-up and completion. Only with sufficient pre-planning, with rigorous and standardized forms and processes, can the Bureau consistently bring projects in on schedule and budget. Like other elements of project management noted throughout this report, this will take time to assimilate in the Bureau, as it represents a departure from past practice. However, as these changes are incorporated as the norm in project management, the project team believes that the City will achieve a much greater success rate as it relates to project delivery.

Recommendation #28: The Bureau of Engineering should expand its project work plans in order to ensure that sufficient project pre-planning has occurred. This includes the development of project descriptions, measures of success, communication plans, risk assessments and other facets of project management.

(5) Cost of Construction Guidelines Should Be Utilized to Document Resource Requirements for the Design and Inspection of Capital Improvement Projects.

The Project Management Institute published a *Guide to the Project Management Body of Knowledge* (PMBOK Guide). Principle 3.41 indicates that among the generally recognized good practices for project management are the development of a work breakdown structure, activities, activity resources, an estimate of costs, and a budget."[4]

Cost of construction guidelines should be used as a budgeting tool to determine the number of staff hours required for design and construction inspection and to evaluate whether projects are being managed and executed efficiently.

The following exhibit presents an example of cost of construction guidelines for the design and inspection of capital improvement projects as a percentage of construction costs.

[4] Project Management Institute, A Guide to the Project Management Body of Knowledge, 2008.

Allocation of Staff Resources for Design and Inspection As A Median Percentage of Net Construction Costs

Type of Project	Street Construction				Street Reconstruction				Traffic Control		Wastewater			
Level of Complexity	Above Average		Average		Above Average		Average		Average		Above Average		Average	
Construction Cost (+/-)	$0.25 million	$1 million	$0.25 million	$1 million	$0.25 million	$1 million	$0.25 million	$1 million	$0.25 million	$1 million	$0.25 million	$1 million	$0.25 million	$1 million
Planning and Scoping	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Design Development	10%	8%	9%	7%	13%	11%	10%	8%	8%	6%	9%	8%	8%	6%
Design Survey	1 ½%	1%	1 ½%	1%	1 ½%	1%	1%	½%	1 ½%	½%	1%	½%	1%	½%
Design Administration	2%	2%	1 ½%	1 ½%	2%	2%	1 ½%	1 ½%	1 ½%	1 ½%	1½%	1½%	1 ½%	1 ½%
Construction Survey	3%	2 ½%	2 ½%	2%	2%	1 ½%	1 ½%	1%	0.1%	0.1%	2½%	2%	2½%	2%
Construction Inspection	5%	5%	4%	4%	5%	5%	4%	4%	3%	3%	4%	4%	4%	4%
Construction Management	3%	3%	2%	2%	3%	3%	1 ½%	1 ½%	2%	2%	3%	3%	2%	2%
Project Closure	0.4%	0.1%	0.4%	0.1%	0.4%	0.1%	0.4%	0.1%	0.4%	0.1%	0.4%	0.1%	0.4%	0.1%
Total	25.4%	22.1%	21.4%	18.1%	27.4%	24.1%	20.4%	17.1%	17%	13.7%	21.9%	19.6%	19.9%	16.6%

Capital projects are most amenable to effective cost management in the early stages of the project and the least in the construction stage. If budgets are not well defined early, project costs will increase as the project progresses. A consistent approach to budgeting practices throughout the various phases in the life of a project can reduce or help manage the uncertainties in project development that can increase project costs.[5]

Percentage of construction costs has been widely used for determining the cost of design and inspection of various works. The following points should be noted concerning this cost of construction guideline.

- Two different levels of complexity are noted: average and above average. An above average level of complexity should be based upon the need to deal with other agencies (e.g., State DOT), the design complexities of the project, or problems with planning and construction determining the compensation of consulting engineers on assignments where the principal responsibility is the design of various works, and the preparation of drawings, specifications, and other contract documents as necessary.

- These guidelines are customized to fit the different types of construction jobs such as street construction, street reconstruction, traffic control, and sewer.

- These guidelines were developed to "fit" the different types of work activities in each capital project. These include planning and scoping, design development, design survey, design administration, construction survey, construction inspection, construction management, and project closure.

- The guidelines are expressed as a percentage of construction (e.g., the cost of staffing as a percentage of construction). To determine the number of staff hours required, divide the cost of the work activity based upon the cost of construction guidelines by the current loaded hourly cost for engineering staff.

- The guidelines identify resource requirements for each work activity associated with a project. These include design development, design administration, etc.

5 City of Seattle, Washington, Capital Improvement Program Study of Seattle Transportation, 2001.

- If a consulting engineer is accomplishing the design, the project manager in the Engineering Bureau would utilize the guideline for design administration, and not design development.

The project managers within the Engineering Bureau should determine the staffing requirements for each project in terms of labor hours required for design and construction inspection utilizing the cost of construction guidelines. This should be accomplished in the preparation of the project work plan. The Associate Engineers should utilize the cost of construction guidelines in the preparation of the staffing requirements before each fiscal year to determine workload capacity of staff versus the workload represented by the capital projects.

Recommendation #29: The Bureau of Engineering should utilize cost of construction guidelines to determine the staffing requirements for each capital improvement program project in terms of person hours required for design and construction inspection.

(6) "Billability" Targets Should Be Established for the Bureau of Engineering Staff.

To assure that the staff of the Bureau of Engineering are efficiently utilized, the Associate Engineers should set "billability" targets for staff assigned to the design and construction management / inspection of capital projects. These targets would represent that proportion of their work time that these staff should charge to projects each month. These staff should be "billable" to projects for not less than 125 hours per month or 1,500 hours annually.

As part of the development of these "billability" targets, principles should be developed by the Finance Department and the Engineering Bureau for what is chargeable to capital projects and what is to be included in the hourly rates charged to capital projects. For example, it should be recognized by the Finance Department and

the Public Works Department that the City Engineer will not routinely charge time to capital projects; the City Engineer should be treated as overhead and the costs of the City Engineer built into the hourly rates. Similarly, the Associate Engineers should not be expected to charge more than one-half of their available work hours to capital projects; the available work hours not charged to capital projects should be treated as overhead and the costs built into the hourly rates. Similarly, a proportionate share of department-wide overhead (e.g., the Commissioner, Deputy Commissioner, Administrative Assistants) and other indirect costs (e.g., Administrative Bureau allocation) should be built into the hourly rates.

While professional services for consultants are charged against the respective projects, the Bureau of Engineering has historically charged costs for internal staff against the General Fund. This results in project costs being understated. Furthermore, on water and sewer projects the costs are charged to the General Fund rather than to a specific fund. This overstates General Fund expenses and understates the costs in other funds.

The project accounting system should be utilized to monitor the performance of these staff against these targets.

Recommendation #30: "Billability" targets should be established for staff of the Engineering Bureau.

Recommendation #31: As part of the development of these "billability" targets, principles should be developed by the City's Finance Department and the Bureau of Engineering for what is chargeable to capital projects and what is to be included in the hourly rates charged to capital projects. The Munis project accounting system should be utilized to monitor the performance of the staff of the Engineering Bureau against these targets.

Recommendation #32: The Bureau should work with the Finance Department to create the necessary management reports for projects and train the Contracts

Clerk and one backup person on the use of Munis so the Bureau can glean the necessary information.

Recommendation #33: Costs for professional fees by staff should be charged against the appropriate project.

(7) The Bureau of Engineering Should Develop A Bi-Monthly Capital Project Status Report.

The Project Management Institute published a *Guide to the Project Management Body of Knowledge* (PMBOK Guide). Principle 10.5 indicates that among the generally recognized good practices for project management includes the reporting of performance. "Report performance is the process of collecting and distributing performance information including status reports, progress measurements, and forecasts. The performance reporting process involves the periodic collection and analysis of baseline versus actual data to understand and communicate the project progress and performance as well as to forecast the project results."[6]

The Bureau of Engineering should prepare a bi-monthly capital improvement program project status report that includes a number of elements regarding each project, including the following:

- Charge number;
- Project number;
- Project title;
- Project description;
- Total budget amount including the original budget and the current revised budget;
- Design budget;

[6] Project Management Institute, A Guide to the Project Management Body of Knowledge, 2008.

- Design expenditures to date separately identifying staff expenditures from consulting expenditures;
- Construction management expenditures to date separately identifying contract administration, construction inspection, and consulting engineering expenses;
- Construction cost as budgeted;
- Current construction cost as estimated by the project manager responsible for construction management.
- Design project manager;
- Construction project manager;
- Design start date – original and revised;
- Design completion date – original and revised;
- Construction start – original and revised:
- Construction end – original and revised; and
- Comments.

These reports should be developed on a bi-monthly basis.

Recommendation #34: The Bureau of Engineering should prepare a bi-monthly capital improvement program project status report, and should be updated and posted to the Public Works Department web site.

(8) The Bureau of Engineering Should Consistently Provide Construction Management and Inspection and the "Asset Manager" with the Opportunity To Provide 30%, 60%, and 90% Submittal Reviews For Constructability and Maintainability.

Other Commissioners (e.g. Parks and Recreation, Parking, Mayor's Office) also known as the "Asset Manager", or Project Owner, have not been consistently provided with the opportunity to conduct constructability reviews of design plans and specifications for capital projects.

The Bureau's Construction Management and Inspection section and the Asset

Manager should be consistently provided with the opportunity to provide 30%, 60%, and 90% submittal reviews for constructability and maintainability as noted below.

- **First / Schematic Submittal Review - 30% design complete**. During the first review, a constructability review of the design should be required. The project manager from the Engineering Bureau should provide Construction Management and Inspection and the Asset Manager with the opportunity to review the plans at 30% completion to cross check the construction plans with the specifications to determine if any conflicts, ambiguities, inaccuracies or deficiencies exist, and to identify construction requirements that are impossible or impracticable to build. A field check should be done to determine if the project can be built where located, and spot check existing topography with what is shown on plans.

  In conjunction with the first review, a field review should be held with Construction Management and Inspection and the Asset Manager, and the project manager from the Engineering Bureau. The field reviews examine the preliminary design documents individually prior to jointly reviewing the design in the field. The field review verifies topographic data, adjacent property elevations, and the feasibility of the design relative to existing field conditions. The project manager from the Engineering Bureau should document the field review in writing, noting all comments of the reviewers.

- **Second / Design Development Submittal Review – 60% design complete**. The project manager from the Engineering Bureau provides Construction Management and Inspection and the "Asset Manager" with the opportunity to assure that all of the 30% review comments have been incorporated. This review ascertains whether the design is progressing in conformance with the project criteria.

- **Third / Construction Document Submittal Review - 90% design complete**. This submittal should provide the Construction Management and Inspection and the "Asset Manager" with the opportunity to review the final plans for the project. In conjunction with the final plan development during this phase, the project manager from the Engineering Bureau should begin finalizing any special provisions required to specify or clarify the construction work elements, completes permit applications and prepare a final quantity estimate, cost estimate and construction schedule, in conjunction with Construction Management and Inspection and the Asset Manager.

  A complete set of documents marked "not for construction" should be provided to Construction Management and Inspection and the Asset Manager. The review ascertains the accuracy and completeness of the design plans, specifications, quantities and cost estimate. The review also determines the adequacy and consistency of the plans and specifications as bidding documents.

  The 30% / 60% / 90% reviews with Construction Management and Inspection

and the Asset Manager should be required as part of a policy and procedure.

Recommendation #35: The Bureau of Engineering should routinely and consistently conduct 30% / 60% / 90% design plan and specification reviews with Construction Management and Inspection and the Asset Manager.

Recommendation #36: The Bureau of Engineering should develop a policy and procedure for the conduct of the 30% / 60% / 90% design plan and specification reviews with Construction Management and Inspection and the Asset Manager.

(9) A Final Report Should Be Prepared upon Completion of a Capital Project.

Without a formal analysis and distribution for review, the mistakes and weaknesses of one project will almost certainly be repeated on others. The final report should focus on analyzing the positive and negative aspects of the completed project, the "lessons learned", transmitting that information to the staff of the Bureau, and providing a convenient summary of the project.

At the completion of the project, the project manager assigned to the project should complete a final report including:

- Project name, project number, and a description of the project.
- Construction costs – planned versus actual with an identification of all of the change orders, their costs and the reasons for those change orders;
- The staff hours allocated to the project - planned versus actual;
- The schedule for completion of the project - planned versus actual including whether drawings, specifications, schedules, and cost estimates were prepared consistently according to schedule;
- The design costs for the project - planned and actual including cost per sheet;
- Whether as-built plans have been completed; and
- Comments and discussion regarding the project as necessary including unusual conditions encountered during the project such as contractor deficiency, quantity difference, scope change, etc.

This report should be circulated to the other project managers, Associate Engineers, the Chief Construction Coordinator and any Inspectors assigned to the project, and the City Engineer. After distribution of this status report, it should be the basis of a meeting to discuss and document in writing the "lessons learned".

Recommendation #37: A final report should be prepared for capital projects by the project manager upon completion of construction and acceptance of the improvements.

5. ANALYSIS OF BUREAU OF HIGHWAYS AND GROUNDS

This section of the report analyzes the operations of the bureaus in the White Plains Department of Public Works.

1. THERE ARE A NUMBER OF POSITIVE ASPECTS OF HIGHWAYS AND GROUNDS BUREAU OPERATIONS.

Although there are opportunities for improvement, there are also several positive aspects of the Highways and Grounds Bureau's current operations that are highlighted below.

- The Bureau is sweeping all areas of the City at least once monthly.
- All playgrounds are inspected weekly.
- The Assistant Superintendent investigates requests for work, and performs quality assurance on most work being performed by Bureau crews.
- The Bureau has instituted a manual work order process by which all work activities are recorded. Although the forms used do not capture all relevant data (e.g., hours of labor by crew member), it represents a positive step, and with refinement, should allow the Bureau to make more meaningful analyses of work performed.

These positive aspects form the foundation for certain improvements in the Highways and Grounds Bureau, which are outlined below.

2. CURRENT HIGHWAYS AND GROUNDS BUREAU STAFFING SUGGESTS THAT IT SHOULD BE ACHIEVING VERY HIGH LEVELS OF SERVICE, HOWEVER CERTAIN METRICS INDICATE THAT THIS IS NOT THE CASE.

The project team has noted elsewhere in this report that workloads and productivity levels are not summarized and reported in the Department of Public Works. This deficiency inhibits the analysis of the actual work accomplished by crews not only in the Bureau of Highways and Grounds, but in the Department, generally.

For cases in which insufficient data exist to definitively analyze the work accomplished in a particular Bureau, the project team utilizes metrics related to the numbers of staff allocated to the maintenance and repair of the infrastructure for which it is responsible. In the case of the Bureau of Highways and Grounds, the Bureau is responsible for the maintenance and repair of 134 centerline miles of paved surfaces with a total of 35 crewmembers, excluding non-working supervisors and managers, but including working crew leaders. This equates to a ratio of only 3.8 centerline miles of roadways per working crewmember. By comparison, typically, the average crewmember is responsible for a range of between 15 and 20 centerline miles, or roughly four to six times as many centerline miles as is the case in the White Plains Bureau of Highways and Grounds. This suggests that there are opportunities for enhancing productivity, which are discussed in the following sections.

(1) The Bureau of Highways and Grounds Should Proactively Maintain the City's Infrastructure with Its Current Complement of Staffing.

Interviews and observations indicate that staffing levels in the Highways and Grounds Bureau are more than sufficient to provide a very high level of service for the infrastructure, which includes 134 centerline miles of paved surfaces, and an unknown number of linear miles of sidewalks. However, interviews and observations indicate that the Bureau is not proactively inspecting and maintaining this infrastructure, but rather is responding to problems either discovered by crews, or reported by residents and others.

Staffing levels are sufficient in this Bureau to proactively inspect sidewalks for tripping hazards on a routine basis, and to repair and maintain these at a very high level of service. The failure to proactively inspect sidewalks could expose the City to lawsuits related to tripping hazards, and therefore, the Bureau should immediately implement a

program of proactive inspection of sidewalks that identifies needed repairs and completes these repairs within one week of the identification of need.

A proactive inspection program should include the visual observation of at least one-fifth of the City's sidewalk network each year, and should note the location, both in documentation and with painted dots or stripes, of defects in the sidewalk. Each defect should be recorded in a form that notes the location, the severity, and the quantities of materials needed for repair. Depending upon the severity, the repairs should be scheduled, or should be noted for repair as crews are in the area completing other work in the rights of way. The Bureau should allocate sufficient staffing resources to the proactive inspection of one-fifth of the City's sidewalks on an annual basis. Again, the number of linear miles of sidewalks in the City is unknown, however it is likely less than 75 miles, which would indicate that no more than 15 linear miles would be inspected each year.

In addition to the relative lack of proactive inspection of City sidewalks, the Bureau of Highways and Grounds does not proactively inspect streetlight outages. The City has over 6,000 streetlights, and allocates one Street Light Installer and one Maintenance Worker to the task of repairing and maintaining these lights. As light outages are reported, they are repaired as the two-person crew is able to respond.

Although a two-person crew should be sufficient for the maintenance of 6,000 streetlights, this crew is effectively somewhat less than a full crew on days in which one or the other crewmember is absent. Interviews indicate that, although the Maintenance Worker who is typically assigned to the crew is proficient in assisting the Installer, when the Maintenance Worker is absent, the productivity of the crew is significantly

diminished when others are assigned to this task, as there has been little cross-training of other Maintenance Workers.

Recommendation #38: Allocate a full time employee to the proactive inspection of the City's sidewalks during the spring, summer and fall seasons. Establish a 48-hour response time to serious tripping hazards, and a one-week response time for all other sidewalk repairs.

Recommendation #39: Cross-train all Maintenance Workers in the maintenance of streetlights. The Street Light repair and maintenance function should operate daily with a fully proficient two-person crew that is able to provide a level of service that allows the two-person crew to respond to outages within 24 hours of the report.

(2) The Bureau Should Eliminate Two Semi-Skilled Laborer Positions and Alter Crew Sizes for Certain Tasks

Depending upon the frequency with which a particular repair task is performed, properly constructing crew sizes can have a very significant effect on the overall productivity of a Department. One such task that typically consumes a large amount of personnel resources in a Highway organization is that of pothole repair.

The project team does not possess data that would indicate the numbers of potholes reported and repaired in any particular fiscal year, however, experience indicates that this may approximate between 10 and 15 per year, per center line mile of paved roadway during the entire year, with the frequency of repair being greater in the spring and summer months. If this frequency were experienced in White Plains, this would equate to between 1,340 and 2,010 potholes per year. The filling of a pothole can take between 15 and 30 minutes, depending upon the season, the size of the pothole, travel time, and other factors.

The Bureau of Highways and Grounds reported that it utilizes a 5 to 6-person crew for pothole repairs, which is well above the typical crew size of a 2-person crew, or

3-person crew for major roads requiring traffic control personnel. If it can be assumed that there are approximately 1,600 reports of individual potholes in an average year, the use of a 5-person crew would result in the expenditure of approximately 2,000 to 4,000 hours, compared to the 800 to 1,600 hours that would be expended using a two-person crew. This equates to an additional 1,200 to 2,400 hours per year for the activity of pothole patching.

The project team recommends that the Bureau establish optimum crew sizes for each activity and, unless unusual conditions exist related, primarily, to securing the safety of the work zone, these crew sizes be adhered to in each instance in order to optimize the productivity of the overall Bureau. To assist in the development of these optimum crew sizes, the project team provides the following guidelines:

- Cold patch (2)
- Crack seal (3)
- Skin patch (3)
- Remove/replace base (3)
- Road shoulder maintenance (4)
- Cleaning ditches with grader (4)
- Culvert cleaning (2)

As was noted above, the Highway and Grounds Bureau is amply staffed to provide a very high level of service. However, at least in some cases, it is failing to employ best practices regarding crew sizes, which is excessively costly to the Bureau and to the Department. The project team recommends that the Bureau reduce staffing by two Semi-Skilled Laborer positions to avoid a cost of $141,259. As there are five vacancies in this classification, the project team recommends that the number of authorized positions be reduced by two.

Recommendation #40: The Bureau should eliminate two Semi-Skilled Laborer positions. There are currently five vacant positions in the Semi-Skilled Laborer

classification, and the project team recommends reducing the authorized contingent by two positions.

Recommendation #41: The Bureau should adopt and adhere to optimum crew sizes for each of its major maintenance and repair activities in order to maximize the productivity of all staff of the Bureau.

3. THE HIGHWAY AND GROUNDS BUREAU SHOULD INSTITUTE A FORMAL PAVEMENT MANAGEMENT PROGRAM THAT OBJECTIVELY EVALUATES STREETS FOR RESURFACING AND RECONSTRUCTION.

Streets represent one of the largest capital investments for the City of White Plains. The City has approximately 134 centerline miles of streets. Maintaining these streets typically involves complex decisions about how and when to overlay or apply surface treatments such as seal coats, chip seals, etc., to keep the street performing and operating costs at a reasonable level. For the past five years, the City has reportedly been resurfacing an average of about five lane miles per year through contracts, and an unknown number of miles using in-house crews in the Highway and Grounds Bureau. This equates to only about 4% of the total paved surfaces on an annual basis, and is insufficient to ensure the protection of the City's paved surfaces. The project team noted several areas of the City in which pavement conditions have been allowed to deteriorate to the point that total reconstruction may be the only recourse in abating poor road conditions.

The Highway and Grounds Bureau, in conjunction with the Engineering Bureau, visually assesses the condition of paved surfaces each year, and develops a list of recommended road segments for resurfacing. However, although visual assessments may suffice for identifying the most obvious areas in need of resurfacing, this method fails to quantify the condition of the roads over time, and cannot model the probable

condition of roads in the future based upon the types of deterioration that each segment exhibits.

There are many advantages to implementing a formal pavement management program over those of visually inspecting City 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
- Formulation of pavement maintenance and repair projects
- Incorporation of graphics
- Capability of storing photos and other images in the database
- Incorporation of GIS

The City of White Plains should develop a systematic approach to the identification of its needs for preventive maintenance. 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 Bureau to take the following steps:

Step	Description
1. Collect data and define the pavement network	This data collection would include the construction records for the street system. This data includes the age, surfacing thicknesses, and surfacing types for all sections. Good age data is essential to the performance of computerized pavement management models that generally rely on age as the basis for performance prediction curves.
2. Assess pavement condition	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.
3. Predict pavement condition in future years	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.
4. Formulate 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.
5. Formulate budgets based on multiple scenarios	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 City. 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 #42: The City should adopt and implement a formal pavement management system that assesses the City's paved surfaces in an objective manner to ensure that there is a systematic process by which paved surfaces do not deteriorate to the point of requiring complete reconstruction, which is by far the most costly alternative.

4. THE PARKS SECTION OF THE HIGHWAY AND GROUNDS BUREAU SHOULD DEVELOP SERVICE LEVEL STANDARDS FOR THE MAINTENANCE OF CITY PARKS.

If polled, most residents generally prefer a park with lush green turf, healthy and attractive plants, shrubs, flowers, and trees, safe and clean recreational facilities in good condition and an attractive area free from debris and litter. However, while there are standards for the appearance of a park in terms of the condition of vegetation in park facilities, as well as standards on the labor required to achieve this condition, wide latitude is possible on the level of service for different types of parks and facilities. Levels of park maintenance will vary depending on the type of facility, intensity of use, and on local standards. For example, parks that are widely used for a variety of leisure activities generally will require a higher level of maintenance than passive neighborhood

parks. This means that different levels of service will prevail throughout the City's park system. Service levels are not fixed levels of maintenance for all facilities, but rather variable levels to be applied to individual facilities.

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

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

- **Mode C** is a moderate level of maintenance associated with locations of moderate to low levels of development and moderate to low levels of visitation. Mode C areas have the following characteristics.

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

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

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

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

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

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

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

The White Plains Parks Section of the Highways and Grounds Bureau has sufficient staff during the summer months to achieve a B mode of service, with 15 field maintenance workers maintaining 155 developed acres. The description above for a B level of service should guide the Bureau in conducting a self-assessment of parks conditions as it goes forward.

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

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

Recommendation #43: The Parks Section of the Bureau should develop formal service level standards for parks and grounds it maintains. A specific level of service should be designated for each site.

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

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

SAMPLE QUALITY STANDARDS FOR MAINTENANCE OF CITY PARKS	
Mowing	Turf area to be mowed weekly during the growing season – grass height 2".
Trimming & Edging	All driveways, sidewalks and edging strips shall be edged every two weeks during the "on" season. Grass and weeds around trees, tree wells, header boards, fences, backstops, etc., shall be trimmed monthly or more frequently to maintain appearance. In no case shall grass or weeds exceed 6". Grass clippings and trimmings in walkways shall be swept or blown off walks and removed if required.
Fertilization	Fertilization of the turf area should be completed with a balanced fertilizer such as 16-6-8 annually once during the summer. Turf should be tested if the recommended fertilizer does not produce desired results.
Insecticides, Herbicides, Pre-Emergents, Insect Control, Disease Control, and Rodent Control	A seasonal spray chart will be developed and maintained in the Parks and Forestry Division. Herbicides and pre-emergents shall be applied according to the approved spray program year-round, weather permitting, with the primary objective being the prevention of weed growth.
Aeration	Turf aeration should be completed during the spring while the grounds are still soft from winter moisture.
Irrigation System	The irrigation system should be set to apply enough water to wet the soil to a depth of 4" to 6". The automatic timing system should be set to avoid interference with sports and other uses. Automatic controllers and sprinkler systems should be checked at least once a week for any abnormalities; failure to do so could result in loss of turf area, the waste of water or the interference with usage.

SAMPLE QUALITY STANDARDS FOR MAINTENANCE OF CITY PARKS	
Litter Control	Park areas shall be maintained constantly and kept in a litter-free condition. Trash pick-up shall be on a regular and frequent schedule to prevent over-accumulation of trash and development of unsanitary conditions. Trash pick-up schedules shall be developed to meet the changing conditions of park usage.
General Site Inspection	The Parks and Forestry Division staff shall inspect the areas in which they are assigned to work on a daily basis, and report any hazards or correct them immediately. All acts of vandalism shall be reported at once and a report written.
Play Area	Swings and play equipment shall be inspected on a weekly basis and serviced if required.
Tennis Courts	Shall be blown weekly to clear dirt and other debris from surface. Surface should be washed weekly, if possible. Nets should be inspected and adjusted weekly.

Recommendation #44: The Parks Section of the Bureau should develop quality standards for the maintenance of City parks.

6. THE PARKS SECTION SHOULD CERTIFY AN EMPLOYEE AS A CERTIFIED PLAYGROUND INSPECTOR.

Interviews indicate that the Parks Section inspects parks and playground equipment using internal staff who are not certified as Playground Inspectors. Given the relatively small investment necessary to obtain certification as a Playground Inspector, this would appear to be a cost-effective initiative on the part of the Section.

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 #45: Certify at least one Parks employee as a Certified Playground Safety Inspector (CPSI).

6. ANALYSIS OF THE BUREAU OF SANITATION

This section of the report analyzes the operations of the Sanitation Bureau.

1. THERE ARE A NUMBER OF POSITIVE ASPECTS OF SANITATION BUREAU OPERATIONS.

Although there are opportunities for improvement, there are also several positive aspects of the Sanitation Bureau's current operations that are highlighted below.

- The Bureau has recently purchased four automated, side-loading, garbage trucks, and plans to purchase more in the future. This transition will allow for the reduction of the numbers of workers on each truck, thereby lowering overall cost, and will also result in fewer workers compensation claims.

- The Bureau provides a high level of service to City residents through its appointment-based bulk item pickup. Residents may also drop off waste, including electronic waste, at the Gedney Recycling Yard free of charge.

- The Bureau has placed GPS in each of the drivers' phones, thereby allowing it to readily determine the closest trash truck to locations of missed pickups.

These positive aspects form the foundation for certain improvements in the Sanitation Bureau, which are outlined below.

2. THE SANITATION BUREAU SHOULD ALTER CERTAIN PRACTICES TO ACHIEVE GREATER EFFICIENCY AND LOWER COSTS.

The City, through its Sanitation Bureau, delivers a very high level of service to residents through the provision of twice-weekly curbside garbage collection. In addition to this intensive level of service, residents also have the option of transporting their trash, yard waste, appliances, compost, recyclables and other items to the Gedney Recycling Yard. Although this level of service is convenient for the Bureau's customers, it is expensive, and is counter to long-term national trends in which municipalities are providing once-weekly collection. Furthermore, the Bureau's crews are making relatively few stops per truck, and are allowed to leave work after completing their

assigned routes for the day. The following sections analyze these practices and make recommendations for a more cost-effective level of service.

(1) The Sanitation Bureau Should Increase the Number of Stops Made by Its Crews

The Sanitation Bureau was unable to provide the project team with the number of residential trash and recycling customers in the City, which prohibits performing a definitive calculation of the number of stops made by each crew on a daily basis. However, the Bureau typically dispatches nine (9) rear-load trucks and three (3) side-load trucks, for a total of 12 residential truck crews each day. The nine rear-load trucks each have a Driver and two Sanitation Workers, whereas each of the three side-load trucks have only a single driver. The Bureau estimates that each of the 12 crews makes an average of 450 stops per day on each of the four days on which residential garbage is collected (Wednesdays are cardboard collection days, only).

In the experience of the project team, a three-person crew working eight hours per day on a rear-loader should be able to collect garbage from between 750 and 900 residences, depending upon the distances between stops, the degree of direct access to garbage containers at the curb, the method of packaging of the garbage, and other factors. The collection, on average, of garbage from 450 residences per day by Sanitation Bureau crews falls far sort of even the minimum standard of 750 stops, however.

Although there may be other mitigating circumstances that account for some of the variation between the productivity levels of the Sanitation Bureau and typical productivity standards, primary among these is that Sanitation Drivers and Workers do not typically work full eight-hour days. Instead, these employees are allowed to leave

work after the completion of their assigned routes. It is common for employees to arrive at work at 8:00 a.m., complete these routes between 11:00 am and noon, and leave work immediately thereafter. This practice, although somewhat common in years past, has been replaced in the large majority of municipalities across the country with the more common model of designing routes so that they are completed within an eight-hour day. This maximizes crew productivity, reduces overall costs and, importantly, makes Sanitation employee work practices equivalent to those of the City's Public Works field employees in other Bureaus.

As noted above, crews are typically able to make 750 to 900 stops per day if routes are designed efficiently. Assuming that the City's Sanitation Bureau redesigned routes in order to assure that crews made 750 stops per day, the Bureau would require four fewer routes, as is shown in the table below.

Description	Number
A. Current stops per route	450
B. Current times each residential account is collected each week	2
C. Current number of crews	12
D. Total stops made by all crews each day (A*C)	5,400
E. Benchmark standard number of stops per day	750
F. Number of crews needed to attain benchmark standard (D/E)	8 (actual = 7.2)

As can be seen from the table, the Bureau could reduce the number of routes from twelve (12) to eight (8) by redesigning routes to ensure that crews make 750 stops per day rather than the current average of 450. The figure of 750 stops per day is achievable in a standard eight hour day. Many municipalities achieve productivity well above the minimal benchmark of 750 per day, with 900 to 1,000 daily stops per crew not

uncommon. Should the White Plains Sanitation Bureau achieve even 800 daily stops per crew, this would reduce the required number of crews to seven rather than the current 12.

If productivity could be increased from 450 to 750 stops per day, this would allow either the reduction of the Sanitation Bureau workforce, or the reallocation of personnel resources to other Bureaus either within or outside the Department of Public Works. Assuming that the Bureau maintains the side-loader fleet at three routes per day (the Bureau actually has four side-load trucks, but uses only three due to the need for a spare), this would allow the reduction of four rear-load packers from the fleet, with the reduction of four Drivers and eight Sanitation Workers, as each rear-load crew consists of one Driver and two Sanitation Workers. Assuming an average salary of a Driver is $68,631, and that of a Sanitation Worker is $63,823, with fringe benefits of 57%, this would result in a cost savings of $1,232,436.

Recommendation #46: The Sanitation Bureau should redesign collection routes to ensure that between 750 and 900 stops are made daily by its crews.

(2) The Sanitation Bureau Should Make the Transition to Once-Weekly Garbage Collection.

Currently, the City of White Plains provides twice-weekly garbage collection for each of its customers, with recyclable materials collected once per week. Although twice-weekly collection is still popular in some sections of the country (primarily Florida and certain other southeastern states), the trend is toward once-weekly collection, for a variety of reasons, some of which are provided below:

- Costs can be significantly reduced, with these savings being passed along to tax payers through reductions in property taxes.

- There are fewer pieces of equipment for the City garage to repair and maintain. Given that garbage packers, whether rear-load, front-load or side-load, are typically among the highest-cost units in a fleet to maintain, this often results in cost avoidances of between $3,000 and $4,000 in maintenance costs per year per unit removed from the fleet. Depending upon the number of packers eliminated form the fleet, this may even allow the reduction of a vehicle mechanic in the garage.

- There are fewer pieces of equipment creating wear and tear on the City's paved surfaces. In White Plains, the average garbage packer travels a route of about five miles per day. Reducing collection frequency from twice to once-weekly in the case of White Plains could reduce the number of miles traveled on the City's streets by as much as 7,000 miles per year.

- Reducing the frequency of garbage collection reduces the environmental impact on the City through fewer emissions and reduced fuel usage, and can reduce the risk associated with vehicle accidents.

- Reducing collection frequency places a greater awareness on recycling and other waste stream diversion practices such as composting.

Studies have shown that for municipalities providing twice-weekly collection, the second collection day of the week results in a much lower volume of municipal solid waste, thereby reducing the utility of the crews making the collection. This is particularly true if Sanitation organizations do not redesign the routes on the second collection day of the week by expanding the routes of crews in anticipation of the lower volume collected. This is the case in the White Plains Sanitation Bureau, as each of the routes each week is duplicated on the second collection day.

Reducing the frequency of garbage collection has many positive benefits, however studies have shown, and the project team's experience verifies, that there is typically a negative public reaction to the lower frequency. The resistance, however, fades over time, as residents adapt to once-weekly collection. This is particularly true when municipalities state a strong financial case for the reduction and pass along the savings to the taxpayer.

The project team recommended, in a previous issue in this report, that the Sanitation Bureau increase the productivity of crews from collecting garbage from an average of 450 residences per day to at least 750 per day. However, even if productivity levels remained at the current 450 stops per day, there are significant cost savings available to the City by making a transition to once-weekly collection, as the table below shows.

Description	Number
A. Current Number of Stops Made Daily by Crews	5,400
B. Current Times Each Residential Account Is Collected Each Week	2
C. Total Number of Residential Accounts (A*B)	10,800
D. Number of Days per Week Collected	4
E. Number of Residential Accounts Collected Each Day of Week (C/D)	2,700
F. Number of Stops Made by Crews Each Day (Current Productivity)	450
G. Number of Crews Needed for Once-Weekly Pickup (E/F)	6
H. Current Number of Crews	12
I. Potential Reduction in Crews (H-G)	6

Given that the Sanitation Bureau already has three side-load units that require only a single driver, the reduction should be made in the read-load crews, which are comprised of three employees (i.e., a Driver and two Sanitation Workers). Therefore, since there are nine rear-load crews currently, the transition to once-weekly garbage collection would allow the Sanitation Bureau to eliminate six rear-load crews, equating to six Drivers and 12 Sanitation Workers. However, if crew productivity could be increased to 750 stops per day per crew rather than the current 450 per day, the number of crews could be reduced from the current 12 to 4 as the table below shows.

Description	Number
A. Current Number of Stops Made Daily by Crews	5,400
B. Current Times Each Residential Account Is Collected Each Week	2
C. Total Number of Residential Accounts (A*B)	10,800
D. Number of Days per Week Collected	4
E. Number of Residential Accounts Collected Each Day of Week (C/D)	2,700
F. Number of Stops Made by Crews Each Day (Current Productivity)	750
G. Number of Crews Needed for Once-Weekly Pickup (E/F)	4 (actual = 3.6)
H. Current Number of Crews	12
I. Potential Reduction in Crews (H-G)	8

As the table shows, increasing crew productivity and decreasing collection frequency could have a significant impact on both the overall cost of sanitation services as well as the strategic direction of the Sanitation Bureau. The City has made a commitment to automated, side-arm collection units that require only a single-person crew (a Driver), and has also placed the purchase of two additional side-loader units in the capital budget for this year, bringing the total fleet of side-load units to six, which is more than sufficient to cover all residential routes and to provide spares in the event of needed maintenance and repairs. Combined with crew productivity increases, the annual cost savings associated with personnel and equipment reductions is approximately $2,464,873.

Recommendation #47: The City should transition from twice-weekly garbage collection to once per week.

(3) The Sanitation Bureau Should Ensure That Collection Routes Are Balanced and Efficient.

Interviews in the Sanitation Bureau indicate that, although routes are reasonably balanced at an average of 450 stops per day per truck, these routes have not been

analyzed for efficiency in many years.

It is common for Sanitation organizations to simply append, or "piggyback" any new stops to adjacent routes. However, over a period of many years, the addition of these stops to the old routes may result in routes that are no longer efficient. And although drivers may, over time, become accustomed to, and even comfortable with, the routes as they have evolved, they may be driving routes that no longer are efficient, and could be resulting in wasted travel time. The project team has made recommendations, above, to both increase the productivity of crews, and to decrease the frequency of trash collection. Either of these recommendations alone would be sufficient reason to reanalyze route designs, however the combination of the two makes it essential.

There are many software packages that can assist Sanitation organizations to analyze the efficiency of their routes. A key component in the analysis of existing routes is an automated vehicle locator (AVL) or similar GPS utility that will allow the Bureau to determine the routes that its collection vehicles are taking, the time spent in travel between stops, the time spent at any single stop, idle time, and the time spent in traffic – both due to normal congestion and to signals and turns. Therefore, although two routes may be collecting, for example, 450 residential accounts in a day, they may be taking different amounts of time due to a variety of factors that would be accounted for in the analysis of GPS data over a period of time.

The Sanitation Bureau does not possess routing software, and managerial staff in the Bureau, do not have experience in running the software, which could cost $3,000 or more. The Bureau should, therefore, contract with a private firm that specializes in

route optimization to ensure the efficiency of routes, which may cost between $8,000 and $10,000.

Recommendation #48: The Sanitation Bureau should analyze the efficiency of current routes to ensure that drivers are minimizing the amount of time taken in trash collection.

(4) The Sanitation Bureau Should Enhance the Utility of Its Web Site

A review of the Sanitation Bureau's web site indicates that, while there are valuable sections and pieces of information, the site could be enhanced to provide more information and educational value to residents. Currently, the site provides information related to collection schedules, recyclable materials accepted at curbside and at Gedney Way, how to dispose of hazardous waste and bulk waste, and a description of automated side load collection and regular trash pickup.

The project team made several visits to the Sanitation Bureau office on Brockway Place and noted that there is an exceptionally heavy volume of calls handled by the managerial staff. One of the primary purposes of a divisional web site is to minimize the need for residents to make phone calls to the office, and the current web site falls short of achieving this objective.

The project team believes the web site could be made more functional by providing additional sections in order to decrease the volume of calls into the office by making certain enhancements, including the following:

- List of accomplishments in previous year (increases in recycling rates, purchase of side-load units, expanded recycling efforts, reductions in operating costs, etc.)
- Listing of acceptable and unacceptable bulk waste items and the procedure for making an appointment for their collection.
- Description of composting, its benefits, how to make compost piles and how to use the finished compost.

- A Bureau document library that would include newsletters, any presentations made by Bureau staff, event calendars (household hazardous waste days, E-waste events, etc.), recycling guides, trash route guide, etc.

- A description/pie chart of the elements of cost for sanitation collection and disposal, including personnel, materials and supplies, equipment maintenance, fuel, landfill tipping fees, and other elements.

- How to report a missing or damaged cart, or request an additional cart via the web site

- How to report a missed pickup via the web site

- How to dispose of yard waste

- How to dispose of unused medications

The objectives of the Bureau's web site should first be to inform and educate residents regarding the Bureau's services, as well as the objectives and benefits of its programs. Secondly, however, the web site should serve as a workforce multiplier by answering questions that residents may have. This latter objective is of great importance to the White Plains Sanitation Bureau in that there is such a heavy volume of phone calls handled by managerial staff in the office.

Recommendation #49: Enhance the functionality of the Bureau's web site by adding information that will both inform and educate residents, and will serve to reduce the call volume in the Sanitation Bureau office.

7. ANALYSIS OF THE BUREAU OF GARAGE AND SHOP

This section of the report analyzes the operations of the Bureau of Garage and Shop.

1. THERE ARE A NUMBER OF POSITIVE ASPECTS OF THE GARAGE AND SHOP BUREAU OPERATIONS.

Although there are opportunities for improvement, there are also several positive aspects of the Garage and Shop Bureau's current operations that are highlighted below.

- The Bureau possesses and utilizes the CFA management information system to track work performed on each vehicle and piece of equipment for which it has responsibility. This automated information system is also used to track parts room receipts and disbursals.

- The Bureau Superintendent has minimized the costs of fire apparatus procurement by purchasing pumper bodies and chassis separately and having a third party assemble these at a lower overall cost.

- The City has appointed a Rolling Stock Committee that identifies needed vehicle and equipment replacements, and places these on a replacement schedule.

- The Bureau has placed a camera in the Parts Room to ensure the security of the parts inventory.

- The City is in the process of retrofitting vehicles and fueling stations with the capacity to identify each unit at the pump in order to facilitate a more accurate and efficient gathering of information related to fuel usage for each unit.

These positive aspects form the foundation for certain improvements in the Garage and Shop Bureau, which are outlined below.

2. THE GARAGE AND SHOP BUREAU SHOULD ELIMINATE ONE MECHANIC POSITION.

One simplistic method for determining the adequacy of staffing in a vehicle maintenance garage is by dividing the number of units maintained by the full time equivalent (FTE) mechanics maintaining them. Known as the "vehicle to mechanic

ratio," this is a crude but quick means of gaining some indication of the adequacy of staffing. In the case of the White Plains Public Works fleet, there were 439 total units in the fleet, as of August, 2014, being maintained by 12 mechanics, a Welder, a Skilled Laborer and a Laborer. The Laborer does not perform mechanical repair and maintenance, so with this position eliminated from the calculation, the ratio of vehicles to mechanic staff is 31.4:1. This is slightly below the expected range of a typical municipal fleet (between 32: 1 and 42:1) that includes a mix of heavy and light-duty units.

Beyond this rough measure, the industry has evolved over time and has developed a more meaningful ratio for determining the adequacy of staffing in maintenance shops. This method, known as the Vehicle Equivalent Unit (VEU) ratio, accounts for the varying intensities of maintenance required by each type of unit being maintained in the fleet. The use of VEUs is an improvement over the simple statement of the numbers of vehicles and pieces of equipment, since not all require the same intensity of maintenance and repair.

The baseline for maintenance and repair is a sedan, which is defined as one VEU. A piece of heavy equipment, such as a backhoe or front end loader, on the other hand, requires more maintenance, and is assigned a VEU of 3. Similarly, street sweepers and garbage packers, which require an even greater level of maintenance, are assigned VEUs of 5. Although White Plains' Garage and Shop Bureau maintains 439 total vehicles and pieces of equipment, the calculation of VEU for its fleet is 1,006.5, as the following table shows.

Class Description	Number in Class	VEU for Class	Total VEU
Sedan, Minivan	54	1 to 1.5	57.0
Heavy Van, Pickup	145	1.5	217.5
Patrol Vehicle	59	2.5	147.5
Heavy Equipment	111	3 to 5	413.0
Trailer	23	0.5	11.5
Pump, Generator, etc.	5	0.5	2.5
Mower, Small Engine	21	0.5	10.5
Fire Apparatus	16	10	144.5
Motorcycle	5	0.5	2.5
Total	**439**	**NA**	**1,006.5**

As was noted above, the Bureau maintains the fleet of 1,006.5 VEUs with a total of 12 Mechanics, a Skilled Laborer and a Welder, for a total of 14 staff members. This equates to a ratio of 71.9 VEUs per staff member. Even when the Skilled Laborer and Welder are removed from the equation, the ratio is 83.4 VEUs per Mechanic, which is below the normal range of 90 to 110 VEUs per Mechanic.

One mitigating factor in any calculation of VEU ratios is the age of the fleet. Specifically, maintaining a very old fleet requires a greater level of repair than a newer one. Therefore, even though, for example, a front end loader may be assigned a VEU of 5, it simply takes more hours to maintain a loader that is 15 years old than it takes to maintain a two-year old loader. Therefore, the calculation of the "normal" range of VEU to mechanic ratios makes certain assumptions:

- There is a typical "mix" of units in the fleet. A municipal fleet will always be composed of a variety of makes and models, however the "normal" ratio of VEUs to mechanics assumes that this mix is not excessively diverse, which creates issues in carrying parts (thereby creating excessive downtime) and in a mechanic's ability to be knowledgeable on an excessive number of models.
- The overall age of the fleet is not excessive. As noted above, an older fleet generally requires a greater level of maintenance than a newer one, which requires a greater number of mechanics.

In reviewing the White Plains fleet, it cannot be said that the fleet mix is excessively diverse. It is true that there are various makes and models, however, 212

of the 439 units (48.3%) that comprise the fleet are manufactured by Ford.

The age of the fleet is somewhat high, however the overall age does not fall outside the range of the typical municipal fleet, as most municipalities across the country were forced to scale back on timely replacements during the past seven to eight years. The table below shows the average ages of each of nine classifications of the White Plains fleet.

Class Description	Number in Class	Average Age
Sedan, Minivan	54	8.0
Heavy Van, Pickup	145	8.9
Patrol Vehicle	59	3.7
Heavy Equipment	111	9.8
Trailer	23	11.9
Pump, Generator, etc.	5	4.6
Mower, Small Engine	21	4.1
Fire Apparatus	16	15.4
Motorcycle	5	6.4
Total	**439**	**8.4**

As the table above shows, there are some older classifications of vehicles and equipment, however, these ages are not excessive as of yet. Clearly, the ages of sedans, vans and pickups should be reduced, and the project team recommends that the City allocate sufficient funding in the immediate future to replace the older units in these classifications of the fleet. However, assuming that the City does, in fact, address the overall age of the fleet in the next two to three years, the current age of the fleet should not be viewed as a factor that is requiring an excessive amount of maintenance and repair time from mechanics.

The project team recommends that the Garage and Shop Bureau reduce staffing by one Mechanic position. The reduction would result in a VEU to Mechanic ratio of 91.5 to 1, which is still at the low end of the “normal” range of 90 to 110 VEUs per Mechanic, and this ratio still allows for the retention of the Skilled Laborer and Welder.

Recommendation #50: Eliminate one Mechanic position. This staff reduction will result in a cost savings of approximately $110,345 including salary and benefits.

3. THE GARAGE AND SHOP BUREAU SHOULD ENHANCE PARTS INVENTORY CONTROLS.

The project team observed parts room operations in the Garage and Shop Bureau, and noted several opportunities for enhancing controls over parts inventory. These are analyzed in the following sections.

(1) The Bureau Should Perform Continuous Inventory Counts to Ensure the Accuracy of the Parts Inventory.

The Garage and Shop Bureau utilizes the CFA information system to record parts inventory. As inventory is purchased for stock in the parts room, the parts identification number, quantities received, and costs are entered into the system and added to existing stock levels. Similarly, as parts are disbursed from inventory, the quantities and costs are reduced from the inventory. Therefore, at the end of any reporting period, the quantities on the shelves in the parts room should match the quantities that are reported within the CFA system.

The project team conducted a small, random sample of parts inventory levels in the parts room, and found a notable number of inaccuracies. The process for conducting this sample consisted of randomly selecting parts line items contained in the CFA system, noting the quantities that the system reported, and comparing these quantities to those actually found in the parts room. The following table provides the results of this random sample.

Part Number	Description	CFA Inventory	Actual Parts Count	Difference
XZY3	Michelin Tire	3	4	1
XDN2	Michelin Tire	4	4	0
1233304	Filter	5	5	0
29548988	Filter Kit	16	16	0
F50227	Filter	4	4	0

Part Number	Description	CFA Inventory	Actual Parts Count	Difference
11026	Alternator	9	9	0
7861	Alternator	7	3	(4)
2472	Battery	10	4	(6)
5008414	Air Dryer Service Kit	6	7	1
5005037	Maintenance Kit	8	9	1

As is shown in the table, five of the 10 line items reflect inaccurate totals. Three of these inaccurate totals reflect differences of only a single item, however the two others reflect significant differences between the calculated quantities in CFA and the actual quantities on the shelves in the parts room.

The sampling of only ten line items clearly is an unscientific one, and it is possible that the identification of error rates in 50% of the items overstates the severity of the issue. However, even if this is the case, it is also true that there is no ongoing reconciliation of parts quantities on hand versus the CFA calculated quantities. The Parts Room Attendant should perform a continuous cycle of reconciliation of these quantities throughout the year in order to identify discrepancies at the earliest possible point. Moreover, these quantities should be compared to inventory levels that are shown in the City's Finance Department, which should have records of both purchases and disbursals, with any discrepancies explained.

The performance of a continuous inventory count is a best management practice of well-managed parts rooms. The process should result in, for example, the monthly comparison of one-twelfth of the total inventory on-hand to the calculated inventory in CFA. The results of the inventory should be reported to Bureau management, Department management and to the Finance Department, with any discrepancies analyzed and reported. There are many possible reasons for discrepancies, including errors in transcription from paper work orders into the CFA system, to incorrect

quantities received at the time of shipment. However, if these errors are allowed to linger in the system without correction, any future errors in the same parts line item compound the problems related to reconciliation.

The continuous inventory count has benefits beyond those of reconciling discrepancies at the earliest possible time, however. Another benefit of this cyclical count is that obsolete, or low-turnover parts, may also be identified. The Garage and Shop Bureau has a relatively large area allocated to the parts room, and therefore the identification of obsolete and low-turnover parts may not be perceives as being a high priority. However, there is a cost associated with holding parts that are not well-utilized, as these parts maybe sold for at least a portion of their original cost. Further, the space allocated to these parts may be either allocated to higher-turnover parts or may possibly be re-purposed for other uses by mechanics.

Recommendation #51: The Garage and Shop Bureau should institute a process of continuous parts inventory counts and reconcile any differences between the physical inventory and that which is reported in the CFA parts module.

(2) The Garage and Shop Bureau Should Hire an Additional Stock Clerk to Provide a Greater Level of Security and Inventory Control.

Currently, there is a single Stock Clerk responsible for the procurement, stocking, disbursal and accounting for the parts inventory in the Garage and Shop Bureau. The parts room over which this Clerk has responsibility is not only a physically large space, but also contains a large dollar volume of parts. The project team was on site in August, 2014, and observed that, for a variety of valid reasons, the Stock Clerk was not always in the parts room, which has the potential to cause delays in providing parts to mechanics, and thereby delaying the return of vehicles and equipment to using departments.

The duties of a Stock Clerk have administrative, clerical and customer service components. Further, the job of the Stock Clerk involves ensuring the security of the parts room in order to provide a level of accountability for the accuracy of the inventory count. Specifically, the Stock Clerk should have the following duties:

- Fill Mechanic orders for parts by making proper parts identification in catalogs, obtaining bids for parts, and obtaining purchase orders from the Finance Department
- Assist Mechanics in determining the correct and necessary part that meets requirements at the lowest cost
- Receive and check parts shipments from vendors; communicate with vendors on late shipments
- Enter parts receipts and disbursals into the Bureau's management information system
- Perform a physical inventory count on a cyclical basis, which should be, at a minimum, on an annual basis
- Reconcile differences in physical parts counts and those reported in the management information system

The Bureau's parts room should be staffed by a Stock Clerk at all times, and this is not feasible with a single Stock Clerk. The Parts Room should be locked and inaccessible to any employee other than the Stock Clerks, the two Supervisors, and the Superintendent, each of whom should be required to sign in and out of the Parts Room as they enter and leave. The hiring of a Stock Clerk is estimated to cost $92,869 in salary and benefits. This cost should be offset by the reduction of one Mechanic in the Bureau, as has been recommended above.

Recommendation #52: The Bureau should hire a second Stock Clerk to ensure a greater level of customer service, parts room security and parts control. The position is anticipated to cost approximately $92,869, including salary and benefits.

4. THE GARAGE AND SHOP BUREAU SHOULD DEVELOP AND DISTRIBUTE A SERVICE LEVEL AGREEMENT FOR ITS CUSTOMERS.

Most City Departments define their "customers" as residents, visitors, contractors, other government agencies, and perhaps others. These customers make requests of City employees via telephone, personal interactions, e-mails, and other methods of communication. However, certain City departments do not have external customers, but rather their customers are internal City departments. The Garage and Shop Bureau is one such City department that serves only internal customers who rely on the Bureau for maintenance and repair of their vehicles and equipment, and expect that these services will be provided with a high level of quality, and within time periods that do not unnecessarily impact their abilities to accomplish the assigned work.

As a Bureau that exists to serve its internal customers, the Garage and Shop Bureau should state the levels of service that it will provide these customers. Known as a "Service Level Agreement" (SLA), this formal document should serve as a contract between the Garage and Shop Bureau and its internal customers. The SLA should define the levels of service that customers can expect, and the Bureau should report on the achievement of these service levels on a periodic basis so that it is held accountable for the performance against an objective set of criteria. The main components of an SLA are listed below:

- An overview of the services provided, the mission statement of the organization, and the guiding principles of the organization that relate to cost of services, quality of service, customer service principles, and others.
- The full listing of services provided. This would include fleet repair, towing, vendor coordination, preventive maintenance, replacement planning, vehicle and equipment specification development, and more.

- Description of the preventive maintenance program, to include the various levels of maintenance services provided for each class of equipment, and at what frequencies.

- Description of vehicle repair services. This would include a description of services provided on overtime and holidays, road call services, those services that are routinely outsourced to vendors, turnaround time commitments for services, fleet availability and downtime targets, authorization requirements for repairs, and other services.

- A description of any equipment modifications that the Bureau performs, as well as any accident repairs.

- A description of the Bureau's vehicle maintenance information system (CFA, currently) and the reports that customers will be provided on a routine basis, and those that may be requested on an ad hoc basis.

- Vehicle and Equipment replacement guidelines.

- A description of customers' responsibilities. This should include a requirement to complete pre-trip inspections, to report any suspected problems with vehicles immediately, a requirement to keep vehicles clean, and a requirement to follow specific instructions when customers are involved in accidents.

The SLA should not be created exclusively by the Garage and Shop Bureau, but should be a collaborative effort with the Bureau's customers. The Bureau should convene a meeting of its primary customers in order to assess their primary concerns in receiving services. This meeting should also apprise customers of the commitments the Garage and Shop Bureau can reasonably make with the staffing and equipment resources it has at its disposal.

Recommendation #53: The Garage and Shop Bureau should meet with its primary customers to develop a Service Level Agreement that defines the levels of service it commits to providing, and also defines customer responsibilities as well.

5. THE CITY SHOULD ADEQUATELY AND SYSTEMATICALLY FUND VEHICLE AND EQUIPMENT REPLACEMENTS.

The project team analyzed the age of the vehicles and equipment maintained by the Department's Garage and Shop Bureau and determined that they maintain a relatively old fleet. The project team placed all 439 vehicles and pieces of equipment maintained by the Bureau into nine categories and determined the average age of the fleet for each of these categories. For purposes of classification, the following were used.

Class Description	Number in Class	Average Age
Sedan, Minivan	54	8.0
Heavy Van, Pickup	145	8.9
Patrol Vehicle	59	3.7
Heavy Equipment	111	9.8
Trailer	23	11.9
Pump, Generator, etc.	5	4.6
Mower, Small Engine	21	4.1
Fire Apparatus	16	15.4
Motorcycle	5	6.4
Total	**439**	**8.4**

As the table shows, the weighted average[7] age of the vehicles and equipment maintained by the mechanics at the shop is 8.4 years, suggesting a replacement cycle of about 16.8 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 an administrative sedan or pickup truck is less than 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 almost 9 years is above the expected range. However, even in examining specific categories of

[7] The weighted average takes into account the numbers of units in each class. Therefore, the age of the 54 sedans and minvans in category 1 account for 12.3% (54/439) of the total average, and so on.

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. White Plains' average age of this class of unit is 8.9 years.

The project team does not possess adequate data to determine the current value of the fleet. However, given that there are 439 vehicles and pieces of equipment being maintained by the Garage and Shop Bureau, it is likely that the current replacement value is close to $22,000,000. As has been noted above, the economic life cycles of each category of equipment varies widely, but assuming, for illustrative purposes, that the overall average economic life cycle of the fleet should be between five and six years, then the City should be making an investment of between $3.6 and $4.4 million per year in the fleet being maintained by the Garage and Shop. The City's FY2014 budget book indicates that it has allocated $2.8 million in the current fiscal year, and $3.5 million in the next fiscal year for "Rolling Stock Replacement", which is somewhat below the project team's estimated budgetary figure that will ensure an adequate replacement cycle for the City's fleet.

The current age of the fleet indicates that the current level of equipment replacement may be inadequate to ensure that the City minimizes its overall investment in its fleet when taking into account the entire life cycle of equipment. 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 allocate 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 at the end of this seven-year period, the replacement cost would be $35,000, the Vehicle Replacement Fund would need to receive an amount of $5,000 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-city mileage versus highway mileage, etc.), predicted salvage values, and the cost of money. These precise calculations, while valuable, require historical data that are unavailable within the Garage and Shop Bureau currently, as it does not capture all of these data to enable a reliable analysis.

The project team has provided a listing of typical economic life cycles for vehicles and equipment in the following table.

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	

Equipment Type	Years	Mileage
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
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

These economic life cycles may or may not reflect the optimum cycles for White Plains, since they are composites of the project team's experience in multiple jurisdictions that may be dissimilar in certain ways to White Plains.

Recommendation #54: The project team recommends the development of standard economic life cycles for vehicles and equipment. Furthermore, the project team 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.

8. ANALYSIS OF THE BUREAU OF WATER AND WASTEWATER

This section of the report provides an analysis of the Water and Wastewater Bureau.

1. THERE ARE A NUMBER OF POSITIVE ASPECTS OF THE WATER AND WASTEWATER BUREAU OPERATIONS.

Although there are opportunities for improvement, there are also several positive aspects of the Water and Wastewater Bureau's current operations that are highlighted below.

- The Bureau expends approximately 95% of all labor hours in the performance of scheduled preventive maintenance activities.
- The Bureau has recently purchased, and was in the process of implementing, a hydraulic valve turning truck that will allow the Bureau to more efficiently turn gate valves, and to accomplish a greater workload.
- The Bureau achieved a third place award in the State for water taste.
- The Bureau maintains the locations of all distribution and collection lines in its Geographical Information System (GIS).
- The Bureau has implemented predictive maintenance program for drives, pumps, motors, generators and compressors in the plant, and performs vibration testing and oil analysis on pumps and motors.

These positive aspects form the foundation for certain improvements in the Water and Wastewater Bureau, which are outlined below.

2. THE BUREAU SHOULD IMMEDIATELY CERTIFY AN ADDITIONAL WATER TREATMENT PLANT OPERATOR

Currently, the Water and Wastewater Bureau operates its treatment plant under the 1A license of a Senior Water Treatment Plant Operator overseeing five Water Treatment Plant Operators, and this employee is the only one with an appropriate

license to operate the plant. Should this employee's employment be terminated for any reason, the City would need to hire an employee from outside the organization unless it certifies another internal employee to obtain a license and train under the Senior Operator.

Water operator applicants in New York must have six months to one year of experience. For grades IA or IB, 10 years of experience is required, usually as a grade IIA or IIB certified operator, depending on the size of the water system. The project team recommends that the Bureau identify one or more employees to obtain the appropriate license and begin training under the Senior Operator as soon as possible.

Recommendation #55: Identify one or more current Water and Wastewater Bureau employees to obtain a 1A license from the State of New York, and begin training under the current Senior Water Treatment Plant Operator.

3. THE WATER AND WASTEWATER BUREAU IS STAFFED SUFFICIENTLY TO PROVIDE A HIGH LEVEL OF SERVICE.

One of the limitations in the study of workloads in the Department of Public Works was the lack of either a computerized maintenance management system or the consistent capture of workload data on manual work reporting sheets. The lack of such data required that the project team use benchmarks and certain assumptions regarding the staffing requirements of the Department. And although the Water and Wastewater Bureau captures a greater level of detail regarding the accomplishment of its work than do other bureaus in the Department, it does not capture and summarize the inputs (i.e., labor hours, materials and equipment use) to a sufficient degree to allow a full analysis of the efficiency and effectiveness of the use of its resources.

In calculating the workload requirements for the maintenance functions of the Water and Wastewater Bureau, the project team utilized the following reported

infrastructure:

- 160 miles of water distribution line
- 125 miles of sewer collection line
- 3,000 gate valves
- 1,835 hydrants

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

- There are about 3,000 gate valves in the system which should be exercised once per two years.
- Water lines should be flushed once per 3 to 4 years. With 160 linear miles of distribution line, this equates to flushing about 45 miles of the system annually.
- Sewer lines should be cleaned once per three years. With 125 miles of collection line, this equates to cleaning about 41 miles annually.
- Experience indicates that about 1.5% of all hydrants will require repair each year. With 1,835 hydrants in the City, this equates to about 28 repairs annually.
- Ten percent (10%) of the City's sewer line should be televised annually to identify inflow and infiltration in the system and proactively treat this common problem. This would require the televising of about 12.5 miles of the system per year.
- There are 3,295 catch basins in the City, which should be cleaned on a three-year cycle, which equates to about 1,098 catch basins each year.
- There are an average of about 4,400 Code 53 calls, or utility locate requests, each year.

With these assumptions, the required numbers of proactive and preventive hours were calculated for the Water and Wastewater Bureau, and are presented on the following page. Note that the total number of person-days is calculated at 1,317.8, which equates to 10,542.4 person hours. If each FTE is available for 1,650 hours per

year, the required number of Water and Wastewater crew members would be 6.4, or 7 FTE, simply to accomplish the proactive events in order to properly maintain the City's distribution and collection system. The Bureau should strive for a ratio of one hour of reactive, or emergency, work for every one hour of proactive maintenance. This ratio indicates that the Bureau requires 14 staff members to accomplish all of the maintenance and repair for the City's distribution and collection system.

In addition to the requirement of 14 staff members to maintain and repair the underground infrastructure, the Bureau is receiving over 1,400 Code 53, or utility locate, requests each year, which requires between two and three employees. In addition, the Bureau is required to send a witness to each backflow device inspection performed by a private company. With 600 backflow devices in the City, some of which require multiple inspections each year, this requires another employee, bringing the total required contingent of employees in the Bureau to between 17 and 18.

Given that there are 19 field employees in the Bureau, the requirement for between 17 and 18 employees indicates that there are sufficient numbers of employees in the Bureau to ensure that the distribution and collection systems receive a high level of service. However, in the absence of a computerized maintenance management system, it is not possible to verify that this is the case. Anecdotally, the Bureau is not experiencing major issues, which would indicate that the preventive maintenance program is having its intended effect. For example, the Bureau reports a total of 23 main breaks over the past 5 years, which equates to 4.6 per year, or about one break per 62 miles, which is much better than the typical range of between 25 and 35 for northern climates. Therefore, although the Bureau currently has one more employee

than is indicated as being necessary (i.e., 19 versus a requirement of between 17 and 18), the project team does not recommend any reduction in staff at this time. However, the project team reiterates the recommendation that the Bureau purchase and install a computerized maintenance management system that is used to record all work in order to determine the tasks on which the Water and Wastewater Bureau is expending staff resources, as well as to be able to plan, schedule and manage work.

Recommendation #56: The implementation of a CMMS would allow the Bureau to plan, schedule and manage its preventive work, and to record its reactive, or emergency, workload in a more effective manner.

9. ANALYSIS OF THE BUREAU OF PUBLIC FACILITIES

This section of the report analyzes the operations of the Bureau of Public Facilities.

1. THERE ARE A NUMBER OF POSITIVE ASPECTS OF THE BUREAU OF PUBLIC FACILITIES OPERATIONS.

Although there are opportunities for improvement, there are also several positive aspects of the Facilities Management Bureau's current operations that are highlighted below.

- The Bureau effectively utilizes contractors to supplement its internal trades staff in the maintenance and repair of the City's facilities.
- The Bureau has been especially proactive in the installation of technological improvements in buildings and other fixed assets, as it has recently installed a SCADA system at the Water Plant, and was in the process of installing an upgraded automated fuel dispensing system on all City vehicles.
- The Bureau has contracted for energy audits in public buildings, and is instituting those recommendations that have been determined to be the most cost-effective.

These positive aspects form the foundation for certain improvements in the Bureau of Public Facilities, which are outlined below.

2. THE BUREAU OF PUBLIC FACILITIES SHOULD INVESTIGATE THE FEASIBILITY OF OUTSOURCING CUSTODIAL SERVICES.

The Bureau of Public Facilities provides custodial services in four City buildings. These include City Hall, the building at 70 Church Street, the Library and the Public Safety Building. The following table provides the square footage in each of these buildings.

Building	Area (sq. ft)
City Hall	35,797
70 Church Street	8,100
Library	81,129
Public Safety	133,383
Total	**258,409**

Services are provided during both day and night time hours at each location. The services provided are typical of custodial operations, and include cleaning floors/carpets, bathroom fixtures, emptying waste cans, take out recyclable materials, setting up for events/moving furniture, checking air conditioners and filters, and other related activities.

In analyzing the effectiveness of custodial services, it is critical that staff be available to not only perform assigned duties such as cleaning floors, stocking bathrooms, emptying waste cans, etc., but that they are available to respond to emergency needs. Further, custodial staff should also be able to identify needed building maintenance, and should be proficient in making minor repairs such as toilet leaks, stopped pipes, and other tasks that can alleviate the need for more skilled labor.

Many municipalities have found that the services provided by private custodial firms are similar to those provided by their internal staffs, but are provided at less cost. The project team has no specific knowledge of the costs of private custodial operations in and near the White Plains area, however a calculation of the costs provided by the City's internal staff indicates that the current costs are relatively high. The benchmark used by the project team is that custodial services should be in the range of $1.50 to $1.75 per square foot of space maintained. However, as the table below indicates, the internal cost of service for only the personal services element of cost indicates that this cost is well above the benchmark.

Position	Salaries	Benefits	Total Personal Svcs.
Lead Bldg. Svc. Worker	$58,154	$29,339	$87,493
Building Svc. Worker	$412,313	$208,016	$620,329
Total	**$470,467**	**$237,355**	**$707,822**

As the table shows, the total salaries and benefits (calculated at 50.45% of salaries, as calculated from City Budget book for 2014-15) are $707,822. With 258,409 square feet of space within which the custodial staff provide services, this equates to about $2.74 per square foot, which is well above the benchmark of $1.50 to $1.75. It must also be noted that the $2.74 figure only includes personal services costs. In addition to this cost, the City incurs the costs of materials and supplies, which increases the total cost of custodial services, likely to close to $3.00 per square foot.

The Bureau of Public Facilities should investigate the feasibility of outsourcing custodial services in order to reduce unit costs. Even if the total cost of a private firm is $2.25 per square foot, the cost savings could be as great as $190,000 per year, assuming the full costs of internal services are $3.00 per square foot.

Recommendation #57: The Bureau of Public Facilities should investigate the feasibility of outsourcing custodial services.

3. THE BUREAU OF PUBLIC FACILITIES UTILIZES AN APPROPRIATE MIX OF CONTRACTED FACILITIES MAINTENANCE SERVICES AND INTERNAL RESOURCES.

The Bureau of Public Facilities has the responsibility for the repair and maintenance of City facilities that cover 666,821 square feet of maintainable space. The Bureau accomplishes the maintenance and repair of these facilities through a mix of internal and contracted maintenance services.

The Bureau utilizes its internal staff for routine responses to repair requests that are determined to be less complex and time-consuming. The Bureau utilizes contractors for preventive maintenance and for more complex repairs that would

consume a large amount of time of the internal staff. In determining the appropriate staffing contingent for facilities maintenance, the project team utilizes a benchmark range of 45,000 to 50,000 square feet of space per maintenance mechanic. This range has been determined through the results of an International Facilities Maintenance Association (IFMA) survey[8], and which has been verified by many years of observation by the project team in well-managed facilities maintenance organizations.

The Bureau of Public Facilities has a staff that consists of the following positions, with salaries and benefits provided in the table below.

Position	Salary	Benefits	Total Compensation
Carpenter	$77,011.00	$38,852.83	$115,863,83
Plumber/Bldg Maint. Mgr.	$77,011.00	$38,852.83	$115,863.83
Crew Leader/Asst. Bldg. Ser.	$71,564.00	$36,104.76	$107,668.76
Maintenance Mechanic	$66,933.00	$33,768.37	$100,701.37
Maintenance Mechanic	$66,933.00	$33,768.37	$100,701.37
Maintenance Mechanic	$66,933.00	$33,768.37	$100,701.37
Motor Equipment Operator	$64,402.00	$32,491.46	$96,893.46
Total	**$490,787.00**	**$247,606.99**	**$738,393.99**
Average Compensation			**$105,484.86**

The project team analyzed the budget for contracted repairs, and determined that the Bureau of Public Facilities budgeted $1,087,019 in FY 2014 for these contracted services. In determining the number of equivalent staff members this figure represents, the project team utilized the average compensation paid to Bureau of Public Facilities staff, which is $105,484.86, as is shown in the above table. Therefore, dividing the total budgeted expenditures for contracted services by this average City compensation figure gives a total of 10.3 full time equivalent staff members paid for contracted services. Added to the seven internal staff members in the Bureau of Public Facilities, this yields a total equivalent staffing contingent of 17.3 maintenance mechanics. Finally, dividing

[8] IFMA, "Operations and Maintenance Benchmark Survey", 2005. This survey of over 650 members indicated that the average rentable area per trades maintenance worker was approximately 47,000 square feet.

the 666,821 square feet of maintainable space by the 17.3 FTEs yields a total of 38,533 square feet of space per maintenance FTE, which is only slightly below the range of 45,000 to 50,000 square feet maintained per FTE.

The project team concurs with the current model utilized by the Bureau of Public Facilities in its use of a mix of private contractors and internal staff to accomplish the maintenance and repair responsibilities for municipal buildings. The deployment of internal staff for emergency response and less-complex repairs, combined with the use of contractors for preventive maintenance and more complex, time-consuming repairs is a prudent business model that maximizes resources.

Recommendation #58: The Bureau of Public Facilities should continue utilizing a mix of internal and contracted services to accomplish facilities maintenance and repair at municipal facilities.

APPENDIX A

DESCRIPTIVE PROFILE OF THE WHITE PLAINS PUBLIC WORKS DEPARTMENT

The purpose of the descriptive profile is to document the project team's understanding of the White Plains Department of Public Works (DPW). The profile includes a summary of the roles and responsibilities for each Bureau, organizational structure, allocation of staff by function, and the principal assigned responsibilities of staff. Data contained in the profile were developed based on work conducted by the project team, including:

- Interviews with White Plains DPW staff to discuss roles and responsibilities, services provided, existing policies and procedures guiding work activities, communication and coordination, technology utilized, etc.
- Interviews with Department management to gain an overview of services provided, issues of concern, background and history of the DPW, etc.
- Collection and review of various data (including annual reports, annual budget, policies and procedures) describing organization and staffing, work processes, policies and procedures, workload and service levels as well as costs.
- Limited observations of worksite, processes, workflow and staff activities.

The structure of this descriptive profile for the White Plains DPW is as follows:

- Introduction
- Organizational charts of each Bureau.
- Summary descriptions of key roles and responsibilities of Bureaus and their component sections.
- Summary of services provided and technology utilized for each Bureau.

The descriptions of responsibilities provided in the "Summary of Key Roles and Responsibilities" section summarize the team's understanding of the major programs and service activities to which staff in the DPW are assigned. These descriptions are not intended to provide the level of detail of a typical job description. Rather, the descriptions provide the basic responsibilities and reporting relationships within each Bureau.

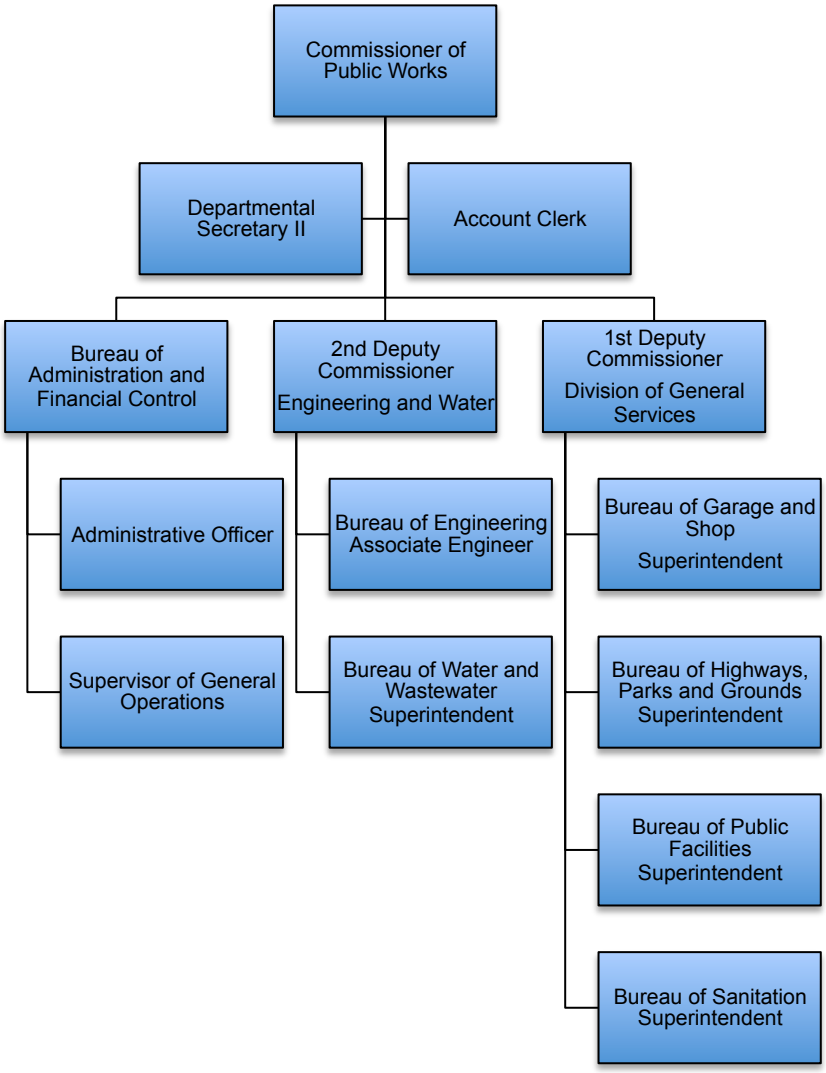
1. DEPARTMENT OF PUBLIC WORKS

The Department of Public Works provides services both to the City's residents, businesses and other City departments. These services include snow removal, highway maintenance, parks and grounds maintenance, facilities maintenance and management, vehicle and equipment maintenance and repair, engineering design, plans review, public construction management, enforcement of municipal codes as they relate to public rights of way, refuse collection and disposal, recyclable materials collection, water treatment, maintenance of distribution and collection lines, internal budget management, as well as others.

(1) Organizational Structure of the Department

The following chart shows the current organizational structure of the Public Works Department:

Public Works Department Organizational Chart



(2) Department Budgets and Expenditures

The following chart provides the actual expenditures for FY 2013 and the budgets for FY 2014 and FY 2015 for the Department of Public Works, at the Bureau level of detail.

Bureau	Actual FY 2013	Revised Budget FY 2014	FY 2015 Budget	Change from FY 2014 to FY 2015
Administration	$1,692,072	$1,688,058	$1,720,590	$32,532
Engineering	$2,210,158	$2,308,429	$2,532,307	$223,878
Building Maintenance	$3,270,026	$4,021,783	$3,697,666	($324,117)
Garage and Shop	$2,271,405	$2,350,989	$2,382,763	$31,774
Stormwater	$145,136	$175,921	$150,185	($25,736)
Highways	$9,294,939	$10,070,318	$9,801,605	($268,713)
Parks Maintenance	$1,938,965	$2,006,510	$2,076,648	$70,138
Sanitation	$7,633,167	$7,642,403	$7,772,558	$130,155
Sewer Rent	$1,912,986	$2,005,304	$2,117,480	$112,176
Water	$11,518,147	$13,004,858	$13,801,403	$796,545
TOTAL	**$41,887,001**	**$45,274,573**	**$46,053,205**	**$778,632**

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

- The largest increase from FY 2014 to the current fiscal year was the $796,545 in the Water Fund. This represents a 6.1% increase.

- The largest decrease from last fiscal year to the current year was the $324,117 in the Building Maintenance Bureau. This represents an 8.1% decrease.

- Overall, the Public Works Department's increase from FY 2014 to FY 2015 was $778,632, or about 1.7%.

- The Water and Sewer Funds are operated as Enterprise Funds. These two Funds comprise $15,918,883 of the total FY 2015 Public Works budget of $46,053,205, or about 34.6%.

The following section provides a summary of the key roles and responsibilities of the positions of the Bureau of Administration.

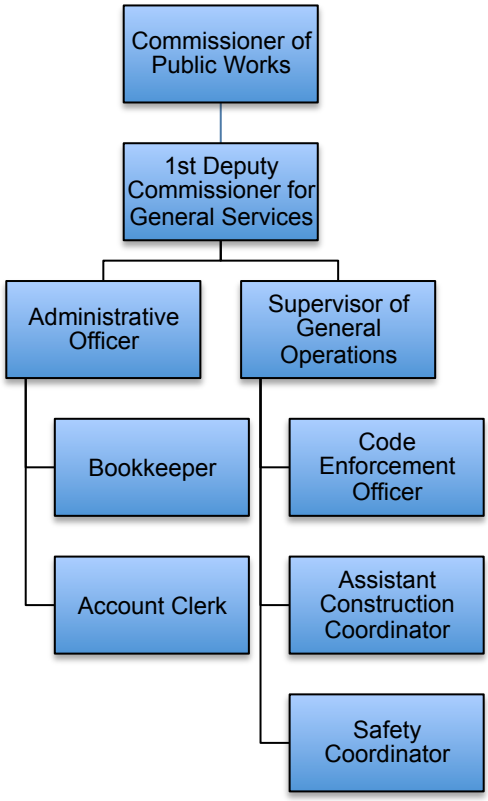
2. BUREAU OF ADMINISTRATION

The Bureau of Administration provides overall policy, budgetary and operational guidance to the Department of Public Works. This Bureau also provides administrative services such as payroll processing, budget development and oversight, procurement of materials and supplies for the Department, as well as issuance of certain permits and

enforcement of related codes, fulfillment of FOIL requests, and soil and erosion control permitting and inspection.

(1) Organization of the Bureau of Administration

The following chart shows the current organizational structure of the Bureau of Administration.



The following table provides the key roles and responsibilities of the Bureau of Administration. The table also provides the number of allocated and filled positions in the Bureau.

(2) Summary of Key Roles and Responsibilities.

Position	Number of Staff	Responsibilities/Roles
Department of Administration		
Department Management Public Works Commissioner 1st Deputy Commissioner 2nd Deputy Commissioner Department Secretary Account Clerk	5.0	• Provides overall guidance to the Department of Public Works • Interacts with the Common Council on departmental matters such as budgets, capital projects, resident concerns, performance objectives, etc. • Deputies oversee the budgets and operations of their assigned bureaus. • Commissioner is Professional Engineer, and approves all engineering design, construction schedules, contractor payments, change orders, etc.
Administrative Services Administrative Officer Bookkeeper Account Clerk	3.0	• Processes FMLA, Workers Compensation claims, payroll, budget for the Department. • Responsible for the payment of all City electric bills, solid waster tipping fees at County landfill. • Creates purchase requests and purchase orders for DPW supplies and materials • Maintains lease agreements for use of City-owned properties and cell towers • Ensures that insurance is current • Polls the CFA software system (soon to transition to Veeder Root system) to compile all fuel consumption for all City vehicles.
General Operations Supervisor (vacant) Code Enforcement Officer Assistant Construction Coordinator Safety Coordinator	6.0	• Issues permits for work being conducted in the City rights of way, such as sidewalk, curb and driveways; street openings, street obstructions. • Performs inspections of work conducted under permit. • Enforces codes related to unauthorized materials and work in the City rights of way. • Enforces rules and regulations related to soil and erosion control at construction sites. • Coordinates and administers the safety program in the Department, procuring specialized safety training instructors, and providing general safety instruction and updates. • Responds to FOIL requests.

(3) Technology Utilized.

The following table summarizes the current technology and software systems utilized by the Bureau of Administration to provide services.

Technology / Software Name	Summary of utilization
Munis	Budget input and reporting Purchase requests Purchase orders
Excel	Tracking of code violations and dates for inspection
CFA	Polling of fuel sites
Fleet Tracker	Lists all City rolling stock

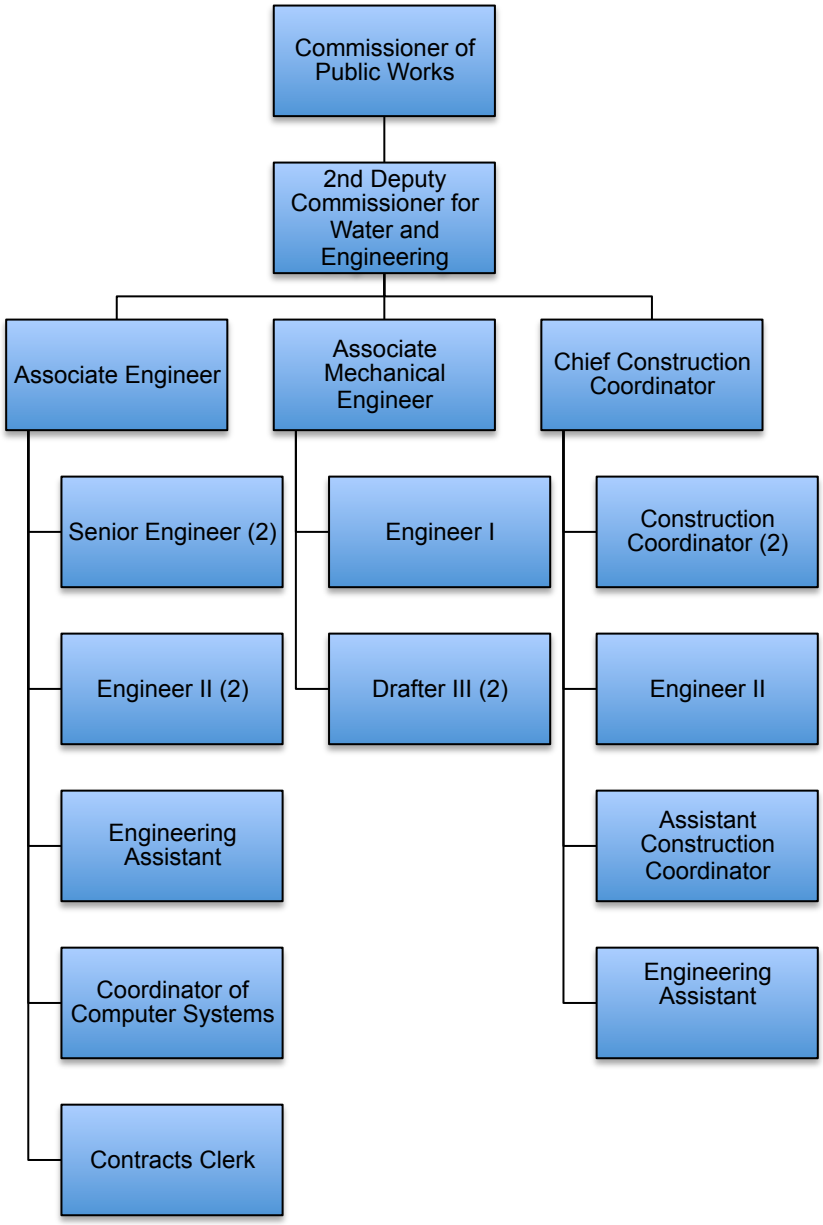
3. BUREAU OF ENGINEERING

The Bureau of Engineering provides design and construction inspection services for all City agencies. It also maintains all records of City infrastructure, including distribution lines, collection lines, storm drains, paved surfaces, facilities, as well as other assets. The Bureau also executes and oversees contracts for construction, maintenance and repair of City infrastructure, and provides advice and technical information to residents, contractors and other City departments.

The next section describes the organizational structure of the Bureau.

(1) Organization of the Engineering Bureau

The following chart shows the current organizational structure of the Engineering Bureau.



The following section provides a summary of the key roles and responsibilities of the Bureau of Engineering.

(2) Summary of Key Roles and Responsibilities

Position	Number of Staff	Responsibilities / Roles
Bureau of Engineering		
Bureau Administration Associate Engineer	1.0	• Provides overall guidance and technical support to staff in the Bureau. • Ensures adherence to design specifications, contract specifications, etc. • Ensures an efficient flow of work in the Bureau • Tracks project budgets and schedules
Buildings and Structures Associate Mechanical Engineer Engineer I Drafter (2)	4.0	• This section conducts construction inspections of vertical structures such as public buildings, parking structures, renovations within public buildings, etc. • Contracts for services are primarily of the lump sum variety • Use AutoCAD to design smaller structures and renovations such as HVAC • Provides estimation of design costs and writes specifications for building improvements, new buildings and structures • Prepares bid documents for design and construction • Conducts plan review of backflow device installations • Oversees contracts for elevator maintenance
Pavement Construction Chief Construction Coordinator Construction Coordinator (2) (1 L-T Disabled) Engineer II Assistant Construction Coordinator Engineering Assistant	6.0	• Plans, inspects, coordinates work of contractors installing “horizontal structures” such as roads/highways, sanitary sewer, storm drains, water and sewer mains, underground utilities, pedestrian ramps, curb installation, etc. • Contracts for services are typically of the unit pricing variety. • Conducts land surveys • In conjunction with Highway and Grounds Bureau, assesses street conditions and develops prioritized listing of paving needs in the City

Position	Number of Staff	Responsibilities / Roles
General Engineering Senior Engineer (2) Engineer II (2) Engineering Assistant Coordinator of Computer Systems Contracts Clerk	7.0	• Designs projects for capital improvements • Reviews plans for Planning Board, ZBA, and conducts site plan reviews • Conducts all plan reviews for Stormwater Pollution Prevention Plans (SWPPP) • Conducts soil testing for storm drainage • Interfaces with engineers, architects, developers in reviewing plans, discussing projects and City requirements • Provides plans and maps from GIS; inputs infrastructure assets into GIS • Provides computer/automation assistance to other DPW Bureaus • Maintains contract files and correspondence • Processes payments to contractors • Develops bids for services • Tracks bonds and insurance of contractors • Maintains records of contractual "hold-backs" related to final close-out items

(3) Workloads and Performance Measures

The following table summarizes the major workloads and performance measures of the Engineering Bureau.

Workload Area	Work
Site Plan Reviews	**2009-2010 Total = 292** Building Dept.: 221 Common Council: 30 Planning Board: 18 SWPPPs: 6 Backflow Device: 17 **2010 – 2011 Total = 219** Building Dept.: 166 Common Council: 22 Planning Board: 16 SWPPPs: 6 Backflow Device: 9 **2011-2012 Total = 303** Building Dept.: 217 Common Council: 34 Planning Board: 36 Zoning Board: 7 (began reviewing 4/23/12) SWPPPs: 9 Backflow Device: 15

	2012-2013 Total = 296 Building Dept.: 174 Common Council: 48 Planning Board: 14 Zoning Board: 32 SWPPPs: 10 Backflow Device: 18 **2013-2014 Total = 303** Building Dept.: 191 Common Council: 41 Planning Board: 17 Zoning Board: 31 SWPPPs: 10 Backflow Device: 13
Linear feet of granite curbing purchased (2008-2014)	71,900
Linear feet of granite curbing installed (2008-2014)	46,900

(4) Technology Utilized.

The following table summarizes the current technology and software systems utilized by the Bureau of Engineering to provide services.

Technology / Software Name	Summary of utilization
Munis	Tracking of budgets
Excel	
AutoCAD	Project design

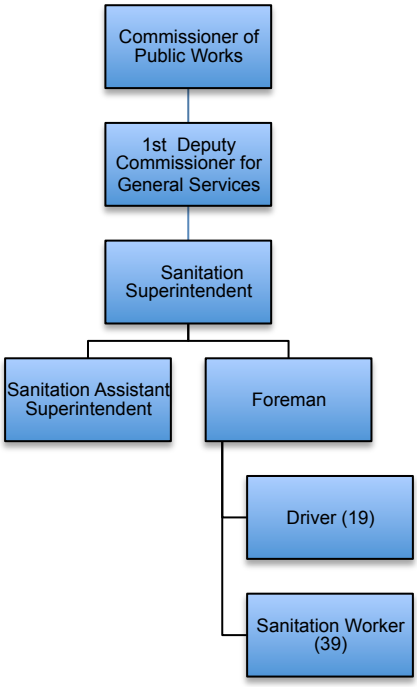
4. BUREAU OF SANITATION

The Bureau of Sanitation provides waste collection for residential units, multi-family complexes, institutions and commercial establishments. This service is provided twice weekly – on Mondays and Thursdays for one set of accounts (generally the northern sections of the City), and on Tuesdays and Fridays for others (generally the south side). On Wednesdays, Sanitation crews collect paper and cardboard. Non-metal, bulk collection occurs on Thursdays for the former set of accounts and on Fridays for the latter.

The Bureau also provides collection of recyclable materials each week. The Bureau has recently purchased four side-arm loading refuse collections vehicles, with the intention of purchasing additional units in the coming fiscal year.

(1) Organization of the Bureau of Sanitation

The following chart shows the current organizational structure of the Sanitation Bureau.



The following section provides a summary of the key roles and responsibilities of the Bureau of Sanitation.

(2) Summary of Key Roles and Responsibilities

Position	Number of Staff	Responsibilities / Roles
Bureau of Sanitation		
Bureau Administration Superintendent Assistant Superintendent Foreman	3.0	• Provides overall guidance and technical support to staff in the Bureau. • Ensures Drivers and Workers know their assigned duties each day • Ensures that crews have necessary safety equipment and uniforms • Ensures the safety and maintenance of the Bureau fleet of vehicles and equipment • Enters attendance in computer; tracks out-of-title pay for Drivers and Workers • Tracks and records quantities and costs of materials taken to landfill; tracks and records all quantities and types of recyclable materials. • Drives the City and notes violations of sanitation codes, ordinances and regulations – issues warning notices and notices of violation.
Field Operations Driver Sanitation Worker	 19.0 39.0	• May drive rear-load or side-load packers in completing assigned residential routes. • May drive front-load packers in collecting commercial or multi-family routes. • Sanitation Workers hoist refuse or recyclable materials into rear-load packers.

(3) Workloads and Performance Measures

The following table summarizes the major workloads and performance measures of the Sanitation Bureau.

Workload	Quantity
Residential accounts	
Commercial accounts	
Commingled bottles, jars, cans, MSW	2010 – 1,524.3 tons 2011 – 1,232.1 tons 2012 – 1,648.1 tons 2013 – 1,738.9 tons
Recyclable paper	2010 – 3,638.4 tons 2011 – 3,493.2 tons

	2012 – 2,953.0 tons 2013 – 3,248.9 tons

(4) Technology Utilized.

The following table summarizes the current technology and software systems utilized by the Bureau of Sanitation to provide services.

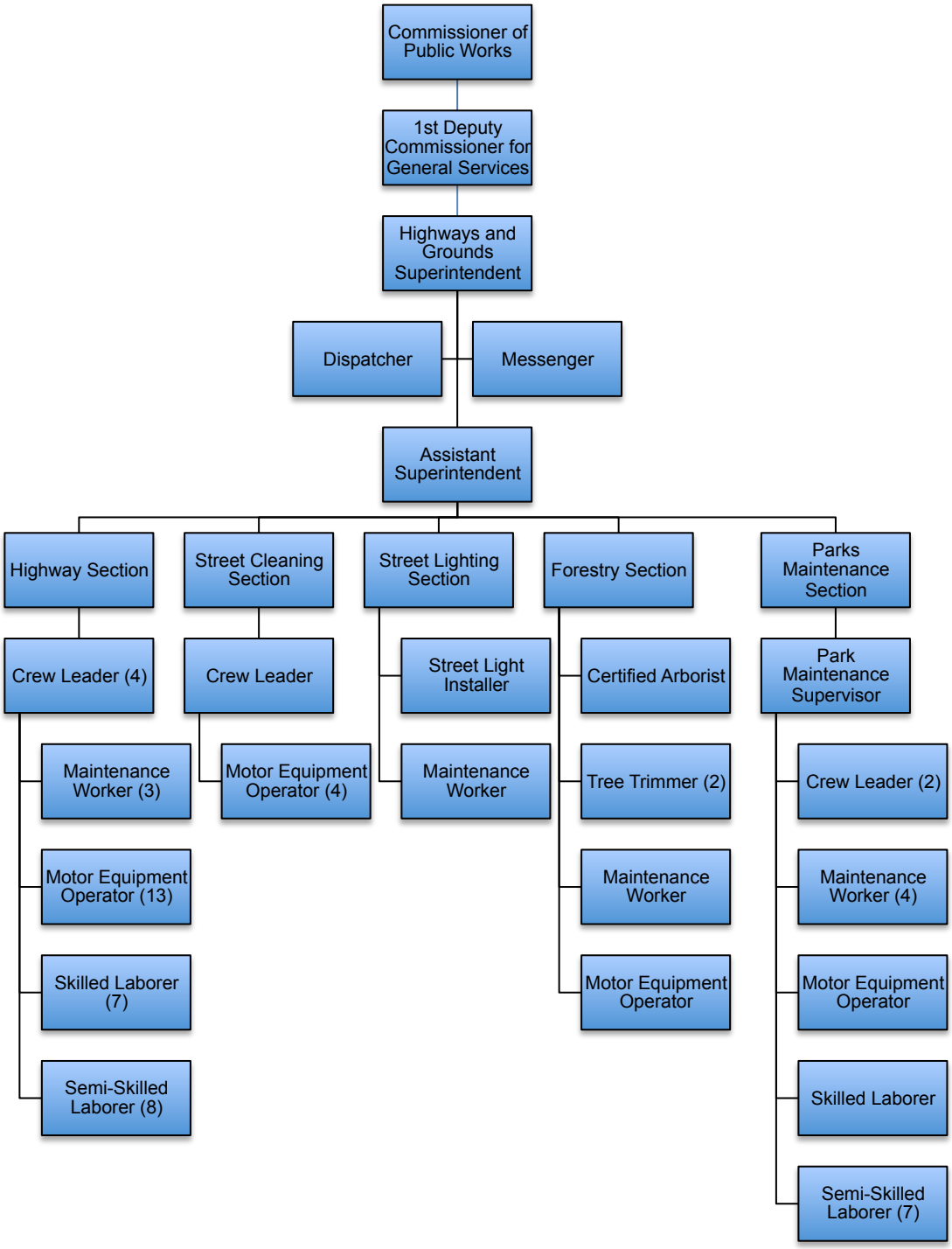
Technology / Software Name	Summary of utilization
Quattro Pro	Tracking of recyclable materials
Automated Vehicle Locator	Tracking of sanitation vehicle locations

5. BUREAU OF HIGHWAYS AND GROUNDS

The Bureau of Highways and Grounds is the largest of the Public Works Department's Bureaus and provides a wide variety of services to residents, including highway maintenance and repair; snow removal street sweeping repair, maintenance and installation of street lights; tree removal and pruning; and maintenance of the City's parks and recreational sites.

(1) Organization of the Bureau of Highways and Grounds

The following chart shows the current organizational structure of the Highways and Grounds Bureau.



The following section provides a summary of the key roles and responsibilities of the Bureau of Highways and Grounds.

(2) Summary of Key Roles and Responsibilities

Position	Number of Staff	Responsibilities / Roles
Bureau of Highways and Grounds		
Bureau Administration Superintendent Assistant Superintendent Dispatcher Messenger	3.0	• Provides overall guidance and support to staff in the Bureau. • Checks on job sites to ensure that work is being performed in accordance with plans and instructions • In conjunction with the Engineering Bureau, assesses conditions of streets to develop a prioritized listing of paving and resurfacing needs • Ensures that crews have necessary equipment, tools and materials for assigned jobs • Oversees budgets and expenditures of the Bureau • Dispatcher answers phones and provides customer service for the Bureau; also prioritizes calls for service, dispatches crews to job sites and during snow removal, develops tree planting list, recovers monies due to damages to guardrails and trees, oversees fuel deliveries. • Receives and distributes mail throughout City Hall and to outlying departments.

Position	Number of Staff	Responsibilities / Roles
Highways Crew Leader (4) Maintenance Worker (3) Motor Equipment Operator (13) Skilled Laborer (7) Semi-Skilled Laborer (8)	35.0	• Ensures safe and efficient travel on City's roadways, bridges and rights of way. • Inspects, repairs, maintains City paved surfaces, bridges and rights of way, including resurfacing and pothole repair • Performs resurfacing of some City roadways (major arteries are resurfaced by contractors) • Removes snow and ice from City roadways as well as 17 miles of County roadways • Operates the Gedney Way Recycling Center and Composting Yard six days per week • Collects leaves, brush and limbs at curbside and transports to Gedney Way facility. Also collects holiday trees and chips to mulch – mulch is available to residents. • Prunes roadside trees; transplants trees in City property, including rights of way, islands, Promenade • Maintains the Downtown Business District shrubs, trees, tree wells, plants, benches, planters, litter baskets, etc. • One of the Maintenance Workers is a mason
Street Cleaning Crew Leader Motor Equipment Operator (4)	5.0	• Removes road litter, sand, salt and other debris from City roadways, bridges, rights of way and other public areas through use of 3 regenerative air Timco sweepers and 2 mechanical Schwarze sweepers • Debris is transported to Gedney Way Compost Facility • Two of the MEOs work 4:00 am till noon from April through December, and from midnight till 8:00 am from December through March • Two sweepers run from 4:00 am till 8:00 am in the Downtown District, and switch to residential cleaning from 8:00 am till noon. • All curb miles are swept monthly

Position	Number of Staff	Responsibilities / Roles
Street Lighting Street Light Installer Maintenance Worker	2.0	• Maintains, repairs and installs over 7,500 City street lights, including those in recreational areas, roadsides, Business District, shopping areas, walkways, etc. • Installs and repairs poles and wiring for street lights. • Oversees contractor work in installing lighting • Interfaces with residents in complaints regarding street lighting • Measures intensity of lighting to determine needs for replacement • Responds to emergency situations in which multiple lighting outages occur • Installs, maintains and removes holiday lighting
Forestry Certified Arborist Tree Trimmer (2) Maintenance Worker Motor Equipment Operator	5.0	• Inspects City trees for disease, insect control needs, pruning needs, site impairment, etc. • Removes trees along rights of way, parks and other public lands • Plants new and replacement trees • Removes diseased trees and trees causing public hazards • Inventories trees on public lands • Interfaces with residents regarding trees needing to be removed, as well as on proper care for trees
Parks Maintenance Supervisor Crew Leader (2) Maintenance Worker (4) Motor Equipment Operator Skilled Laborer Semi-Skilled Laborer (7)		• Manages and maintains the City's parklands and recreational sites through painting, trash removal, carpentry, fencing, turf maintenance, repair and maintenance of park equipment such as nets, goals, playground equipment, tennis court surfaces, picnic equipment, etc. • Provides support for special programs and events such as parades, recreational programs (ice shows, walkathons, teen sports, etc.), music and theater programs, seasonal and holiday programs, etc. • Plants and maintains flowers in parks • Installs and maintains benches in parks • Conducts safety checks of playground equipment • Assists in leaf pickup and removal

(3) Workloads and Performance Measures

The following table summarizes the major workloads and performance measures of the Highways and Grounds Bureau.

Workload	Quantity
Center line miles of paved surfaces	134
County center line miles plowed during snow/ice events	17
Street lights maintained	6,000 in City 300 in parks 400 decorative lights in Promenade
Curb miles swept monthly	268 (plus downtown area swept daily)
Parkland maintained	213 acres
Recreational sites maintained	75

(4) Technology Utilized.

The following table summarizes the current technology and software systems utilized by the Bureau of Highways and Grounds to provide services.

Technology / Software Name	Summary of utilization
Excel	Tracking of work performed by site, date, crew member, type of work

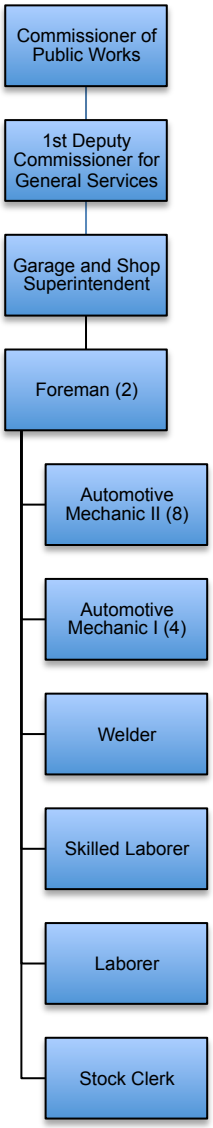
6. BUREAU OF GARAGE AND SHOP

The Bureau of Garage and Shop repairs and maintains the Public Works fleet of vehicles and equipment, Police vehicles, specialized fire equipment, as well as the City Schools' fleet of 30 vehicles. This includes diagnosing mechanical problems; preventively maintaining the fleet; completing repairs; welding metallic frames, plows, trailers and other items; receiving, stocking, and distributing automotive parts; maintaining the automated fueling site; determining equipment replacement needs; as

well as other services. The Garage includes 17 service bays, seven (7) above-ground lifts, and one (1) engine hoist.

(1) Organization of the Bureau of Garage and Shop

The following chart shows the current organizational structure of the Garage and Shop Bureau.



The following section provides a summary of the key roles and responsibilities of the Bureau of Garage and Shop.

(2) Summary of Key Roles and Responsibilities

Position	Number of Staff	Responsibilities / Roles
Bureau of Garage and Shop		
Bureau Administration Superintendent Foreman (2)	3.0	• Provides guidance and technical expertise to shop and parts room personnel • Superintendent develops budget, develops equipment specifications, purchases equipment, interfaces with contractors, Schools personnel, DPW personnel and others, and assembles and reports data related to vehicle repair, fuel consumption, contractor repairs, and other activities and services • Foremen write service orders, allocate work to Mechanics, get vehicles into shop for PM and inspections, etc. • Foremen repair and maintain vehicles and equipment as necessary
Shop Operations Automotive Mechanic II (8) Automotive Mechanic I (4) Welder Skilled Laborer Laborer	15.0	• Repairs and maintains DPW, Schools, Police and specialized fire fleets. • Diagnoses mechanical malfunctions in vehicles and equipment • Performs preventive maintenance on vehicles and equipment in accordance with scheduled frequencies and required services • Welder welds metal frames, snow plows, trailers, etc. • Skilled Laborer breaks down and repairs and installs tires on vehicles and equipment • Laborer performs housekeeping in shop, retrieves parts from local parts houses as needed, takes vehicles to local repair shops as required and assists Mechanics in manual service activities
Parts Room Stock Clerk	1.0	• Orders, stocks, retrieves and accounts for parts needed by Mechanics in repair of vehicles and equipment • Conducts periodic parts inventory • Purges infrequently-used parts from inventory

(3) Workloads and Performance Measures

The following table summarizes the major workloads and performance measures of the Garage and Shop Bureau.

Workload	Quantity
Number of units in fleet	431 City units 150 small engines 30 School vehicles
Preventive Maintenance program	PM between 2,500 and 3,000 miles

(4) Technology Utilized.

The following table summarizes the current technology and software systems utilized by the Bureau of Highways and Grounds to provide services.

Technology / Software Name	Summary of utilization
CFA	Tracking of work performed by unit Tracking of automotive parts inventory Tracking of fuel usage by vehicle
Allis Automatic and Cummins diagnostic software	Diagnosis of mechanical, electrical, system malfunctions

7. BUREAU OF WATER AND WASTEWATER

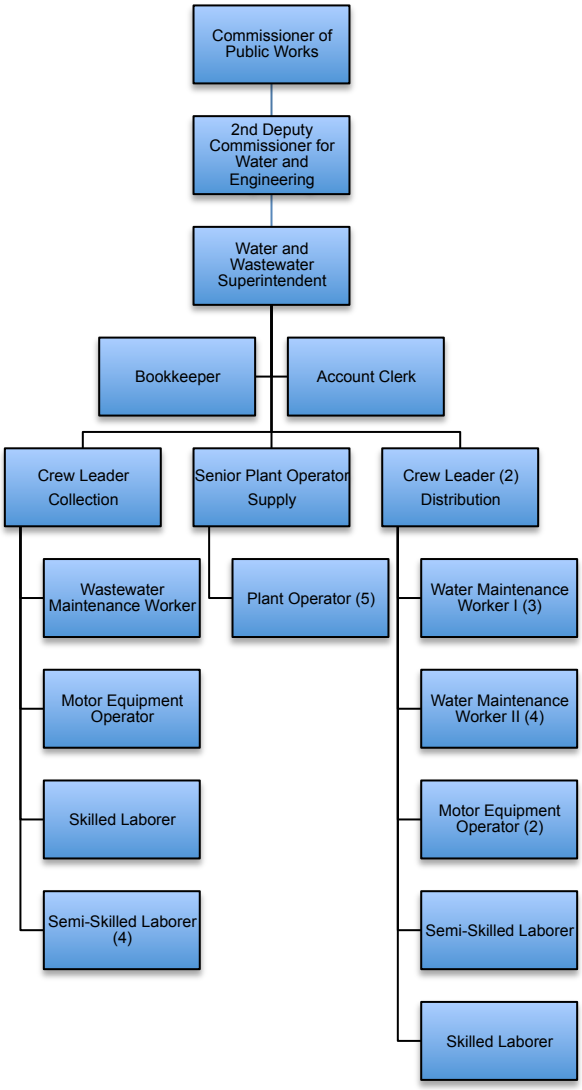
The Bureaus of Water and Wastewater supply water to City residents, businesses and institutions in compliance with the Safe Water Drinking Act, maintains, repairs and replaces the distribution and collection systems, as well as the stormwater drainage system, and tests the quality of the water supplied by New York City, which is initially chlorinated by Westchester County, and makes water treatment adjustments as necessary.

The Bureau operates and maintains municipal water pumping stations, as well as the water treatment facility and chlorination facilities at Orchard Street and Central Avenue. The laboratory at Orchard Street performs required testing of water for bacteria, chemical and mineral levels and physical/observable characteristics such as odor, color and taste.

The Bureau inspects and maintains water mains, hydrants, valves, service lines, backflow prevention devices and makes repairs to the infrastructure as necessary. The Bureau also maintains and repairs the wastewater collection system, which includes sewer mains, catch basins, manholes, stream channels. The Bureau also maintains and repairs the City's stormwater drainage system.

(1) Organization of the Bureau of Water and Wastewater

The following chart shows the current organizational structure of the Water and Wastewater Bureau.



The following section provides a summary of the key roles and responsibilities of the Bureau of Water and Wastewater.

(2) Summary of Key Roles and Responsibilities

Position	Number of Staff	Responsibilities / Roles
Bureau of Water and Wastewater		
Bureau Administration Superintendent Assistant Superintendent Bookkeeper Account Clerk	4.0	• Superintendent provides overall guidance in the formation of policies and operations of the Bureau, develops and ensures adherence to budgets, determines capital requirements for plant as well as the distribution and collection systems, and represents the Bureau to the public and to internal and external government agencies, including regulatory agencies • The Assistant Superintendent develops daily work orders for crews in the maintenance of the distribution and collection systems
Collection Crew Leader Wastewater Maintenance Worker Motor Equipment Operator Skilled Laborer Semi-Skilled Laborer (4)	8.0	• Crews flush sewer mains with flushing truck, clean catch basins with Vac-All, repair catch basins and manhole castings, televise sewer lines to check for illicit discharges and I&I, and rod sewers as required. • Crew members may cross over to the Distribution section of the Bureau as needed. • Crews respond to sewer line breaks and repair as required • Crews work from 8:00 a.m. till 4:30 p.m.

Position	Number of Staff	Responsibilities / Roles
Supply Senior Plant Operator Plant Operator (5)	6.0	• Monitors SCADA for proper pump operation • Ensures proper chemical feeds in treatment operations and makes adjustments as necessary • Conducts water sampling and testing for pH, chlorine, chloride, turbidity, BacT, organics, THMs (at certified lab) • Sr. Operator has 1A license and supervises the activities of Plant Operators. Position is responsible for responding to calls regarding water and wastewater repairs, and the Supply section also handles these calls for DPW after hours as well. • Plant Operators must possess 2B license, then after one year of experience operating the filter, must obtain 2B license • Staffing of the section: - M-Th: Sr. Operator + 2 Plant Operators from 8:00 am till 4:00 pm - F: Sr. Operator + 1 Plant Operator from 8:00 am till 4:00 pm - M-F: From 4:00 pm till midnight, additional 1 Plant Operator - M-F: From midnight till 8:00 am, additional Plant Operator - Sa, Su: 1 Plant Operator on each of three shifts
Distribution Crew Leader (2) Water Maintenance Worker I (3) Water Maintenance Worker II (4) Motor Equipment Operator (2) Skilled Laborer Semi-Skilled Laborer	13.0	• Two crew members are dedicated to meter reading. Each meter is manually read and billed semi-annually. Crews inspect, repair and replace meters and check for accuracy. • Crews flush all hydrants annually, perform utility-locates (Code 53). Crews also paint hydrants • Crews install service lines, repair leaks, respond to emergencies such as water main breaks • One Maintenance Worker witnesses backflow tests • Crews inspect water mains, hydrants, valves, service lines.

(3) Workloads and Performance Measures

The following table summarizes the major workloads and performance measures of the Water and Wastewater Bureau.

Workload	Quantity
Linear miles of distribution line	160
Linear miles of collection line	125
Number of gate valves	3,000
Number of catch basins	3,295
Number of catch basins cleaned last 5 years	877
Number of hydrants	1,777 City hydrants 58 private hydrants maintained by City crews
Number of water tanks	1
Number of pump and lift stations	4
Number of backflow devices	600-700
Fee for backflow device inspection witness	$25
Code 53 (“Call before you dig”) last 5 years	4,490
Linear miles of collection line flushed last 5 years	161.5
Linear miles of collection line televised last 5 years	7
Percentage of unaccounted for water	16%
Utility accounts	788 commercial 9,491 residential 10,279 total
Main breaks last 5 years	23
Service leaks repaired last 5 years	69

(4) Technology Utilized.

The following table summarizes the current technology and software systems utilized by the Bureau of Water and Wastewater to provide services.

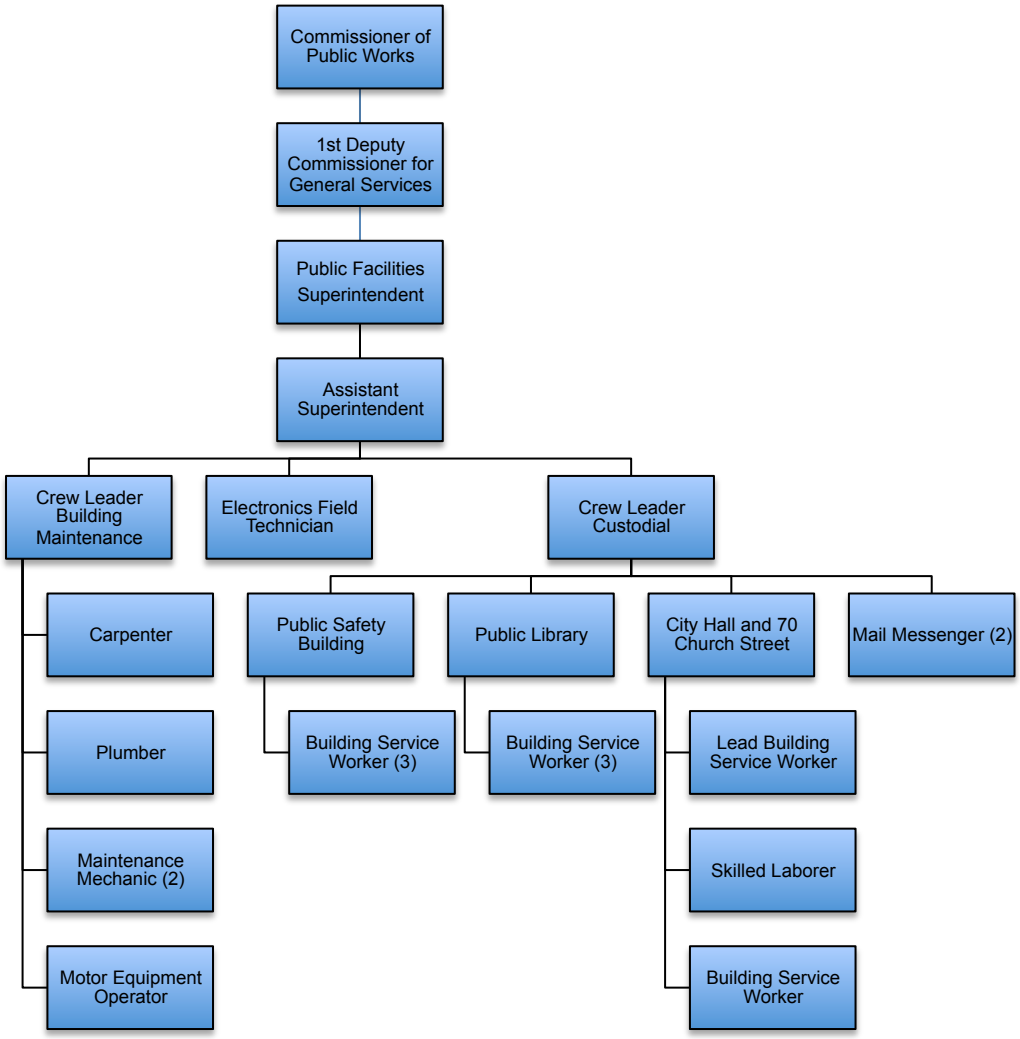
Technology / Software Name	Summary of utilization
SCADA	Monitoring of pumps and pump stations

8. BUREAU OF PUBLIC FACILITIES

The Bureau of Public Facilities is responsible for the maintenance and repair of City-owned structures, and performs custodial services as well as preventive and corrective maintenance and repairs on these structures. The Bureau also installs and maintains automated systems in facilities such as SCADA, CCTV, card access systems, alarms, automated fuel dispensing systems building automation systems, fiber optic networks and other electronic systems.

(1) Organization of the Bureau of Public Facilities

The following chart shows the current organizational structure of the Public Facilities Bureau.



The following section provides a summary of the key roles and responsibilities of the Bureau of Public Facilities.

(2) Summary of Key Roles and Responsibilities

Position	Number of Staff	Responsibilities / Roles
Bureau of Public Facilities		
Bureau Administration Superintendent Assistant Superintendent	2.0	• Superintendent provides overall guidance in the formation of policies and operations of the Bureau, develops and ensures adherence to budgets, determines structural and systems capital requirements, and represents the Bureau to the public and to internal and external government agencies • Ensures that crews have sufficient tools and materials for jobs • Develops operating and capital budgets for the Bureau, and ensures adherence to these budgets • Oversees installation of automated systems both by contractors as well as by internal crews • Ensures that special and routine tasks are performed according to instructions by making inspections of buildings, HVAC equipment, plumbing fixtures, carpentry work, electrical repairs, cleaning of facilities, and others. Interacts with building tenants in remediating problems
Electronics Electronics Field Technician	1.0	• Inspects, installs, troubleshoots, maintains and oversees the installation of automated building operating and telecommunications systems and equipment • Responds to calls for service related to automated systems and telephones • Assists with snow and ice removal

Position	Number of Staff	Responsibilities / Roles
Facilities Maintenance Crew Leader Carpenter Plumber Maintenance Mechanic (2) Motor Equipment Operator	7.0	• Performs preventive, corrective and emergency repairs on City structures, including buildings and parking structures. • Crew Leader makes maintenance and repair assignments and participates in performing repairs. Inspects work of trades workers under supervision • Carpenter and Plumber perform maintenance and repairs within their respective trades. Carpenter is also a Mason and does bathroom renovations and tiling. • Maintenance Workers assist in maintenance and repair of buildings and parking structures • One Maintenance Mechanic serves as locksmith, issuing keys and maintaining key database. Also patches walls and moves furniture • The Motor Equipment Operator serves in same capacity as Maintenance Mechanics

Position	Number of Staff	Responsibilities / Roles
Custodial Crew Leader Lead Building Service Worker Building Service Worker (7) Skilled Laborer	11.0	• Crew Leader assigns work to custodial staff in buildings and makes staffing adjustments as necessary. Responds to complaints in the four buildings in which custodial services are provided. Inspects work of custodial staff. Crew Leader is stationed at the Public Safety Building. • Lead Building Service Worker performs custodial services at City Hall and handles minor problems such as spills at 70 Church Street. Works 3:30 pm till midnight, and stays at meetings to clean up if meetings go past midnight. Works with Skilled Laborer who works same shift, and performs custodial services and light maintenance (e.g., loose door handles, change light bulbs, hanging fixtures, etc.). A Building Service Worker works from 8:00 am till 4:30 pm M-F. • Building Service Workers perform custodial services in one of four assigned buildings. Services include cleaning floors/carpets, bathroom fixtures, emptying waste cans, take out recyclable materials, setting up for events/moving furniture, checking air conditioners and filters. One of these positions is vacant. • Public Library is staffed 7 days per week with one Building Service Worker working one of three shifts. One works from 7:00 am till 3:30 pm, M, T, W, Th, Su. One works 2:0 pm till 10:30 pm, M-F. One works 1:00 pm till 9:30 pm, M-F, and from 10:00 am till 6:30 pm on Sa. • Public Safety Building is staffed by the Crew Leader from 7:00 am till 4:00 pm M-F, a Building Service Worker from 7:00 am till 4:00 pm, M, T, Th, F, Sa; a Building Service Worker from 7:00 am till 4:00 pm M-Th and Su, and a Building Service Worker from 2:00 pm till 10:30 pm, M-F.
Messenger Service Mail Messenger	2.0	• Collects and distributes postal and inter-office mail to City buildings

(3) Workloads and Performance Measures

The following table summarizes the major workloads and performance measures of the Public Facilities Bureau.

Workload	Quantity
Facilities Area	4,496,812 square feet (3,829,991 sq ft is parking garages)

APPENDIX B

BEST PRACTICES ASSESSMENT OF THE DEPARTMENT OF PUBLIC WORKS

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 these various divisions. These performance measures comprise the main thrust of this best practices assessment.

The measures utilized have been derived from the project team's collective experience and represent the following ways to identify divisional 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 divisions meet the performance targets.

The purpose of the diagnostic assessment was to develop an overall assessment of the various Bureaus within Public Works. Detailed analysis of the issues identified was conducted and resulted in the recommendations contained in the main body of the report. The following sections cover each of the major Bureaus within the Department.

1. GARAGE AND SHOP

Best Management Practice	Strengths	Opportunities for Improvement
The Fleet organization is administratively centralized to capture economies of scale.	Fleet maintenance and management have been centralized in the Garage and Shop Bureau of Public Works to capture economies of scale.	
Fleet asset management receives appropriate organizational priority	The Garage and Shop Superintendent maintains a vehicle and equipment replacement spreadsheet that identifies those units that should be replaced. The City also has a "Rolling Stock Committee" that identifies and approves replacements for recommendation to the Common Council.	Fleet replacement decisions are not based on quantitative methods that incorporate actual costs of maintenance over the vehicle's life cycle.
Policies and procedures are well documented.		There is no formal polices and procedures manual available.
A formal skills assessment and training plan has been developed to keep employees current with changes in the fleet management industry.		There is no formal skills enhancement program other than the regular safety meetings and presentations made by the Safety Coordinator
An Internal Service Fund (ISF) is in place for the fleet program.		There is no internal service fund for fleet maintenance and management. An ISF is a best business practice to assure that the fleet management function charges the full costs of services back to its customers and breaks even at the end of the fiscal year.
Operating and capital costs are segregated within the fleet ISF.		There is no ISF in place for the Garage and Shop Bureau.

Best Management Practice	Strengths	Opportunities for Improvement
A replacement reserve or sinking fund is used to insure the timely replacement of fleet assets.		There is no replacement fund for the replacement of City vehicles and equipment. Replacement funding is approved on an annual basis, with the amount dependent upon available funds in each particular year. A dedicated replacement fund would ensure sufficient funding for each vehicle, the amount of which is dependent upon the vehicle type, its projected economic life, the projected replacement cost at the end of this economic life cycle, the maintenance cost history of the unit type, and the projected salvage value at the end of this economic life cycle.
A charge-back system is in place.	The Garage and Shop charges each department for its fuel usage and for automotive parts.	There are no charge-back rates in place for the recovery of labor, materials and administrative costs.
Charge-back rates promote cost recognition and control.		There are no charge-back rates in place. The institution of charge-back rates is a best business practice that forces users to analyze the full costs of the services it "purchases" from its fleet maintenance and management provider. Excessive costs paid by departments for vehicles and equipment that have only marginal utility may force these departments to analyze the costs and benefits associated with the retention of these units rather than continuing to keep the unit in the fleet.
Vehicle replacement cycles are reasonable and in accord with standard industry practice.		The Garage and Shop Bureau does not utilize standard fleet replacement cycles, but rather assesses the continued utility of each unit on an ongoing basis each year.

Best Management Practice	Strengths	Opportunities for Improvement
Focus is on matching vehicle design to meet specific customer job requirements and customers are given ample input into the specification process.	This appears to be a particular strength of the Bureau as it recently purchased a fire apparatus body and pumper body separately, and had a third party (Smeal Fire Apparatus) assemble the pumper at a significant discount from a dealer purchase.	
Cooperative purchasing agreements are used in order to take advantage of volume pricing.	The Bureau uses the National Joint Purchasing Alliance for equipment and has recently purchased trailers, a hot box and some fire apparatus. It also uses Westchester County's purchasing cooperative for the purchase of Ford, GM and Dodge automotive parts.	
Efforts are taken to maximize the residual value of used vehicles.	The Rolling Stock Committee attempts to replace vehicles and equipment on a pre-defined schedule.	The overall age of the fleet is somewhat high, indicating that replacements have not always been made in a timely manner. This has the effect of not only increasing maintenance and repair costs, but also minimizing residual, or salvage, values for vehicles.
A professional auctioneer is used to organize, market, and conduct sales.	Although this is not the responsibility of the Garage and Shop Bureau (it is a responsibility of the Purchasing Department), the City has recently made a transition to an on-line auction through Auction International.	
A Fleet Policy Manual has been prepared setting forth policies in areas such as personal use, carrying passengers, traffic tickets, license requirements, accident response, etc.		There are no formal policies and procedures in place in the Bureau regarding these topics.
A formal process exists for ensuring compliance with State and Federal driver license requirements.	The garage and Shop Bureau posts dates of employee drivers license expirations on the wall in the Superintendent's office.	This process is decentralized, with each City department responsible for ensuring that its own employees' licenses are current. This responsibility should be centralized within the Garage and Shop to ensure that a standard approach is followed.

Best Management Practice	Strengths	Opportunities for Improvement
A formal program exists for driver and operator training in general and for problem drivers.		There is no formal mechanism in place in the City to identify problem drivers and to ensure that these employees receive remedial training.
The focus of the organization is clearly on PM services.	The Bureau has a strong PM program that is intended to prolong the economic lives of vehicles and equipment, and to minimize the incidence of emergency, or unscheduled repairs.	
PM services are completed after normal working hours in order to increase convenience to customers.		There is only a single shift at the Garage. PM services are accomplished during this shift.
The PM program incorporates multiple echelons of progressive services.	The PM program incorporates multiple levels of maintenance services that are progressively intensive, varying from basic oil changes to such services as checks of engine timing and full brake inspections.	
Shop business hours have been set for customer convenience.		The garage is open only for one shift. Availability of a second shift allows for the performance of preventive maintenance during hours for which there are fewer needs for vehicles and equipment. Day shift operations can be primarily dedicated to the performance of unscheduled repairs.
Warranty recoveries are actively pursued for both repairs and parts.	The Bureau has access to GM, Dodge/Chrysler and Freightliner databases in which it checks for warranty coverage.	
Technicians are encouraged to keep skill levels current through financial incentives to obtain ASE certification.		There are no incentives for mechanic staff to acquire or retain ASE or EVT certifications.

Best Management Practice	Strengths	Opportunities for Improvement
The organization has a clear outsourcing strategy that focuses on core competencies and service improvements.	The Bureau routinely contracts out specialized or time-consuming repairs such as front end alignments, heavy body collision repair, aerial work on bucket trucks and fire apparatus, and other similar services.	
Access to the fleet automated information system is readily available to all staff, including parts clerks and technicians.	Shop personnel have access to the automated information system.	
The parts inventory is managed to balance the needs of Mechanics against the carrying and holding costs of the inventory	This appears to be the case, although there are no metrics available to determine the parts "fill rates", which measure the frequencies with which mechanics are able to obtain a part from inventory.	A walk-through in the parts room suggests that there are likely some obsolete and/or slow-moving parts that should be purged from inventory in order to make room for parts for which mechanics have greater needs. The relatively large amount of space available for parts has likely allowed the Bureau to stock a greater number of parts than necessary.
Access to the parts room is restricted to only a limited number of authorized employees.	Yes, only the Parts Clerk, the Superintendent and the two Foremen are allowed in the parts room. Further, there is a camera in the parts room. These steps minimize the potential of inventory shrinkage.	

Best Management Practice	Strengths	Opportunities for Improvement
The parts inventory is well-managed, and the number and costs of parts on hand is reconciled against financial records provided by the City's Finance Department.		The Garage and Shop Bureau is not required to reconcile its parts inventory against an independent record provided by the Administrative Bureau of the Department. As parts are purchased, these should be recorded by the Administration Bureau, as should the parts that are used in the course of repairs and other maintenance events at the Shop. This independent record should be utilized by the Garage and Shop to reconcile its annual physical inventory, with any discrepancies investigated and explained. Interviews by the project team indicate that this reconciliation is not occurring, and further, there is no physical inventory accomplished. A random sampling of 10 parts line items conducted by the project team indicated that there were enough discrepancies between the records in the CFA information system with the actual numbers of parts on the shelves that there should be a thorough physical inventory conducted this fiscal year.
The automated fueling system provides useful information regarding fuel usage and mileage.	The City currently has a PetroVend fueling system that provides mileage and fuel usage by vehicle. The City is in the process of switching to a Gas Boy fueling system, and will be fitting each vehicle and piece of equipment with the capability to emit a radio frequency that will allow the DPW to auto-poll odometer readings and other useful information such as when "check engine" lights come on in the vehicles.	The utilization of vehicles and equipment are not routinely assessed to determine the utility of the units. Many cities find that a routine analysis of vehicle utilization identifies specific units that may be candidates for removal from the fleet, or may be candidates for consolidation or pooling between departments.

2. SOLID WASTE AND RECYCLING

Best Management Practice	Strengths	Opportunities for Improvement
Policies and procedures are well documented.		There are no formal policies and procedures in place in the Bureau related to such topics as general work rules, equipment use and maintenance expectations of drivers and workers, summary of disciplinary rules, local and state rules and regulations related to refuse and recyclable collection and disposal, etc.
A formal skills assessment and training plan has been developed to keep employees current with changes in the solid waste collection and disposal industry.		The Bureau does not formally assess skills and develop a training program for its workers and drivers.
Effective safety procedures are in place.	The Bureau relies upon the Safety Coordinator in the Administration Bureau to provide safety training and to procure outside specialized training.	In agencies that rely heavily upon manual labor in performing their primary duties, it is advisable to establish internal safety committees to conduct periodic safety talks. These committees should be headed by an appointed representative in the Bureau, and should meet both formally (i.e., scheduled talks and reviews of safety performance) and informally (e.g., "brown bag" lunches).
Businesses are charged for solid waste collection and disposal.	Businesses are charged for solid waste and disposal on an ad valorem basis.	
Solid waste collection and disposal rates promote cost recognition and waste control.		Residents are assessed on an ad valorem basis, which does not promote cost recognition and waste control as, for example, do "Pay As You Throw" (PAYT) programs.
A formal quality assurance process is in place that includes periodic review of solid waste collection work practices and monitoring of missed collection rates.		Although the Bureau log missed calls, it does not track and report these, or any other performance measure, in any manner once the problems are abated.

Best Management Practice	Strengths	Opportunities for Improvement
A formal performance measurement system is in place to track the effectiveness of service outcomes, and performance levels compare reasonably well to industry benchmarks.		There are no performance measures reported in the Bureau. These should include such measures as numbers of stops per truck and per worker, missed calls as a percentage of total stops, cost per stop, equipment maintenance and repair costs per unit, and others.
The Sanitation Bureau provides refuse collections in a cost efficient manner.		The project team does not have full costs for sanitation collection and disposal, however this cost is higher than could be achieved through implementation of certain operational changes such as once-weekly pick-up and/or revision of the work rule that allows sanitation workers to leave work after completing their assigned daily routes.
Route sizes are appropriate. Each route collects from between 750 and 900 households.		Routes are not managed according to the number of stops, but rather on balancing workloads and times for crews to complete their assignments. The Bureau could not provide the numbers of accounts by type for the project team, however, the Bureau reports that there are typically nine (9) rear load routes and three (3) side load routes that each collect approximately 450 residential locations on each of four days per week. This is well below the benchmark of 750 to 900.
The Sanitation Bureau utilizes one-person crews.	The Bureau uses one-person crews on its four recently-purchased side-arm units as well as front-loaders used for commercial and multi-family unit pick-ups.	The Bureau utilizes three-person crews for most residential routes.

Best Management Practice	Strengths	Opportunities for Improvement
The average cost per capita is reasonable when compared to other municipal agencies.	The Sanitation budget for FY 2015 is $7,772,558. With a 2012 population of 57,403, this equates to a per capita cost of $135.40. Assuming there are about 23,000 households in the City, this equates to $337.94 per household. The cost per capita in Scarsdale (population of 17,196 and solid waste budget of $2,368,394) is $137.73, which is comparable to that of White Plains. The cost per capita in Port Chester (population of 29,209 and solid waste budget of $1,438,284) is $49.24.	
A formal process exists for ensuring compliance with State and Federal commercial driver license requirements.	The Bureau takes photographs as new workers are hired, and annually afterwards. This also includes updating of addresses.	
A formal program exists for driver and operator training in general and for problem drivers.		There is no formal program in place, although interviews indicate few problems with the workforce, and disciplinary procedures are outlined in the labor contract.
The ratio of supervisory and support positions to line employees is reasonable. (One to 14-15 is reasonable)		There are three (3) supervisory/management positions (no dedicated clerical support positions) for 58 drivers and sanitation workers. This equates to a ratio of 1:19.
The level of productivity for solid waste meets acceptable standards. (10 to 12 tons per route)		The project team cannot verify this metric given the data provided. However, as is noted elsewhere in this document, the productivity of solid waste collection crews falls short of standards due to working less than an 8-hour day. Therefore, although the project team cannot verify the 10 to 12 tons per day metric, it is very unlikely that crews are achieving this standard of productivity.

Best Management Practice	Strengths	Opportunities for Improvement
Annual surveys are conducted to assess customer satisfaction.		There are no routine customer satisfaction surveys
Customers are always called upon response to complaints (e.g., missed collection) to assure satisfactory response.		Customers are not always specifically called, although they are often in the yard awaiting pickup.
An information system provides up to date functionality asset management, maintenance management, performance measurement, business planning, customer relationship management, and cost reporting.		The Bureau has no access to a management information system. This inhibits the analysis of the productivity of crews, the management of assets and the tracking of customer relationships.
Solid waste collection and disposal has reengineered its business processes to take advantage of improvement opportunities afforded by the information technology system (e.g., use of GIS for route planning analysis).		Although the Bureau recently redesigned collection routes, this was not accomplished through use of a GIS, to which the Bureau does not have access.
Information produced by the system is routinely used to make management decisions.	The Bureau has placed Automatic Vehicle Locators (AVL) in its sanitation trucks to enable managers to quickly ascertain the location of each unit. This has proven to be valuable in dispatching the closest vehicle to collect missed pickups.	The Bureau does not use any automation other than AVL to make management decisions.
The Sanitation Bureau has set an aggressive goal of an achieving an annual recycling rate of 50% within five to eight years including waste reduction and yard waste reduction.		The Bureau does not state recycling goals, or waste stream diversion rates, however, the calculated rate for 2012 was 14%.

Best Management Practice	Strengths	Opportunities for Improvement
Waste reduction efforts have been focused on programs that educate businesses and residents.		There is no proactive program for waste reduction efforts, or to enhance recycling rates other than the information on the DPW web site. The site provides information on acceptable and unacceptable recyclables, as well as etiquette for recycling. Although the web site does note that new recycling containers may be obtained at the Gedney Way recycling yard, there is no description of what residents may drop off at the yard, nor the other amenities, such as "Take it or Leave It", or the availability of mulch.
Yard waste reduction efforts have been focused on programs that educate residents on reducing and properly managing yard wastes, and also develop landscape practices which reduce or eliminate the types of yard waste in need of management.		There are no proactive education programs for residents. Communities exercising recycling best practices advertise the availability of Solid Waste and Recycling personnel to address schools, neighborhood and other community groups in the areas of enhanced recycling and reduction of yard wastes.
The Sanitation Bureau has installed a program to manage certain household hazardous wastes (HHW) and problem materials through recycling, diversion, reusing, reduction or proper disposal methods.	HHW is handled by Westchester County.	
Solid Waste provides a Major Appliance Recycling Program accepting for a fee, dishwashers, dryers, stoves, refrigerators, microwaves, furnaces, dehumidifiers, garbage disposals, trash compactors, water heaters, and air conditioners.	Major appliances may be dropped off at the Gedney Way recycling yard. Residents may also call to set an appointment for pick-up on scheduled collection days for their areas of the City.	There is no fee to residents for disposal of major appliances.
All single family through four-plex residences in the City are offered curbside recycling service.	Yes, the Bureau utilizes two front-end loaders to collect these recyclables.	

3. STREET AND STREET LIGHT MAINTENANCE

Best Management Practice	Strengths	Opportunities for Improvement
Managerial responsibility for the maintenance and repair of streets, sidewalks, street sweeping, signals and lighting has been centralized.	Most maintenance of grounds, infrastructure and other assets has been centralized within the Highways and Grounds Bureau of Public Works. This includes street and sidewalk maintenance, rights of way maintenance, and street lights.	Traffic sign and signal maintenance are the responsibilities of Traffic Engineering, which is not within the Department of Public Works.
Ratio of supervisory and support positions to line or service delivery position is reasonable.	There are four crew leaders in the Highway section of the Bureau, and 31 crew members, for a ratio of 1:7.75, which is reasonable for the work of field crews.	
The number of street and sidewalk maintenance staff approximates 1 staff for every 12 to 15 centerline miles of paved streets.		Including working Crew Leaders, there is a total of 35 Highway section crew members responsible for the maintenance of 134 center line miles, for a ratio of 1:3.8. This represents a staffing ratio that should allow for a very high level of service for the City's streets.
Service requests for street and sidewalk maintenance and repair are closed promptly.	These requests appear to be closed promptly in a random analysis of several requests.	
The crew sizes utilized for street maintenance are appropriate to the work performed. • Two-person crews are utilized for pothole patching; and • Four-person crews are utilized for skin patching, base repair, and crack sealing		The Bureau utilizes 5-6 person crews for pothole patching and for crack sealing. Depending upon the volume of traffic, an additional crew member may be required for the performance of pothole patching, however this activity is typically accomplished with no more than three crew members.
The productivity of the pothole patching crews meets reasonable standards or 1.5 to 2.5 tons per crew day.		The Bureau does not capture time expended in performing this work, which prohibits the calculation of crew productivity for this, and all other, metrics.

Best Management Practice	Strengths	Opportunities for Improvement
Streets are crack sealed on an ongoing annual basis to mitigate the penetration of water into the street base.	The Bureau crack seals certain street segments in order to extend their useful lives, and for which base damage is not extensive.	
Skin patching is performed on an ongoing annual basis to address raveling, rutting, and depressions or distortions.	Skin patching is not routinely performed, however crews are patching streets daily during the season. Crews patch potholes in assigned geographic areas, and will even patch larger areas covering 400 – 500 square feet of surface.	
A sidewalk inspection and repair program is in place that includes: • A systematic inspection of sidewalks once every three to five years to identify tripping hazards; • Temporary patches of the tripping hazards within thirty days of hazard identification; and • Use of sidewalk replacement or grinding to eliminate tripping hazards.		Sidewalk inspection is conducted only in reaction to complaints. A proactive inspection program should include the visual observation of at least one-fifth of the City's sidewalk network each year. The program should note the location, both in documentation and with painted dots or stripes, of defects in the sidewalk. Each defect should be recorded in a form that notes the location, the severity, and the quantities of materials needed for repair. Depending upon the severity, the repairs should be scheduled, or should be noted for repair as crews are in the area completing other work in the rights of way.
The sidewalk maintenance crew uses a sidewalk grinder on an ongoing / monthly basis to address small displacements.	The Bureau possesses a sidewalk grinder, but this is used only occasionally, and in response to complaints.	
The crew size used for sidewalk maintenance and repair ranges from 1-staff for sidewalk grinding, 2-staff for base and construct forms and forms removal, 3-staff for sidewalk removal to 4-staff for sidewalk placement and finishing.	These crew sizes are used for the occasions on which sidewalk repair is conducted.	

Best Management Practice	Strengths	Opportunities for Improvement
The productivity of the sidewalk maintenance and repair crew meets reasonable standards or 1 – 3 cubic yards of ready mix concrete per crew day.	Crews reportedly accomplish between 1 and 2 yards per day.	
Regenerative air street sweepers are utilized for street sweeping to reduce equipment maintenance costs and downtime.	The Bureau has five sweepers, three of which are regenerative air models, and two are mechanical broom sweepers.	
High dump street sweepers are utilized.	One of the Bureau's sweepers is a high-dump model.	
The level of service for street sweeping is: • Once monthly for residential; • Once daily for the major streets (e.g., arterials).	The Bureau sweeps the downtown area each day, with all other street segments in the City being swept monthly.	.
Street sweepers have GPS units installed.	Yes, all Highway vehicles and equipment are equipped with GPS.	
Street sweeper operators are assigned routes for sweeping.	Sweeper drivers have assigned routes, but are redirected as necessary to cover for other drivers.	
Drop boxes are located at strategic locations throughout the City to minimize lost time for street sweeper operators to dump their sweeper debris		There is only one drop facility in the City, however it is relatively centrally-located at the Gedney Way drop off facility.
Street sweepers have large hoppers to minimize lost time for street sweeper operators to dump their sweeper loads.		The Bureau's regenerative air sweepers are equipped with 4 cubic yard hoppers, which is only average for this type of equipment. The Bureau should discuss these specifications during the next sweeper replacement cycle in order to minimize the trips to the recycling yard to dispose of debris.
A parking ban has been adopted to aid street sweeping.	There is a parking ban from 2:00 am till 6:00 am.	There is no parking ban during daylight hours. Sweepers and snow removal equipment must maneuver around parked cars during other hours.

Best Management Practice	Strengths	Opportunities for Improvement
Sweeper cams are utilized to issue parking citations for those residents that violate the parking ban.		There is no parking ban, so there are no cameras on the sweepers to document the violations.
Street sweeper productivity meets acceptable levels of productivity in terms of curb miles swept and the proportion of time spent sweeping.		Initial calculations show very poor productivity in the street sweeping function. There are 268 curb miles in the City, of which about 4 miles are in the downtown area. If it can be assumed that the downtown area is swept daily, and the other areas are swept monthly, and that there are 5 drivers assigned to street sweeping activities, this equates to only about 0.5 miles per day, per driver.
The Section periodically evaluates the cleanliness of streets to evaluate the effectiveness of the street sweeping program.	The Superintendent and the Assistant Superintendent drive the City on a regular basis to assess the cleanliness of streets, as well as to assess the work of other field crews.	
Crew sizes for street sweeping are appropriate to the work performed.	Yes, there is only a single driver assigned to each street sweeper.	
The streetlights are owned and maintained by the City (and not owned and maintained by private electrical utilities).	Yes, approximately 7,500 street lights are owned by the City	
The number of staff required for street light maintenance and repair approximates 6,500 streetlights per technician.	There are approximately 7,500 street lights maintained by the Technician, wit assistance form a Maintenance Worker.	
The bulbs used in the light fixtures are high-pressure sodium. These bulbs are energy efficient and provide approximately five years of service life.	The City has high-pressure sodium bulbs, but is in the process of transitioning to a more cost-effective LED lighting solution. About 300 of the 6,000 City-owned lights have been fitted with LED to date.	

Best Management Practice	Strengths	Opportunities for Improvement
Streetlights on arterial and other major streets are inspected for "burnouts" once a quarter.		There is no proactive inspection program. Rather, the Technician responds to complaints of lights-out, and makes note of lights-out conditions during travels around the City.
A CMMS is installed and utilized including a work order system, annual work program, a reporting system to report actual versus planned performance, asset management system, and defined service levels and performance standards for each work activity.		The Bureau does not possess a CMMS, but has attempted to track work through an internal system that utilizes an electronic spreadsheet program. However, the program in use only captures dates, crew members, locations and types of work performed. This does not facilitate the analysis of the productivity of crew members, as it does not capture the time spent against specific work orders, and cannot be sorted according to work type. A functional CMMS would allow the Bureau to quantify the activities in which its employees were expending time, and would identify areas in which it either excels or requires remedial training. Further, it would allow an analysis of the effects of fewer or additional staff on the Bureau's ability to accomplish work.
Levels of service have been developed that define the frequency with which maintenance tasks are to be performed.	The Bureau has significant experience in defining the frequencies with which specific activities are performed, and the levels of service that are achievable with a given amount of labor, equipment and materials.	Although the Bureau does have significant experience in defining when tasks should be performed, it is clear that there have been impediments to accomplishing certain tasks, such as street paving – both through contracts and with internal crews. In the current year, paving activities did not begin until the latter half of July, which is at least two, and likely three, months later than is typical for this section of the country, as it narrows the time period available before weather conditions prohibit these activities.

Best Management Practice	Strengths	Opportunities for Improvement
An annual maintenance calendar has been developed that identifies when seasonal tasks will be performed		There is no formal maintenance calendar of activities. The value of a formal maintenance calendar is in the programming of staff, and staff hours, for each task, and the resulting ability to display the impact slippages in schedules will have in the Bureau's ability to accomplish other work for which staff are scheduled to perform.
The section has identified the maintenance activities and staff hours required to maintain the infrastructure using the inventory information, levels of service, and annual maintenance calendar.		The Bureau does not formally project the number of staff hours required to accomplish work. The absence of a CMMS inhibits its ability to develop boundaries of reasonable amounts of time by crew member to allocate to tasks.
Work orders are used to record all maintenance activities and staff hours.	Work orders are used to document the assignment and accomplishment of all work in the Bureau. The Bureau has recently implemented a system whereby the work is input into an electronic spreadsheet, however it does not capture all necessary elements of the work performed to enable managers to comprehensively analyze the productivity with which crews accomplished the assigned work.	

Best Management Practice	Strengths	Opportunities for Improvement
Work accomplishments, performance, and expenditures are reported on an ongoing basis.	The project team was provided a Department "Annual Report" for fiscal year 2007, in which many measures of workloads accomplished were reported. These included such activities as linear feet of street light wiring replaced, number of fuses and fuse sockets repaired and replaced, number of telephone calls received in the forestry section, tons of wood chipped into mulch, salt and sand used in snow removal, etc.	The FY 2007 Annual Report was the last such report available as a reflection of the work performed by the DPW and its component bureaus. The reporting of work accomplished is somewhat valuable as an indicator of productivity and utilization of crews, however without context, its value is diminished. It is of little value to the average reader to know that 379 gallons of crack sealer was used in roadway maintenance (as was reported on page 68 of the Annual Report) without knowing the cost of labor and materials that were expended in laying the sealant, and the value of using crack sealant rather than hot mix overlay in the particular areas that it was applied. The Bureau is not reporting workload or productivity metrics, and is inhibited in this effort by not having access to a CMMS to accumulate the data that go into reporting.
Quality standards have been developed for the maintenance of street, sidewalk and lighting infrastructure.		There are no formal quality standards for the maintenance of these assets. Visual observations made by the project team indicate that there are uneven levels of quality of pavement and sidewalk conditions in the City.
The Highway section has a clear formal written outsourcing strategy that focuses on core competencies and service improvements.		There is no formal outsourcing policy. The policy should address factors such as core competencies of staff versus those of private contractors, the availability of contractors in the local area, the costs of outsourcing, the opportunity costs of performing work with internal crews, as well as other dimensions.

Best Management Practice	Strengths	Opportunities for Improvement
The CMMS is utilized to track customer service requests and document response time.	The Dispatcher logs all calls for service that result in work for Highways and Grounds crews.	
Policies and procedures are well documented.		The Bureaus does not have a formal set of policies and procedures.
An up-to-date computerized geographic information system is available that provides records of the components of the infrastructure system directly on laptops and/or maps		GIS information is not available to workers in the field.

4. URBAN FORESTRY

Best Management Practice	Strengths	Opportunities for Improvement
A tree inventory exists of all trees including location, size species, and condition.	The Section maintains a tree inventory in GIS that displays the type of tree and the diameter.	
The Forestry Section has established a tree canopy target of at least 20%.		The Section has not established an urban tree canopy (UTC) target. The advantages associated with establishing a target of at least 20% include reduced summer peak temperatures and the related energy conservation, reduction, reduced stormwater runoff, improved air quality, and others.
A user-friendly CMMS is utilized that is easily accessible by Forestry staff to regularly update the urban forest inventory, record maintenance activities, manage the maintenance program, and evaluate the value and costs of each urban forest management and maintenance activity.		There is no CMMS available in the Bureau of Highways and Grounds, but the Bureau has attempted to track work through an internal system that utilizes an electronic spreadsheet program. However, the program in use only captures dates, crew members, locations and types of work performed. This does not facilitate the analysis of the productivity of crew members, as it does not capture the time spent against specific work orders, and cannot be sorted according to work type. A functional CMMS would allow the Bureau to quantify the activities in which its employees were expending time, and would identify areas in which it either excels or requires remedial training. Further, it would allow an analysis of the effects of fewer or additional staff on the Bureau's ability to accomplish work.

Best Management Practice	Strengths	Opportunities for Improvement
Work for the staff in Forestry is planned and scheduled on a bi-weekly basis.		There is no formal work scheduling program in the Forestry section, as almost all of the work is conducted in response to complaints and observations of trees that require removal or trimming to enhance site distance.
A tree ordinance has been adopted that covers planting and removal of trees within public rights-of-way, maintenance or removal of private trees which pose a hazard, tree planting requirements such as those requiring tree planting in parking lots, and providing protection for trees requiring that a permit be obtained before trees can be removed, encroached upon, or in some cases, pruned.		There is no tree ordinance in the City that addresses removal of private trees, tree planting requirements, removal or encroachments requiring permits, etc.
Formal, written policies and procedures are established for tree planting and pruning programs.		There are no formal policies and procedures in place that describe tree planting and pruning programs.
City trees located along streets and in parks receive an annual inspection to evaluate their condition and potential hazard.		There are no proactive inspections made, but the Arborist and crews observe the conditions of trees in the areas in which they are working.
When trees are removed, the stumps are removed as well.	The Forestry crews removed trees, and Highway section crews remove stumps at a later time, typically 7-10 days after tree removal. Code 53 ("Call Before You Dig") requires that utilities be located and marked prior to stump removal, which may take several days.	
All trees that are removed are replaced.	The Forestry section has a policy of replacing one tree for every tree removed. Reportedly, this policy is extended to two or more trees on occasion.	

Best Management Practice	Strengths	Opportunities for Improvement
Tree planting is provided proactively, not just for removals, within established neighborhoods planting areas where tree stocking is inadequate based on existing canopy coverage.	The majority of tree plantings are done as replacements of trees that have been removed, however the remainder of trees are planted in areas in which trees are requested by residents, in parks, or in areas of low canopy coverage. The City, in conjunction with the Schools has an Arbor Day celebration during which the tree contractor gives away about 100 trees to those in attendance, and these are planted at various locations in the City and in residents' yards.	
Forestry purchases street trees at local nurseries and does not operate its own nursery.	The Forestry section obtains trees both from local nurseries and from specialized providers that may not be local. The section does not attempt to operate its own nursery, which would involve a significant cost for the size of the City of White Plains.	
A plan exists to cost-effectively recycle and utilize green waste and debris created by urban forest maintenance activities through such methods as milling products from large wood and re-cycling of wood chips as mulch for use within landscapes or as soil enhancement.	Trees are chipped at the Recycling yard, with the chips and mulch given to residents for landscaping purposes.	
A regular professionally managed in-service training program to keep step with state-of-the-art advances and continuously improve workers' knowledge and skills in safety, tree planting, and care and maintenance practices.	The Arborist must maintain certification, and attends regular training to do so. The training skills acquired during these events are passed along to staff.	
Trees are trimmed on a proactive, block-by-block basis.		Trees are primarily trimmed in response to complaints.

Best Management Practice	Strengths	Opportunities for Improvement
Tree complaints are inspected within one workday, and scheduled for trimming based upon a risk assessment.	The Bureau reports that tree complaints are typically investigated within 24-48 hours, with trees scheduled for removal as the investigations indicate are necessary.	

5. PARKS MAINTENANCE

Best Management Practice	Strengths	Opportunities for Improvement
The levels of service provided have been formally adopted and classified as level "A," level "B," level "C," or "level D" (or similar classification system) to ensure a linkage between policy-level decision-making (community expectation) and actual service delivery.		There are no formal designations for the maintenance service levels associated with parks
Sufficient resources have been provided to maintain at least a "B" level of maintenance such as weekly mowing, bi-weekly edging, weekly inspection of playground equipment, daily restroom cleaning, aeration 2 to 3 times annually, fertilization once annually, etc.	There are 15 field employees in the Parks Maintenance Section of the Highways and Grounds Bureau. These employees maintain 155 acres of parklands in the City, which equates to a ratio of about 10 developed acres per employee, which equates to a "B" level of service for parks.	
The section keeps a comprehensive list of park-related inventory such as the square feet of turf, linear feet of edging, square feet of sidewalks, number of picnic areas, etc.	The Section does maintain a listing of square footage of maintainable space, numbers of trash and recycle bins in each park and the collection frequencies.	
The Department maintains and uses information on the full unit costs of maintenance activities.		This is not the case in the Parks Maintenance section, or in the Bureau generally, as labor and equipment costs are not recorded for any work orders. These are critical elements in the determination of full costs of service.
An annual maintenance calendar has been developed that identifies when seasonal tasks will be performed (e.g., turf will be fertilized in March and September, color planting in Spring, etc.).	The Parks Maintenance section fertilizes three times per year between March and November.	There is no formal maintenance calendar. The Parks Maintenance section over-seeds as necessary, but does not aerate fields.

Best Management Practice	Strengths	Opportunities for Improvement
Parks has identified the maintenance tasks and staff hours required to maintain service areas using specific inventory information, desired levels of service, and an annual maintenance calendar. As a result, Parks is able to deploy staffing levels to meet targeted service levels.		The Parks Maintenance section has not identified the numbers of labor hours associated with any specific tasks.
A computerized maintenance management system i(CMMS) s in place to handle and schedule preventive, routine, and emergency maintenance service requests.		There is no CMMS in place in Parks Maintenance or in the Bureau generally. This inhibits the section's ability to determine the full costs of services, the productivity of crews, the impact of additional parkland on staffing requirements, and many other facets of effective management of the section.
Alternative service delivery methods are periodically assessed to determine if there are cost-effective alternative service delivery options.	This is subjectively assessed by management of the section.	Without adequate internal cost of service data, the Parks Maintenance section has no objective method by which to determine the cost-effectiveness of alternatives to service delivery.
A cost-effective balance between full-time versus- part-time and volunteer staff is utilized.		There is very little use of volunteers. These volunteers, when available, are used for minor activities such as collecting and disposing of debris. Many municipalities find that full-time staff time may be leveraged through the use of volunteers and volunteer organizations that adopt parks and provide maintenance and minor landscaping.
An integrated pest management program is utilized that includes a range of treatment strategies.	The Parks Maintenance section staff do not possess herbicide or pesticide licenses, so it contracts for these services, which are generally performed only on ballfields and at Liberty Park.	

Best Management Practice	Strengths	Opportunities for Improvement
The Department makes effective use of pre-and post-emergent chemicals for pest control. This should be part of an Integrated Pest Management (IPM) program.	This is done by the contractor at least three times annually.	
Management, supervisory, and line staff have obtained appropriate certification in their profession. Pesticide applicators possess state-required applicators licenses.	No internal staff possess these licenses. The Section obtains contractors who have the appropriate licenses and who apply pesticides and herbicides.	
Safety reviews of facilities, parks, playground equipment and other resources are conducted at an appropriate frequency level (such as: playground equipment – daily to weekly; facilities and parks – monthly, etc.)	The Parks Maintenance Supervisor inspects each playground weekly. The Custodian inspects each bathroom facility daily, cleans, and replenishes supplies. The parks are mowed once every 10 days, and staff inspect the grounds during these events.	
Continuous training programs are provided to keep step with state-of-the-art advances and continuously improve workers' knowledge and skills in safety, park care and maintenance practices.	The Administration Bureau provides safety training to Parks Maintenance staff as well as all other Public Works staff.	The staff have not received any professional development and training in park care, horticulture, proper maintenance practices, or other job-specific topics in park maintenance.

6. ENGINEERING SERVICES

Best Management Practice	Strengths	Opportunities for Improvement
All engineering design services provided by the City are centralized in the Public Works Department to capture economies of scale.	Engineering Design services are centralized in the Engineering Bureau within Public Works under the Associate Engineer with the exception of Traffic Engineering which is under the Parking Commissioner.	Coordination between Traffic Engineering and Public Works should be enhanced.

Best Management Practice	Strengths	Opportunities for Improvement
The organizational structure facilitates communications within and outside of the Engineering Bureau.	The Commissioners effectively work for the City Council.	Resolution of issues between Commissioners/Departments typically occurs based on influence, the ability to negotiate and the strength of that Commissioner within the organization. Good organizations will valid have differences of opinion or perspective at times. Consequently there needs to be a mechanism for accountability and resolution of those issues short of those issues being resolved by City Council.
The ratio of supervisory and support positions to line employees in the Engineering Services is reasonable.	There are three supervisory/management positions for 15 staff positions in the Bureau. This represents a 1:5 ratio.	The Bureau Associate Engineer performs a detailed review of documents and then submits them to the Public Works Commissioner for final review prior to issuance for bid. Generally there is a lack of reliance on staff, however, in some instances it is technical capacity capability to complete the assignments and maintain quality control. While the span of control for the Bureau is appropriate, most of the staff effectively report to the Bureau Associate Engineer. This approach results in a structure larger than one person can manage.
The Public Works Commissioner and the City Engineer are distinct and separate positions.		The Public Works Commissioner serves as the Administrative Manager of the Public Works and the City Engineer. This position has also taken on the responsibility for the issuance of all stormwater permits and issuance of bid documents.
There are sufficient numbers of Certified Professional Engineers.	Excluding the Public Works Commissioner, the Division has one Mechanical and one Civil Engineer who are duly registered.	Additional Professional capacity is required.

Best Management Practice	Strengths	Opportunities for Improvement
A five-year capital improvement program has been developed and adopted by the City Council.	A five year CIP program has been adopted.	There is a five-year Capital Improvement Program. While more detailed project sheets are submitted, that information is not included in the Capital Improvement Plan.
Staffing specialties are appropriate for the type work performed.	The Bureau's stated intent is that all staff be capable of designing civil and water and sewer projects.	
The five-year capital improvement program for the Capital Projects Management Division clearly identifies the goals, priorities, and expected outcomes of the program.	A five-year CIP program exists.	Goals, priorities and expected outcomes are not identified in the Plan.
A formal written capital improvement program prioritization process has been developed for the five-year capital improvement program.	The City has a Committee for the Capital Improvement Plan and a Separate Committee for Rolling Stock Replacement.	There is no formal written program prioritization process.
Capital Improvement Requests are submitted in a timely manner.		Public Works has not submitted the Rolling Stock or Capital Improvement Requests in a timely manner. This has resulted in a delay of the Committee meeting on the Rolling Stock. This is reportedly a recurring issue, and if true, this should be corrected in the next capital budget cycle.
A list of deferred capital projects is presented within the five-year capital improvement program; project requests are not rejected due to funding limitations.	Deferred capital projects are generally recognized by the various Commissioners, however, there is no formal documentation included in the CIP.	The CIP should include a plan of the total Capital needs of the City showing funded and unfunded projects.
Capital project proposal packages are developed that present needed information in a consistent format and with adequate depth.	Capital project proposal packages are developed, however, are not presented in the adopted CIP.	We recommend that a one or two sheets be included in the CIP that provides a narrative overview of the project, time frame, funding required by year, and a location map with a few project pictures.

Best Management Practice	Strengths	Opportunities for Improvement
The Capital Improvement Plan is on the City's website.	The City's Budget is on the City's website, however, only an abbreviated CIP.	The project team was unable to find the full Capital Improvement Plan on line. The Capital Improvement Plan should be easily accessible on-line
When necessary, capital projects are proposed and budgeted by phase. This applies to large, multi-year projects that require significant community and stakeholder input or projects with limited funding or significant regulatory requirements.	Most projects (generally major) have varied multi-year phases to include environmental/design/construction, etc. The City has a requirement that funds are budgeted through the CIP process; however, funding needs to be formally requested as needed.	The City should consider using the CIP as the funding authorization and allow the Commissioner of Finance and the City's Chief Executive Officer to determine the timing for funding within the year. Naturally the issuance of any bonds would require Council approval.
Staffing requirements for all of the capital projects in the first year of the five-year capital improvement program have been identified.		Project cost design and construction supervision dollars are not tracked by project and are charged to the General Fund. This understates the project cost and makes employee tracking of dollars on specific projects designed or constructed impossible. Hour estimates for each project and estimated costs should be captured to insure that design costs are competitive with outsourcing. The design cost needs to be viewed as a percentage of the total project and assessment made whether the work would be performed better and/or more cost effectively in-house or through contact services.
The Engineering Bureau has a systematic and formal process in place to determine whether an "alternative delivery" approach (e.g., Design-Build, Design-Build-Operate, Construction Management [CM] at Risk, self-performed construction, and other strategies) or the traditional Design-Bid-Build model would be most appropriate for increased quality and / or reduced cost for each project		Alternate delivery approaches are not fully considered, however, options are somewhat limited under state law. The City should explore an Indefinite Delivered Unit Price contract. This type of contract provides for unit prices only for the various types of work performed. This type of contracting vehicle permits work to proceed more quickly.

Best Management Practice	Strengths	Opportunities for Improvement
The staffing for the design of capital projects uses a resource loading approach (to avoid exceeding or underestimating staff capacity over a six to twelve month period) based on the use of cost of construction guidelines.	Historic contract bid prices are used; however, other construction guidelines are used when warranted. Larger projects are handled through consultants. Small street and sewer projects are handled by staff. The Bureau, however, assigns internal staff to design fire alarms and systems.	The Bureau does not capture costs for design or for any activity performed by staff within the Bureau. ASCE issues guidelines for costs of design, survey and construction inspection and vary according to the type and complexity of specific construction projects. The Bureau should utilize these guidelines both for estimating the cost of internal staff cost for design, as well as in developing ranges for costs associated with design submitted by consultants.
The Engineering Buerau has a clear design outsourcing strategy that focuses on core competencies and the continuity of the workload.	Outsourcing alternatives for design are made based on a project-by-project basis based on many factors including size, complexity, type of work.	
The Engineering Bureau has developed a fully documented capital project delivery approach and structure. This approach and structure clearly establish how projects should be executed, including the roles, responsibilities, and measures of performance for all parties involved. This process should include not only individuals in the Engineering Bureau, but the ultimate “owner” of projects as well as any key support individuals or units.		A capital project delivery structure should be developed to insure roles, responsibilities and expectations are clearly understood and communicated.
Designs and projects are complete on time.		There were a number of issues with completing the design and construction in a timely manner. This was demonstrated by both interviews, review of project schedules and the timing and use of funds. Sometimes delays are inevitable; however, delays were excessive on a number of critical projects.

Best Management Practice	Strengths	Opportunities for Improvement
Stormwater Management permits are appropriately reviewed and processed in a timely manner.	The City has a strong stormwater permitting process. The process is well explained also well explained on the City's website.	The Commissioner of Public Works signs off on all stormwater permits. The Associate Engineer is also involved in the permitting process. The process and the need for sign offs on all permits causes delays in the permitting process.
A different project control system is utilized for small capital projects than large i.e., use of standard designs, streamlined bidding process, site visits to equipment vendors, use of preferred construction vendors, etc.		An RFP should be issued every other year and a dollar threshold should be established for large projects. A small project rotation list could then be established based on the type of work and complexity. Contracts above a certain dollar threshold require signoff by the City's Chief Executive Officer.
Feasibility studies are completed prior to defining budget and scope for large capital projects.	City projects are not generally of this magnitude or complexity to warrant feasibility studies. Alternative analysis is performed to provide varying alternatives, estimated costs and alternatives when necessary.	When conducted this analysis is not distributed or communicated within the organization. Furthermore this analysis is frequently not contracted for and completed in a timely fashion.
Capital projects are scoped and cost estimates developed before the commencement of design.	Projects are scoped and estimated before design with one section of the Bureau developing costs for HVAC, plumbing and electrical projects and another section for road design.	A comparison of engineer's estimate of cost, budget, change order analysis, and final project cost is not readily available.
A project manager is assigned to the management of the design, construction inspection, and construction management of capital improvement projects.	Project managers are assigned for each capital project with the assignment made on the basis of the type of project, and the expertise of the project manager.	Better coordination is needed with Traffic Engineering.

Best Management Practice	Strengths	Opportunities for Improvement
Project managers are responsible for capital improvement projects from "cradle to grave", with the authority, expertise, and responsibility to keep capital projects within budget and on schedule for project development, design, construction inspection, construction management, and closeout.	Project managers manage from inception till close out. Further, Supervisors ensure that all inspectors are familiar with the details of all projects for which they are directly responsible in the event that an assigned inspector is unavailable.	Contractors typically work at least 8 hours per day during the construction season; however, City staff work a 7 hour day. This results in the automatic accumulation of overtime.
Standard design criteria (such as minimum grades for pipelines, maximum manhole spacing, etc.) have been established in writing.	Design criteria are available in the Municipal Code, Health Department regulations and other City and State documents.	
The design consultant selection is qualification based.	The City generally uses the County list of design consultants.	
An annual RFQ solicitation is used to develop an on-call list of pre-approved consultants.		The City does not have a list of pre-approved consultants. Rather, it may use design consultants based on its own experience with a firm. There is no requirement to conduct formal solicitations for professional services.
A pre-qualification process is utilized for selecting design consultants for large and complex projects.		A Request for Proposal process should be used for larger projects and consultants rating form used to evaluate consultants.
Design of capital projects are accomplished on a 2D CAD system.	An appropriate 2D CAD system is utilized.	
A consultant rating system is utilized that identifies and evaluates the quality of consultant performance.		Consultant ratings are not formally performed (e.g. narrative write-up) in a post-project conference but rather decisions are based on the memory of staff.
The location of capital projects are portrayed in the City's GIS system and on the department's web site.		Locations of projects are not available on the City's website.

Best Management Practice	Strengths	Opportunities for Improvement
Designers are required to develop a formal written project plan and schedule prior to the commencement of design.	Deputy discusses with the contractor and the Engineering Bureau receives bi-weekly updates on schedule progress.	
Appropriate internal controls exist for reviewing plans, specifications and bid documents prior to issuance	Plans appear to be appropriately assigned, however, the process was recently changed.	All projects must be signed off by the Commissioner of Public Works before a bid is issued. The volume of work is too great for an employee at this level to handle all projects. A system needs to be developed to delegate projects based on size and complexity. A standard also needs to be established for turnaround time.
The capital project plan and schedule are reviewed with customers / stakeholders before the commencement of design.		Internal City Departments do not receive sufficient updates (formal or informal) regarding schedule status or the impact of critical issues on schedules.
When engineering design is provided for special revenue funds, internal service funds, or enterprise funds, the costs of design are charged to those funds.		Engineering inspection and design costs are charged to the General Fund if performed with force account labor. If a consultant is used the costs are charged to the project.
"Billability" targets have been set for the amount of hours that engineering staff charge to design and inspection of capital improvement projects and management monitors their success in meeting these guidelines.		Engineers do not charge time against specific projects.
A Gantt chart schedule has been developed for capital improvement projects for a two to three year period that shows start and finish dates for projects.	Once a contract is awarded, the time for completion is governed by the contract.	There are no Gantt charts developed or timeliness developed regarding projects. The lack of comprehensive, multi-year project schedule inhibits the Bureau's ability to assess the impact of scheduling delays.

Best Management Practice	Strengths	Opportunities for Improvement
There are clear, easily read capital improvement project status reports that match the level of detail needed by the expected audience.		There are no formal project status reports developed for the project end-user and the public. The Bureau should produce a quarterly report for use internally, by elected Officials and the public.
Customers receive quarterly project updates that contain status, schedule, task/time assessments, budget update, program update, potential problems, and critical issues.	A Monthly Status Report was last prepared in July. The information provided is Project, Department, Percent Complete, Bid Date and Comments	Detailed formal reports or updates regarding schedule status or the impact of critical issues on schedule should be provided.
The Engineering Bureau has clearly identified and defined its customers, established formal methods for communication with them, actively solicits feedback from them, and incorporates their feedback, as appropriate, into its activities to support project-specific goals and objectives.	These activities are performed formally for Plan Check and informally for other project-related activities. Monthly project meetings occurred until last summer, however, have largely ceased.	The Bureau should better define the process and Traffic Engineering's involvement should be increased for traffic signalization and street lighting issues, improvement and upgrades.
The Engineering Bureau has established formalized partnerships with the "owners and operators" of the facilities it delivers. Engineering Services has formalized the partner expectations by partner segment and tracks results relevant to the expectations to assure that they are meeting and/or exceeding the requirements of its partners.	These activities are performed informally.	There is no formal process in place to track and ensure "high customer satisfaction."
A formal pavement management system has been developed and includes a system to regularly collect pavement condition data based upon a systematic evaluation of the pavement every two to four years	The Highway, Grounds Superintendent and Chief Construction Coordinator survey the roads annually.	Only visual assessments of street segments are made. These are done by the Highway and Grounds Superintendent in coordination with the Chief Construction Coordinator
The pavement management system uses a computer database, such as APWA MicroPAVER, to sort and store the collected data		There is no automated pavement management assessment tool available to the Bureau

Best Management Practice	Strengths	Opportunities for Improvement
The pavement management system assigns a PCI score to the pavement (0 to 100) based upon the pavement condition		The visual observations of roads are subjective and do not assign quantitative measures to the conditions of roads. Various methods have reportedly been used in the past to categorize roads (e.g., "good", "fair", "poor"), however these are not used currently. The Highway and Grounds Superintendent and Chief Construction Coordinator subjectively prioritize roads and present these for consideration by the DPW Commissioner.
The pavement management system evaluates repair or preservation strategies and suggests cost-effective projects to maintain pavement		The road assessments are performed annually, however with no quantitative indexing, and no categorization of the issues experienced by each road segment (e.g., washboarding, rutting, raveling, etc.) there is no quantitative means by which the Bureau may project the condition of roads over a multi-year period other than through experience, the results of which may vary depending upon the evaluator.
The City uses seal coats to preserve streets, and applies these seal coats, on the average, every seven years.		The City uses seal coats to preserve streets, and applies these seal coats, on the average, every seven years.
The City considers the entire arterial and residential street network as a whole, and performs the budgetary analyses to determine street seal coat, overlay, and reconstruction priorities. (e.g., it does not set aside a percentage of the street CIP funds for arterial and a percentage of the street CIP funds for residential.)	The City does not segment the road network by type of road (e.g., arterial, residential, feeder, etc.) for the purposes of allocating funding for paving and reconstruction.	The City considers the entire arterial and residential street network as a whole, and performs the budgetary analyses to determine the street seal coat, overlay, and reconstruction priorities. (e.g., it does not set aside a percentage of the street CIP funds for arterial and a percentage of the street CIP funds for residential.)

Best Management Practice	Strengths	Opportunities for Improvement
The City has a One-Stop permitting system		This is not the case. Customers must determine the number of plans required for each department in the review process, and physically transport the plans to Engineering when that Bureau is involved in the review.
A project cost accounting system is utilized to enable comparisons of planned versus actual staff hours for the design of capital projects.	The official comparison of estimates versus actuals is maintained within the City's financial system, however, the Associate Engineer maintains data manually using pencil and paper.	The manual tracking of financial data requires a significant amount of time to maintain, and the "official" information is contained in the financial records of the City maintained in the Finance Department. The Financial records of the City and manual tracking do not agree based upon a statistical sampling of the records. The financial system reporting should be tailored to meet the financial needs of Public Works and the same records should be used by all parties.
Project managers have access to the automated financial management system to monitor the actual versus planned design, inspection, and construction costs for capital projects.	Engineering Bureau staff do not have access and/or knowledge to use fiscal information within the City's financial system with the exception of one employee in the Commissioner's Office.	All financial reports are produced by the Finance Department. Public Works should work with the Finance Department to facilitate the necessary reporting and/or training

Best Management Practice	Strengths	Opportunities for Improvement
The Engineering Bureau ensures that staff responsible for delivering capital projects are competent in performing their current and future project assignments. The Bureau has established competency criteria for all key project management functions and activities, e.g., years of experience, professional certifications, education, and demonstrable capabilities in performing technical, engineering, and project management work from entry to advanced level. The Bureau monitors training requirements for its staff, develops budgets and schedules to allow sufficient training, and maintains records of training and other professional development. These training activities are coordinated with Human Resources so that their training activities are complementary.	Project assignments are made consistent with knowledge, skills and abilities. Professional Staff are required to obtain a certain level of train to maintain their certifications.	Training for non-certified staff is not formalized and somewhat inconsistent. Training and the enhancement of skills are the foundations to any successful service organization.
Contracts are issued in a timely manner to maximize use of the construction season		A large number of contracts are issued in the spring, summer and fall. This does not provide contractors the opportunity to plan their work and staffing requirements, potentially extending the length of the project and increasing the overall cost.
Contract incentives for contractors are used in an appropriate manner	Engineering Services uses an incentive/ penalty system to challenge the contract to perform.	
Contractors must submit reasonable cash bonds with bids.		The City's requirement of a 5% bond discourages some bidders who cannot meet this large monetary requirement, thus unnecessarily restricting the number of potential bids received from otherwise qualified contractors.

7. FACILITIES MAINTENANCE AND MANAGEMENT

Best Management Practice	Strengths	Opportunities for Improvement
Policies and procedures are well documented.		Although policies and procedures are evidently known by staff, they have not been formalized. Formal policies and procedures should include topics such as services provided internally; services provided under contract; key control and issuance procedures; record-keeping; preventive maintenance plans and elements; requests for service from Public Facilities; project management, inspection and approvals; and many others.
A formal skills assessment and training plan has been developed to keep employees current with changes in the facilities maintenance and management industry.		Employees do not receive routine skills training in facilities maintenance or custodial services.
Effective safety procedures are in place.	The Public Facilities Bureau receives safety training from the Safety Coordinator, as do all other bureaus in the DPW	
Existence of a preventive maintenance program for building maintenance	The Bureau contracts for almost all HVAC preventive maintenance, and also conducts annual walk-throughs with the City's insurance company in conducting thermal imaging of electrical equipment such as pumps, motors and switch gears to identify potential hot spots.	
Existence of performance measures to evaluate effectiveness of work performed		The Bureau does not capture data related to crew productivity or cost, and does not report performance measures such as cost of maintenance per square foot, custodial cost per square foot, response times to requests for service, percentage of PMs completed on time, ratio of scheduled to unscheduled work, etc.

Best Management Practice	Strengths	Opportunities for Improvement
Existence of an energy management plan	The Bureau has had energy audits conducted in the past, and has received recommendations that were implemented. Although there is no specific capital plan to retrofit all building components with more energy efficient controls, boilers, lighting systems, etc., the Public Facilities Bureau analyzes each component on a case-be-case basis as new systems are installed in order to maximize energy efficiency.	
Periodic evaluation of feasibility of contracting and/or "in sourcing"	The Public Facilities Bureau has an annual contract for HVAV preventive maintenance. In conjunction with the City's insurance company, the Bureau also completes an annual walk-through of facilities an utilizes thermal imaging to identify electrical components such as motors, pumps and switch gears that may become "hot spots in the coming year, and these systems are repaired or replaced.	
The Facilities organization is administratively centralized to capture economies of scale.	All facilities maintenance and management services to the City are provided by the Public Facilities Bureau of Public Works.	
An Internal Service Fund (ISF) is in place for the facilities maintenance program.		The Public Facilities Bureau does not operate as an ISF, and therefore does not "charge" departments for its services.
Operating and capital costs are segregated within the fleet ISF.		The Public Facilities Bureau does not operate as an ISF.
A replacement reserve or sinking fund is used to insure the timely replacement of structural assets.		This is not the case, as structural assets and major maintenance equipment are funded as needed on an annual basis.

Best Management Practice	Strengths	Opportunities for Improvement
A charge-back system is in place.		The Public Facilities Bureau does not charge departments and agencies for its services.
Charge-back rates promote cost recognition and control.		There are no charge-back rates in place. The institution of charge-back rates is a best business practice that forces users to analyze the full costs of the services it "purchases" from its facilities maintenance and management provider.
Customers receive a monthly schedule of PM services forecast to be due.		The Public Facilities Bureau does not issue a PM schedule to tenants of buildings in which it provides service, however the HVAC contractor for PM services notifies the Bureau well in advance of its services, and the Bureau notifies the tenant.
Customers receive regular and useable facilities costs reports.		The Bureau does not issue reports to "customers" in buildings, as departmental agencies do not pay for services.
All technician time is recorded and monitored on a daily basis.		The Public Facilities Bureau does not capture or report the technician time expended on any work performed.
Technicians are encouraged to keep skill levels current through financial incentives.		There are no financial incentives for skills enhancements, although performance appraisals identify any skills that are necessary to perform job assignments.
Annual surveys are conducted to assess customer satisfaction.	The project team was not made aware of any complaints about the services provided by the Public Facilities Bureau.	The Bureau does not conduct annual surveys of customer satisfaction.

Best Management Practice	Strengths	Opportunities for Improvement
Technician staffing levels are in the range of one trades staff member per 45,000 to 50,000 square feet of space maintained (excluding large open space such as garages, etc.)	The Bureau contracts for a significant portion of PM and unscheduled repairs, which effectively increases the workforce.	Parking garages account for over 85% of all municipal maintainable space, however the Public Facilities Bureau is not directly responsible for maintenance of these garages. This is the responsibility of the Traffic and Parking Department. Therefore, although there are 4,496,812 square feet of space, only 666,821 square feet are non-parking garage areas. Even with this qualification, however, each of the seven (7) staff members engaged in facilities maintenance is responsible, on average, for about 95,260 square feet of space.
The organization has a clear outsourcing strategy that focuses on core competencies and service improvements.	The Bureau is not staffed sufficiently to accomplish all work, and therefore must outsource a significant amount of work. The Bureau outsources almost all HVAC preventive maintenance, and contracts for annual inspection and repair of fire alarms, burglar alarms, elevators, etc. The Bureau also contracts for any major electrical and plumbing repairs as well.	
A formal quality assurance process is in place that includes periodic review of technician work and monitoring of repeat-call rates for rework.	The Building Maintenance Crew Leader is responsible for the assurance of quality work performed by the Plumber, Carpenter and Maintenance Mechanics.	

Best Management Practice	Strengths	Opportunities for Improvement
Formal service level agreements have been negotiated with primary customer groups.		The Public Facilities Bureau does not issue a service level agreement to its building tenants. A SLA should address such issues as the mission and objectives of the Bureau; the services it provides internally, and the conditions under which it contracts for services; the scope of its services, including a description of the PM program; response time targets for inspection and repair; equipment replacement policies; policies regarding structural modifications; how to make a service request; responsibilities of Public Facilities, and those of building tenants; etc.
Asset management system provides up to date functionality asset management, maintenance management, performance measurement, business planning, customer relationship management, and cost reporting.		The Public Facilities Bureau does not possess an asset management system with this functionality.
Additional facilities maintenance business tools, such as electronic repair manuals, are part of the facilities management organization's technology strategy.	All manuals are available electronically. Of specific note is the SCADA system at the Water Plant, which was installed and programmed by Public Facilities. This system was designed with complete documentation, including drawings, for plant control.	
Routine reports of corrective, preventive and deferred maintenance are issued and analyzed by management and supervisors		The Bureau does not capture data related to the status of corrective, preventive and deferred maintenance requests.

Best Management Practice	Strengths	Opportunities for Improvement
The organization has established a numerically-based priority system for call-in response.		The Bureau does not utilize a formal priority coding system. Many facilities management organizations utilize these systems in order to "triage" the work required of staff. For instance, the following priority system is common: **Priority 1** – Response time by the assigned technician is not to exceed 32 hours. **Priority 2** – Response time by assigned technician is not to exceed 24 hours. **Priority 3** – Response time by assigned technician is not to exceed 16 hours. **Priority 4** - Response time by assigned technician is not to exceed 2 hours during regular working hours. After-hours response is dictated by the assigned technician's location at the time of emergency, and whether the technician is already working on an emergency. Examples of work include main sewer stoppage, heating/AC system failure, building equipment failure, major power failure, security breach, building safety hazards. **Priority 5** - Response time by assigned technician is not to exceed 1 hour. Examples of work include power outages that could be life threatening, bomb threats, natural gas leaks, water main breaks, major power outages, building or equipment fire, etc. Local law enforcement agencies and/or fire department(s) should be contacted immediately upon receiving the call and prior to the contacting the on-call technician.

8. WATER AND WASTEWATER

Best Management Practice	Strengths	Opportunities for Improvement
Wastewater General Operations and Collection System Maintenance		
A five-year capital improvement plan has been developed for the repair, replacement, or addition of infrastructure.	The City has a six-year capital budget and there are several funded waster and wastewater projects in the current year's plan. These include a $1.5 million replacement and reconstruction of various water lines, $2 million for the replacement of a fluoride tank, $2 million for the rehab of the micro-filtration plant and $75,000 in vehicle and equipment replacements.	
A long-term financial plan has been prepared for the wastewater enterprise fund.	Water and Sewer has a 6-year capital plan	The CIP and financial plan are not integrated
A CMMS is installed and utilized including a work order system, annual work program, a reporting system to report actual versus planned performance, asset management system, and defined service levels and performance standards for each work activity.		The Water/Wastewater Bureau does not possess a CMMS, which inhibits its ability to develop and report on performance measures such as cost per foot of pipe installation, response times to calls for service, cost per linear foot of wastewater main cleaned, and others.
Work orders are used to record all maintenance and repair activities.		Although the Bureau records assignments and the completion of work on manual worksheets, these are not summarized in any meaningful manner, and do not assist managers in making decisions related to crew productivity, training needs, outsourcing needs, etc.
The City has adopted a Fats, Oil and Grease (FOG) control ordinance.	The Building Department is responsible for this program	
There is a formalized method to track service requests and document response time.		The Bureau does not record starting or ending times for its activities, and cannot report response times to calls for service.

Best Management Practice	Strengths	Opportunities for Improvement
Reactive, unscheduled maintenance (repair of failures) requires less than 20% of available labor hours. Predictive and preventive maintenance exceeds 50% of available labor hours. The focus of the organization is clearly on Preventive Maintenance service.	The Department reports an unusually high level of scheduled maintenance versus that of unscheduled repairs. The ratio, as reported by the Department is one unscheduled repair for every 35 scheduled repairs.	
Run-to-failure is utilized as a maintenance approach for non-critical equipment with a low replacement cost. Run-to-failure maintenance includes items that are frequently not critical to the operation, or that have a redundant piece of equipment available. These are normally pieces of equipment that can be easily repaired and replaced from stock in inventory, and for which the cost of replacement at failure makes more economic sense than ongoing maintenance.	The Bureau does utilize run-to-failure as a viable maintenance strategy for low-cost and non-critical parts and equipment.	
Predictive maintenance (condition monitoring) is utilized for critical equipment or equipment that is expensive to replace or repair. The predictive maintenance program covers all major rotating equipment such as pumps, drives, motors, generators, compressors, etc.	The Bureau utilizes predictive maintenance techniques for expensive, critical equipment.	
A continuous monitoring capability is available at water and wastewater through a SCADA (Supervisory Control And Data Acquisition) system. A SCADA system is utilized for control, data acquisition, and alarming for the plants.	The Bureau has SCADA installed in the plant and in pump stations.	
Precision maintenance technologies are utilized including thermographic imaging, vibration analysis, ultrasonic analysis, oil analysis, laser alignment, and dynamic balancing.	Thermal imaging is conducted annually on electrical equipment such as pumps, motors and switch gears.	

Best Management Practice	Strengths	Opportunities for Improvement
Customer satisfaction with services is routinely monitored and satisfaction with those services is high.	An information booklet is mailed to each customer annually. This lists numbers to call for any concerns or comments. White Plains DPW was voted 3rd place best tasting water in New York State. Tap water taste test is conducted by the NYS DOH each year.	
There is a wastewater main televising program (CCTV) based upon condition assessment information.	The Bureau has a CCTV program that is based on condition assessments.	The Bureau reports that only 7 miles of line have been televised since 2011, which equates to about 0.5 miles per year. This is equivalent to less than 1% of lines annually, which is far less than the benchmark of 10%. The project team did not validate the condition assessment rating system used by the Bureau, however these ratings should include the following defect categories: • Failed coatings or linings • Residential connection leaks • Illegal connections • Pipe Corrosion • Fats, Oils and Grease (FOG) • Broken Pipes • Debris • Line Deflection • Joint Separation • Crushed/Collapsed Pipe • Offset Joints • Root Intrusion • Minor Cracks • Other

Best Management Practice	Strengths	Opportunities for Improvement
The CCTV of sanitary sewers results in the assignment of condition grades.	The Bureau reports that it assigns condition grades to the sanitary sewers as they are televised.	It was noted above that the number of miles televised on an annual basis falls short of benchmarks, and should be increased in order to ensure that degradation of the system is identified as early as possible, and that corrective actions can be initiated. The Bureau should create logs for every segment of line televised, and these should include the following pipe attributes: • Structural Rating of the Pipe • Pipe size, type, length, and joint spacing • Distance Recorded • Location and identification of line being televised by manholes • Cleanliness of the Line • Name(s) of the Operator(s)
A GIS has been developed for the sanitary sewer collection system that provides both mapping data on the location of the collection system assets as easy access to other data such as maintenance history and asset information (installation date, material, size, condition, etc.).	The Bureau's assets have been incorporated into GIS.	
25% to 30% of the wastewater mains are cleaned on an annual basis.	The Bureau has cleaned 161.5 linear miles of collection line in the past five years, equating to about 32.3 miles annually, or 25.8% of the total.	
SSOs are less than 4 to 7 per 100 miles of main per year.	The Bureau reports that there were 4 SSOs last year in a total of 125 linear miles of line, which is well below the threshold.	The Bureau also reports that 4 SSOs was lower than normal, however it is not clear at this time the precise numbers of SSOs that have occurred in previous years.
An infiltration and inflow (I/I) monitoring program is in place and the data reported on an ongoing basis.	The Bureau televises lines to inspect for I/I.	

Best Management Practice	Strengths	Opportunities for Improvement
A standard protocol has been established and communicated for reacting to an emergency situation / SSO.	The Bureau has a standard protocol for reacting in emergency situations.	
The chain of communication for reporting SSOs has been designated in writing.	The Bureau has established a chain of communication for reporting SSOs	
Water Operations and Distribution		
The allowable contaminants reported in the most recent Consumer Confidence Report were within allowable contamination levels.	The Bureau reports that all contaminants fall within allowable limits.	
The fire suppression capabilities of the distribution system provide homeowners and business with low fire insurance rates as a result of the ISO rating.	The City has an ISO rating of 1, which is the highest rating conveyed by the rating agency.	
The water mains have been appropriately looped to provide adequate pressure for daily peak and fire protection flows, and to reduce inconvenience to customers during planned and emergency repairs.	Almost all mains in the City are looped.	
The water distribution system has storage tanks located appropriately through the system for pressure balancing, peak demands, fire protection, and emergency needs.	The City has one storage tank that meets peak water demands and is sufficient for fire protection and emergency requirements.	
A five-year capital improvement plan has been developed for the repair, replacement, or addition of infrastructure.	The Bureau has a 6-year CIP	
Fire hydrants are preventively maintained annually (e.g., lubricate threads, replace missing caps, operate valves, etc.)	The Bureau preventively maintains each hydrant in the City on an annual basis.	
Approximately 16 fire hydrants can be preventively maintained daily.	The Bureau reports that crews can preventively maintain 30 hydrants daily.	

Best Management Practice	Strengths	Opportunities for Improvement
Fire hydrant flushing of pubic apparatus is conducted approximately once per year by Water or Fire Department staff.	Flushing of all hydrants occurs annually.	
Distribution valves are exercised routinely. Distribution valves 10" or larger are exercised each year; valves 8" or smaller are exercised on a two-year cycle.	The Bureau has ordered a new valve operator that will allow an expanded and more efficient valve exercising program.	The Bureau has not historically exercised valves on a routine basis.
Dependent upon use of manual or hydraulic valve turning, approximately 20-30 valves can be exercised daily.	Crew will be able to achieve this level of productivity with the arrival of the new valve operator	The Bureau has not historically exercised valves on a routine basis.
The water loss is less than 10% unaccounted for water per AWWA's Leak Detection and Accountability Committee.		Unaccounted for water is reportedly 22%

APPENDIX C

PUBLIC WORKS DEPARTMENT RESULTS OF EMPLOYEE SURVEY

The Matrix Consulting Group conducted a survey of the White Plains Public Works Department's employees in order to gauge their attitudes and opinions on a number of organizational and operational issues. The survey was distributed to 55 recipients by email, of which 22 responded for a response rate of 40%. An additional 27 responses were received in the form of physical paper surveys, for a total of 49 responses. Considering the 206 authorized positions in the Department, this response rate is somewhat low, but it allows the project team to get an idea of the issues that employees see as most important.

1. INTRODUCTION TO THE PURPOSE AND STRUCTURE OF THE SURVEY

The survey consisted of two primary sections. The first section contained 26 multiple-choice statements to which respondents were asked to select one of the following responses: "strongly agree," "agree," "neutral," "disagree," "strongly disagree," and "N/A". For purposes of discussion, agreeing and strongly agreeing responses have been grouped in the tables in this document, as have disagreeing and strongly disagreeing responses. In the second section, respondents were presented with open-ended questions, and they had the opportunity to describe the Department's strengths, as well as changes they would like to see, in their own words. Between the two primary sections, employees were asked about the weight of their current workload.

While survey responses were confidential, respondents were asked at the beginning of the survey to indicate the division to which they are currently assigned. The following table breaks down their responses.

Employees by Division		
Assignment	**# Respondents**	**% Respondents**
Administration	**3**	**6.8%**
Engineering	**10**	**22.7%**
Garage and Shop	**1**	**2.3%**
Highways, Parks, and Grounds	**14**	**31.8%**
Public Facilities	**8**	**18.2%**
Sanitation	**4**	**9.1%**
Water and Wastewater	**4**	**9.1%**
TOTAL	**44**	**100%**

2. MULTIPLE-CHOICE STATEMENT RESPONSES

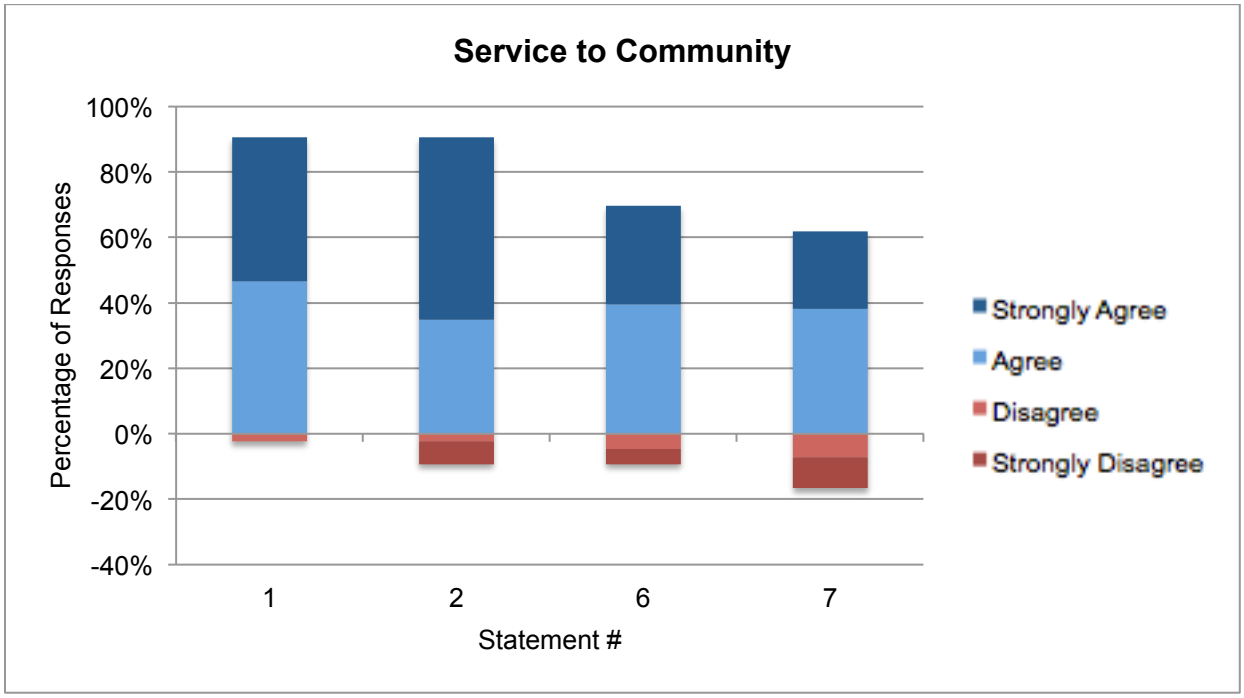
The following sections show employees' responses to multiple-choice statements in the first primary section of the survey. Statements have been divided by their topic, and responses have been condensed into agreeing, neutral, and disagreeing in the tables. A short analysis follows each topical group of statements.

(1) Employees Have Positive Opinions About The Service Provision Of Their Divisions And The Commitment Of Their Colleagues. Engineering Staff Have Concerns About The Culture Of Improvement Within Their Division.

The following table shows the responses of employees to statements addressing the level of service provided to the community.

#	Statement	Agree	Neutral	Disagree	N/A
1	**My colleagues are committed to providing a high quality of work for the City.**	**90.7%**	**4.7%**	**2.3%**	**2.3%**
2	**My Bureau provides high levels of service to the residents of White Plains.**	**90.7%**	**0%**	**7.3%**	**0%**
6	**My Bureau is innovative in the way it provides services and products to its customers.**	**69.8%**	**18.6%**	**9.3%**	**2.3%**
7	**My Bureau promotes a culture that continuously improves the quality of services and products delivered.**	**61.9%**	**21.4%**	**16.7%**	**0%**

The chart below shows the number of agreeing and disagreeing responses to statements in this group.



- Every statement in this group received more than three times as much agreement as disagreement and more strongly agreeing responses than all disagreeing responses combined.
- Engineering staff were significantly less likely to agree with statement #7 than employees in other divisions.

Employees' responses show that they firmly believe in the commitment of their colleagues and the quality of service they provide to the City of White Plains. Likewise, they generally believe their divisions to be innovative in service provision and constantly striving to improve.

The negative responses of Engineering staff to statement #7 is somewhat concerning – they actually responded with disagreement more than agreement and provided all of the strongly disagreeing responses received to this statement. As seen in

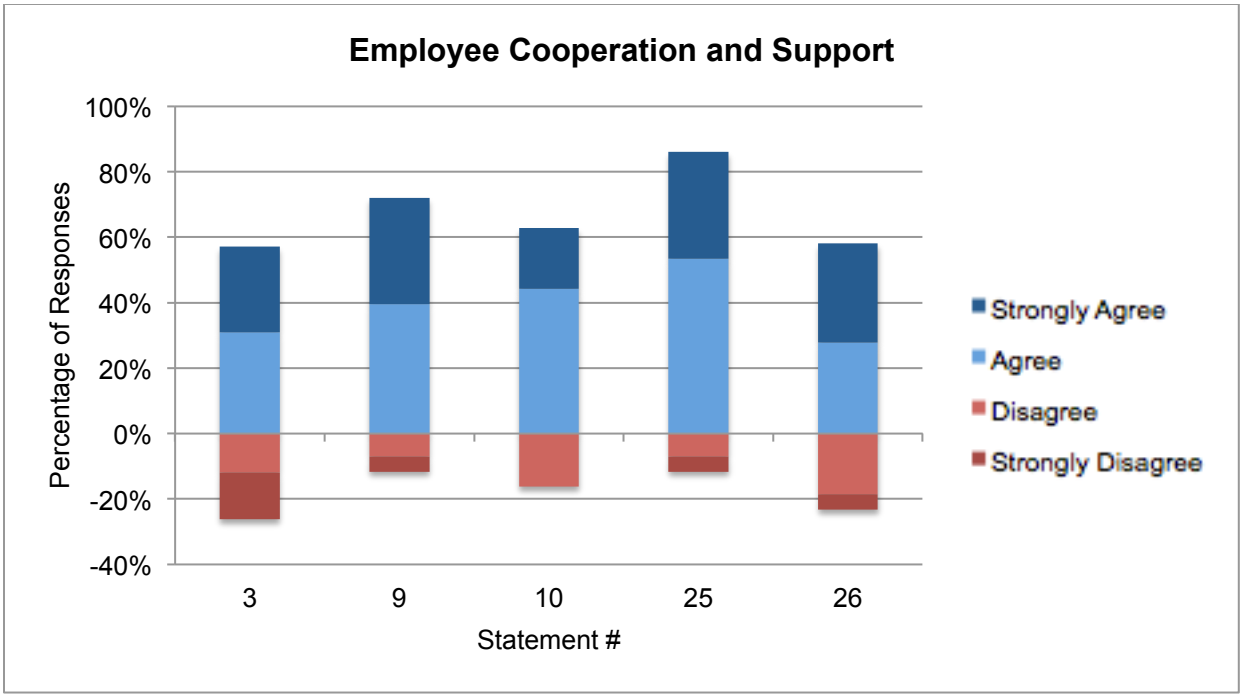
later sections, the culture of the Engineering division should be a focus for improvement as the Department continues its study.

(2) Employees Have Positive Opinions About Employee Support And Cooperation Levels, But Engineering And Administrative Staff See The Need For Additional Clerical Assistance.

The following table shows employee responses to statements about the employee support and cooperation within the Department.

#	Statement	Agree	Neutral	Disagree	N/A
3	My Bureau has the secretarial and clerical support it needs to accomplish its goals and objectives efficiently and effectively.	57.1%	11.9%	26.2%	4.8%
9	The employees within my Bureau cooperate with each other to get the job done.	72.1%	16.3%	11.6%	0.0%
10	There is a high level of cooperation between my Bureau and employees from other divisions in order to provide services to the City.	62.8%	20.9%	16.3%	0.0%
25	I have the tools and equipment I need to efficiently provide service.	86.1%	2.3%	11.6%	0.0%
26	My Bureau strives to provide its employees with the latest technology required to do our jobs.	58.1%	18.6%	23.3%	0.0%

The chart below shows the level of agreement and disagreement with each statement in this group.



- Every statement in this section received more than twice as much agreement as disagreement.
- The one administrative employee who responded to statement #3 strongly disagreed, and Engineering staff responded with more disagreement than agreement as well.
- The administrative respondent also disagreed with statement #26, regarding the provision of technology to staff. Engineering staff and water/wastewater staff trended toward neutrality.

Responses to statements in this section demonstrate that employees experience a high degree of cooperation, both within their divisions and between their division and others, to provide services to the City. Additionally, the large majority of them feel that they have the tools they need to get their jobs done, although they were less positive on whether the Department provides them “the latest technology”.

The lone administrative respondent, as well as two-thirds of Engineering staff, disagreed with the statement that they have adequate clerical support. While the

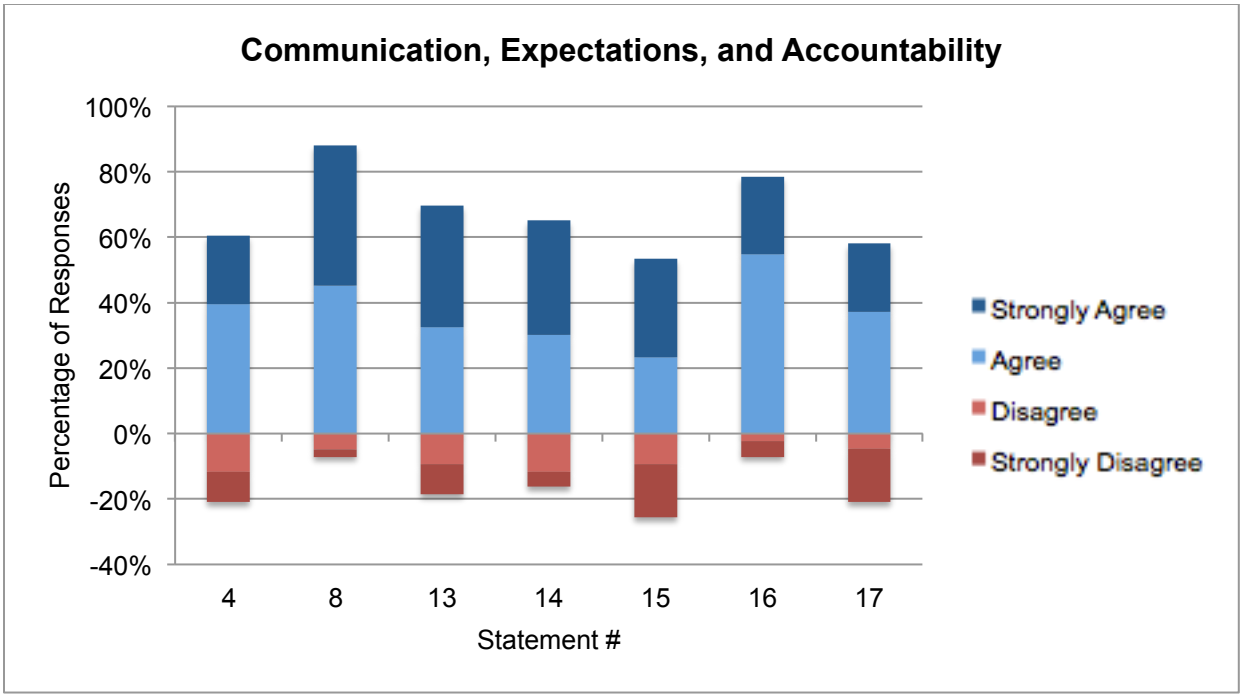
reasons for this sentiment may be clarified later in the survey, it should be noted and the concern addressed by the Department going forward.

(3) Employees Are Generally Positive About Communication, Expectations, And Accountability In Their Divisions, But Several Have Concerns About Certain Aspects Of These Areas, Particularly As They Relate To Their Supervisors.

The following table contains employee responses to statements relating to communication, expectations, and accountability within the Department.

#	Statement	Agree	Neutral	Disagree	N/A
4	My Bureau has clear, well-documented policies and procedures to guide my day-to-day work.	60.5%	18.6%	20.9%	0.0%
8	I understand clearly what is expected of me at work.	81.1%	4.8%	7.1%	0.0%
13	My immediate supervisor clearly communicates performance expectations to me.	69.8%	11.6%	18.6%	0.0%
14	My immediate supervisor gives me timely feedback about my job performance.	65.1%	18.6%	16.3%	0.0%
15	Managers and supervisors in my Bureau do a good job of communicating information to me in a timely manner.	63.5%	20.9%	25.6%	0.0%
16	My immediate supervisor holds employees accountable for their job performance.	78.6%	14.3%	7.1%	0.0%
17	Managers and supervisors in my Bureau are held accountable for their job performance.	58.1%	18.6%	20.9%	2.3%

The chart below depicts the amount of agreement and disagreement received from staff for each statement in this group.



- Every statement in this group received more than twice as much agreement as disagreement.
- Administrative and Engineering staff were much less agreeable with statement #4 than the rest of employees.
- Water & Wastewater employees responded with significantly less agreement to statement #8 than employees in other divisions.
- Sanitation and Water & Wastewater staff were less agreeable with statements #13 and #14, regarding performance expectations and feedback provided by supervisors, than employees in other divisions.
- Water & Wastewater staff did not strongly agree with statement #15, #16, or #17, while Engineering and sanitation employees both tended to agree with #16 but withhold their agreement on #15 and #17.

General agreement was high with these statements, and every statement received at least 50% combined agreement, indicating that most staff feel positively about the expectations and accountability present in the Department. A few concerning trends are apparent, however. In addition to the mostly negative responses by the administrative respondent, staff in the Water & Wastewater division did not provide a

strong level of agreement to any statement, and tended to disagree with most of them. Additionally, Engineering staff were negative on the communication practices of their supervisors and the level of accountability to which those supervisors are subject. Sanitation staff were even more negative about their supervisors, providing robust agreement to only statement #16 regarding the accountability applied to employees by supervisors.

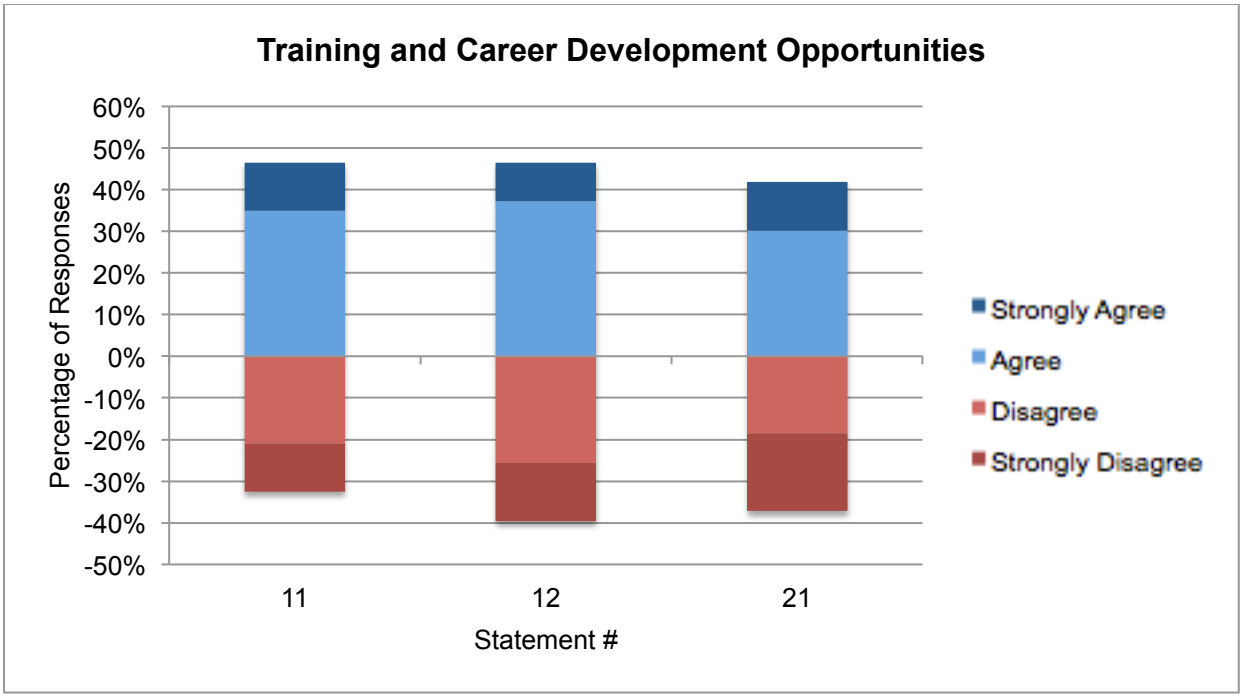
The responses to these statements show that Engineering staff have significant concerns about supervisor accountability in their division and the lack of written policies and procedures. Sanitation and Water & Wastewater staff, likewise, have issues with their supervisors' leadership. The comments received to open-ended questions later in the survey illuminate the specifics of the concerns in these divisions.

(4) Employees Have Mixed Feelings About The Training And Career Development Opportunities Available To Them.

The following table contains responses by employees to statements regarding the training and career development opportunities available in the Department.

#	Statement	Agree	Neutral	Disagree	N/A
11	**My Bureau has a strong emphasis on training and professional development.**	**46.5%**	**20.9%**	**32.6%**	**0.0%**
12	**I have ample opportunities to engage in training that improves my ability to provide services to the City.**	**46.5%**	**14.0%**	**39.5%**	**0.0%**
21	**Opportunities exist in the Department for career advancement.**	**41.9%**	**18.6%**	**37.2%**	**2.3%**

The chart below shows the level of agreement and disagreement received for each statement in this group.



- Although each statement in this group was met with more agreeing responses than disagreeing, this group of statements received more disagreement than any other group of statements on the survey.

- Public Facilities and Sanitation employees were the only ones who responded with more agreement than disagreement to statements #11 and #12. All other divisions trended toward neutral or disagreement.

- Engineering and Water & Wastewater employees were noticeably more negative than other divisions on statement #21 regarding opportunities for career development.

The mix of agreeing and disagreeing responses to this group of statements indicates that employees have concerns about the training and career development opportunities available to them in the Department. Engineering staff, Water & Wastewater staff, and Highways, Parks, & Grounds staff especially viewed the training opportunities as substandard. Likewise, Engineering staff and Water & Wastewater staff suggested that they felt more negatively than their counterparts in other divisions about the career development opportunities (or lack thereof) in the Department.

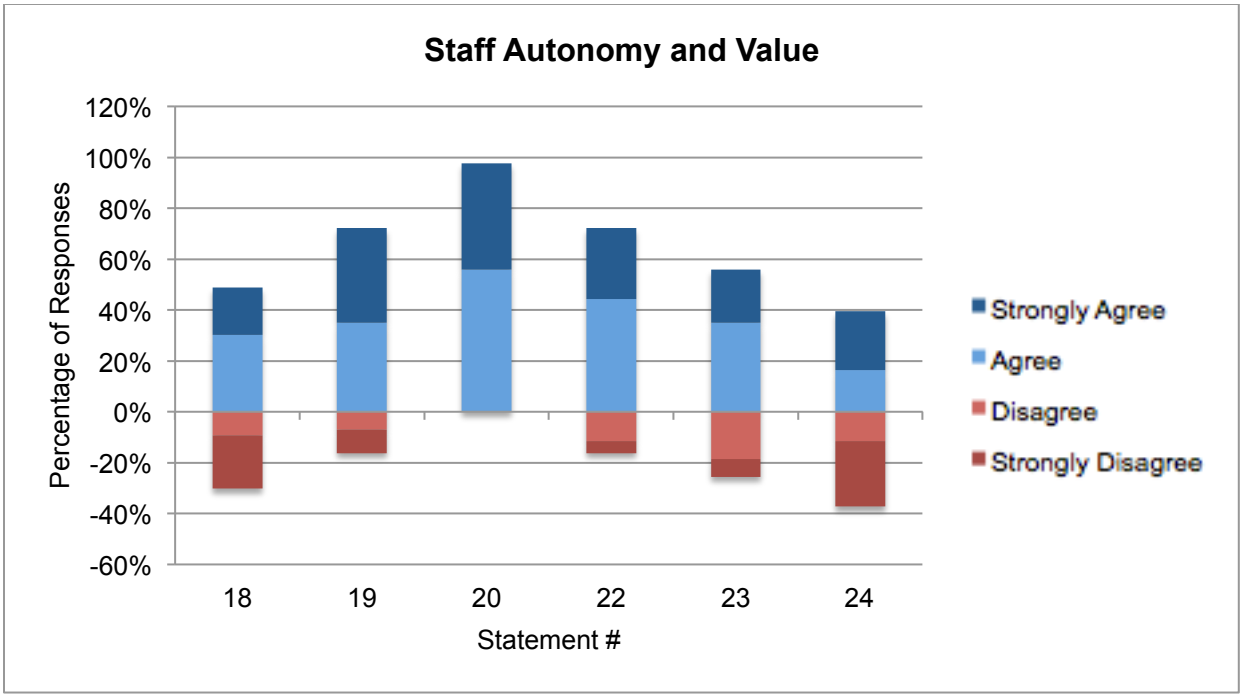
While these results themselves are cause for concern, they appear to fit within a larger, more significant theme of employee responses. Staff members stated in their comments that their morale is low because they feel micromanaged and inequitably treated. While they claim to feel valued (statement #19), a third of employees do not feel empowered to make decisions (statement #18) or challenge the status quo (statement #24). The lack of training and career development available to staff compounds their existing sentiment that their skills and abilities as employees are not valued.

(5) Employees Have Mostly Positive Sentiments About The Degree Of Autonomy They Have And The Degree To Which They Are Valued, But Some Divisions Have Concerns.

The following table shows employee responses to statements addressing the employee experience and degree of staff autonomy found throughout the Department.

#	Statement	Agree	Neutral	Disagree	N/A
18	I am empowered to make decisions concerning my work.	48.8%	20.9%	30.2%	0.0%
19	I feel that I am valued as a member of my Bureau.	72.1%	1.6%	16.3%	0.0%
20	Overall, I understand how the work I do relates to the overall goals and priorities of my Bureau.	97.7%	2.3%	0.0%	0.0%
22	My current work assignments enable me to apply and practice my knowledge and skills.	72.1%	9.3%	16.3%	2.3%
23	I have input into decisions that affect my work.	55.8%	18.6%	25.6%	0.0%
24	I feel encouraged to come up with new and better ways of doing things in my Bureau.	39.5%	23.3%	37.2%	0.0%

The chart below depicts the levels of agreement and disagreement found in employees' responses to statements in this group.



- All statements in this sections received more agreement than disagreement. Statement #20 received no disagreeing responses.
- Engineering staff were fare more negative than other divisions on statement #18, a trend that parallels their open-ended question responses.
- Engineering staff and Water & Wastewater staff were much less agreeable than other divisions on statement #19, regarding their perceived value to their Bureau. They were likewise far more negative than other divisions on statement #24.

The prevalence of agreement with statements in this section indicates that employees generally feel valued and experience a satisfactory degree of autonomy. The disagreement with some statements is primarily driven by a few divisions, namely Engineering and Water & Wastewater. Their responses were more negative than others throughout the multiple-choice section, and the stark difference in their responses to these statements provide additional insight into these employees' mindset. They do not feel that they have the ability to make decisions or improvements regarding their work, and they feel less valued than employees in other divisions as a result. The results of

the open-ended questions provide further clarification for the reason that these divisions feel this way.

(6) Employees Generally Believe They Have A Reasonable Workload.

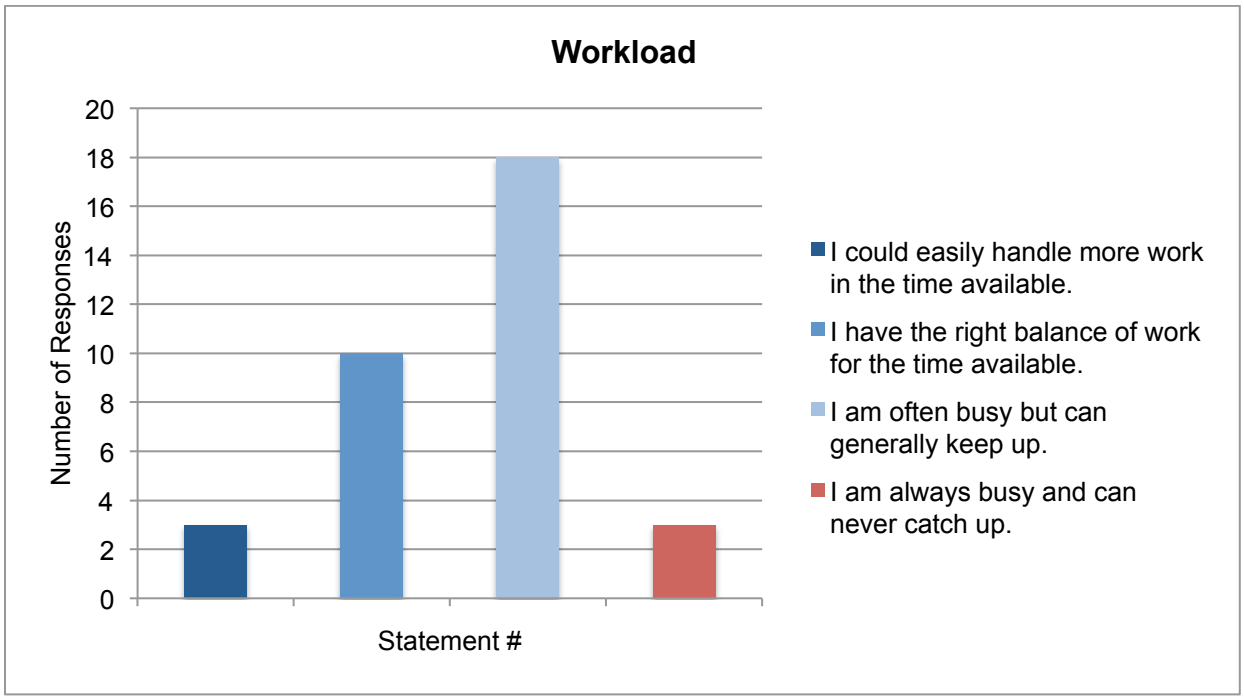
The following table shows employees' responses to Statement #5, regarding employee workload.

#	Statement	Agree	Neutral	Disagree	N/A
5	**My Bureau is able to avoid crisis mode due to excessive workload.**	**47.6%**	**23.8%**	**26.2%**	**2.4%**

The final multiple-choice statement asked employees to select one of a set of statements that best described their workload. The options given were:

- I am always busy and can never catch up.
- I am often busy but can generally keep up.
- I have a good balance of work for the time available.
- I could easily handle more work in the time available.

The following chart shows employee responses.



- Over 82% of staff indicated that their workload was either just right or slightly heavy but manageable. Just 6 out of 34 respondents said that they were overloaded or under-utilized.

- Highways, Parks, and Grounds staff, as well as Public Facilities Staff, were the only divisions to suggest that they may be unable to keep up with their workload. These were the divisions most likely to provide positive responses throughout the survey.

- Engineering and Administration provided the most disagreeing responses to statement #5, but said that they generally can handle their workload when asked about it directly.

Workload does not appear to be a significant issue in the Department. Other than a number of open-ended responses asking for more full-time manpower, all signs (including responses to these workload-related questions) indicate that staff are able to manage the tasks assigned to them without undue difficulty. One possible exception: while only one administrative employee responded to the survey, they suggested that their division is sometimes in crisis mode and that they are under-resourced in terms of clerical support, responses that match their assertion that their workload is often heavy.

3 OPEN-ENDED QUESTION RESPONSES

In the second primary section of the survey, respondents were presented with three open-ended questions, to which they provided answers in their own words regarding the strengths of the Department, perceived opportunities for improvement, and any additional thoughts that they wished to share with the project team.

(1) Employees Believe That Quality Staff And Excellent Service To The Community Are The Department's Greatest Strengths.

The first question asked what employees viewed as the strengths of the Department. The following themes appeared among their responses:

- Highly skilled, knowledgeable, hardworking staff (11 responses)
- High level of service to community (8 responses)

- Operational efficiency (3 responses)
- High quality of equipment and support available (3 responses)
- Cooperation and teamwork among staff (2 responses)

Employees clearly stated that they believe their colleagues' ability and work ethic to be the strength of the division, along with the high level of service they provide to the community. Teamwork was also listed as a strength, suggesting a level of camaraderie among employees. The Department's staff clearly have confidence in their ability to perform their jobs well.

(2) Employees View A Lack of Equity And Autonomy As The Primary Opportunities For Improvement In The Department.

The second question asked what employees would change about the Department if given the opportunity. The following themes appeared among their responses:

- Eliminate favoritism or nepotism in the Department (12 responses)
- Delegate work and cease micromanagement (11 responses)
- General improvements to managerial practice (10 responses)
- Increase the amount of full-time manpower (6 responses)
- Improve morale and the treatment of employees (4 responses)
- Grant overtime fairly and equitably (4 responses)
- Improve communication throughout the Department (4 responses)
- Provide more opportunities for internal promotion and career development (2 responses)
- Improve employees and supervisory training (2 responses)
- Go electronic and improve employees' technology (2 responses)

Comments to this statement shed light on responses received to multiple-choice statements earlier in the survey. Several employees, especially Engineering staff, believe that there is nepotism occurring in the supervisory ranks of their division. In addition to this and suggestions for general improvement in supervisory leadership, multiple staff members said that they felt micromanaged by the commissioner, a sentiment that echoes the lack of autonomy felt by many of them earlier in the survey.

This perception of nepotism and micromanagement, along with improved training and career development opportunities, are the primary things that must be dealt with to build employee morale as the Department moves forward.

(3) Additional Comments

The final question asked employees to share any additional thoughts with the project team. While some responses echoed sentiments from earlier in the survey, the following responses introduced new issues:

- Superintendent is an excellent supervisor, but employees view the commissioner less favorably
- Management-level staff should have a presence in the field
- Some believe that laborers are underpaid
- Taxpayers and city employees should be prioritized
- Administrative staff is poorly utilized
- Simple problems are made bigger than they need to be
- Work environment discourages suggestions for improvement or accountability

General suggestions about taking better care of field staff were received, as well as a suggestion that managers spend time in the field to get an understanding of the work that happens on the front lines. A work environment that discourages attempts at improvement and accountability was another concern of employees, as well as a habit of making small problems bigger than they need to be. These concerns should be kept in mind as the Department works to regain the trust of its employees in regard to equity and autonomy in their work. While these concerns may dissipate as those widespread issues are dealt with, they may require additional scrutiny in order to improve employee relations.