Chesapeake
VIRGINIA

PERFORMANCE AUDIT

OCTOBER 2017 TO JULY 2018

CITY OF CHESAPEAKE, VIRGINIA
AUDIT SERVICES DEPARTMENT

Chesapeake VIRGINIA

Audit Services Department
306 Cedar Road
Post Office Box 15225
Chesapeake, Virginia 23328
(757) 382-8511
Fax (757) 382-8860

November 30, 2018

The Honorable Rick W. West and
Members of the City Council
City of Chesapeake
City Hall – 6th Floor
Chesapeake, Virginia 23328

Dear Mayor West and Members of the City Council:

The Audit Services Department has completed its review of the City of Chesapeake (City) Department of Public Works (DPW) for the period October 17, 2017 to July 13, 2018. The review was conducted for the purpose of determining whether the DPW was providing services in an economical, efficient, and effective manner, whether its goals and objectives were being achieved, and whether it was complying with applicable City and departmental procedures related to DPW staffing and operations, and the Chesapeake Transportation System (CTS) activities and operations.

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. Those standards required that we plan and perform the audit to obtain sufficient and appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believed that the evidence obtained provided a reasonable basis for our findings and conclusions consistent with audit objectives.

DPW provided essential services for the City. DPW consisted of 19 service areas, organized into eight divisions, two of which operated as enterprise funds. The remaining six divisions were part of the City's General Fund. Three of the service areas, Resource Management, Solid Waste Disposal, and Contractual Services will be discontinued and folded into other service areas effective with the Fiscal Year (FY) 2019 budget.

DPW's primary services included the collection and recycling of solid waste; design, review, approval, and inspection of capital improvement plans for the construction of roads, bridges and major highways; installation, repair, and maintenance of traffic signals, signs, and pavement markings; operation and maintenance of streets, bridges, drainage and stormwater infrastructure elements, inspection of contract maintenance work, including street cleaning and vegetation control; construction inspection and maintenance of municipal buildings; and storm water management. DPW had been accredited by the American Public Works Association (APWA) since September 2006 and was re-accredited in November 2010 and 2014. The results of the next re-accreditation review were due in December 2018.

For FY 2018, DPW had an operating budget of over $96 million and an authorized complement of approximately 478 personnel. The Central Office was located in the City Hall Building with an Operations Center at Greenbrier Yard and smaller centers in the Bowers Hill and Hickory sections of the City. In July of 2010, the former General Services Department divisions of Facilities Maintenance and Facilities Construction were reorganized and placed into Public Works.

To conduct this audit, we reviewed and evaluated City and DPW policies, procedures, operations documents, and reports, both internal and external. We also reviewed and evaluated various aspects of departmental operations. We conducted site visits to obtain a general understanding of various departmental processes. We discussed these audit areas and conducted interviews with departmental management and various other personnel.

Based on our review, we determined that DPW had accomplished its overall mission of providing a variety of core services that were critical to the operations of the City. However, we did identify several areas of concern that needed to be addressed. Those areas included retention of employees in several key positions, most notably motor equipment operators, operational issues related to the opening of the Dominion Boulevard Veterans Bridge; and possible City Code revisions related to the release of performance bonds.

This report, in draft, was provided to DPW officials for review and response and their comments have been considered in the preparation of this report. These comments have been included in the Managerial Summary, the Audit Report, and Appendix A. DPW management, supervisors, and staffs were very helpful throughout the course of this audit. We appreciated their courtesy and cooperation on this assignment.

Sincerely,

Jay Poole
City Auditor
City of Chesapeake, Virginia

C: James E. Baker, City Manager
Robert N. Geis, Deputy City Manager
Eric Martin, Director of Public Works

Managerial Summary

A. Objectives, Scope, and Methodology

The Audit Services Department has completed its review of the City of Chesapeake (City) Department of Public Works (DPW) for the period October 17, 2017 to July 13, 2018. The review was conducted for the purpose of determining whether the DPW was providing services in an economical, efficient, and effective manner, whether its goals and objectives were being achieved, and whether it was complying with applicable City and departmental procedures related to DPW staffing and operations, and the Chesapeake Transportation System (CTS) activities and operations.

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. Those standards required that we plan and perform the audit to obtain sufficient and appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believed that the evidence obtained provided a reasonable basis for our findings and conclusions consistent with audit objectives.

DPW provided essential services for the City. DPW consisted of 19 service areas, organized into eight divisions, two of which operated as enterprise funds. The remaining six divisions were part of the City's General Fund. Three of the service areas, Resource Management, Solid Waste Disposal, and Contractual Services will be discontinued and folded into other service areas effective with the Fiscal Year (FY) 2019 budget.

DPW's primary services included the collection and recycling of solid waste; design, review, approval, and inspection of capital improvement plans for the construction of roads, bridges and major highways; installation, repair, and maintenance of traffic signals, signs, and pavement markings; operation and maintenance of streets, bridges, drainage and stormwater infrastructure elements, inspection of contract maintenance work, including street cleaning and vegetation control; construction inspection and maintenance of municipal buildings; and storm water management. DPW had been accredited by the American Public Works Association (APWA) since September 2006 and was re-accredited in November 2010 and 2014. The results of the next re-accreditation review were due in December 2018.

For FY 2018, DPW had an operating budget of over $96 million and an authorized complement of approximately 478 personnel. The Central Office was located in the City Hall Building with an Operations Center at Greenbrier Yard and smaller centers in the Bowers Hill and Hickory sections of the City. In July of 2010, the former General Services Department divisions of Facilities Maintenance and Facilities Construction were reorganized and placed into Public Works.

Divisions within Operations included Streets, Bridges, Drainage, Stormwater, Operations Group, and Contractual Services. These areas were reorganized into three functional groups: Administration, Planning and Scheduling, and Execution.

To conduct this audit, we reviewed and evaluated City and DPW policies, procedures, operations documents, and reports, both internal and external. We also reviewed and evaluated various aspects of departmental operations. We conducted site visits to obtain a general understanding of various departmental processes. We discussed these audit areas and conducted interviews with departmental management and various other personnel.

Major Observations and Conclusions

Based on our review, we determined that DPW had accomplished its overall mission of providing a variety of core services that were critical to the operations of the City. However, we did identify several areas of concern that needed to be addressed. Those areas included retention of employees in several key positions, most notably motor equipment operators, operational issues related to the opening of the Dominion Boulevard Veterans Bridge; and possible City Code revisions related to the release of performance bonds.

This report, in draft, was provided to DPW officials for review and response and their comments have been considered in the preparation of this report. These comments have been included in the Managerial Summary, the Audit Report, and Appendix A. DPW management, supervisors, and staffs were very helpful throughout the course of this audit. We appreciated their courtesy and cooperation on this assignment.

B. Performance Information

Public Works had 19 services areas split into eight divisions which provided a wide variety of different citizen and City services. These divisions included Resource Management/Customer Service, Engineering, Operations, Streets and Bridges (which reported to Operations), Stormwater Management/Drainage (which also reported to Operations), Facilities Management, Waste Management, Traffic Operations, Contractual Services, and the Chesapeake Expressway. Three of the service areas, Resource Management, Solid Waste Disposal, and Contractual Services will be discontinued and folded into other service areas effective with the FY2019 budget.

1. Resource Management/Customer Service Division (Customer Service, Accounting, and Safety)

The Resource Management Division was comprised of three major components: Customer Service, Accounting, and the Safety Program. Customer Service processed DPW-related calls received by the City's Customer Contact Center. Calls were logged and distributed to the various divisions to be addressed.

2. Operations Divisions

Operations provided oversight and technical support to several divisions and budgetary sections of DPW including Street Maintenance, Bridges, Drainage, Contractual Services, Operations Group, and Stormwater. The Operations Group was led by an Operations Manager who was responsible for supervision and oversight of all of these divisions. Separate from these divisions, Operations included two Customer Support Technicians, an Administrative Assistant, three Engineering Technicians, an Engineering Specialist, a GIS Analyst and a Storekeeping Supervisor, Surveyor, Accountant, Safety Officers, two Engineer IIs, Project Manager Operations Administrator (P.E.), Operations Superintendent, and an Engineer III all of whom provided support services to the other divisions as well. In addition, Operations was responsible for managing emergency operations, with all divisions collectively responding to clearing roadways and drainage facilities during snow, ice, hurricane, tornado, and flooding events.

3. Street Maintenance/Bridges and Structures (Operations Division)

The Street Maintenance/Bridges and Structures Division reported to Operations and maintained and repaired the City's right-of-way, which included more than 2,300 lane miles. It also maintained 112 bridges and overpasses and structures, three of which were movable bridges. These bridges opened approximately 30,000 times a year for water vessels.

4. Contractual Services (Operations Division)

Contractual Services, a separately identified section in the City's budget was functionally part of Operations. It procured and administered contracts for Street Maintenance/Bridges, Traffic Operations, Stormwater Management/Drainage, and other functions within Public Works.

5. Engineering Division

There were approximately 100 staff in Engineering. DPW Engineering as a division had multiple sections:

- Traffic Engineering conducted traffic studies for problem areas related to highway capacity, traffic signalization, and intersection signalization. Traffic was also responsible for the operational side. For instance, when a traffic signal was not working, traffic technicians were sent into the field to make repairs. The traffic signs were created in Traffic Engineering. They handled everything related to Traffic except for Transportation projects.
- Design Construction Management (DCM) was responsible for the design and construction management of Transportation projects.
- Stormwater Engineering was part of the Stormwater Management Division. This section was responsible for designing stormwater systems in compliance with federally mandated EPA requirements.

The DCM staff consisted of a total of 22 FTEs responsible for oversight of the design and construction of the City's CIP Budget (which exceeded $732 million) and the City's stormwater construction projects (which exceeded $28.5 million)

6. Stormwater Management

Stormwater Management, which reported to the Director, was a mandated federal and state program that required the City to regulate stormwater runoff in an effort to reduce pollution. Since neither the federal nor state government provided funding, the revenues needed to support the program were provided through a Stormwater Utility fee, which was the primary source of revenue for the Stormwater Management Enterprise Fund. Owners of developed property (property that contained impervious areas), both residential and non-residential, were billed this fee.

Stormwater Management was responsible for maintaining more than 1,730 miles of public ditches and stormwater pipes, and 38,000 inlets and manholes. As the City continued to acquire and construct more storm drain pipes, ditches, and channels, the City was expected to maintain those newly constructed systems and address “nuisance flooding” caused by poor or congested drainage. New environmental regulations for runoff quality were pending. DPW faced many new requirements to meet the Total Maximum Daily Load (TMDL) water quality requirements for the Chesapeake Bay and impaired local waterways.

7. Waste Management

Waste Management provided refuse collection once every week for over 68,500 residences in Chesapeake. Over 100,000 tons of refuse was collected annually. The City's solid waste was transported to the Southeastern Public Service Authority (SPSA) transfer station on Greenbrier Parkway or the regional Refuse Derived Fuel Facility in Portsmouth. Waste Management was responsible for bulk trash pick-up. They also managed the City’s five-year contract with TFC Recycling, a recycling contractor. Waste Management had become more fuel efficient as a result of the City‘s purchase of approximately 25 trucks that ran on natural gas. All collection trucks were outfitted with DriveCam GPS and cameras. Waste Management had also improved the efficiency of operations through the use of its RouteSmart system.

8. Facilities Management (Facilities Maintenance and Facilities Construction)

Facilities Management was the City's internal resource for constructing and maintaining City-owned facilities. It included two sections: Facilities Maintenance and Facilities Construction. In July 2010, these sections were transferred into DPW from the General Services Department, which was eliminated. Although DPW managed the two sections separately, they were still consolidated under Facilities Management in the City’s operating budget. This section manages several facility replacement or expansion projects such as fire stations 7 and 10. The section recently completed the $40 million

public safety operations center well under budget. An example of ongoing projects managed by this section was the jail expansion.

9. Safety Meetings

DPW Operations held weekly safety meetings live for all operations staff in order to improve safety and efficiency at the same time. These meetings were broadcast to other areas in the Bowers Hill and Hickory locations. Using various internet broadcast tools such as Skype, DPW Operations could reach all employees without requiring them to assemble at the Butts Station location. This saved time and travel for employees at outlying locations and allowed for the DPW Management's weekly agenda to be communicated to all field employees in a prompt and efficient manner. DPW Operations disseminated other information on a weekly basis: employee opportunities, Administrative and Department Regulations, equipment status, and CDL training schedules.

10. Chesapeake Transportation System (CTS)

The CTS operated and maintained the Chesapeake Expressway (Expressway) and the Dominion Boulevard Toll Road (Blvd), as well as the associated toll collection equipment.

a) ***Expressway*.** The Expressway was a 16-mile long, four lane divided highway which opened in 2001 and linked Interstate 64 to North Carolina and the Outer Banks. Expressway staff managed an electronic toll collection system which incorporated open-road technology. Vehicles equipped with an E-Z Pass transponder could pass through the "express lane" at the toll facility without stopping. The Expressway was built parallel to Battlefield Boulevard, which it crossed in three places. As many as 40,000 vehicles passed through the toll plaza on a peak weekend day. The Expressway used a peak/off peak rate schedule. The peak period was roughly weekends between mid-May and early September. According to DPW's CTS Monthly Disclosure Report from July 17, 2017 through November 17, 2018, the cumulative number of cars that had used the Expressway was 2,060,384.

b) ***Dominion Boulevard Project.*** Construction on the project began in January 2013 and was substantially completed in November 2016. The 3.8-mile project widened Dominion Boulevard from two to four lanes from Cedar Road to Great Bridge Boulevard, replaced the two-lane drawbridge over the Elizabeth River with a four-lane, fixed-span, high-rise bridge, and provided improved connection between the I-64/464 interchange and the southernmost portion of U.S. Route 17. Funding was provided by toll revenue bonds, previously committed funds, and a $152 million loan from the Virginia Transportation Infrastructure Bank. According to DPW's CTS Monthly Disclosure Report, from July 17, 2017 through November 17, 2018, the cumulative number of cars that had used the Dominion Blvd. Veterans Bridge was 3,560,511.

The Dominion Boulevard Improvement Project was the recipient of the American Society of Highway Engineers 2018 National Project Award of the Year in the over $20 million category. This national recognition adds to a long list of awards for the project.

11. 2010 Reorganization of DPW Responsibilities Regarding Performance and Defect Bonds

On July 1, 2010, the City officially reorganized the staff of the DPW and the Department of Development and Permits (DDP). This change had been in progress since February 2010. Under City Code 1970 Sec. 70-122 – Acceptance of Bonding of Physical Improvements, the City fundamentally changed the process for the release of Performance Agreements and Defect Bonds[1] and moved the responsibility of releasing the bonds from DPW to DDP.

DPW was no longer responsible for performing the final quality review to ensure newly installed infrastructures were meeting operational standards prior to the City's acceptance and release of the Performance Agreements and Defect Bonds. DPW was only involved after the ownership was transferred to the City. It would be prudent to transfer the acceptance authority to the owner (DPW) to ensure the expected service life of improvements was met from a maintenance perspective.

12. DPW Operations – Proposed Apprenticeship Academy

In an effort to train and retain qualified employees for MEO positions DPW Operations was researching the creation of an apprenticeship academy program which would include a Motor Equipment Operator In Training (MEOIT). This program as envisioned would allow DPW Operations to team up with Tidewater Community College (TCC), University of Virginia (UVA) Transportation Training Academy, and Hampton Roads Public Works (HRPW) Academy to provide the necessary training to develop employees who wanted a career as heavy equipment operators for the City. The involvement with TCC would either be TCC directly providing the classes necessary, or training subject matter experts and trainers within DPW to bring the training "in house."

The program required that applicants have a basic understanding of construction work in various areas such as asphalt, concrete, and excavation. Applicants to the program also needed to have a valid driver's license and an acceptable driving record. Upon acceptence, the employee would start training class as well as hands-on training with crew leaders and supervisors in order to obtain the necessary skills required to achieve licensure and certification during their probationary period.

13. Service Level Agreement Between Central Fleet (CF) and DPW'S Waste Management Division (WM)

[1] Performance Agreements and Defect Bonds are also known as Agreements and Bonds With Surety

In March of 2016, the CF and the WM Divisions entered into a service level agreement for fleet management and maintenance services. This agreement as designed:

- Created a collaborative partnership to manage, maintain and replace the WM fleet in the most efficient and economical manner possible while also maintaining vehicle availablity
- Focused the priority needs of both CF and WM
- Established clear performances roles, responsibilities, and expectations for both CF and WM
- Identified and perform fleet management and maintenance services according to agreed upon standards, schedules, and deadlines
- Established performances metrics
- Created a culture of service quality and embraced continuous improvement concepts

14. Plans for a DPW Central Warehouse and Other Administrative and Operational Building Needs

In 2017, DPW Operations recognized a need to construct a permanent building structure for the purpose of creating a central warehouse. The warehouse would be used to store DPW supplies and equipment most needed by the various DPW work crews as well as the Sheriff's inmate workforce crews. DPW Operations did not maintain a central warehouse for its supplies. Work crews were required to make purchases from local hardware stores in order to replenish supplies. The new central warehouse, combined with the storeroom, work order, and inventory processes in the Maximo System, was intended to create more efficient use of resources and crew time. Additionally, supplies could be ordered at reduced bulk pricing, minimizing the number of separate trips work crews would need to make to replenish supplies at the local hardware stores. The new building would allow a small team of storeroom clerks to gather and assemble the necessary supplies, equipment, and other materials necessary for the work crews to fulfill work orders as needed.

.

An Administrative building with ample parking was also proposed to house the management, supervisory, and inspection staff from DPW, and Department of Public Utilities (DPU). The corner vacant lot of the Public Works Greenbrier Operations location was also proposed for the construction site of this building to allow for the least disruptions to day-to-day operations. DPW indicated that this option would free up the land occupied by the DPW & DPU dilapidated buildings/trailers for either crew shops or sold for commercial re-development. This building was estimated at $12.5 M(illion). The existing available funds as of October 8, 2017 were approximately $11M ($7.1M General Obligation Bond & Cash and $3.9M Public Utility Revenue Bond).

15. CSR Mobile App

The CSR Mobile application was primarily aimed at citizens and would allow them to request a variety of City services over their mobile devices. The CSR mobile application had a soft roll out in February 2018 at Apple and Android sites and was being used by a small number of users. This was expected to change when the application was officially launched to the general public. The main functionalities of the application were:

- Ability to submit and view the status of service requests
- Ability to view recent requests from other users
- Ability to attach pictures to a service request
- Ability to use GPS locations to enter service requests

The CSR Mobile App would have the potential to significantly increase the number of work orders for DPW as more citizens become aware of this mobile application.

16. Mowing in the City Right-of-Ways

To help further the City's economic development goals, the City's leadership was being proactive by making improvements to the attractiveness and presentation of the City. In FY 2018, DPW was approved to increase mowing cycles on tall weeds and grass in the City's maintained right-of-way areas for the major economic development corridors. The goal was to give perspective business and citizens a positive perception of the City.

DPW planned to increase the mowing of open areas from three cycles a year to four cycles at an additional annual cost of $13,500.00, and increased the mowing of ditch back slopes from two cycles to three at an additional annual cost of $52,500.00, as funds became available and appropriated.

C. Employee Turnover and Staffing Impacts

DPW was experiencing a shortage of qualified field operations personnel and other significant technical positions due to vacancies created by high employee position turnover. The situation was particularly acute for Motor Equipment Operators, since their salaries were not as competitive as they could be. Furthermore, the City was not tracking the employee turnover rate, nor the cost of employee turnover by department. (Note: Audit Services developed a process to assess the employee turnover rate and will share the process City-wide to ensure all departments have the ability to track this data). As a result, DPW was experiencing overtime, service delivery, and other adverse impacts. As a result of turnover, DPW experienced 3,228 months of employee vacancies and an increase in operational inefficiencies. The City incurred an obligation of approximately $3.6 million of various known expenses relative to employee turnover between April 8, 2011 and October 17, 2017.

1. High MEO and Other Position Turnover

Finding - DPW was experiencing a shortage of qualified MEO personnel and other significant operational and technical positions due to high employee turnover.

Recommendation - DPW should continue to work with the City and HR to take additional steps to address the MEO and other significant position turnover issues.

Response – ***HR staff planned and executed a major undertaking to recruit MEOs in June 2018. Staff from HR, PW and PU participated in the hiring event from processing applications to conducting interviews and making conditional offers all on a Saturday. The event had received a new level of advertising campaign well before that day. The selected candidates failed to fill the vacant positions due to various reasons. As of today, the number of vacancies remain the same.***

PW initiated a similar attempt independently last year by posting a 'Now Hiring· sign at the Greenbrier yard. The sign attracted over 230 local marginally qualified applicants over a short period of time. This attempt coupled with the recent HR Hiring Event indicate that attracting applicants is not the issue. The real issue is RETENTION. Once they are considered, the pay becomes the deciding factor. **(Note: the full text of the DPW response is included in the audit report.)**

2. Salary Competitiveness for MEO and Solid Waste Positions

Finding – MEO and Solid Waste salaries were not as competitive as those in some neighboring localities, and changes made to increase the pool of applicants may adversely impact future promotion for the affected staff.

Recommendation - The City should explore alternate means of becoming more competitive for MEO and other positions. Additionally, the City should also take steps to ensure that any newly hired MEO's can eventually be promoted.

Response - Although some localities offer higher salaries, they basically face the same retention issue. Private sectors who currently offer higher salaries and bonuses should be included in the benchmarking analysis. However, the current approach to lower education requirements for MEOs to attract entry level applicants will limit promotional opportunities to supervisory and lead crew positions requiring additional formal education.

The proposed robust training/apprenticeship program will provide the desired competitive edge as an alternative/interim step to competitive salaries. The MEO education requirements may need to be reverted to HS diploma or GED. Almost all MEO Hiring Event applicants had their HS diploma or GED.

3. Tracking and Monitoring of Employee Turnover

Finding - The City did not track, monitor, or report on the status of employee turnover by position within departments and their divisions. Consequently, employee retention at those levels was also not monitored by the City. Additionally, the City did not require exit interviews for separating employees, making it difficult to gain the full understanding for

reasons why employees left. Both HR and DPW agreed that changes were needed to address the staffing issues.

Recommendation - The City should identify ways to more effectively track, monitor, and report on the status of employee turnover by position within departments and their divisions. Similarly, the City should explore methods of increasing the number of exit interviews for separating employees.

Response - The Auditor created additional vacancy reports that were not previously available that showed the length of time vacancies occurred rather than the incidences as was previously available. These reports should be continued and expanded to other departments to show the full impact of lost time due to vacant positions.

PW Operations initiated independent exit interviews last year. The results indicated that the majority of employees sought outside employment for higher salaries. The records indicate that the department has been successful to promote from within competitively. PW will continue conducting exit interviews and share the results with HR.

4. Overtime Costs

Finding - DPW Overtime costs increased substantially over a seven year period. The increase appeared to be related predominantly to staff shortages.

Recommendation – DPW should continue its efforts to reduce vacancies, so that overtime is reduced**.**

Response – We concur with this finding. Some overtime is inevitable due to Public Works emergency management role - snow fighting and storm responses. But we also have had to overextend the capability of the workforce to deliver core services under the current vacancy rates (10-15%). Apprenticeship Academy/training seems to be a logical and practical approach to increasing staffing levels thereby lowering overtime costs and maintaining the expected level of service. Although frequent overtime may be attractive to some employees, it promotes fatigue and missing work in the long nm which eventually contributes to high turnover rates.

Alternatively we have had to contract for basic maintenance services to augment our short staffing. For example, the current cave-in repair backlog by contractor amounts to $800,000. At least 60-70% of this work could be completed by the in-house workforce if PW had its full complement.

5. Service Delivery Delays Caused by Staffing Shortages

Finding – DPW was experiencing delayed service delivery due to staffing shortages.

Recommendation – DPW should continue to monitor the impact of service delays and ensure that City management is aware of potential impacts.

Response - PW has established Service Goal Days for every major service category. Our annual performance measurement reports track accomplishments in terms of output measures. Those reports show the reduced level of staffing has had a direct impact on our ability to provide timely services to our customers. While priority repairs will be made, routine service responses are being delayed due to lack of staffing - resulting in backlogs or work, longer response times, and delayed completion of work. This is reflected in growing dissatisfaction with the length of time it takes to schedule and complete urgent and routine work.

To help connect our workforce performance to our customers, PW added a new part time position last year to conduct customer satisfaction surveys on the quality and timeliness of services. The data will be used to determine an outcome performance measurement on a semi-annual basis and provide feedback to crews on the satisfaction with their work.

6. DCM Staff Shortage Impacts

Finding – DCM was experiencing staff shortages that required extensive usage of contractors, potentially increasing contract costs.

Recommendation - The City should continue supporting DCM in utilizing consultants for specialized projects, on-call consultants, and staff augmentation for vacant positions until filled.

Response - Public Works concurs with the recommendations. Continued high turnover in the engineering division has significant impacts on project delivery schedules resulting in delayed improvements to our customers and to increased costs due to construction inflation.

7. Other Employee Turnover Impacts

Finding – The City was experiencing a number of other employee turnover impacts including higher worker's compensation costs. Increased administrative workload, cost of hiring and training new employees, potentially avoidable City closures, and other costs.

Recommendation - The City should monitor cost an impacts in these areas and take action if necessary.

Response - Those factors are somewhat expected when the workforce is overextended to meet the day-to-day demands of designing and repairing the streets, bridges and drainage ways safely. We believe that significant lost time (not currently captured) is spent in interview panels, new employee training and orientation, limited productivity of new worker, etc. We concur - the costs

including the hidden costs should be collected as a City-wide effort to be analyzed and compared to the cost of impacted employee classification pay increases.

D. Chesapeake Transportation System

The Chesapeake Transportation System (CTS) consisted of the Chesapeake Expressway (Expressway) and Dominion Boulevard Veteran's Bridge (DBVB) Toll Roads. While the Expressway has been operational since 2001, the DBVB just initiated operations on February 9, 2017. Based upon our review of CTS operations, we identified several areas of concern, including concerns related to backroom operations that needed to be addressed for both DBVB and the Expressway.

1. CTS DBVB Operational Issues

Finding – There were a number of areas related to CTS's operation of the DBVB that were experiencing challenges. These areas included the vendor contract, cost of collections for toll-by-plate and VTOLL transactions, incomplete transfer of duties to the new customer services manager, issues with collections on delinquent account written off by the vendor, the resignation of the Fiscal Administrator and insufficient cross training of the accounting staff, and the vendor continuing to send toll notices to accounts with invalid addresses (bad addresses).

Recommendation – CTS management should work with the City Attorney's Office and Purchasing to revise the existing contract with UBP to reduce operational costs. Remaining CSM job responsibilities should be transferred to the position as quickly as feasibly possible. Collection efforts for delinquent toll and fee accounts should be made a high priority. Consideration should be given to having the CTS Fiscal Administrator position jointly overseen by CTS and the Finance Department, and CTS should reevaluate their staffing needs to ensure they have sufficient and cross-trained staff to perform CTS job responsibilities, timely, effectively and efficiently. A process should be developed and implemented for invalid addresses so that toll violators can be invoiced for toll violations.

Response – (DPW responded to the individual bulleted items. In order:)

- ***CTS, in conjunction with the City Attorney's office and Purchasing staff will be entering negotiations with UBP in preparation for contract renewal in February 2019. The goal of the contract negotiations will be to better refine contract requirements and reduce operational costs.***
- ***A reciprocity agreement with NC falls under the jurisdiction of the Virginia Department of Transportation (VDOT) Toll Division. VDOT has indicated they are currently in discussions with NC to develop a reciprocity agreement that will better enable Va. agencies to seek payment from NC users of Va. toll systems.***
- ***CTS has recently hired a Fiscal Administrator. CTS Management will work with CTS financial staff to develop tracking tools to carefully monitor the success of the delinquent account collection process. UBP***

is developing a new reporting suite to be implemented with the delinquent toll account collections process to better facilitate monitoring and reporting of delinquent account revenue capture. **(Note: the full text of the DPW response is included in the audit report.)**

2. CTS Expressway Operations

Finding – The operations function for the CTS Expressway needed improvement in the following areas: segregation of duties related to invoicing and posting of payments, system reconciliation, billing process, and issuance and inventory of EZ Pass transponders.

Recommendation – CTS management should review the operational work flow to find areas to streamline processes to get day-to-day work done in a timely fashion. CTS should consider ways to expedite the selling and inventorying of the E-Z pass transponders and find ways to expedite the counting of all funds.

Response – (DPW responded to the individual bulleted items. In order:)

- ***Implemented during the audit period.***
- ***Implemented during the audit period.***
- ***System currently in use does not support this function.***
- ***Cross training of administrative staff has been implemented to allow for processing of all payments received by 3 pm; payments received after 3 pm are processed the next business day.*** **(Note: the full text of the DPW response is included in the audit report.)**

E. Other DPW Operational Issues

We noted that DPW Operations was being required to repair streets transferred to the City by developers earlier than anticipated in some cases due to construction issues. We also noted that areas of the DPW website needed updating.

1. Infrastructure Issues

Finding – Some completed streets submitted by developers to the City were deteriorating more rapidly than expected in some cases, creating additional costs and workload for the City.

Recommendation – The City should consider revising City Code section to require approval from DPW prior to surety bond release.

Response - We concur, the mechanism that establishes departments' authority (the City Code) should be revised to reflect PW (the owner) responsibility to review and accept the completed work prior to the releasing the bonds to ensure it meets city requirements.

D&P currently reviews and approves development plans, accepts agreements/bonds to guarantee construction of the infrastructure elements according to the approved plans, inspects the construction activities, accepts the improvements for maintenance on behalf of PW and releases the performance as well as defect bonds upon completion of the projects. PW has delegated plan review to D & P. PW then inherits the maintenance responsibility of the new streets and drainage improvements as soon as the performance bond is released. PW has the option of requesting certain requirements through PFM. The PFM addresses design criteria, construction standards and specifications. In reality, many development and construction aspects such as equipment access, easements and particularly non-engineering maintenance requirements are difficult to be simply captured in the PFM

2. DPW Web Pages

Finding – Some Public Works' webpages on the City's website contained out-of-date information and had other issues as well.

Recommendation – Public Works should ensure the webpages are reviewed as necessary to ensure the information provided is accurate and timely.

Response- The PW Public Information Specialist is tasked with updating the Department's webpage. Position is currently vacant which is causing delays in timely updating. Vacancy issue should be resolved by October.

Chesapeake Department of Public Works (DPW)
Performance Audit
July 1, 2017 to July 13, 2018

Table of Contents

Appendices

A. Objectives, Scope, and Methodology

The Audit Services Department has completed its review of the City of Chesapeake (City) Department of Public Works (DPW) for the period October 17, 2017 to July 13, 2018. The review was conducted for the purpose of determining whether the DPW was providing services in an economical, efficient, and effective manner, whether its goals and objectives were being achieved, and whether it was complying with applicable City and departmental procedures related to DPW staffing and operations, and the Chesapeake Transportation System (CTS) activities and operations.

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. Those standards required that we plan and perform the audit to obtain sufficient and appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believed that the evidence obtained provided a reasonable basis for our findings and conclusions consistent with audit objectives.

DPW provided essential services for the City. DPW consisted of 19 service areas, organized into eight divisions, two of which operated as enterprise funds. The remaining six divisions were part of the City's General Fund. Three of the service areas, Resource Management, Solid Waste Disposal, and Contractual Services will be discontinued and folded into other service areas effective with the Fiscal Year (FY) 2019 budget.

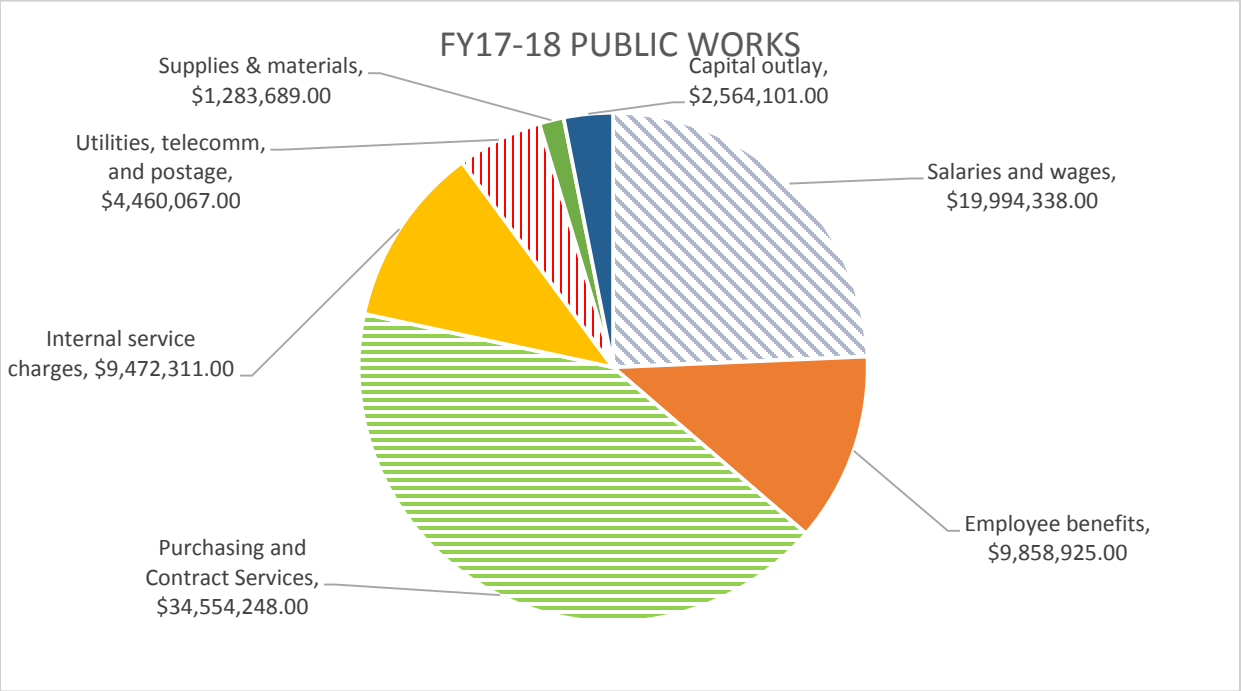
DPW's primary services included the collection and recycling of solid waste; design, review, approval, and inspection of capital improvement plans for the construction of roads, bridges and major highways; installation, repair, and maintenance of traffic signals, signs, and pavement markings; operation and maintenance of streets, bridges, drainage and stormwater infrastructure elements, inspection of contract maintenance work, including street cleaning and vegetation control; construction inspection and maintenance of municipal buildings; emergency operations; and stormwater management. DPW had been accredited by the American Public Works Association (APWA) since September 2006 and was re-accredited in November 2010 and 2014. The results of the next re-accreditation review were due in December 2018.

For FY 2018, DPW had an operating budget of over $96 million and an authorized complement of approximately 478 personnel. The Central Office was located in the City Hall Building with an Operations Center at Greenbrier Yard and smaller centers in the Bowers Hill and Hickory sections of the City. In July of 2010, the former General Services Department divisions of Facilities Maintenance and Facilities Construction were reorganized and placed into Public Works.

Photo of a DPW Work Crew courtesy of DPW

Divisions within Operations included Streets, Bridges, Drainage, Stormwater, Operations Group, and Contractual Services. These areas were reorganized into three functional groups: Administration, Planning and Scheduling, and Execution.

Exhibit A
Public Works Budget for FY 2017-18



To conduct this audit, we reviewed and evaluated City and DPW policies, procedures, operations documents, and reports, both internal and external. We also reviewed and evaluated various aspects of departmental operations. We conducted site visits to obtain a general understanding of various departmental processes. We discussed these audit areas and conducted interviews with departmental management and various other personnel.

Major Observations and Conclusions

Based on our review, we determined that DPW had accomplished its overall mission of providing a variety of core services that were critical to the operations of the City. However, we did identify several areas of concern that needed to be addressed. Those areas included retention of employees in several key positions, most notably motor equipment operators, operational issues related to the opening of the Dominion Boulevard Veterans Bridge; and possible City Code revisions related to the release of performance bonds.

This report, in draft, was provided to DPW officials for review and response and their comments have been considered in the preparation of this report. These comments have been included in the Managerial Summary, the Audit Report, and Appendix A. DPW management, supervisors, and staffs were very helpful throughout the course of this audit. We appreciated their courtesy and cooperation on this assignment.

Methodology

To conduct this audit, we reviewed various aspects of DPW's divisional practices. The specific steps in each area are highlighted below:

1. Operations Divisions - Stormwater Management/Drainage

- Interviewed the Public Works Operations Manager to obtain a general understanding of DPW Operations, staffing, and management plans
- Gathered information regarding subdivision acceptance on new neighborhood developments from Development and Permits
- Worked with DPW's Senior GIS Analyst to illustrate the growth of the City through subdivision acceptance information
- Reviewed yearly performance measurements for stormwater (pipe and ditch), drainage, and streets
- Worked with DPW to identify newer streets that might need unanticipated repairs

2. Waste Management

- Interviewed Waste Management Administrator to obtain a general understanding of Waste Management operations

3. Employee Turnover

- Interviewed the Director of Human Resources (HR)
- Interviewed various DPW and HR personnel
- Reviewed and analyzed vacancy reports provided by the Budget Department
- Reviewed FT turnover data provided by Human Resources *"Work Force at a Glance" presentation*
- Reviewed performance measurement – recruitment tracked by DPW
- Reviewed a sample of employee files to determine if they were filled within 90 days
- Reviewed comparative data from neighboring cities
- Computed cost of turnover using various established metrics
- Worked in coordination with Information Technology to extract employee data from the Munis HR/Payroll System for the purpose of performing an in-depth audit analysis on employee turnover at the department/division level

4. Vacancy Savings

- Calculated an estimated vacancy savings over a period of approximately six years by multiplying the number of months each position was vacant by the minimum monthly salary, as of FY17-18, for each specific position.

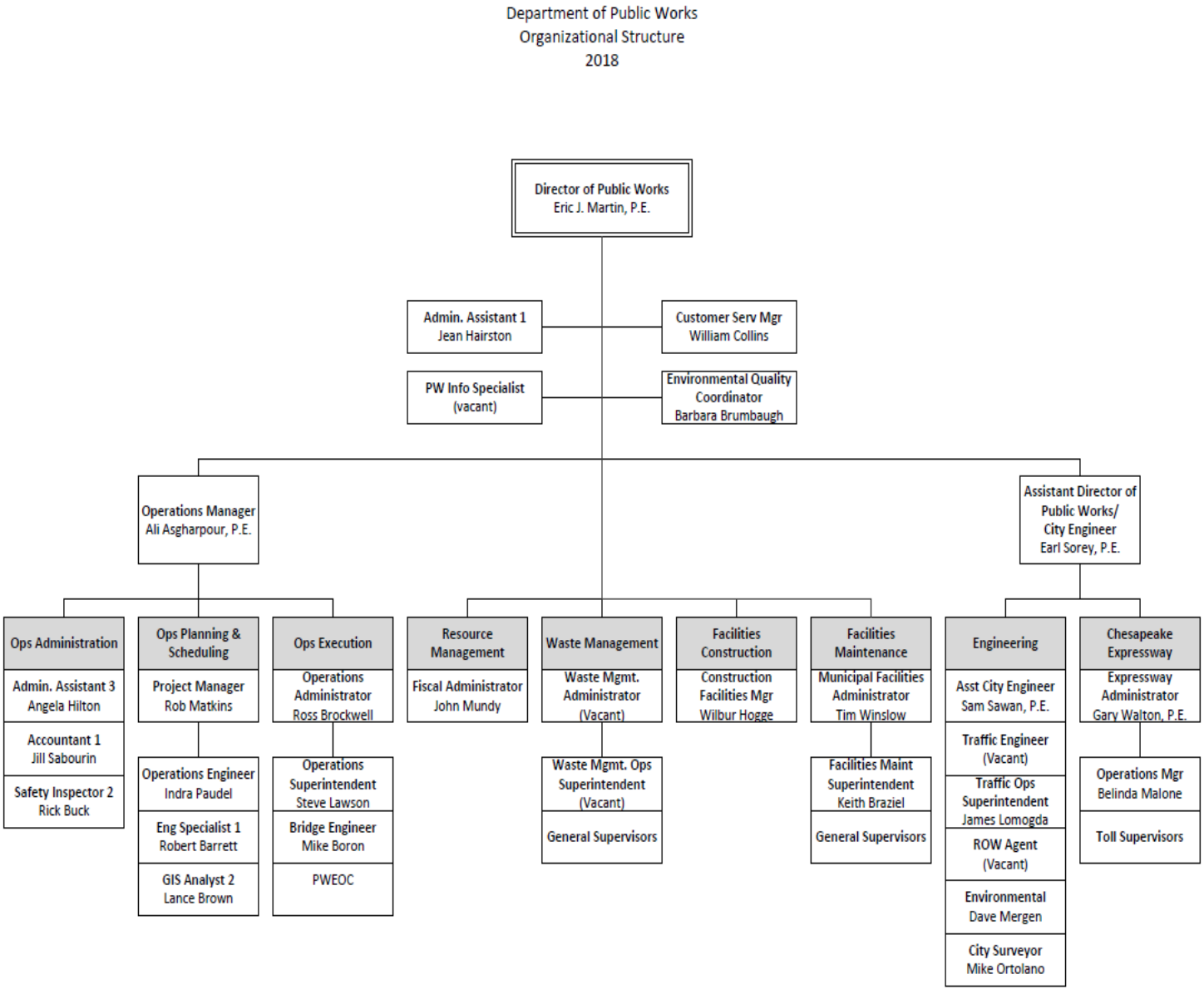
5. Chesapeake Transportation System (CTS)

- Interviewed the Expressway Management
- Reviewed cash handling and deposit procedures
- Reviewed toll revenue collections for both facilities
- Reviewed Dominion Boulevard processing of violations and collections of amounts owed

B. Performance Information

Public Works had 19 services areas split into eight divisions which provided a wide variety of different citizen and City services. These divisions included Resource Management/Customer Service, Engineering, Operations, Streets and Bridges (which reported to Operations), Stormwater Management/Drainage (which also reported to Operations), Facilities Management, Waste Management, Traffic Operations, Contractual Services, and the Chesapeake Expressway. Three of the service areas, Resource Management, Solid Waste Disposal, and Contractual Services will be discontinued and folded into other service areas effective with the FY2019 budget.

Exhibit B - DPW – Department Organizational Structure



Organization Chart courtesy of DPW

1. Resource Management/Customer Service Division

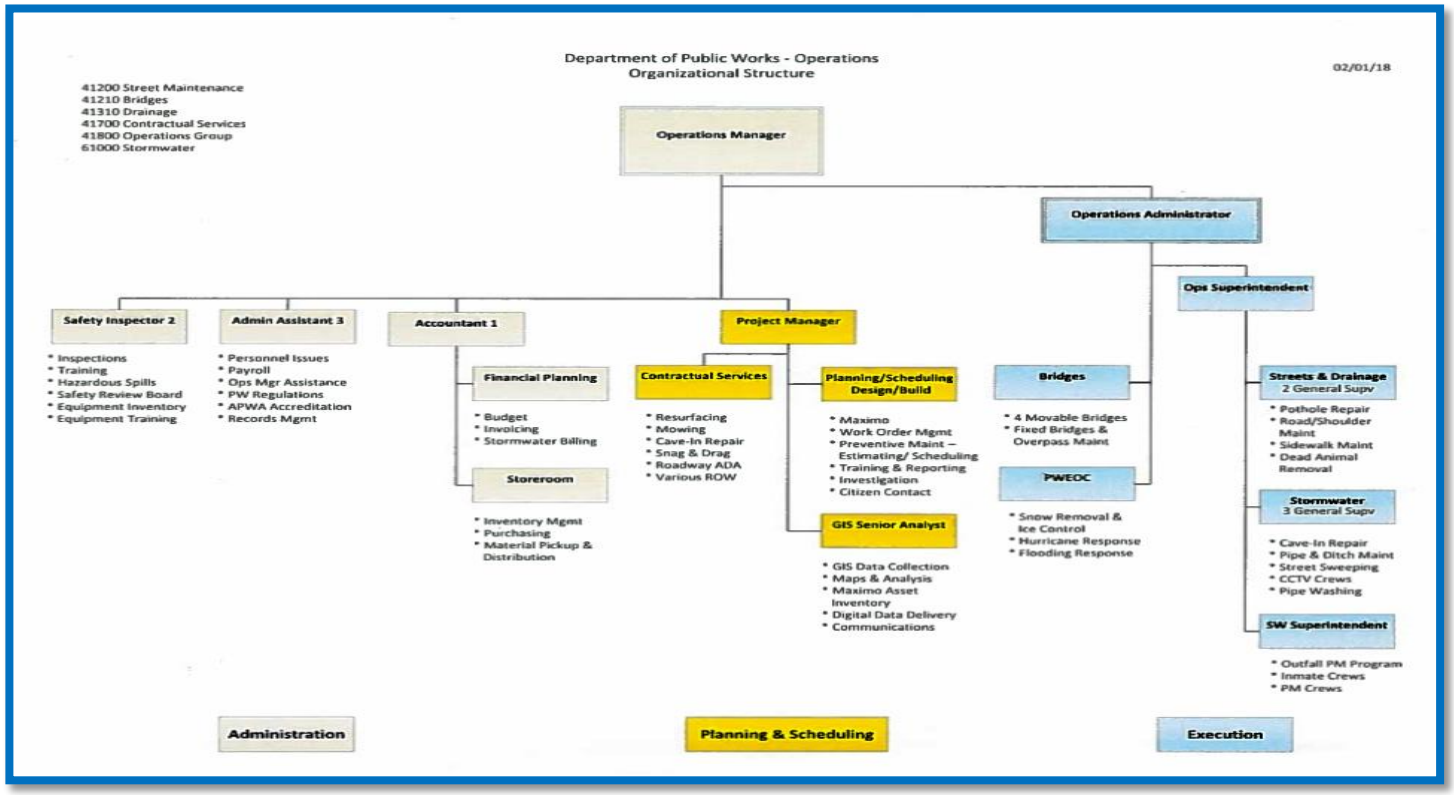
The Resource Management Division was comprised of two major service areas: Customer Service, and Accounting. Customer Service processed DPW-related calls received by the City's Customer Contact Center. Calls were logged and distributed to the various divisions to be addressed.

Accounting processed over $13 million in invoices annually, coordinated and tracked DPW's operating and capital improvement budgets, and managed the payroll for full and part-time employees. Accounting was also responsible for the maintenance of the PeopleSoft Project Management accounting records for all Public Works divisions.

2. Operations Divisions

Operations provided oversight and technical support to several divisions and budgetary sections of DPW including Street Maintenance, Bridges, Drainage, Contractual Services, Operations Group, Safety, and Stormwater. The Operations Group was led by an Operations Manager who was responsible for supervision and oversight of all of these divisions. Separate from these divisions, Operations included two Customer Support Technicians, an Administrative Assistant, three Engineering Technicians, an Engineering Specialist, a GIS Analyst and a Storekeeping Supervisor, Surveyor, Accountant, Safety Officers, two Engineer IIs, Project Manager Operations Administrator (P.E.), Operations Superintendent, and an Engineer III all of whom provided support services to the other divisions as well. In addition, Operations was responsible for managing emergency operations, with all divisions collectively responding to clearing roadways and drainage facilities during snow, ice, hurricane, tornado, and flooding events.

Exhibit C - DPW – Operations Organizational Structure



Organizational Chart courtesy of DPW Operations

Operations had over 200 people (crews, equipment). Operations was responsible for operating and maintaining public infrastructure. When streets were blocked, potholes formed, ditches were blocked or needed maintenance, crews were sent to the field to repair those issues and perform maintenance to extend the life of the City's infrastructure to keep it functioning.

Safety ensured that procedures and guidelines were followed to minimize work-related accidents and was also responsible for coordinating the activities of the Safety Board. In addition, Safety was responsible for administering the Safe Driving Program (designed to increase driver proficiency and skill), updating safety regulations, and training employees on safety procedures. Safety also administered the Safety Award Recognition Program that recognized employees with small tokens of appreciation when they were observed following appropriate safety procedures and practices.

3. Street Maintenance/Bridges and Structures (Operations Division)

The Street Maintenance/Bridges and Structures Division reported to Operations and maintained and repaired the City's right-of-way, which included more than 2,300 lane miles. It also maintained 112 bridges and overpasses and structures, three of which were movable bridges. These bridges opened approximately 30,000 times a year for water vessels.

Photo of the City of Chesapeake Great Bridge Bridge courtesy of DPW and WCTV

4. Contractual Services (Operations Division)

Contractual Services, a separately identified section in the City's budget was functionally part of Operations. It procured and administered contracts for Street Maintenance/Bridges, Traffic Operations, Stormwater Management/Drainage, and other functions within Public Works.

5. Engineering Division

There were approximately 100 staff in Engineering. DPW Engineering as a division had multiple sections:

- Traffic Engineering conducted traffic studies for problem areas related to highway capacity, traffic signalization, and intersection signalization. Traffic was also responsible for the operational side. For instance, when a traffic signal was not working, traffic technicians were sent into the field to make repairs. The traffic signs were created in Traffic Engineering. They handled everything related to Traffic except for Transportation projects.
- Design Construction Management (DCM) was responsible for the design and construction management of Transportation projects.
- Stormwater Engineering was part of the Stormwater Management Division. This section was responsible for designing stormwater systems in compliance with federally mandated EPA requirements.

The DCM staff consisted of a total of 22 FTEs responsible for oversight of the design and construction of the City's CIP Budget (which exceeded $732 million) and the City's stormwater construction projects (which exceeded $28.5 million). DCM's staffing complement is shown in Exhibit D.

Exhibit D – DCM Staffing Complement

Position Type	No. of Positions
Assistant City Engineer	1
Project Managers	3
Engineers	7
Engineering Technicians	4
Construction Inspector Supervisor	1
Construction Inspectors	6
Totals	22

DCM was organized into three project management teams. Two teams were responsible for the design and construction of CIP and stormwater projects (ranging from $300K into the millions), while the third team was responsible for small stormwater projects and studies ($100k-$150K). In 2018, DCM had 40 stormwater

projects and 30 transportation projects that were in various stages of completion. Each project team had one project manager, two to three engineers, one engineering technician, and two inspectors.

6. Stormwater Management

Stormwater Management, which reported to the Director, was a mandated federal and state program that required the City to regulate stormwater runoff in an effort to reduce pollution. Since neither the federal nor state government provided funding, the revenues needed to support the program were provided through a Stormwater Utility fee, which was the primary source of revenue for the Stormwater Management Enterprise Fund. Owners of developed property (property that contained impervious areas), both residential and non-residential, were billed this fee. As of 2018, residential rates in Chesapeake were **$7.35** per month (billed twice a year as **$44.10**), which was among the lowest in Hampton Roads. Monthly fees in other cities were as follows: Virginia Beach **$13.74**; Norfolk **$11.56**; Newport News **$11.60**; Hampton **$7.83;** Portsmouth **$10.50**. In addition to the enterprise fund activities, Stormwater Management also provided oversight for drainage activities and projects funded through the City's general fund.

Cooper's Ditch Dredging Project 2017. Photo courtesy of DPW and WCTV

Stormwater Management was responsible for maintaining more than 1,730 miles of public ditches and stormwater pipes, and 38,000 inlets and manholes. As the City continued to acquire and construct more storm drain pipes, ditches, and channels, the City was expected to maintain those newly constructed systems and address "nuisance flooding" caused by poor or congested drainage. New environmental regulations for runoff quality were pending. DPW faced many new requirements to meet the Total Maximum Daily Load (TMDL) water quality requirements for the Chesapeake Bay and impaired local waterways.

7. Waste Management

Waste Management provided refuse collection once every week for over 68,500 residences in Chesapeake. Over 100,000 tons of refuse was collected annually. The City's solid waste was transported to the Southeastern Public Service Authority (SPSA) transfer station on Greenbrier Parkway or the regional Refuse Derived Fuel Facility in Portsmouth. Waste Management was responsible for bulk trash pick-up. They also managed the City's five-year contract with TFC Recycling, a recycling contractor. Waste Management had become more fuel efficient as a result of the City's purchase of approximately 25 trucks that ran on natural gas. All collection trucks were outfitted with DriveCam GPS and cameras. Waste Management had also improved the efficiency of operations through the use of its RouteSmart system.

Exhibit E - SPSA Fees

SPSA Billing Period	Fees	Total Paid
January 2018 – June 2018	$65/ton	Total fees paid FY2018 through 5/22/18 was $7,874,677
July 2017- December 2017	$125/ton	
July 2016 – June 2017	$125/ton	Total fees paid FY2017 was $10,283,830

8. Facilities Management (Facilities Maintenance and Facilities Construction)

Facilities Management was the City's internal resource for constructing and maintaining City-owned facilities. It included two sections: Facilities Maintenance and Facilities Construction. In July 2010, these sections were transferred into DPW from the General Services Department, which was eliminated. Although DPW managed the two sections separately, they were still consolidated under Facilities Management in the City's operating budget. This section manages several facility replacement or expansion projects such as fire stations 7 and 10. The section recently completed the $40 million public safety operations center well under budget. An example of ongoing projects managed by this section was the jail expansion.

The groundbreaking for the new jail expansion was held on 8/29/16 with a scheduled completion date in March of 2018. Due to unexpected circumstances the new jail expansion opened in December 2018. Managed jointly with the Chesapeake Sherriff's Office, the new jail expansion was one of 11 major projects managed by DPW Facilities Management at the time of this audit. The facility will be used to house inmates in the Work Release program and Inmate Workforce program. There will be 17 – 18 work crews available from this facility of which 13 were assigned to DPW. With four pods which would be used to house inmates, the new jail is a Department of Corrections (DOC) compliant facility with a maximum of 192 beds and 8 special purpose cells. The facility was equipped with a location for the work vans to drive in and pick up the work crews. There was also a space for employees to pick up work release inmates.

Photo courtesy of the Chesapeake Sheriff's Office

A rendering by Moseley Architects showed the planned 47,282 square-foot expansion of the Chesapeake Correctional Center. The new building will house 192 inmates and serve as home-base for the facility's community programs.

9. Safety Meetings

DPW Operations held weekly safety meetings live for all operations staff in order to improve safety and efficiency at the same time. These meetings were broadcast to other areas in the Bowers Hill and Hickory locations. Using various internet broadcast tools such as Skype, DPW Operations could reach all employees without requiring them to assemble at the Greenbrier Yard location. This saved time and travel for employees at outlying locations and allowed for the DPW Management's weekly agenda to be communicated to all field employees in a prompt and efficient manner. DPW Operations disseminated other information on a weekly basis: employee opportunities, Administrative and Department Regulations, equipment status, and CDL training schedules.

DPW Annual Equipment Rodeo and Safe Driving Awards Ceremony - May 24, 2018

10. Chesapeake Transportation System (CTS)

CTS operated and maintained the Chesapeake Expressway (Expressway) and the Dominion Boulevard Toll Road (Blvd), as well as the associated toll collection equipment.

a) ***Expressway.*** The Expressway was a 16-mile long, four lane divided highway which opened in 2001 and linked Interstate 64 to North Carolina and the Outer Banks. Expressway staff managed an electronic toll collection system which incorporated open-road technology. Vehicles equipped with an E-Z Pass transponder could pass through the "express lane" at the toll facility without stopping. The Expressway was built parallel to Battlefield Boulevard, which it crossed in three places. As many as 40,000 vehicles passed through the toll plaza on a peak weekend day. The Expressway used a peak/off peak rate schedule. The peak period was roughly weekends between mid-May and early September. According to DPW's CTS Monthly Disclosure Report from July 17, 2017 through November 17, 2018, the cumulative number of cars that had used the Expressway was 2,060,384.

b) ***Dominion Boulevard Project.*** Construction on the project began in January 2013 and was substantially completed in November 2016. The 3.8-mile project widened Dominion Boulevard from two to four lanes from Cedar Road to Great Bridge Boulevard, replaced the two-lane drawbridge over the Elizabeth River with a four-lane, fixed-span, high-rise bridge, and provided improved connection between the I-64/464 interchange and the southernmost portion of U.S. Route 17. Funding was provided by toll revenue bonds, previously committed funds, and a $152 million loan from the Virginia Transportation Infrastructure Bank. According to DPW's CTS Monthly Disclosure Report, from July 17, 2017 through November 17, 2018, the cumulative number of cars that had used the Dominion Blvd. Veterans Bridge was 3,560,511.

VETERANS BRIDGE PROJECT RECEIVES AWARD

On Thursday, October 12, the Virginia Transportation Construction Alliance presented the Project of the Year Award for the Dominion Boulevard Veterans Bridge Project.

Earl Sorey, Assistant Director of Public Works with the City of Chesapeake, and Scott Lovell, Vice President of WSP, the City's design firm, accepted the award on behalf of the project team.

Earl Sorey, Assistant Director of Public Works, and Scott Lovell, Vice President of WSP USA.

The Dominion Boulevard Veterans Bridge Project was selected because of its complex design, innovative financing, and completion under budget and ahead of schedule. This is the second Project of the Year award for Dominion Boulevard, the first being awarded by the American Public Works Association-Mid Atlantic Division earlier this year.

Source: Team Chesapeake Employee Newsletter November 2017 Edition

The Dominion Boulevard Improvement Project was the recipient of the American Society of Highway Engineers 2018 National Project Award of the Year in the over $20

million category. This national recognition adds to a long list of awards for the project. Past awards included:

- American Public Works Association Mid-Atlantic Chapter Transportation Project of the Year in the over $75 million category
- American Public Works Association Mid-Atlantic Chapter Consultant of the Year
- American Public Works Association Mid-Atlantic Chapter Contractor of the Year
- Virginia Transportation Construction Alliance Engineering Awards Program - Project Greater than $10 million, Non-VDOT
- 2016 Crown Communities Award from American City & County magazine

11. 2010 Reorganization of DPW Responsibilities Regarding Performance and Defect Bonds

On July 1, 2010, the City officially reorganized the staff of the DPW and the Department of Development and Permits (DDP). This change had been in progress since February 2010. Under City Code 1970 Sec. 70-122 – Acceptance of Bonding of Physical Improvements, the City fundamentally changed the process for the release of Performance Agreements and Defect Bonds[1] and moved the responsibility of releasing the bonds from DPW to DDP. The new process:

a. Subdivider/developer – executed and furnished to the City a Performance Agreements and Defect Bonds in an amount equal to the cost of the improvements
b. City Attorney - approved the Performance Agreements and Defect Bonds.
c. DDP – Approved for conformance with plans.
   Approved the subdivider's/developer's Performance Agreements and Defect Bonds in an amount equal to the cost of all physical improvements.
d. DDP - Notified subdivider/developer of any defects or deficiencies.
   Made partial or complete release of the Performance Agreements and Defect Bonds.

DPW was no longer responsible for performing the final quality review to ensure newly installed infrastructures were meeting operational standards prior to the City's acceptance and release of the Performance Agreements and Defect Bonds. DPW was only involved after the ownership was transferred to the City. It would be prudent to transfer the acceptance authority to the owner (DPW) to ensure the expected service life of improvements was met from a maintenance perspective.

12. DPW Operations – Proposed Apprenticeship Academy

In an effort to train and retain qualified employees for MEO positions DPW Operations was researching the creation of an apprenticeship academy program which would include a Motor Equipment Operator In Training (MEOIT). This program as envisioned would allow DPW Operations to team up with Tidewater Community College (TCC), University of Virginia (UVA) Transportation Training Academy, and Hampton Roads Public Works (HRPW) Academy to provide the necessary training to develop employees who wanted a career as heavy equipment operators for the City. The

[1] Performance Agreements and Defect Bonds are also known as Agreements and Bonds With Surety

involvement with TCC would either be TCC directly providing the classes necessary, or training subject matter experts and trainers within DPW to bring the training "in house."

The program required that applicants have a basic understanding of construction work in various areas such as asphalt, concrete, and excavation. Applicants to the program also needed to have a valid driver's license and an acceptable driving record. Upon acceptence, the employee would start training class as well as hands-on training with crew leaders and supervisors in order to obtain the necessary skills required to achieve licensure and certification during their probationary period.

"An alternative to offering competitive wages to all City Equipment Operators that would have significant budgetary impact, PW proposes a robust and meaningful training program.

The College of Apprenticeship will provide classroom as well as hands-on training opportunities to attract, promote, and retain interested candidates with a bright outlook to a sustainable career path. The program extends training opportunities to existing employees, outside local candidates and high school students who seek a career in the maintenance of the City's infrastructure assets – a highly demanding workforce career.

This training program requires funding temporary positions at the entry level maintenance workers ($11.24 per hour) during their 12-month training period for an approximate [total] amount of $400K annually. Upon satisfactory completion of the program, they can earn $12.38 - $15.19 per hour depending on available vacancies.

Source: DPW Operations

Photo of a DPW Snowplow courtesy of DPW and WCTV

The training program would train full-time positions with applicable salary and benefits. The program was scheduled to be twelve months long and wouid take the employee through four steps of development. Each step would increase the employees's knowledge and certification and licenses. A successful completion of the program would

result in the employee having CDL Class A and B licenses as well as advanced skills in such areas as pipe repair, excavation, and operation of a variety of heavy equipment. After completion the employee would have his, or her pay, adjusted from an under grade pay plan to the original MEO position starting salary. This may result in a lump sum bonus payment to the employee for the adjusted pay rate. Also, the employee would be required to enter into an agreement to remain with the City for three years after completion or pay back various costs associated with the training. If the Apprenticeship program were to be funded with vacancy savings, the program would be projected to have minimal budgetary impact.

13. Service Level Agreement Between Central Fleet (CF) and DPW'S Waste Management Division (WM)

In March of 2016, CF and the WM Divisions entered into a service level agreement for fleet management and maintenance services. This agreement as designed:

- Created a collaborative partnership to manage, maintain and replace the WM fleet in the most efficient and economical manner possible while also maintaining vehicle availablity
- Focused the priority needs of both CF and WM
- Established clear performances roles, responsibilities, and expectations for both CF and WM
- Identified and perform fleet management and maintenance services according to agreed upon standards, schedules, and deadlines
- Established performances metrics
- Created a culture of service quality and embraced continuous improvement concepts

14. Plans for a DPW Central Warehouse and Other Administrative and Operational Building Needs

In 2017, DPW Operations recognized a need to construct a permanent building structure for the purpose of creating a central warehouse. The warehouse would be used to store DPW supplies and equipment most needed by the various DPW work crews as well as the Sheriff's inmate workforce crews. DPW Operations did not maintain a central warehouse for its supplies. Work crews were required to make purchases from local hardware stores in order to replenish supplies. The new central warehouse, combined with the storeroom, work order, and inventory processes in the Maximo System, was intended to create more efficient use of resources and crew time. Additionally, supplies could be ordered at reduced bulk pricing, minimizing the number of separate trips work crews would need to make to replenish supplies at the local hardware stores.

The new building would allow a small team of storeroom clerks to gather and assemble the necessary supplies, equipment, and other materials necessary for the work crews to fulfill work orders as needed. Design plans for the new building were in progress with City funds. The design had matured and was submitted as a FY20 Capital project. If funded, DPW planned to utilize in-house engineers to develop approriate site and building plans for the new central warehouse. DPW considered reusing the former Proteus temporary jail facility for its central warehouse. However, the $200,000 Proteus fee to

reassemble the temporary structure, in addition to other costs necessary to develop the desired site was not considered cost effective.

The Operations Center in Greenbrier was home to many employees - primarily Public Works, Public Utilities and the City Garage's staff. Most buildings, particularly a few modular trailers, were overcrowded and in many cases dilapidated. On October 8, 2017, DPW proposed to replace two Stormwater trailers with a Butler Building or equivalent pre-fabricated metal structure with parking spaces valued at $500,000. DPW believed that this option would be more cost effective in providing the same stockroom replacement than the reuse of Proteus Building A. Proceeds from the sale of the Proteus Building, combined with warehouse insurance funds ($485,000), could offset the price of the new warehouse facility.

An administrative building with ample parking was also proposed to house the management, supervisory, and inspection staff from DPW, and Department of Public Utilities (DPU). The corner vacant lot of the Public Works Greenbrier Operations location was also proposed for the construction site of this building to allow for the least disruptions to day-to-day operations. DPW indicated that this option would free up the land occupied by the DPW & DPU dilapidated buildings/trailers for either crew shops or sold for commercial re-development. This building was estimated at $12.5 M(illion). The existing available funds as of October 8, 2017 were approximately $11M ($7.1M General Obligation Bond & Cash and $3.9M Public Utility Revenue Bond).

Dilapidating Buildings, Hickory Operations Yard **July 2018**

Fig 1. Hickory Operations Yard, Main Office

Fig 2. Hickory Operations Yard, Garage

Fig 3. Hickory Operations Yard, Obsolete Building

Fig 4. Hickory Garage Facilities

15. CSR Mobile App

As part of the City's commitment to customer service and to keep up with cutting edge technology, the City Information Technology Department had been working on creating mobile applications that would allow the users to conduct business with the City using a cell phone or other mobile devices.

The CSR Mobile application was primarily aimed at citizens and would allow them to request a variety of City services over their mobile devices. The CSR mobile application had a soft roll out in February 2018 at Apple and Android sites and was being used by a small number of users. This was expected to change when the application was officially launched to the general public. The main functionalities of the application were:

- Ability to submit and view the status of service requests
- Ability to view recent requests from other users
- Ability to attach pictures to a service request
- Ability to use GPS locations to enter service requests

As of 2018, the application allowed the users to request a variety of DPW services such as the following:

- Report drainage issues such as blocked ditches or blocked drain pipes
- Report street maintenance issues such as potholes, street light out, or a traffic signal malfunction
- Request bulk trash pickups, report needed trash can replacement, or missed trash
- Report violations of City ordinances such as tall grass and weeds, inoperable vehicle, or recreational vehicle in the front yard

The CSR Mobile App would have the potential to significantly increase the number of work orders for DPW as more citizens became aware of this mobile application.

16. Mowing in the City Right-of-Ways

To help further the City's economic development goals, the City was being proactive by making improvements to the attractiveness and presentation of the City. In FY 2018, DPW was approved to increase mowing cycles on tall weeds and grass in the City's maintained right-of-way areas for the major economic development corridors. The goal was to give perspective business and citizens a positive perception of the City. In order to facilitate this improvement, DPW:

- Restored street sweeping cycles citywide back to 5 – 6 annually (from 3 – 4)
- Committed dedicated Sheriff's inmate crews to additional median mowing
- Continued to use contractors to maintain the gateway landscape areas
- Extended median mowing to all of Military Highway to the 14 day median standard
- Matched the Dominion Boulevard mowing to the Chesapeake Expressway

DPW planned to increase the mowing of open areas from three cycles a year to four cycles at an additional annual cost of $13,500.00, and increased the mowing of ditch back slopes from two cycles to three at an additional annual cost of $52,500.00, as funds became available and appropriated.

C. Employee Turnover and Staffing Impacts

DPW was experiencing a shortage of qualified field operations personnel and other significant technical positions due to vacancies created by high employee position turnover. The situation was particularly acute for Motor Equipment Operators, since their salaries were not as competitive as they could be. Furthermore, the City was not tracking the employee turnover rate, nor the cost of employee turnover by department. (Note: Audit Services developed a process to assess the employee turnover rate and will share the process City-wide to ensure all departments have the ability to track this data). As a result, DPW was experiencing overtime, service delivery, and other adverse impacts. As a result of turnover, DPW experienced 3,228 months of employee vacancies and an increase in operational inefficiencies. The City incurred an obligation of approximately $3.6 million of various known expenses relative to employee turnover between April 8, 2011 and October 17, 2017.

1. High MEO and Other Position Turnover

Finding - DPW was experiencing a shortage of qualified MEO personnel and other significant operational and technical positions due to high employee turnover.

According to Article 1, Section 1.1 – GENERAL PRINCIPLES - of the City's Human Resources Classification and Compensation Plan (Effective August 7, 2017):

"The specific objectives of the City's Human Resources Classification and Compensation Plan include the following:

- *Establish a competitive pay structure that will attract and retain qualified employees;*
- *Maintain the pay structure in proper relation to competitive pay practices in the public sector labor markets in which the City competes;*
- *Establish and maintain pay ranges that assure internal equity of compensation based on a systematic evaluation of the job classifications within each range; and*
- *Provide a uniform basis for pay adjustments".*

As of FY 2018, the City's Budget Office was reporting monthly vacancy statistics for each department periodically throughout the year. Human Resources (HR) was also maintaining employee turnover city-wide annually and published its results in the HR Workforce at a Glance report; however, due to limitations of the Munis HR System, the system did not provide the ability for HR to extract employee turnover for each City department or their divisions. Each department was required to maintain the status of vacant positions on its own within respective areas.

In the absence of employee turnover data available at the department and division levels, Audit Services conducted an independent assessment of employee turnover and retention using starting and ending payroll dates recorded in the Munis Payroll system for city employees who held positions within all DPW divisions.

Based upon our analysis, DPW experienced a 55.42% turnover rate for positions that turned over from April 8, 2011 through October 17, 2017. Although DPW was

experiencing high turnover in the 168 Toll Road Collectors and other financial administrative support functions (77.78%), Contract Services Division (75%), and CTS Administration (75%), employee turnover in the DPW field operation positions had the greatest adverse impact on City operations. Much of this high vacancy rate was attributable to an extremely high turnover in DPW's MEO positions. Approximately 73.33% of MEO positions experienced excessive turnover. Conversely, only 26.67% of MEO positions did not experience turnover for the period under review.

Exhibit F
Audit Services' Analysis of DPW Turnover and Retention Rates between April 8, 2011 - October 17, 2017

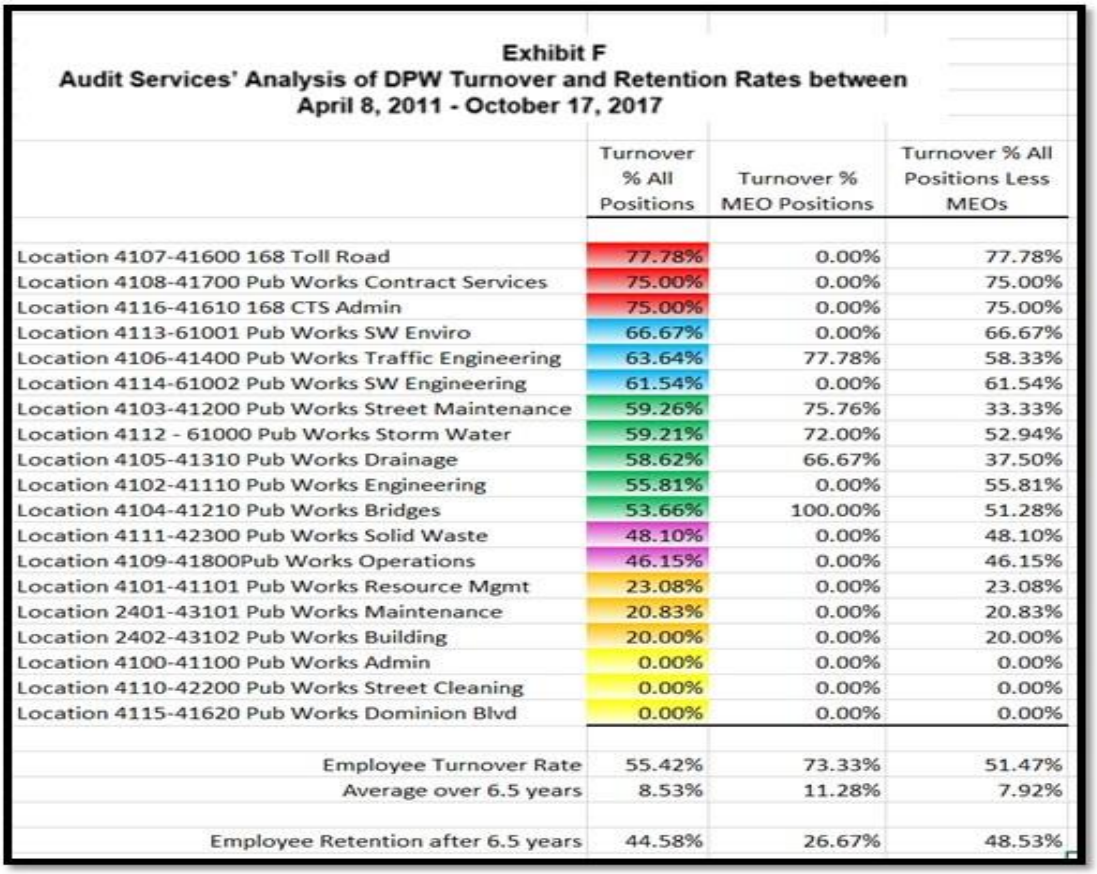
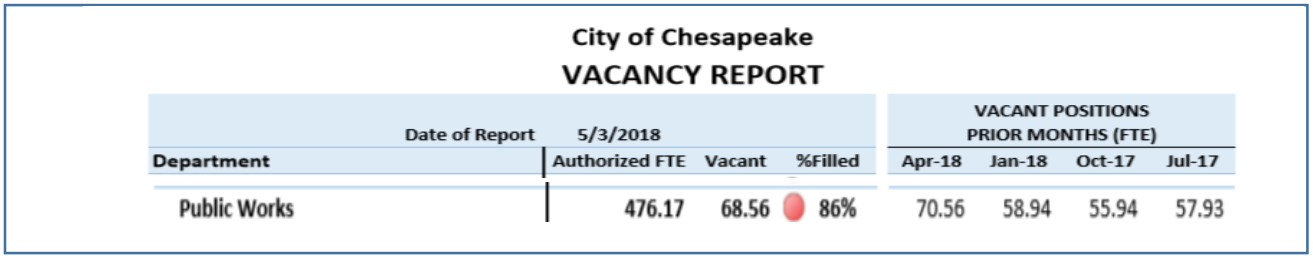


Exhibit F
Audit Services' Analysis of DPW Turnover and Retention Rates between April 8, 2011 - October 17, 2017

	Turnover % All Positions	Turnover % MEO Positions	Turnover % All Positions Less MEOs
Location 4107-41600 168 Toll Road	77.78%	0.00%	77.78%
Location 4108-41700 Pub Works Contract Services	75.00%	0.00%	75.00%
Location 4116-41610 168 CTS Admin	75.00%	0.00%	75.00%
Location 4113-61001 Pub Works SW Enviro	66.67%	0.00%	66.67%
Location 4106-41400 Pub Works Traffic Engineering	63.64%	77.78%	58.33%
Location 4114-61002 Pub Works SW Engineering	61.54%	0.00%	61.54%
Location 4103-41200 Pub Works Street Maintenance	59.26%	75.76%	33.33%
Location 4112 - 61000 Pub Works Storm Water	59.21%	72.00%	52.94%
Location 4105-41310 Pub Works Drainage	58.62%	66.67%	37.50%
Location 4102-41110 Pub Works Engineering	55.81%	0.00%	55.81%
Location 4104-41210 Pub Works Bridges	53.66%	100.00%	51.28%
Location 4111-42300 Pub Works Solid Waste	48.10%	0.00%	48.10%
Location 4109-41800Pub Works Operations	46.15%	0.00%	46.15%
Location 4101-41101 Pub Works Resource Mgmt	23.08%	0.00%	23.08%
Location 2401-43101 Pub Works Maintenance	20.83%	0.00%	20.83%
Location 2402-43102 Pub Works Building	20.00%	0.00%	20.00%
Location 4100-41100 Pub Works Admin	0.00%	0.00%	0.00%
Location 4110-42200 Pub Works Street Cleaning	0.00%	0.00%	0.00%
Location 4115-41620 Pub Works Dominion Blvd	0.00%	0.00%	0.00%
Employee Turnover Rate	55.42%	73.33%	51.47%
Average over 6.5 years	8.53%	11.28%	7.92%
Employee Retention after 6.5 years	44.58%	26.67%	48.53%

As of May 3, 2018, the Budget Office was reporting in its *City of Chesapeake VACANCY REPORT* that Public Works was having continuous vacancy issues:

Exhibit G: An excerpt from the Budget Department's "Vacancy Report"



City of Chesapeake
VACANCY REPORT

Date of Report	5/3/2018			VACANT POSITIONS PRIOR MONTHS (FTE)			
Department	Authorized FTE	Vacant	%Filled	Apr-18	Jan-18	Oct-17	Jul-17
Public Works	476.17	68.56	86%	70.56	58.94	55.94	57.93

Source: ***5:\17-18 Operating Budget\Vacancy Reports\vacancy report 2018.0503***

The high turnover appeared to be attributable to competitive salaries and benefits offered by outside public and private organizations for similar jobs. Internal promotions also factored into the high turnover rate.

Exhibit H-1: Vacancies by DPW Location from April 8, 2011 through October 17, 2017

Exhibit H: Vacancies by DPW Location from April 8, 2011 through October 17, 2017	
DPW Division Locations	**Number of Months Vacant**
Pub Works Street Maintenance	571
Pub Works Storm Water	453
Pub Works Solid Waste	428
168 Toll Road	387
Pub Works Bridges	309
Pub Works Traffic Engineering	219
Pub Works Drainage	201
Pub Works Engineering	160
Pub Works Maintenance	128
Pub Works SW Engineering	125
Pub Works SW Environment	105
Pub Works Operations	56
168 CTS Admin	29
Pub Works Contract Services	28
Pub Works Resource Management	18
Pub Works Building	11
Pub Works Admin	0
Pub Works Street Cleaning	0
Pub Works Dominion Blvd	0
Total Months of Vacancies by Division from 4/8/2011-10/17/2017	3,228
Average Months of Vacancies over approximately 6.5 years	497

As a result of turnover, DPW experienced 3,228 months of employee vacancies (Exhibit H-1) and an increase in operational inefficiencies. The City incurred an obligation of approximately $3.6 million of various known expenses relative to employee turnover between April 8, 2011 and October 17, 2017 (Exhibit H-2)

Exhibit H-2

Financial Impact of Employee Turnover in DPW from the period beginning April 8, 2011 through October 17, 2017 (cont'd):

$3.6 Million

DWP Overtime was approximately $3.6M incurred from FY2011 - FY2017
This amount includes after hours emergency response times for on-duty officers.

The city incurred additional hidden costs each time MEO, Engineering, Waste Management Operators, and other technical positions turned over. Industry standards rates turnover costs for lower level positions from a low of 50% to as high as 150% of an employee's salary each time a position turns over. The percentage increases with higher level positions. This cost includes:[1]

- The cost of hiring a new employee including the advertising, interviewing, screening, and hiring.
- Lost productivity—it may take a new employee one to two years to reach the productivity of an existing person.
- Lost engagement—other employees who see high turnover tend to disengage and lose productivity.
- Customer service and errors—for example new employees take longer and are often less adept at solving problems.
- Training cost—for example, over two to three years, a business likely invests 10 to 20 percent of an employee's salary or more in training

Cost of turnover was unknown. The City did not track the turnover rate routinely, or the cost of turnover for each department to monitor employee retention.

Other adverse effects and hidden costs caused by employee turnover includes, but are not limited to:

- Increased risk to public safety and employee safety
- Increased work load for the remaining staff
- Lowered employee morale
- Loss of institutional knowledge
- Chronic staffing shortages and employee retention issues resulting from high employee turnover, untimely hiring practices, and a non-competitive pay structure
- Delays in service delivery and an increased backlog of work orders
- Shift in management's focus from DPW program goals and objectives to a constant focus on recruitment, hiring, and training
- DPW was also experiencing an increase in contractor costs to augment the Operations and Engineering staff due to employee vacancies

$3.6 Million*

Estimated known expenses relative to employee turnover in DPW from April 8, 2011 through October 17, 2017

****This figure does not include the cost of turnover and opportunity cost to the DPW.***

[1] In a recent article on employee retention, Josh Bersin of Bersin by Deloitte outlined factors a business should consider in calculating the "real" cost of losing an employee. These bullets were excerpts from Josh Bersin's article of employee retention.

There was no question that the City needed to reduce the high levels of vacancies. Human Resources addressed this as a recruitment issue and focused its efforts toward advertisement and job fair efforts. DPW also advertised for these positions. Human Resources and DPW agreed to offer a Class B Commercial Driver's License (CDL) and Endorsement Agreement. The program was designed with the intent to create incentives for existing Laborer/Operators and Waste Management Worker I positions to be promoted and fill vacant slots. The program would require an employee to repay the city for the cost of in-house training/CDL licensing fee should the employee decide to separate within a year of being hired.

Recommendation - DPW should continue to work with the City and HR to take additional steps to address the MEO and other significant position turnover issues.

The City should consider the following:

- Revise the Classification and Compensation Plan to authorize the City to review the competitiveness of salaries of both public and private organizations that compete for similar positions.
- Adjust compensation packages for MEOs and other technically skilled positions with high turnover to make them more competitive in order to retain employees.
- Create incentives to encourage more applicants to pursue careers as MEOs with the City. Place a priority on making changes to increase the level of employee retention to reduce the cost associated with employee turnover.
- Consider funding a DPW Training Division and curriculum development for the proposed DPW Apprenticeship program that includes the Motor Equipment Operation in Training (MEOIT) initiative.

Response – ***HR staff planned and executed a major undertaking to recruit MEOs in June 2018. Staff from HR, PW and PU participated in the hiring event from processing applications to conducting interviews and making conditional offers all on a Saturday. The event had received a new level of advertising campaign well before that day. The selected candidates failed to fill the vacant positions due to various reasons. As of today, the number of vacancies remain the same.***

PW initiated a similar attempt independently last year by posting a 'Now Hiring· sign at the Greenbrier yard. The sign attracted over 230 local marginally qualified applicants over a short period of time. This attempt coupled with the recent HR Hiring Event indicate that attracting applicants is not the issue. The real issue is RETENTION. Once they are considered, the pay becomes the deciding factor.

The influx of interested local applicants to PW hiring initiative sparked an idea to think 'outside the box'. The question then became 'how can we incentivize this great humane resource to join our workforce?' The answer was either competitive salary to attract and retain qualified candidates or train the marginally qualified applicants. The latter seemed to be the more viable option in the current financial situation.

Motor Equipment Operator In Training (MEOIT) - this program has little or no budgetary impact that places marginally qualified employees in the vacant positions who would receive classroom as well as on the job training. However, a sensible business model needs to be implemented to attract and retain marginally qualified candidates. The program would require administrative actions by HR to hire candidates under-grade and reward them with the difference once they successfully complete the training requirements. Candidates would enter an agreement to remain in the position for 3 years to receive the pro-rated salary differences. In addition, the incentive plan would provide an achievable path to career advancement as well.

Apprenticeship Academy - this program requires budgeting for 10 new temporary positions plus two qualified trainers. The training program and conditions would be similar to the MEOIT program. Trainees would fill the vacant positions after satisfactory completion of the apprenticeship competitively at the equitable salary rate. The apprenticeship positions would be requested/renewed as needed as part of the annual budget cycles.

2. Salary Competitiveness for MEO and Solid Waste Positions

Finding – MEO and Solid Waste salaries were not as competitive as those in some neighboring localities, and changes made to increase the pool of applicants may adversely impact future promotion for the affected staff.

According to Article 1, Section 1.1 – GENERAL PRINCIPLES of the City's Human Resources Classification and Compensation Plan (Effective August 7, 2017):

> *"In order to recruit and retain a high performing workforce, it is the fundamental policy of the City of Chesapeake that a fair and uniform classification and compensation plan is established for its employees.*
>
> *The City of Chesapeake is committed to establishing pay ranges based upon comparable benchmark job classifications in the six (6) other Hampton Roads municipalities, while retaining internal equity.*

HR conducted its compensation study to include only the neighboring localities and the Hampton Roads Average (excluding Chesapeake.) HR indicated that the City's HR Administrative Regulation limited its ability because of the language *"… establishing pay ranges based upon comparable benchmark job classifications in the six (6) other Hampton Roads municipalities, while retaining internal equity."*

Audit Services conducted an independent review of compensation with regard to the MEO 1, 2 and 3 positions. In reviewing the charts in Exhibit I*, it should be noted that while Chesapeake's MEO 1 and MEO 2 positions ranked fourth overall, and were above both Hampton Roads averages, they were not actually competitive. The MEO 1 position was behind Norfolk by just over $3,600 and behind VA Beach by just under $3,500 and was only competitive with Newport News. The MEO 2 position was behind Virginia Beach

by almost $4,400 and Norfolk and Suffolk by over $2,000. The Chesapeake MEO 3 position was not deemed competitive with other local cities falling below both Hampton Roads averages and fifth behind Virginia Beach by almost $6,000.

- Chesapeake's MEO 1 salaries ranked fourth behind Norfolk, Virginia Beach, and Newport News. For this analysis, it was determined that Norfolk's Equipment Operator I (EO I) job description was not comparable to other cities MEO 1 positions and was not used. For comparison purposes, Chesapeake's MEO 1, 2, and 3 positions were equivalent to Norfolk's EO II, III, and IV positions respectively.
- Chesapeake's MEO 2 salaries also ranked in fourth place behind Virginia Beach, Norfolk, and Suffolk. Chesapeake's MEO 3 salaries ranked below four localities, and the Hampton Roads Averages (including and excluding Chesapeake salaries.)
- Chesapeake's MEO 2 and MEO 3 salaries were not competitive with even the mid-range of other localities offering MEO 1 salaries making it ripe for other localities to offer higher compensation packages to the City of Chesapeake's MEO 2 and MEO 3 skilled, seasoned positions.

Exhibit I: Compensation comparisons between Chesapeake's MEO positions and those of other cities in Hampton Roads - March 16, 2018

Locality		Rg Min	Rg Mid	Rg Max
EO II	NORFOLK	$29,391.00	$38,676.50	$47,962.00
	VIRGINIA BEACH	$29,203.20	$36,264.80	$43,326.40
	NEWPORT NEWS	$26,436.80	$35,079.20	$43,721.60
MEO I	CHESAPEAKE	$25,744.00	$34,111.00	$42,478.00
Hampton Roads Average (including Chesapeake)		$25,357.67	$33,823.16	$42,288.66
Hampton Roads Average (excluding Chesapeake)		$25,280.00	$33,766.00	$42,251.00
	HAMPTON	$21,123.00	$29,552.00	$37,981.00
	PORTSMOUTH	$20,248.00	$29,255.50	$38,263.00
	SUFFOLK	$0.00	$0.00	$0.00
Chesapeake vs. Hampton Roads Average (excluding Chesapeake)		1.80%	1.01%	0.53%
Chesapeake vs. Hampton Roads Average (including Chesapeake)		1.50%	0.84%	0.45%
	VIRGINIA BEACH	$33,862.40	$42,057.60	$50,252.80
EO III	NORFOLK	$31,804.00	$41,834.00	$51,864.00
	SUFFOLK	$31,597.00	$40,602.50	$49,608.00
MEO II	CHESAPEAKE	$29,503.00	$39,092.00	$48,680.00
Hampton Roads Average (including Chesapeake)		$29,132.72	$38,416.59	$47,700.57
Hampton Roads Average (excluding Chesapeake)		$29,071.00	$38,304.00	$47,537.00
	NEWPORT NEWS	$28,080.00	$37,013.60	$45,947.20
	HAMPTON	$26,759.00	$36,125.00	$45,490.00
	PORTSMOUTH	$22,324.00	$32,193.00	$42,062.00
Chesapeake vs. Hampton Roads Average (excluding Chesapeake)		1.46%	2.02%	2.35%
Chesapeake vs. Hampton Roads Average (including Chesapeake)		1.26%	1.73%	2.01%
	VIRGINIA BEACH	$37,377.60	$46,425.60	$55,473.60
	SUFFOLK	$36,579.00	$47,003.50	$57,428.00
EO IV	NORFOLK	$34,445.00	$45,303.00	$56,161.00
	NEWPORT NEWS	$33,654.40	$44,158.40	$54,662.40
Hampton Roads Average (excluding Chesapeake)		$32,666.00	$43,015.00	$53,364.00
Hampton Roads Average (including Chesapeake)		$32,512.43	$42,849.65	$53,186.72
MEO III	CHESAPEAKE	$31,591.00	$41,859.00	$52,126.00
	HAMPTON	$28,097.00	$37,931.00	$47,765.00
	PORTSMOUTH	$25,843.00	$37,267.00	$48,691.00
Chesapeake vs. Hampton Roads Average (excluding Chesapeake)		-3.40%	-2.76%	-2.38%
Chesapeake vs. Hampton Roads Average (including Chesapeake)		-2.92%	-2.37%	-2.03%
	VIRGINIA BEACH	$41,267.20	$51,251.20	$61,235.20
	NEWPORT NEWS	$35,776.00	$47,507.20	$59,238.40
MEO IV	CHESAPEAKE	$34,934.00	$46,288.00	$57,642.00
Hampton Roads Average (including Chesapeake)		$34,327.64	$45,617.38	$56,907.11
	HAMPTON	$32,526.00	$43,910.00	$55,294.00
Hampton Roads Average (excluding Chesapeake)		$27,341.00	$36,360.00	$45,379.00
	PORTSMOUTH	$27,135.00	$39,130.50	$51,126.00
	NORFOLK	$0.00	$0.00	$0.00
	SUFFOLK	$0.00	$0.00	$0.00
Chesapeake vs. Hampton Roads Average (excluding Chesapeake)		21.74%	21.45%	21.27%
Chesapeake vs. Hampton Roads Average (including Chesapeake)		1.74%	1.45%	1.27%

Additional notes about Exhibit I:

- The analysis in Exhibit I includes two averages for Hampton Roads. The first, ***"Hampton Roads Average (excluding Chesapeake),"*** is the average of the six Hampton Roads cities and excludes the City of Chesapeake. The second, ***"Hampton Roads Average (including Chesapeake),"*** is the average of all seven Hampton Roads cities including Chesapeake.
- When looking at the Mid(level) and Max(imum) pay levels for the MEO positions Chesapeake showed no change in position relative to the other cities.

We noted a similar situation for Solid Waste. Waste Management Operator II's in Chesapeake ranked behind three other cities and ranked approximately $2,300 below that regional midpoint (inclusive of Chesapeake).

Exhibit J: Compensation Comparison between Chesapeake's Waste Management Operator II position and those of other cities in Hampton Roads (as of 5/16/2018)

Bechmark #	Locality	Benchmark or COC Job Title	Locality Job Title	Rg Min	Rg Mid	Rg Max
2080	Norfolk	SANITATION WORKER, SENIOR	Refuse Collector Lead	$40,805	$53,696	$ 66,586
2080	Suffolk	SANITATION WORKER, SENIOR	Refuse Equipment Operator II	$34,838	$44,766	$ 54,693
		Hampton Roads Average (excluding Chesapeake)		**$33,425**	**$43,551**	**$ 53,676**
		Hampton Roads Average (including Chesapeake)		**$32,981**	**$43,084**	**$ 53,188**
2080	Hampton	SANITATION WORKER, SENIOR	Solid Waste Equipment Operator II	$30,977	$41,819	$ 52,661
2080	Chesapeake	SANITATION WORKER, SENIOR	Waste Management Operator II	$30,756	$40,752	$ 50,748
2080	Virginia Beach	SANITATION WORKER, SENIOR	Waste Management Operator II	$30,680	$38,121	$ 45,561
2080	Newport News	SANITATION WORKER, SENIOR	Equipment Operator, Senior	$29,827	$39,354	$ 48,880
2080	Portsmouth	SANITATION WORKER, SENIOR	No Match			
Chesapake vs. Hampton Roads Average (excluding Chesapeake)				**-8.7%**	**-6.9%**	**-5.8%**
Chesapake vs. Hampton Roads Average (including Chesapeake)				**-7.2%**	**-5.7%**	**-4.8%**

HR focused on this as a recruitment issue and worked with DPW to delete the Laborer/Operator job class and reclassified the position to Laborer or MEO 1. As of July 1, 2017, HR was no longer requiring MEO 1 positions to have a minimum of a high school diploma or a Commercial Driver's License upon hire. HR only required a minimum of a 10th grade education. HR made this revision in hopes to increase the pool of applicants.

Lowering the educational requirement for MEO 1 positions had the potential to create a succession planning dilemma as the higher positions such as supervisor and crew leader positions required the CDL and a minimum of a high school diploma. If an MEO 1 employee only had a 10th grade education, it would be difficult for that individual to be promoted to higher level lead/supervisory positions with higher educational requirements.

In order to address the staffing shortage, HR held an MEO hiring event on 6/9/2018. According to DPW, HR made the decision to reduce the educational requirements for MEO 1, 2, and 3 positions, thereby lowering the minimum employment

requirements originally established by DPW Operations management. HR would no longer require a minimum high school diploma or equivalent and a CDL license or CDL permit prior to employment. Instead, these positions would require, at a minimum, a 10th grade education.

The photo above is courtesy of DPW Operations. It shows a picture of DPW Operations job advertisement that generated over 200 applicants in a short time

Norfolk Naval Shipyard and the City of Norfolk also held job fairs for technical skilled positions on June 2, 2018 and June 7, 2018, respectively. Norfolk Naval Shipyard hosted its career fair at Chesapeake Conference Center on June 2 and emphasized shipyard career opportunities in the production skill trades. The City of Norfolk Workforce Development Center hosted its Spring Career Fair June 7 with more than 50 employers who planned to attend the event.

On July 2nd, DPW Operations provided a summary of vacant positions subsequent to the Chesapeake MEO Job Fair held on June 9, 2018:

"MEO 1 Hiring Event – PW had 7 vacant positions to fill. We selected 7 + 4 alternates. One of the selectees declined and one disqualified. We picked 2 from the eligibility list (alternates) and 1 being interviewed for MEO3 and one went to PU. Two will be coming onboard and the remaining 5 are in process.

Breakdown of vacant positions as of today:

1. *MEO 1 – 12 vacant, 7 in hiring process, 3 pending advertisement, 2 almost vacant due to promotion*
2. *MEO 2 – 11 vacant, 3 in hiring process, 6 being advertised, 2 almost vacant due to promotion/separation*
3. *MEO 3 - 5 vacant, 3 in hiring process, 1 being advertised, 1 almost vacant due to promotion/separation*

[There are a] total [of] 28 positions. If you take out the 5 almost vacant ones there will be a total of 23 MEO vacant positions."
DPW Operations Manager

In conclusion, without a competitive advantage, DPW had been, and continued to experience employee turnover and staffing shortages. DPW was already losing trained MEOs and Waste Management Operators to other entities.

Recommendation - The City should explore alternate means of becoming more competitive for MEO and other positions. Additionally, the City should also take steps to ensure that any newly hired MEO's can eventually be promoted.

DPW Operations recognized the need for ongoing training and proposed a CHESAPEAKE COLLEGE OF APPRENTICESHIP training program.

> *"Norfolk is hiring our trained operators at higher salary. FYI - VDOT has increased their highway construction and maintenance budget by $37M. Licensed operators are in high demand right now. I was hoping maybe a supplemental pay provision could be applied in this case.*
>
> *In the absence of such a pay provision, I am thinking about proposing incentive plans and/or special pay adjustments for the Operations equipment operator classification in the next budget cycle should market sustain its demand. We receive our maintenance budgets from the VDOT maintenance reimbursement program and SW fees. VDOT's increase in their maintenance budget may support our workforce sustainability proposal."*
> *DPW Operations Division Management*

DPW apprenticeship program would need funding to create apprenticeship positions for training. As an immediate alternative, DPW proposed an incentive plan for MEO 1 positions that would have little impact to the city budget. DPW proposed reducing the starting pay by approximately 20%. After 12 months of service the compensation would be raised by 20% (equivalent to $8K-$10K) upon completion of training, passing the DMV test, and obtaining the Commercial Driver's License. The goal was to build in a financial incentive for new employees and to ensure that new MEOs provide, at a minimum, 12 months of service to the city in exchange for the DPW training time and CDL licensing costs.

In addition to considering the aforementioned proposal, DPW and HR should work with Chesapeake Public Schools, to provide opportunities for any employyees hired without a High School Diploma the opportunity to pursue an equivalency diploma. This will allow these employees to becom eligible for fuure promotions.

Response – ***Although some localities offer higher salaries, they basically face the same retention issue. Private sectors who currently offer higher salaries and bonuses should be included in the benchmarking analysis. However, the current approach to lower education requirements for MEOs to attract entry level applicants will limit promotional opportunities to supervisory and lead crew positions requiring additional formal education.***

The proposed robust training/apprenticeship program will provide the desired competitive edge as an alternative/interim step to competitive salaries. The MEO education requirements may need to be reverted to HS diploma or GED. Almost all MEO Hiring Event applicants had their HS diploma or GED.

3. Tracking and Monitoring of Employee Turnover

Finding - The City did not track, monitor, or report on the status of employee turnover by position within departments and their divisions. Consequently, employee retention at those levels was also not monitored by the City. Additionally, the City did not require exit interviews for separating employees, making it difficult to gain the full understanding for reasons why employees left. Both HR and DPW agreed that changes were needed to address the staffing issues.

According to the City's Employee Handbook (2018).
"All employees are *encouraged* to complete an *online* exit interview before leaving the City, Exit interviews are one of the best ways for us to get true and honest feedback from employees. Your honest feedback will not result in repercussions, and statements made during an exit interview will not be used to prevent future eligibility for rehire. The exit interview is an integral part of the City's employee retention efforts. We are always looking for ways to keep our key employees and we certainly value feedback."

Thus, while the City encouraged exit interview feedback, it was not a requirement, and employees often left City service without completing the form. DPW Operations provided detailed records of its vacancies for a period beginning July 1, 2017 through April 16, 2018. Exhibit I below shows reasons for position turnover during this period.

Exhibit K - Reasons why DPW Operations positions turned over July 1, 2017 to April 16, 2018

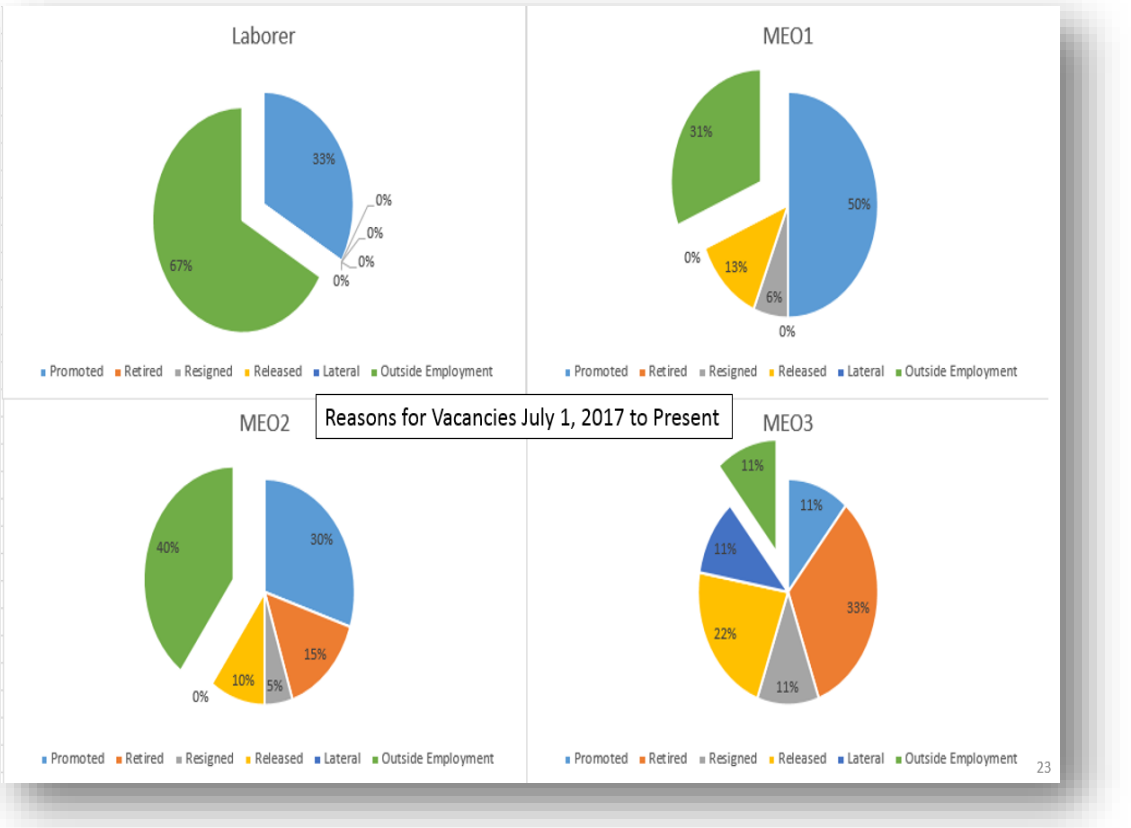
Reasons for leaving		
promoted	32	39.02%
found outside employment	20	24.39%
retired	9	10.98%
released	7	8.54%
unknown	3	3.66%
new position	2	2.44%
demoted	2	2.44%
resigned	2	2.44%
lateral to other Ops division	2	2.44%
deceased	1	1.22%
voluntarily quit	1	1.22%
position transfer from Resou	1	1.22%
	82	100.00%

Source: DPW Operations Management

DPW Operations also provided a breakdown of turnover by specific position.

Exhibit L

Excerpt from DPW's FY2019 Budget 2/6/18 Presentation



The pie charts above show the percentage of laborers and MEOs leaving for various reasons including outside employment from 7/1/2017 to 2/6/2018. Exhibit I shows the number of vacancies and the number of interviews conducted by DPW as of 1/29/2018.

As of April 16, 2018, DPW Operations had 82 vacancies with a total fill rate of 63.41%. MEO 1, 2, and 3 positions made up a total of 60.98% of the vacancies. Bridge Maintenance Mechanics and Bridge Operators made up 14.63% of the vacancies and Laborers made up 6.10%. All other vacancies made up the remaining 18.29%.

Exhibit M
Makeup of DPW Operations' Vacancies (as of April 16, 2018)

Positions	Number of Vacancies	Percentage of Vacancies
MEO 1, 2, and 3	50	60.99%
Bridge Mechanics and Operators	12	14.63%
Laborers	5	6.10%
All Others	15	18.29%
Total	82	**100%**

Source: DPW Management

Within the Engineering section, the delayed placement process directly impacted the workload of the staff, which extended the timeline of capital project work that was in progress. The following is an analysis of turnover from April 8, 2011 through October 17, 2017 in Public Works Engineering, Stormwater Engineering, and Traffic Engineering.

Exhibit N
Engineering Turnover - April 8, 2011 to October 17, 2017

Analysis	Engineers Table	All Others Table	All Positions Table
No. of Positions that Turned Over	9	16	25
Total Positions	26	25	51
Turnover Rate	34.62%	64.00%	49.02%
Total No. of Times Positions Turned Over	13	24	37
Total No. of Vacant Months	92	153	245
Vacancy Savings/Opportunity Cost	$ 493,146.17	$ 555,307.83	$ 1,048,454.00

DPW's performance goal to fill vacant positions within a 90 day period was not being met. The status of DPW Operations vacancies were summarized in Exhibit O. The results showed that only 23.17% of those positions were being filled within the 90 day target. The remaining majority were being filled beyond the 90 day target or many were still vacant as of the date of their report. DPW also provided performance measures regarding recruitment to show evidence of retention issues.

Exhibit O

Status of DPW's Performance Measures of Employee Vacancies	
Of the 82 vacant positions tracked between 7/1/17 through 4/16/2018	
23.17%	(19/82) were filled within the 90 day target window
40.24%	(33/82) were filled beyond the 90 day target window
36.59%	(30/82) had not been filled as of 4/16/18, of the 36.59% ▪ 40% (12/30) were still within the 90 day target window ▪ 60% (18/30) were beyond the 90 day target window
Of the 82 positions that were vacant between 7/1/17 and 4/16/2018	
Average of 24 days	Average number of days to fill the 19 positions that were within the 90 target window
Average of 154 days	Average number of days to fill the 33 positions that were beyond the 90 day target window
Of the 30 positions that had not been filled	
▪ 12 positions were still within the 90 day target window at 21 days	
▪ 18 positions were beyond the 90 day target window at 216 days	

Source: CPW Management

The HR Department also reported in its ***Workforce at a Glance*** presentation in FY2017 that DPW was showing a turnover of its full time staff at 13.45% as of the end of FY2017. According to HR, the turnover chart reflected employee turnover city-wide and that the chart represented the percentage of employees who vacated the city. It did not include employee movement between or within city departments.

Exhibit P

An excerpt from HR's FY2017 "Workforce at a Glance" Chart (a presentation of FT Employee Turnover for DPW

Source: HR Department

The lack of turnover information occurred because the City did not track turnover within the City or within divisions due to Munis system limitations. The lack of exit interview information resulted from the voluntary nature of the City's program. If these items are not addressed. The City will continue to remain unaware of the causes of large portions of employee turnover.

Recommendation - The City should identify ways to more effectively track, monitor, and report on the status of employee turnover by position within departments and their divisions. Similarly, the City should explore methods of increasing the number of exit interviews for separating employees.

The City should consider the following:

- Develop and monitor employee turnover reports that show turnover at various levels from Division, to Department, to City Clusters, and City-wide in order to monitor and manage employee retention.
- Expand methods for exit interviews to encourage greater feedbacks from separating staff, and consider doing in-person interviews in at least some instances as circumstances warrant.

***Response** - The Auditor created additional vacancy reports that were not previously available that showed the length of time vacancies occurred rather than the incidences as was previously available. These reports should be continued and expanded to other departments to show the full impact of lost time due to vacant positions.*

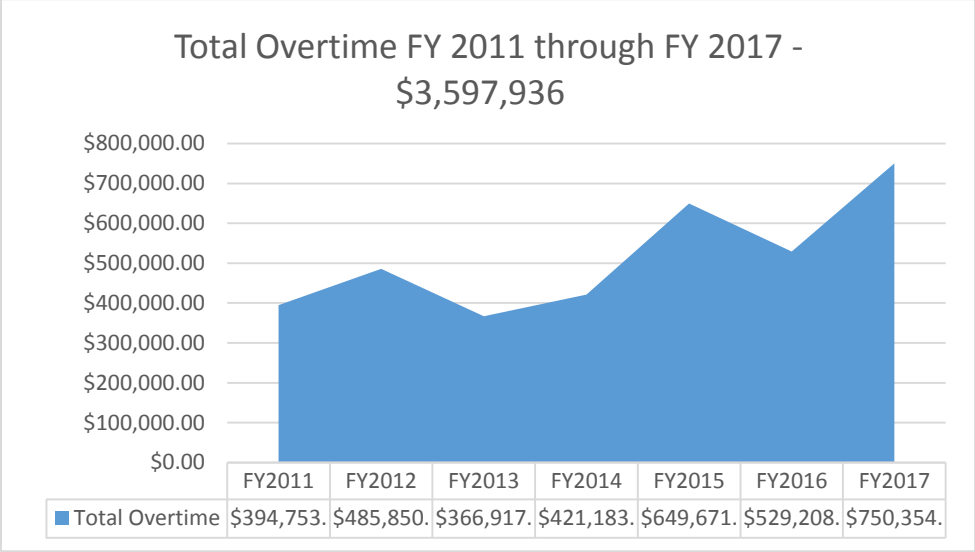
PW Operations initiated independent exit interviews last year. The results indicated that the majority of employees sought outside employment for higher salaries. The records indicate that the department has been successful to promote from within competitively. PW will continue conducting exit interviews and share the results with HR.

4. Overtime Costs

Finding - DPW Overtime costs increased substantially over a seven year period. The increase appeared to be related predominantly to staff shortages.

A fully staffed department should experience limited amounts of overtime. However, significant vacancies can result in substantial overtime costs. DPW was experiencing a steady increase in overtime and was compelled to rely heavily on the existing staff. DPW incurred an increasing obligation of nearly $3.6 million in overtime expenses over a seven year period from FY 2011 through FY2017 due to their chronic personnel shortage. The chart below shows this upward trend in overtime costs over the seven year period. Please note that these overtime amounts include after-hours emergency response times for on-duty officers.

Exhibit Q



Source: City of Chesapeake PeopleSoft Financial System. The amounts are overtime reflected in DPW

This situation was a result of vacancies: as previously noted, DPW experienced 3,228 months of vacancies during that period. While the vacancies produced vacancy savings (estimated $8.6 million) lost productivity and lower morale cold have longer term negative impacts for DPW and the City.

Recommendation – DPW should continue its efforts to reduce vacancies, so that overtime is reduced.

As previously noted, DPW has been working with the City and HR developing initiatives to reduced overtime. These efforts should continue.

Response – We concur with this finding. Some overtime is inevitable due to Public Works emergency management role - snow removal and storm responses. But we also have had to overextend the capability of the workforce to deliver core services under the current vacancy rates (10-15%). Apprenticeship Academy/training seems to be a logical and practical approach to increasing staffing levels thereby lowering overtime costs and maintaining the expected level of service. Although frequent overtime may be attractive to some employees, it promotes fatigue and missing work in the long nm which eventually contributes to high turnover rates.

Alternatively we have had to contract for basic maintenance services to augment our short staffing. For example, the current cave-in repair backlog by contractor amounts to $800,000. At least 60-70% of this work could be completed by the in-house workforce if PW had its full complement.

5. Service Delivery Delays Caused by Staffing Shortages

Finding – DPW was experiencing delayed service delivery due to staffing shortages

Staffing shortages created a backlog of work orders and challenges in reaching DPW strategic performance goals. DPW was responsible for maintaining public drainage systems which received runoff from public property such as streets and sidewalks. With approximately 1,730 miles of public ditches and stormwater pipes and nearly 37,000 drainage structures throughout the City, DPW indicated that the department did not have the resources to clean and clear every ditch in the City every year. Their priority was to respond to emergency situations and customer complaints.

The following tables and charts shows 2013 through 2017 DPW performance measures for Drainage, Stormwater, and Streets Performance data was not available for 2017 as of the date of this report. Exhibit O shows cleaned and repaired declined substantially (from 750 to 15) over a two-year period.

Exhibit R: Budget to Actual Comparisons of Drainage Performance Measures

Drainage		FY2013	FY2014	FY2015	FY2016	FY2017
# of catch basins cleaned & repaired	Budget	600	600	1,000	1,000	250
	Actual	930	750	66	15	
Linear feet of ditch cleared by crew	Budget	400,000	400,000	40,000	38,000	40,000
	Actual	428,208	38,208	38,208	34,500	
Linear feet of pipes rehabilitated	Budget	50,000	50,000	50,000	50,000	45,000
	Actual	52,800	25,000	3,000	99,722	
Linear feet of ditches re-graded	Budget	15,000	not listed	40,000	38,000	35,000
	Actual	6,600	26,982	29,966	56,079	
Linear feet of ditch cleaning (snag & drag)	Budget	400,000	15,000	15,000	15,000	15,000
	Actual	428,208	15,000	18,500	18,500	

Exhibit S shows a decline in FY2016 for both sidewalk and curb/gutter repair:

Exhibit S: Budget to Actual Comparisons of Streets Performance Measures

Streets		FY2013	FY2014	FY2015	FY2016	FY2017
New lane miles added to maintenance	Budget	10	10	12	12	10
	Actual	0	1.78	1.40	18.00	
Linear feet of sidewalks repaired	Budget	3,000	3,000	3,000	3,500	3,200
	Actual	2,189	2,549	3,386	2,402	
Linear feet curb/gutter repaired	Budget	3,500	35,000	3,500	3,500	3,500
	Actual	2,988	1,674	2,332	1,682	
Lane miles of roadway resurfaced	Budget	35	35	50	50	0
	Actual	50	35	38	67	

The City has over 2,300 lane miles of streets
The City has over 1,000 center lane miles

Exhibit T shows challenges meeting projections for pipe washing:

Exhibit T: Budget to Actual Comparisons of Stormwater Performance Measures

Stormwater		FY2013	FY2014	FY2015	FY2016	FY2017
Linear feet of pipes washed	Budget	125,000	125,000	100,000	100,000	75,000
	Actual	90,100	2,575	23,748	10,148	
Detention/retention basins inspected	Budget	650	650	600	600	600
	Actual	543	704	650		
# of erosion/sediment	Budget	4,000	4,000	4,100	4,100	7,000
	Actual	4,097	5,484	7,643	0	
Curb miles swept	Budget	5,030	not listed	5,030	5,030	5,000
	Actual	5,030	4,491	1,168	6,446	

The City has nearly 1,100 miles of underground pipe which equates to 5,808,000 feet.
The City has nearly 37,000 drainage structures.

Source for Exhibits R, S, and T – City Budget Reports

Delayed service delivery resulted in a decline in DPW's ability to keep up with its field operations maintenance and repair commitments. This also increased reliance on existing DPW Operations staff to perform the work, as indicated by the following:

Street Maintenance Backlog - "At the moment, Streets is the most impacted [by position vacancies.] I think this does multiply in its effects on Streets…. It's safe to say that a 31% vacancy rate results in a greater than 31% decrease in output, for several reasons. Most days we have to combine crews because of vacancies to meet work zone or other staffing requirements, so what would have been two separate crews working on separate lists in a day often must become one. (So this scenario amounts to at least a 50% reduction, in principle.) It's difficult to quantify, but the concrete numbers seem to support this. They are at 60% and 46% of estimated production, respectively. Potholes are affected similarly, although the number won't show it as dramatically. Small crews can do multiple small, short-duration repairs, and keep the numbers closer. What suffers are the larger patches that take large crews and/or more work zone requirements. So the remaining backlog [of] potholes tend to be fewer in number but larger in severity and impact to traffic, as well as continued impact on the road condition. Which leads to more requirements for large repairs and contractual expenditures to rehabilitate roads…"

Ditch Maintenance Backlog – "…Regrade numbers do seem to show similar impacts. 30,517 of estimated 60,000."

Cave-in Backlog – "Backlog of cave-ins on our in-house list is about 80. We were able to push and get this down to about 50 at one point, but with the resource shortfall it always seems to go back in the red when the intake frequency spikes. We won't give up on getting ahead of it of course, but it is proving difficult, to say the least. Cave-ins we have had to put on the contractors list show the same trend. They are around 90 now, and have been orbiting around 100-110 for several years. These also tend to be larger and turn-around times longer."

DPW Operations Management

Without sufficient staffing, DPW Operations Division's service level performance, including Waste Management Services, will continue to suffer due to significant shortfalls caused by employee turnover. It is also anticipated that, without the proper repair and maintenance of DPW assets, City streets, stormwater, drainage and other DPW operational assets will deteriorate at a much faster pace and reduce the useful life of city assets. As a result, the City will need to replace these assets sooner than anticipated with the associated cost.

Recommendation –DPW should continue to monitor the impact of service delays and ensure that City management is aware of potential impacts.

Until such time as staffing levels can be restored, DPW should continue to monitor performance measures and ensure that City management is aware of any potential difficulties, so that emergencies can be addressed and public safety maintained.

Response - PW has established Service Goal Days for every major service category. Our annual performance measurement reports track accomplishments in terms of output measures. Those reports show the reduced level of staffing has had a direct impact on our ability to provide timely services to our customers. While priority repairs will be made, routine service responses are being delayed due to lack of staffing - resulting in backlogs or work, longer response times, and delayed completion of work. This is reflected in growing dissatisfaction with the length of time it takes to schedule and complete urgent and routine work.

To help connect our workforce performance to our customers, PW added a new part time position last year to conduct customer satisfaction surveys on the quality and timeliness of services. The data will be used to determine an outcome performance measurement on a semi-annual basis and provide feedback to crews on the satisfaction with their work.

6. DCM Staff Shortage Impacts

Finding – DCM was experiencing staff shortages that required extensive usage of contractors, potentially increasing contract costs.

Staffing shortages created a backlog of work orders and challenges in reaching DPW strategic performance goals. DCM (a subdivision of DPW's Engineering Division) had been experiencing challenges with delayed placement processes for its Project Manager, Engineer, and Construction Inspector positions. After exhausting many alternatives with Human Resources to address the issue, the City supported DCM's decision to utilize consultants to augment vacant engineering positions. As of June 2018, DCM reported $33,194 in additional unanticipated project costs for these consultants. There were also two vacant Construction Inspector positions (of seven in total) which had a significant adverse impact on the inspection process.

As noted in Section B of this report, the DCM staff consisted of 22 FTE's, who were responsible for oversight of the design and construction projects in the City's CIP budget. Due to the large scale of these design and construction projects and limited staffing and slow process for filling vacant positions, DCM staff was required to absorb additional responsibilities which contributed to project delays and additional costs for DCM projects.

DCM management indicated that utilizing consultant contractors more often was effective in helping them meet expectations. DCM had already been using consultants for design and construction management of City projects. However, DCM also began using consultants for staff augmentation to assist with the workload during the process.

For example, after six months of having the staff absorb the workload, DCM decided to contract with a consultant to provide a temporary Project Manager for a vacated Project Manager position. DCM utilized one of its consultant contracts for this purpose, resulting in an unanticipated project cost of $33,194. Although it cost more to hire a consultant, DCM indicated that augmenting the staff through the consultant contract was justified given the department's hiring process limitations.[2] According to DCM management, a Project Manager's compensation (depending on experience) ranged from $90 to $95K utilizing the consultant contract – an amount above the City's minimum salary (about $70K) for a comparable engineer position.[3] Since DPW lacked control over engineering staff compensation, they saw utilizing the consultant as a viable alternative.

As of July 2018, DCM also had two Construction Inspector vacancies. According to DCM, this vacancy was significant because it was equivalent to almost 1/3 of the manpower resource available (2 of 7) to cover inspections.[4] One of the two positions had been vacant for almost six months. The City's HR department had advertised the position on Click but had no results. DCM had also reached out to the Community College bulletin boards and relied on the Public Information Officer to advertise vacant positions.

---

[2] The Project Manager and Inspector Supervisor positions perform a significant role to the city. Those positions are responsible for substantial inspection to ensure the project is compliant with plans. If there are deficiencies, contractors are given 30 days to remedy issues found in the initial and final inspections. Once complete, the Project Manager will sign an acceptance form and release the final payment to the contractor and accept the project to begin the closeout. Operations is notified so that the new street and internal infrastructure becomes part of the City's inventory.

[3] ***Comparison between consultants and in-house engineers.*** According to the DCM, consultants do not have more experience and expertise than in-house engineers. The big difference is that DCM cannot ask for new positions. The division has to work with the existing staff. When the DCM is assigned new projects the DCM is not authorized to hire new engineers. However, the consultants have the flexibility to hire engineers and adjust the number of staffing needed to match the workload. The DCM engineers do a wide range of different projects while consultants are specialized (i.e., bridges, stormwater, etc.). DCM engineers do all of them. The DCM Assistant City Engineer not only looks at staffing, he also determines if he has the right level of expertise in-house.

[4] DCM currently has seven Construction Inspectors (which includes the Inspector Supervisor who supervises all inspectors.) Inspectors are field personnel hired to ensure compliance with project plans. Projects are at different levels of completion at any given time across the City. DCM's seven inspectors are required to cover 2-3 projects at any given time and review the progress of the piping as they are laid in the ground.

While HR appeared to be focus on Operator and Laborer (MEO) positions, DCM management considered utilizing the consultant contracts to fill the two Construction Inspector vacancies. According to the DCM Assistant City Engineer;

> *"There will always be a need to utilize consultants because we will never have all the expertise we need…If we could get continued management support with utilizing consultants, staff augmentation, and on-call contractors, we'll be closer to meeting expectations."*

The delayed placement processes resulted in (1) the redistribution of the workload in order for existing engineering and inspection staff to absorb responsibilities of vacant positions, (2) more utilization of consultants for staff augmentations of DCM Project Manager, Engineer, and Construction Inspector positions, (3) delays in completing Capital Improvement Projects (CIP) and Stormwater projects.

Recommendation - The City should continue supporting DCM in utilizing consultants for specialized projects, on-call consultants, and staff augmentation for vacant positions until filled.

The City should also consider the following to reduce the time it takes to attract applicants and retain employees:

- Expand the classification and compensation study to compare the competitiveness of the City's compensation for Project Managers, Engineer, and other technical positions to other public and private organizations competing for similar positions. Salaries should be adjusted accordingly for new hires and existing positions.
- Hold more frequent job fairs to advertise all vacant position in the DPW.

Response - Public Works concurs with the recommendations. Continued high turnover in the engineering division has significant impacts on project delivery schedules resulting in delayed improvements to our customers and to increased costs due to construction inflation.

7. Other Employee Turnover Impacts

Finding – The City was experiencing a number of other Employee Turnover impacts including higher worker's compensation costs. Increased administrative workload, cost of hiring and training new employees, potentially avoidable City closures, and other costs.

The high employee turnover in DPW was creating other challenges for the City as well. Some of these challenges were as follows:

a. Safety Issues and Costs

Inexperienced/unskilled workers increase the risk of legal liability to the City as they are more prone to accidents and faulty workmanship which may result in injury. Public Safety is a major concern for both DPW as well as Public Utilities. DPW invests a significant amount of time and effort in job inspections, performing on-site training, and safety training. The safety review board focuses on educating staff on workforce safety to minimize the risk of endangering field personnel and citizens alike. For this reason, DPW placed a high priority on hiring individuals that had the necessary skillsets to meet their needs, as opposed to just hiring anyone at minimum cost. We noted that DPW had experienced an uptick from FY 2017 ($271,386) to FY 2018 ($524,622) in worker's compensation cost, as illustrated in Exhibit U.

Exhibit U
DPW Worker's Compensation Costs

Workman's Compensation Data Provided by Risk Management		
Fiscal Year	**Top Three Injuries Reported**	**DPW Workman's Compensation Value**
FY2016	strains, fall/slip, and struck by	$370,850
FY2017	strains, fall/slip, and motor vehicle	$271,386
FY2018 through 5/31/2018	strains, fall/slip, and motor ve [an object]	$524,622

Source: Risk Management Division of Finance

b. Administrative Workload

Employee turnover resulted in increased costs of recruiting to hire new employees to fill the vacated positions. Increase costs to the City attributable to hiring on new employees included:

- Increased administrative time dedicated to advertising, interviewing, screening, hiring, and cost of onboarding new staff (training, management time). Administrative time was also necessary to process terminated employees out of the City's Human Resources, Finance Payroll, IT Computer User Access systems, and other administrative systems.
- Increased training cost necessary for MEOs to obtain their CDL license
- Lost productivity until new employees were trained to operate equipment (6-12 months to train employees on Motor equipment)
- Lowered employee morale.

c. Turnover Costs

Industry standards rated turnover costs for lower level positions from a low of 50% to as high as 150% of an employee's salary each time a position turned over. The percentage increased with higher level positions. These cost included:[5]

[5] In a recent article on employee retention, Josh Bersin of Bersin by Deloitte outlined factors a business should consider in calculating the "real" cost of losing an employee. These bullets were excerpts from Josh Bersin's article of employee retention.

- The cost of hiring a new employee including the advertising, interviewing, screening, and hiring.
- Lost productivity—it may take a new employee one to two years to reach the productivity of an existing person.
- Lost engagement—other employees who see high turnover tend to disengage and lose productivity.
- Customer service and errors—for example new employees take longer and are often less adept at solving problems.
- Training cost—for example, over two to three years, a business likely invests 10 to 20 percent of an employee's salary or more in training

d. Other Costs

Other adverse effects and hidden costs caused by employee turnover include, but are not limited to:

- Increased work load for the remaining staff
- Loss of institutional knowledge
- Shift in DPW management's focus from operations supervisory responsibilities to a constant focus on recruitment, hiring, and training
- Increased technical consultant costs (i.e. project managers and engineers)

Delays in addressing these issues will create risks for DPW field staff and citizens alike. DPW will experience lost opportunity costs and excessive overtime costs, which can be attributed to chronic shortage of personnel due to employee turnover in DPW Operations. In addition the City may experience a reduction in DPW Operations services pertaining to maintenance and repairs to city assets, higher consumption rate of consumable items, and risk of loss due to operating conditions.

Recommendation -The City should monitor cost and impacts in these areas and take action if necessary.

The City should consider the following:

- Continue to ensure that new hires receive appropriate safety training
- Support efforts to make administrative processes associated with making the hiring process more efficient.
- Continue to attempt to maximize the number of equipment operators available in inclement weather situations.
- Monitor employee morale and other potential staff shortage impacts.

Response - Those factors are somewhat expected when the workforce is overextended to meet the day-to-day demands of designing and repairing the streets, bridges and drainage ways safely. We believe that significant lost time (not currently captured) is spent in interview panels, new employee training and orientation, limited productivity of new worker, etc. We concur - the costs including the hidden costs should be collected as a City-wide effort to be analyzed and compared to the cost of impacted employee classification pay increases.

D. Chesapeake Transportation System

The Chesapeake Transportation System (CTS) consisted of the Chesapeake Expressway (Expressway) and Dominion Boulevard Veteran's Bridge (DBVB) Toll Roads. While the Expressway has been operational since 2001, the DBVB just initiated operations on February 9, 2017. Based upon our review of CTS operations, we identified several areas of concern, including concerns related to backroom operations that needed to be addressed for both DBVB and the Expressway.

1. CTS DBVB Operational Issues

Finding – There were a number of areas related to CTS's operation of the DBVB that were experiencing challenges. These areas included the vendor contract, cost of collections for toll-by-plate and VTOLL transactions, incomplete transfer of duties to the new customer services manager, issues with collections on delinquent account written off by the vendor, the resignation of the Fiscal Administrator and insufficient cross training of the accounting staff, and the vendor continuing to send toll notices to accounts with invalid addresses (bad addresses).

Project management best practices should include the following:

- Assignment of a project manager
- Assignment of a vendor project consultant
- Project team selection (should be stakeholders in the project)
- Development of an Approach document
- Development of a Design document
- Identification, monitoring, and communication of key project dates and milestones
- Planning and management of testing activities
- Development of project training requirements
- Performing a minimum of three dress rehearsals prior to implementation
- Determining operational readiness (go, no/go decision)
- Planning and management of implementation and post implementation support

DBVB opened for toll traffic on February 9, 2017. After reviewing various records and discussions with various CTS staff, we determined that CTS was experiencing significant operational challenges from its opening, as evidenced by the following:

- The vendor contract with United Bridge Partners, Dominion, LLC (UBP), for back office invoice processing was heavily weighted in favor of the vendor.
- The cost of collections for Toll by Plate violations and VTOLL (except for EZ Pass) exceeded the revenue collected from those tolls.
- A Customer Service Manager (CSM) was hired on July 22, 2017 to handle the increased workload that the opening of DBVB created. However, all of the position's anticipated responsibilities had not been transferred as of May 2018. Therefore, the existing staff had to absorb the additional workload.

- The process developed for the City Treasurer to collect delinquent tolls and fees did not work as designed. Therefore, collection of delinquent tolls and fees was placed on hold in July 2017 and not reinstated until the beginning of April 2018. Customers had not received any invoices/notifications during that time period.
- The Fiscal Administrator (FA) resigned on March 2, 2018 and the accounting staff had not been fully cross trained to handle all of the FA's job responsibilities. As of May 30, 2018, the FA's position had not been filled.
- The vendor's process for obtaining valid addresses for toll violators with invalid addresses was insufficient. Therefore, numerous toll violators had not received an initial invoice for their outstanding toll fees. This process was still not fully functional as of May 30, 2018.

a. Vendor Contract

The vendor contract between UPB and CTS commenced on February 8, 2016 for a three-year term with two optional renewals of two years each. The UBP contract was due for renewal on February 8, 2019. We found that the vendor contract with UBP for back office invoice processing was heavily weighted in favor of the vendor and was costing the CTS more in collection expenses than actual revenues collected.

In addition, three change orders (COs) had been submitted for the UBP contract. While one, for invalid address processing, was rejected and another, for collections, was still being processed, a CO for VTOLL processing had been approved. As part of the VTOLL CO, UBP could automatically receive $540,000 a year in transaction fees, resulting in the creation of $540,000 in additional fixed costs for DBVB. Also, the CO in process for collections addressed Virginia, but did not address North Carolina (NC) or other out-of- state collection efforts. There was a large volume of toll violators from NC.

b. Cost of Collection for Toll by Plate and VTOLL

From our review of DBVB records and discussions with the Fiscal Administrator, we found that the amount of revenue collected for Toll by Plate and VTOLL was less than the monthly cost of collections. We noted the following, as highlighted in Exhibit S:

- For the period February 2017 thru November 2017, total revenue collected for Toll by Plate was $2,235,730 versus total costs of $3,277,306, resulting in a net loss of $1,041,576.
- For the period February 2017 thru November 2017, total revenue collected for VTOLL transactions was $394,466 versus total costs of the City $617,193, resulting in a net loss of $222,727.
- Combined, revenues for Toll by Plate and VTOLL were $2,630,196 versus expenses of $3,894,499, or a net loss of $1,264, 303. The FA had informed CTS management of this trend.

Exhibit V
DBVB Net Revenue Collections for February – November 2017

	Fiscal YTD 17		Fiscal YTD 18	Total Net Revenue
Toll by Plate:				
Toll by Plate Revenue Collected	781,365.47		1,454,365.00	2,235,730.47
Cost to Collect	1,600,799.35		1,676,506.68	3,277,306.03
Cost to Collect Toll by Plate Revenue (loss)	(819,433.88)		(222,141.68)	(1,041,575.56)
V Toll:				
V Toll Revenue Collected	182,865.50		211,601.00	394,466.50
Cost to Collect	298,059.16		319,134.72	617,193.87
Net Cost V Toll Revenue (loss)	(115,193.66)		(107,533.72)	(222,727.37)
Net Revenue for Non EZ Pass Transactions (loss)	(934,627.54)		(329,675.40)	(1,264,302.93)
EZ Pass:				
EZ Pass Revenue Collected	2,565,580.00		3,048,284.00	
Cost to Collect	174,601.41		207,130.23	
Net Revenue EZ Pass Revenue (loss)	2,390,978.59		2,841,153.77	5,232,132.35
Net Revenue for DBVB Toll Road for the period March 2017 Thru November 2018	1,456,351.05		2,511,478.37	3,967,829.42

c. Customer Service Manager

The Customer Service Manager for the DBVB was hired on July 22, 2017. This position was created to provide management oversight of back office vendor operations in the areas of customer service and toll dispute resolution. We found that all of the job responsibilities for the position had not been transferred to the Customer Service Manager (CSM). The Toll Operations Manager had to absorb the remaining job responsibilities of the CSM. As of May 30, 2018, this position was still not functioning as designed.

We also determined that system reports were not being reviewed to identify high usage toll by plate violators that were not paying their tolls, numerous businesses that were paying their bills each month but were not paying them in full, and violators that had one EZ Pass transponder with multiple vehicles tied to one transponder; therefore, fees had to be processed through VTOLL. There was no plan in place to contact customers to resolve these types of issues.

d. Collection of Written off Accounts

The DBVB toll road opened in February 2017. The City Treasurer had agreed to attempt to collect all of the delinquent toll fees written off of the vendor's automated system. On July 1, 2017, the Treasurer received the first group of written off delinquent accounts totaling $282,000 in tolls and fees, which were posted to the Treasurer's invoicing system.

After mailing the invoices there was a deluge of calls from customers. The Treasurer did not have the resources to handle the high call volume received from disgruntled customers regarding their nonpayment of tolls and fees they owed. Because the Treasurer did not have the resources to handle the increased call volume, incoming calls were transferred to CTS staff for handling. CTS did not have sufficient resources to handle the high volume of calls while keeping up with the day-to-day workload created by the opening of DBVB. CTS management approached the Treasurer and requested that they put the write off collection effort on hold until a plan "B" could be developed and put in place.

On July 28, 2017, delinquent write off accounts collection efforts ceased until a new approach for collecting could be developed. CTS management worked with the vendor to resolve the write off collection dilemma. On December 17, 2017, a temporary agreement was reached with the vendor as to the following: The Treasurer would collect all delinquent accounts greater than $50. The Treasurer received 5,663 delinquent accounts and delinquent tolls with fees totaling $596,274. The vendor would collect all delinquent accounts less than $50. The vendor would handle 30,093 delinquent accounts with delinquent tolls and fees totaling $747,420.

It should be noted that 35,756 delinquent accounts totaling $1,343,694 were written off the vendor's system and maintained on a flat file until a decision was made as to when the delinquent account data would be transferred to the City's invoicing system. The delinquent accounts greater than $50 were not completely transferred to the City's

invoicing system until May 7, 2018. Therefore, for the period July 28, 2017 thru May 7, 2018, all of those accounts were not on the City's or vendor's books.

In addition, these delinquent accounts had not received any invoices/notifications for the delinquent tolls and fees that were owed to the City. During the transition, the vendor ceased writing off accounts and allowed the accounts to remain on their system and continued to send those accounts invoices. Therefore, the number of write off accounts (accounts that were past due in excess of 125 days) that needed to be written off continued to grow in numbers with minimal collection efforts by the vendor. There were no reports created for CTS management to monitor the collection efforts of the vendor.

e. Fiscal Administrator Function

The Fiscal Administrator (FA) performed the daily system reconcilements and processed all journal entries to the PeopleSoft system. The FA also had a full-time job handling the reporting and reconciling for CTS prior to the opening of DBVB. The daily accounting requirements created by the opening of the DBVB toll facility had a significant impact on the accounting function. The FA was the only person who knew how to reconcile the DBVB system, prepare journal entries, and prepare required monthly disclosure reports for CTS. There were two accounting staff members that had been partially cross trained on how to perform the daily and monthly job responsibilities required of the FA in the event that the FA was absent for an extended period of time or resigned from their position. In addition, there were no documented procedures that outlined how to perform the daily and monthly job responsibilities of the FA.

The FA resigned from her position on March 2, 2018. The FA position has had previous turnover issues, and the position had not been filled as of May 31st. The CTS had to hire an outside temp person to assist with the daily and monthly accounting responsibilities. Public Works preferred to have the position jointly overseen by both CTS and Finance to ensure that incumbent's performance was adequate for both CTS and the City, but Finance had not previously concurred with the change.

f. Bad Addresses

After reviewing the bad address report for DBVB and discussing the matter with employees, we noted that for the period February thru August 2017, the vendor did not place mail holds on customer accounts that had returned mail. These accounts continued to age and invoices continued to be mailed regardless of the invoices being returned as undeliverable. The vendor only used the U. S. Postal Service National database to search for the correct better address.

For the period August 2017 thru May 16, 2018, there were 10,840 customer accounts indicated on the bad address report with outstanding toll fees of $229,136. As of May 16th, none of these accounts had received the first invoice for outstanding tolls and fees owed.

g. Fleet Payments (Fees for City vehicles using the DBVB toll road)

City departments that used the DBVB toll road had to pay for their tolls each month. The departments had to go online and look up their invoice for the month's utilization and pay for their tolls. We were informed that the departments were paying their tolls by check which meant that the CTS had to manually process the payments. We also determined that if the departments paid by credit card, the vendor would process the payments and this practice eliminated excess processing time for CTS staff. **This process was corrected during the audit.**

These situations existed because CTS management did not anticipate the volume of work the opening of the DBVB would create for the CTS staff. Therefore, staffing was not sufficient to handle the volume of work. DBVB opened on February 9, 2017, but a Customer Service Manager was not hired until July 22, 2017. As of May 31, 2018, all anticipated duties had not been transferred to the position. The City Treasurer agreed to handle written off accounts received from the vendor. However, CTS management underestimated the volume of inquiries and associated work related to the collection of delinquent toll accounts. Therefore, the Treasurer was overwhelmed with inquires and the collection of delinquent accounts was suspended on July 28, 2017, and was not fully reinstated until May 7, 2018. The CTS Fiscal Administrator (FA) resigned March 2. 2018, and there was no backup for this position. There were no documented procedures and the accounting staff had only been partially crossed trained on the FA's job responsibilities. Finally, mail holds had not been placed on accounts with invalid addresses, causing bills to be sent to them multiple times

If these situations are not addressed, collection of delinquent accounts will continue to be problematic for CTS management. Toll violators may continue to not pay tolls owed to CTS. If the workload situation is not addressed it could affect employee morale and could cause additional employee turnover. If monetary losses for Toll by Plate and VTOLL continue and the delinquent collections process is not successful, it may negatively impact the ability to repay bond holders. Finally, continually sending mail to invalid addresses results in unnecessary postal costs.

Recommendation – CTS management should work with the City Attorney's Office and Purchasing to revise the existing contract with UBP to reduce operational costs. Remaining CSM job responsibilities should be transferred to the position as quickly as feasibly possible. Collection efforts for delinquent toll and fee accounts should be made a high priority. Consideration should be given to having the CTS Fiscal Administrator position jointly overseen by CTS and the Finance Department, and CTS should reevaluate their staffing needs to ensure they have sufficient and cross-trained staff to perform CTS job responsibilities, timely, effectively and efficiently. A process should be developed and implemented for invalid addresses so that toll violators can be invoiced for toll violations.

The following changes should be considered:

- In conjunction with the City Attorney's Office, CTS should evaluate what changes can be made to the UBP contract to improve the City's position. Special attention should be given to any future change orders to ensure they are in the City's financial interest.

- Obtaining a reciprocity agreement with NC for the collection of tolls and fees. In the interim CTS management should develop a collection plan for collecting tolls and fees for North Caronia and other out-of-state toll violators**.**
- Develop a monitoring process so that the CTS management can track the success rate of the collection process that will be in place with the vendor.
- Expand the Customer Service Manager's responsibilities to include developing a marketing and financial strategy that will get more EZ Pass transponders in the hands of toll violators to reduce the cost of collection. For example: System reports should be developed so that the CSM can review and identify high volume violators on the DBVB toll road as well as business that don't pay in full. These customers should be contacted to determine if they understand the invoicing process.
- Closely monitor the vendor's efforts in collecting delinquent accounts.
- Have a backup for the Fiscal Administrator position. In case the FA is absent for an extended period of time and/or resigns. This can be accomplished by cross training qualified staff or having a backup person fully trained on the FA's job responsibilities. This was a critical position for CTS operations
- Establish documented policies and procedures for the FA's job responsibilities and consider having the position jointly overseen by CTS and Finance.
- Develop an invalid address process that requires accounts with returned mail for bad addresses be researched when received and mailed once a new address is found.

Response – (DPW responded to the individual bulleted items. In order:)

- ***CTS, in conjunction with the City Attorney's office and Purchasing staff will be entering negotiations with UBP in preparation for contract renewal in February 2019. The goal of the contract negotiations will be to better refine contract requirements and reduce operational costs.***
- ***A reciprocity agreement with NC falls under the jurisdiction of the Virginia Department of Transportation (VDOT) Toll Division. VDOT has indicated they are currently in discussions with NC to develop a reciprocity agreement that will better enable Va. agencies to seek payment from NC users of Va. toll systems.***
- ***CTS has recently hired a Fiscal Administrator. CTS Management will work with CTS financial staff to develop tracking tools to carefully monitor the success of the delinquent account collection process. UBP is developing a new reporting suite to be implemented with the delinquent toll account collections process to better facilitate monitoring and reporting of delinquent account revenue capture.***
- ***CTS staff conducted several EZPass marketing events prior to and immediately after tolling began, as a result, the EZPass penetration rate is now among the highest EZPass penetration rates at other toll facilities in Virginia. Future increases in EZPass usage are expected to be incremental at best. CTS management and the CSM will investigate further actions to promote transition of toll-by-plate customers to***

EZPass customers. In addition, some duties shall remain with the Toll Operations Manager as they require the most experienced staff members' attention and evaluation. The CSM position can support marketing efforts by using customer service demands to help shape marketing strategy, but actual marketing must be conducted by others (PW PIO or Pub Comm.); this position as currently established does not have financial components as part of the job responsibilities and duties except for taking payment and daily reconciliation activities.

- ***UBP will be implementing additional reporting specific to delinquent accounts and the associated revenue. In addition, CTS Management will work with CTS financial staff to develop monitoring and tracking tools to carefully monitor the success of the vendor's delinquent account collection process.***
- ***CTS Management will discuss and work collaboratively with the Finance Dept. to ensure adequate FA support is available as needed. In addition, through the absence of the FA, current financial staff have been cross training as has existing Finance Dept. staff on the duties, requirements and responsibilities of the FA position. There is currently one senior level accountant in Finance that has been heavily involved in the CTS finances.***
- ***A draft job responsibility document was created prior to the departure of the previous FA. The FA's job responsibilities will be further developed and refined when the new FA begins. CTS would welcome a partnership with finance and the Finance Dept. will continue to exercise oversight and coordinate with the CTS administrator.***
- ***CTS management has worked with the Vendor to implement a more formal skip tracing process for accounts with returned mail (effective June 10, 2018).***

2. CTS Expressway Operations

Finding – The operations function for the CTS Expressway needed improvement in the following areas: segregation of duties related to invoicing and posting of payments, system reconciliation, billing process, and issuance and inventory of EZ Pass transponders.

Effective management best practices for an operation such as the Expressway should include the following:

- Ensuring that key functions, processes and requisite expertise are in place for effective program operations.
- Ensuring that reconciliation processes are in place to check the accuracy of financial data and transactional data and counts.
- Ensuring that segregation of duties exist so that the authorization of a transaction, the recording of a transaction, and maintaining custody of any related assets

should be handled by different personnel. If cash handling duties are performed by different employees, it helps ensure that not one person has complete control over the cash handling process.

- Ensuring that assets are safeguarded. Assets should be under control using locked facilities, drawers, inventories, and if cash frequent cash counts.
- Ensuring that there is accountability: Ensure all cash transactions have been authorized, have been properly accounted for, and have been documented properly. Ensuring accountability among employees also helps to reduce the risk of lost or stolen cash receipts and incorrect recording of transactions.
- Ensuring that business operations and processes include performance-based measures and processes to monitor the program, identify problems or inefficiencies, and develop corrective action when needed.

Our review of Expressway operations and discussions with Expressway staff identified the following concerns.

- The invoicing and mailing process for toll violations was a time-consuming process that needed to be streamed. We found that 200 or more violation invoices were being prepared for mailing by employees each day. The employees had to manually fold and stuff envelopes and then process the envelopes through the mailing machine for postage. This process took time away from their day-to-day workload. Also, invoices with bad addresses had to be manually segregated, as they were not excluded from printing on the automated system, and individuals with more than one invoice had to be manually segregated as well in order to merge the multiple invoices into one mailing.
- At the time of the audit, the mailing of customer invoices for toll violations was at least two months behind.
- The reconcilement and verification of daily cash balancing documentation for the expressway was behind by numerous days.
- EZ Pass transponders were being issued by staff for customers. It took about 20 to 30 minutes of staff time to issue and set up transponders. This process took time away from the day to day work load. Expressway staff indicated that it would reduce staff time if they only issued retail EZ Pass transponders to customers or got someone from central EZ Pass to service customers needing transponders. In addition, issuing retail transponders would create an additional revenue stream for the Expressway.
- The EZ Pass transponder inventories were only being audited once a month. Because several individuals had access to the working supply of transponder inventory, we believe that the working supply of transponders should be counted at the end of each day rather than once a month.
- Segregation of duties was not in place at the time of our audit. We found that the individual who prepared invoices was also the person who processed payments.
- All toll violation payments received by the Expressway were not always being processed on the date received.

- Credit Card payments were processed by one person because there was only one point-of-sale device in the office. In addition, there was no online capability to accept credit card payments for tolls and fines.
- All payments for expressway violations were being processed manually. The expressway lacked the capacity to process violations online.
- Toll collection cash was verified several times which took an excessive amount of time, especially during peak season.

These situations existed because Expressway staff were continuously interrupted to wait on walk in customers which affected their ability to get required daily work completed. Also, a historically high staff turnover resulted in gaps where different positions were vacant, often for an extended period of time, causing both a backlog of work and an office where job functions were not able to be segregated. Another issue was the lack of sufficient online capabilities to allow for both payments and online look ups for simple questions.

If these situations are not addressed the backlog of work may never be caught up, potentially impacting morale and employee turnover. Also, lack of proper segregation of duties may lead to fraudulent activity, and the lack of a frequent inventory of transponders puts them at risk of loss, theft, or accidental depletion.

Recommendation – CTS management should review the operational work flow to find areas to streamline processes to get day-to-day work done in a timely fashion. CTS should consider ways to expedite the selling and inventorying of the E-Z pass transponders and find ways to expedite the counting of all funds.

CTS should consider the following:

- Flag all bad addresses in the automated billing system to suppress the print function.
- Automate the folding and stuffing of invoices.
- Program the system to collate multiple invoices for one address.
- Process all payments on the date received.
- Sell retail toll transponders, allowing the customer to set up their own transponder.
- Inventory the working supply of transponders daily
    - List the serial numbers of the working supply on an inventory sheet and as they are sold complete the required information on the inventory log
- Reduce the mailing backlog for customer toll invoices current and keep them current.
- Use straps and bundle bags during the counting and verification of the toll collection cash.
- Develop processes to reduce the number of times the toll collection cash is handled.
- Implement an online payment process.

Response – (DPW responded to the individual bulleted items. In order:)

- ***Implemented during the audit period.***
- ***Implemented during the audit period.***
- ***System currently in use does not support this function.***
- ***Cross training of administrative staff has been implemented to allow for processing of all payments received by 3 pm; payments received after 3 pm are processed the next business day.***
- ***The Expressway has established itself as a quasi-EZPass customer service center (note that at this time, the Expressway is NOT a full service EZPass customer service center). We have received tentative agreement from VDOT to provide a full time EZPass customer service representative which will allow the Expressway to function as a full service customer service center. As such, we believe it's best to maintain our current EZPass inventory and method of customer service delivery while using a full-time EZPass customer service rep to perform these functions.***
- ***Task has been added to daily closing procedures as follows-list the serial numbers of the working supply on an inventory sheet and as they are issued an inventory log will be completed. Note, this task will be assigned to the EZPass customer service rep.***
- ***Toll invoicing/violation processing is now current (current means 10-days due to VToll process).***
- ***The current process works well with our toll collector audit procedures and allows for immediate identification of discrepancies.***
- ***The current process involves only the toll collector preparing their own deposit which is then verified by the administrative staff the following business day.***
- ***The violations processing system currently in use does not possess this functionality.***

E. Other DPW Operational Issues

We noted that DPW was being required to repair streets transferred to the City by developers earlier than anticipated in some instances due to construction issues. We also noted that areas of the DPW website needed updating.

1. Infrastructure Issues

Finding – Some completed streets submitted by developers to the City were deteriorating more rapidly than expected in some cases, creating additional costs and workload for the City.

According to City Code Section 70-122. - Acceptance of bonding of physical improvements:

(a) Prior to signing of plats for recordation as established under section 70-29 et seq., all physical improvements required by the provisions of this chapter for the subdivisions so platted shall be installed therein, and approved for the conformance with the plans and specifications thereof; except, that in lieu of actual installation of such physical improvements, the subdivider shall execute and furnish to the city an agreement and bond with surety in an amount equal to the total cost of all physical improvements within the subdivision, unless the director of development and permits, or designee determines that sufficient improvements have been made to allow for a credit factor to be established. The amount and duration of the surety bond shall be determined by the director of development and permits, or designee, according to the nature and extent of the improvements required. The agreement shall be executed for the city by the city manager or his or her designee.

(b) Such agreement and bond with surety shall guarantee that all physical improvements will be installed within a certain period from and after the date of the approval of such plat; provided that such time of completion may be extended by the city manager upon application by the owner to the city manager, because of unusual circumstances proven by the owner.

Exhibit W shows DPW's corresponding streets in the subdivisions accepted and approved by Development and Permits in FY 2014-FY 2017 that could experience early deterioration issues. The report shows the status of the streets' pavement conditions on the surface as well as the section hidden beneath the surface of the asphalt. DPW concentrated on the "Pavement" condition numbers because they reflect both the condition of the surface pavement visible to the naked eye and the condition beneath the surface.

Exhibit W: DPW Operations IMS Infrastructure Information

Year Property Accepted by the Department of Development & Permits	Subdivision	Streets Name	Present Condition Number	Surface Condition Number	Pavement Condition Number	Key Performance Indicator Target Grade
2014	Halstead Landing	Bobby Ryan Way	72	92	72	80
2014	Oak Bridge Farms	Disdale Ln	65	80	68	80
2014	Elizabeth Street	Elizabeth Ave	63	92	63	80
2014	The Estates of Grassfield	Majestic Ct	72	93	72	80
2014	Centerville Commons, Phase 2	Appalachian Bv	74	88	78	80
2014	Centerville Commons, Phase 2	Benff Ct	77	81	77	80
2014	Centerville Commons, Phase 2	Allegheny Way	77	89	77	80
2014	Centerville Commons, Phase 2	Teton Ct	79	88	79	80
2015	Dock Landing Road Subdivision	Emerhill Ln	71	60	73	80
2015	Dominion Forest	Destiny Way	73	93	73	80
2015	Hanbury Woods	Queensbury Dr	66	91	66	80
2015	Culpepper Landing Phase 1A	Mill Creek Pkwy	57	68	64	80
2016	Curling Property, Parcel AB Lots A1-A5	Sign Pine Rd	55	81	58	80
2016	Charlestown Shores	Kinderly Lane	54	81	58	80
2016	Charlestown Shores	Stacy Place	63	73	63	80
2016	Calloway Ave Road	Calloway Ave	69	72	69	80
2016	Homestead at Bowers Hill, Phase 1 Section 2	Horseshoe Dr	73	73	76	80
2016	Albemarle River Phase 1A	Copperknoll Ln	73	86	76	80
2017	Boon Acres	Benefit Rd	73	89	77	80

Source: DPW Operation's Infrastructure Info – IMS

Notes to column headings:

"Present" condition number represents the street's rank compared to all other streets within Chesapeake.
"Surface" condition number represents the ranking of the street's surface based on what is visible (i.e., cracks).
"Pavement" condition number represents the combination of various factors including but not limited to the surface, the weight that the road can handle, and what's beneath the road's surface.

With the life expectancy of asphalt being 15-20 years, DPW did not expect the "Pavement" condition number to fall below 80 in just a few years after construction. However, several streets had already fallen below this acceptable key performance grade. We researched DPW's work order system to determine work performed by the work crews in these subdivisions. While the vast majority of streets did not show any service request/work performed (as expected), there were streets where activities have already taken place. The total cost to perform these task so far was $8,909. This amount was anticipated to increase with the premature deterioration of those streets.

Historically, there were other examples, such as 16 drainage system cave-ins with 11 on one street at Greystone when the development was only five to seven years old. Those repairs cost the city $9,365. Repairs to infrastructure at Hickory Plantation cost the City approximately $180,000. DPW indicated that the developer never put the surface course of asphalt down, the base coarse crumbled, the bond expired and DPW reclaimed (rebuilt) the entire road with resurfacing program money for approximately $180,000 – money that could have been spent on another City project.

This situation occurred because City Code gave Development and Permits responsibility for releasing the performance bond even though they were not always in the best position to determine the quality of the construction work performed (DPW possessed the specially required video equipment while Development and Permits did not). Due to this premature deterioration of streets, DPW Operations anticipated that the City will need to dedicate more costs in labor and material to maintain these newer roads to the City's standard. This situation will also contribute to the backlog of work for DPW work crews.

Recommendation – The City should consider revising City Code section to require approval from DPW prior to surety bond release.

The City should consider amending City Code Section 70-122 to create a validation check requiring DPW Operations – responsible for maintaining the infrastructure improvements for the City after acceptance – to maintain and authorize the release of Performance and Defect Bonds upon satisfactory completion of improvements. Such an amendment would reduce the future risk that the City bears infrastructure costs that were supposed to be borne by developers.

Response - ***We concur, the mechanism that establishes departments' authority (the City Code) should be revised to reflect PW (the owner) responsibility to review and accept the completed work prior to the releasing the bonds to ensure it meets city requirements.***

D&P currently reviews and approves development plans, accepts agreements/bonds to guarantee construction of the infrastructure elements according to the approved plans, inspects the construction activities, accepts the improvements for maintenance on behalf of PW and releases the performance as well as defect bonds upon completion of the projects. PW has delegated plan review to D & P. PW then inherits the maintenance responsibility of the new streets and drainage improvements as soon as the performance bond is released. PW has the option of requesting certain requirements through PFM. The PFM addresses design criteria, construction standards and specifications. In reality, many development and construction aspects such as equipment access, easements and particularly non-engineering maintenance requirements are difficult to be simply captured in the PFM

2. DPW Web Pages

Finding – Some Public Works' webpages on the City's website contained out-of-date information and had other issues as well.

Admin Regulation 1.26, Development and Delivery of Official City of Chesapeake Information on the Internet states:

> "The City of Chesapeake provides information to the public through the City's official web site: CityOfChesapeake.Net. The website is designed to provide a consistent point of entry for citizens seeking information online about Chesapeake and to reduce confusion about where to locate official City information. The purpose of the web site is to provide citizen-oriented, accurate and useful information, and to provide opportunities to conduct business transactions with the City of Chesapeake online."

The webpages of the Stormwater Division, as of February 27, 2018, were several years out of date. We noted the following items:

- The performance measures (metrics) used to describe the Stormwater Utility fee dated back to 2013. Subsequent metrics from 2016 indicated the following:

Exhibit X
Stormwater Utility Fee Metrics

Performance Measures from Operating Budget	2016 Actual	2013 Actual	% difference
# of catch basins cleaned & repaired	15	930	-98.39
Linear feet of ditch cleared by crew	34,500	428,208	-91.94
Linear feet of pipes rehabilitated	99,722	52,800	88.87
Linear feet of ditches re-graded	56,079	6,600	749.68
Linear feet of ditch cleaning (snag & drag)	18,500	428,208	-95.68
Linear feet of pipes washed	10,148	90,100	-88.74
Curb miles swept	6,446	5,030	28.15

- The webpage "Best Management Practices" (BMPs) had a hyperlink for "apply for a credit in stormwater fees" to a superseded form.
- The webpage "Chesapeake Stormwater Committee" had no hyperlink to minutes of Committee's meetings.

In addition to the Stormwater discrepancies, as of February 28, 2018, the Motorcycle webpage stated, "If you ride a motorcycle on the Chesapeake Expressway, the cash toll is $1.00 ($2.67 during Peak Weekends). If you use an EZ Pass transponder coded for a motorcycle, the toll remains $1.00 ($2.67 during Peak Weekends)." This information conflicted with the City Council's approved rate schedule of $2.00 for Peak Weekends dated July 13, 2016. (Note: the webpage was updated after this discrepancy was brought to Public Works' attention).

These discrepancies occurred because these webpage had not been updated or reviewed by Public Works as frequently as needed. If this situation continues, the public will not have accurate and useful information in the areas noted.

Recommendation – Public Works should ensure the webpages are reviewed as necessary to ensure the information provided is accurate and timely.

As was noted, Public Works has already addressed the motor cycle fee issue. The department should ensure that the Stormwater pages are maintained and updated in a timely manner as necessary.

Response- ***The PW Public Information Specialist is tasked with updating the Department's webpage. Position is currently vacant which is causing delays in timely updating. Vacancy issue should be resolved by October.***

Appendices

Appendix A

DPW Management Response

Chesapeake VIRGINIA

City of Chesapeake

Department of Public Works
Post Office Box 15225
Chesapeake, Virginia 23328
(757) 382-6101
(757) 382-6310 FAX
(757) 382-8537 FAX

Memorandum

To: Jay Poole, City Auditor

Via: Robert N. Geis, Deputy City Manager

From: Eric J. Martin, P.E., Director of Public Works

Date: September 7, 2018

Re: Public Works Management Response to the Departmental Audit

---

We are pleased to provide our department's formal management response to the recent audit performed by your office. We wish to thank your staff for the thorough and insightful examination of our department and their highlighting of issues that merit attention.

Our response falls into three main sections; PW Operations, PW Engineering and the Chesapeake Transportation System (CTS). After this draft was developed additional information was generated through discussions between Public Works Engineering Division, Waste Management, and the assigned auditor. We request that the draft audit be amended to include the concerns of the Engineering Division to provide a complete picture of the department's challenges with special attention to our continuing staffing and retention problem across the department.

The following attachments make up our response:

1. PW Audit response Attachment 9-7-18
2. Audit Section for DPW Design Construction Management
3. F03 02 Summary of Findings – DBVB responses Final Draft
4. F06 02 Summary of Findings – Expressway Responses

These contain a number of suggested corrections or refinements of the original audit as well as our formal responses to the recommendations. Please contact me at 382-6380 if you have any questions.

Cc: Earl Sorey, P.E., Assistant Director Public Works
Ali Asgharpour, P.E., Operations Manager
John Mundy, PW Fiscal Administrator
Gary Walton, P.E., CTS Administrator

C. Employee Turnover and Staffing Impacts

DPW was experiencing a shortage of qualified field operations personnel and other significant technical positions due to vacancies created by high employee position turnover. The situation was particularly acute for Motor Equipment Operators, since their salaries were not as competitive as they could be. Furthermore, the City was not tracking the employee turnover rate, nor the cost of employee turnover by department. As a result, DPW was experiencing overtime, service delivery, and other adverse impacts. As a result of turnover, DPW experienced 3,228 months of employee vacancies and an increase in operational inefficiencies. The City incurred an obligation of approximately $3.6 million of various known expenses relative to employee turnover between April 8, 2011 and October 17, 2017.

1. High MEO and Other Position Turnover

Finding **-** DPW was experiencing a shortage of qualified MEO personnel and other significant operational and technical positions due to high employee turnover.

Recommendation - DPW should continue to work with the City and HR to take additional steps to address the MEO and other significant position turnover issues.

Response – HR staff planned and executed a major undertaking to recruit MEOs in June 2018. Staff from HR, PW and PU participated in the hiring event from processing applications to conducting interviews and making conditional offers all on a Saturday. The event had received a new level of advertising campaign well before that day. The selected candidates failed to fill the vacant positions due to various reasons. As of today, the number of vacancies remain the same.

PW initiated a similar attempt independently last year by posting a 'Now Hiring· sign at the Greenbrier yard. The sign attracted over 230 local marginally qualified applicants over a short period of time. This attempt coupled with the recent HR Hiring Event indicate that attracting applicants is not the issue. The real issue is RETENTION. Once they are considered, the pay becomes the deciding factor.

The influx of interested local applicants to PW hiring initiative sparked an idea to think 'outside the box'. The question then became 'how can we incentivize this great humane resource to join our workforce?' The answer was either competitive salary to attract and retain qualified candidates or train the marginally qualified applicants. The latter seemed to be the more viable option in the current financial situation.

Motor Equipment Operator In Training (MEOIT) - this program has little or no budgetary impact that places marginally qualified employees in the vacant positions who would receive classroom as well as on the job training. However, a sensible business model needs to be implemented to attract and retain marginally qualified candidates. The program would require administrative actions by HR to hire candidates under-grade and reward them with the difference once they successfully complete the training requirements. Candidates would enter an agreement to remain

in the position for 3 years to receive the pro-rated salary differences. In addition, the incentive plan would provide an achievable path to career advancement as well.

Apprenticeship Academy - this program requires budgeting for 10 new temporary positions plus two qualified trainers. The training program and conditions would be similar to the MEOIT program. Trainees would fill the vacant positions after satisfactory completion of the apprenticeship competitively at the equitable salary rate. The apprenticeship positions would be requested/renewed as needed as part of the annual budget cycles.

2. Salary Competitiveness for MEO and Solid Waste Positions

Finding – MEO and Solid Waste salaries were not as competitive as those in some neighboring localities, and changes made to increase the pool of applicants may adversely impact future promotion for the affected staff.

Recommendation - The City should explore alternate means of becoming more competitive for MEO and other positions. Additionally, the City should also take steps to ensure that any newly hired MEO's can eventually be promoted.

Response - Although some localities offer higher salaries, they basically face the same retention issue. Private sectors who currently offer higher salaries and bonuses should be included in the benchmarking analysis. However, the current approach to lower education requirements for MEOs to attract entry level applicants will limit promotional opportunities to supervisory and lead crew positions requiring additional formal education.

The proposed robust training/apprenticeship program will provide the desired competitive edge as an alternative/interim step to competitive salaries. The MEO education requirements may need to be reverted to HS diploma or GED. Almost all MEO Hiring Event applicants had their HS diploma or GED.

3. Tracking and Monitoring of Employee Turnover

Finding - The City did not track, monitor, or report on the status of employee turnover by position within departments and their divisions. Consequently, employee retention at those levels was also not monitored by the City. Additionally, the City did not require exit interviews for separating employees, making it difficult to gain the full understanding for reasons why employees left. Both HR and DPW agreed that changes were needed to address the staffing issues.

Recommendation - The City should identify ways to more effectively track, monitor, and report on the status of employee turnover by position within departments and their divisions. Similarly, the City should explore methods of increasing the number of exit interviews for separating employees.

Response - The Auditor created additional vacancy reports that were not previously available that showed the length of time vacancies occurred rather than the

incidences as was previously available. These reports should be continued and expanded to other departments to show the full impact of lost time due to vacant positions.

PW Operations initiated independent exit interviews last year. The results indicated that the majority of employees sought outside employment for higher salaries. The records indicate that the department has been successful to promote from within competitively. PW will continue conducting exit interviews and share the results with HR.

4. Overtime Costs

Finding - DPW Overtime costs increased substantially over a seven year period. The increase appeared to be related predominantly to staff shortages.

Recommendation – DPW should continue its efforts to reduce vacancies, so that overtime is reduced**.**

Response – We concur with this finding. Some overtime is inevitable due to Public Works emergency management role - snow fighting and storm responses. But we also have had to overextend the capability of the workforce to deliver core services under the current vacancy rates (10-15%). Apprenticeship Academy/training seems to be a logical and practical approach to increasing staffing levels thereby lowering overtime costs and maintaining the expected level of service. Although frequent overtime may be attractive to some employees, it promotes fatigue and missing work in the long nm which eventually contributes to high turnover rates.

Alternatively we have had to contract for basic maintenance services to augment our short staffing. For example, the current cave-in repair backlog by contractor amounts to $800,000. At least 60-70% of this work could be completed by the in-house workforce if PW had its full complement.

5. Service Delivery Delays Caused by Staffing Shortages

Finding – DPW was experiencing delayed service delivery due to staffing shortages.

Recommendation – DPW should continue to monitor the impact of service delays and ensure that City management is aware of potential impacts.

Response - PW has established Service Goal Days for every major service category. Our annual performance measurement reports track accomplishments in terms of output measures. Those reports show the reduced level of staffing has had a direct impact on our ability to provide timely services to our customers. While priority repairs will be made, routine service responses are being delayed due to lack of staffing - resulting in backlogs or work, longer response times, and delayed completion of work.

This is reflected in growing dissatisfaction with the length of time it takes to schedule and complete urgent and routine work.

To help connect our workforce performance to our customers, PW added a new part time position last year to conduct customer satisfaction surveys on the quality and timeliness of services. The data will be used to determine an outcome performance measurement on a semi-annual basis and provide feedback to crews on the satisfaction with their work.

6. DCM Staff Shortage Impacts

Finding – DCM was experiencing staff shortages that required extensive usage of contractors, potentially increasing contract costs.

Recommendation - The City should continue supporting DCM in utilizing consultants for specialized projects, on-call consultants, and staff augmentation for vacant positions until filled.

Response - Public Works concurs with the recommendations. Continued high turnover in the engineering division has significant impacts on project delivery schedules resulting in delayed improvements to our customers and to increased costs due to construction inflation.

7. Other Employee Turnover Impacts

Finding – The City was experiencing a number of other employee turnover impacts including higher worker's compensation costs. Increased administrative workload, cost of hiring and training new employees, potentially avoidable City closures, and other costs.

Recommendation - The City should monitor cost an impacts in these areas and take action if necessary.

Response - Those factors are somewhat expected when the workforce is overextended to meet the day-to-day demands of designing and repairing the streets, bridges and drainage ways safely. We believe that significant lost time (not currently captured) is spent in interview panels, new employee training and orientation, limited productivity of new worker, etc. We concur- the costs including the hidden costs should be collected as a City-wide effort to be analyzed and compared to the cost of impacted employee classification pay increases.

D. Chesapeake Transportation System

The Chesapeake Transportation System (CTS) consisted of the Chesapeake Expressway (Expressway) and Dominion Boulevard Veteran's Bridge (DBVB) Toll Roads. While the Expressway has been operational since 2001, the DBVB just initiated operations on February 9, 2017. Based upon our review of CTS operations, we identified several areas of concern, including concerns related to backroom operations that needed to be addressed for both DBVB and the Expressway.

1. CTS DBVB Operational Issues

Finding – There were a number of areas related to CTS's operation of the DBVB that were experiencing challenges. These area included the vendor contract, cost of collections for toll-by-plate and VTOLL transactions, incomplete transfer of duties to the new customer services manager, issues with collections on delinquent account written off by the vendor, the resignation of the Fiscal Administrator and insufficient cross training of the accounting staff, and the vendor continuing to send toll notices to accounts with invalid addresses (bad addresses).

Recommendation – CTS management should work with the City Attorney's Office and Purchasing to revise the existing contract with UBP to reduce operational costs. Remaining CSM job responsibilities should be transferred to the position as quickly as feasibly possible. Collection efforts for delinquent toll and fee accounts should be made a high priority. Consideration should be given to having the CTS Fiscal Administrator position jointly overseen by CTS and the Finance Department, and CTS should reevaluate their staffing needs to ensure they have sufficient and cross-trained staff to perform CTS job responsibilities, timely, effectively and efficiently. A process should be developed and implemented for invalid addresses so that toll violators can be invoiced for toll violations.

Response – (DPW responded to the individual bulleted items. In order:)

- *CTS, in conjunction with the City Attorney's office and Purchasing staff will be entering negotiations with UBP in preparation for contract renewal in February 2019. The goal of the contract negotiations will be to better refine contract requirements and reduce operational costs.*
- *A reciprocity agreement with NC falls under the jurisdiction of the Virginia Department of Transportation (VDOT) Toll Division. VDOT has indicated they are currently in discussions with NC to develop a reciprocity agreement that will better enable Va. agencies to seek payment from NC users of Va. toll systems.*
- *CTS has recently hired a Fiscal Administrator. CTS Management will work with CTS financial staff to develop tracking tools to carefully monitor the success of the delinquent account collection process. UBP is developing a new reporting suite to be implemented with the delinquent toll account collections process to better facilitate monitoring and reporting of delinquent account revenue capture.*

- *CTS staff conducted several EZPass marketing events prior to and immediately after tolling began, as a result, the EZPass penetration rate is now among the highest EZPass penetration rates at other toll facilities in Virginia. Future increases in EZPass usage are expected to be incremental at best. CTS management and the CSM will investigate further actions to promote transition of toll-by-plate customers to EZPass customers. In addition, some duties shall remain with the Toll Operations Manager as they require the most experienced staff members' attention and evaluation. The CSM position can support marketing efforts by using customer service demands to help shape marketing strategy, but actual marketing must be conducted by others (PW PIO or Pub Comm.); this position as currently established does not have financial components as part of the job responsibilities and duties except for taking payment and daily reconciliation activities.*
- *UBP will be implementing additional reporting specific to delinquent accounts and the associated revenue. In addition, CTS Management will work with CTS financial staff to develop monitoring and tracking tools to carefully monitor the success of the vendor's delinquent account collection process.*
- *CTS Management will discuss and work collaboratively with the Finance Dept. to ensure adequate FA support is available as needed. In addition, through the absence of the FA, current financial staff have been cross training as has existing Finance Dept. staff on the duties, requirements and responsibilities of the FA position. There is currently one senior level accountant in Finance that has been heavily involved in the CTS finances.*
- *A draft job responsibility document was created prior to the departure of the previous FA. The FA's job responsibilities will be further developed and refined when the new FA begins. CTS would welcome a partnership with finance and the Finance Dept. will continue to exercise oversight and coordinate with the CTS administrator.*
- *CTS management has worked with the Vendor to implement a more formal skip tracing process for accounts with returned mail (effective June 10, 2018).*

2. <u>CTS Expressway Operations</u>

Finding – The operations function for the CTS Expressway needed improvement in the following areas: segregation of duties related to invoicing and posting of payments, system reconciliation, billing process, and issuance and inventory of EZ Pass transponders.

Recommendation – CTS management should review the operational work flow to find areas to streamline processes to get day-to-day work done in a timely fashion. CTS should consider ways to expedite the selling and inventorying of the E-Z pass transponders and find ways to expedite the counting of all funds.

Response – (DPW responded to the individual bulleted items. In order:)

- *Implemented during the audit period.*

- *Implemented during the audit period.*
- *System currently in use does not support this function.*
- *Cross training of administrative staff has been implemented to allow for processing of all payments received by 3 pm; payments received after 3 pm are processed the next business day.*
- *The Expressway has established itself as a quasi-EZPass customer service center (note that at this time, the Expressway is NOT a full service EZPass customer service center). We have received tentative agreement from VDOT to provide a full time EZPass customer service representative which will allow the Expressway to function as a full service customer service center. As such, we believe it's best to maintain our current EZPass inventory and method of customer service delivery while using a full-time EZPass customer service rep to perform these functions.*
- *Task has been added to daily closing procedures as follows-list the serial numbers of the working supply on an inventory sheet and as they are issued an inventory log will be completed. Note, this task will be assigned to the EZPass customer service rep.*
- *Toll invoicing/violation processing is now current (current means 10-days due to VToll process).*
- *The current process works well with our toll collector audit procedures and allows for immediate identification of discrepancies.*
- *The current process involves only the toll collector preparing their own deposit which is then verified by the administrative staff the following business day.*
- *The violations processing system currently in use does not possess this functionality.*

E. Other DPW Operational Issues

We noted that DPW Operations was being required to repair streets transferred to the City by developers earlier than anticipated in some cases due to construction issues. We also noted that areas of the DPW website needed updating.

1. Infrastructure Issues

Finding – Some completed streets submitted by developers to the City were deteriorating more rapidly than expected in some cases, creating additional costs and workload for the City.

Recommendation – The City should consider revising City Code section to require approval from DPW prior to surety bond release.

Response - We concur, the mechanism that establishes departments' authority (the City Code) should be revised to reflect PW (the owner) responsibility to review and

accept the completed work prior to the releasing the bonds to ensure it meets city requirements.

D&P currently reviews and approves development plans, accepts agreements/bonds to guarantee construction of the infrastructure elements according to the approved plans, inspects the construction activities, accepts the improvements for maintenance on behalf of PW and releases the performance as well as defect bonds upon completion of the projects. PW has delegated plan review to D & P. PW then inherits the maintenance responsibility of the new streets and drainage improvements as soon as the performance bond is released. PW has the option of requesting certain requirements through PFM. The PFM addresses design criteria, construction standards and specifications. In reality, many development and construction aspects such as equipment access, easements and particularly non-engineering maintenance requirements are difficult to be simply captured in the PFM

2. DPW Web Pages

Finding – Some Public Works' webpages on the City's website contained out-of-date information and had other issues as well.

Recommendation – Public Works should ensure the webpages are reviewed as necessary to ensure the information provided is accurate and timely.

Response- The PW Public Information Specialist is tasked with updating the Department's webpage. Position is currently vacant which is causing delays in timely updating. Vacancy issue should be resolved by October.

Appendix B

Proposed DPW Apprentice Program

(Source: Public Works)

MEO In Training Program (MEOIT)

As an immediate alternative, the MEOIT initiative may be instituted which basically has no budgetary impact. However, it requires administrative support to hire new and existing employees/trainees undergrade (below the current 5% limit) during the training period and reward graduates with the difference in salary as a bonus.

The MEOIT Program provides a platform for candidates who want to begin a career in Chesapeake Public Works Department. The program positions candidates to be field operators who through training would operate heavy equipment in performing a variety of tasks in the maintenance of the City's infrastructure assets. The training program may be extended to Public Utilities and Parks, Recreation & Tourism.

To qualify for the program, candidates must at a minimum have a valid driver's license and basic understanding of construction work in the areas of excavation, concrete, asphalt and pipe repairs.

The training program is a full-time positon with benefits and is a stepping stone to a future career in higher level MEO and lead/supervisory positions. Successful candidates will start working directly with crew leaders and supervisors to acquire the required licensure, certifications and skill sets as follows:

- Three months – CDL Class B permit, Safety Certification, excavation safety, flagging certification, basic work zone understanding, basic concrete and asphalt placement and finishing skills, basic pipe repair procedures, use of simple and powered hand tools
- Six months – CDL Class B, confined space training, snow plow and salt spreader operation, skilled operation of lower-end heavy machinery such as small excavators, roller compactors, and forklifts
- Nine months – CDL tanker endorsements, intermediate concrete, asphalt, excavation and pipe repair skills, skilled operation of frequently-used motor equipment such as backhoes, bobcats, and front end loaders
- Twelve months – CDL Class A (for MEO 2 and 3), general concrete, asphalt, excavation and pipe repair skills, basic operation of advanced motor equipment such as road graders, concrete trucks, asphalt trucks, bucket and crane trucks, large excavators, vac-trucks and sweepers

An undergrade pay plan would start trainees at the minimum salary rate ($11.53 per hour) for the first 12 months. The employees will then be placed in the position that they were originally hired for (MEO1 – MEO3) and will receive the salary difference in a lump sum at the end of 12 months (or pro-rated over 3 years) – similar to reverse arrears pay.

Graduates of the program are expected to enter an agreement to remain with the City for 3 years after completing the program – similar to CDL agreement.

Required Equipment Operating Skills by Position - PW Operations

Title	Backhoe	Bobcat	Bulldozer	Car\Van\Pickup	Chainsaw	Chipper	Concrete Pump	Crack Sealer/Air compressor	Ditcher Master	Excavator Small	Excavator Tire	Excavator Trac	Forklift	Gradall	Gunite Machine	Motor Grader	Wheel Loader	Rollers	Snow Equipment	Street Sweepers	Tractors/Tractors	Asphalt/Patcher	Truck/Aerial Lift	Truck/Bucket	Truck/Camera	Truck/Concrete	Truck/Crane	TMA/Crash Cushion	Truck/ Dump	Truck/Grapple	Truck/Paint	Truck/Pipewasher	Truck/Snooper
MEO 1	X	X	X	X	X	X		X	X	X		X	X	X			X	X	X		X							X	X				
MEO 2	X	X	X	X	X	X		X	X	X		X	X	X			X	X	X		X	X						X	X			X	
MEO 3	X	X	X	X	X	X		X	X	X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
Crew Leader	X	X		X		X		X				X	X	X		X	X	X	X		X	X				X		X	X	X		X	
Crew Supervisor 1	X	X		X		X		X				X	X	X		X	X	X	X		X	X				X		X	X	X		X	
General Supervisor	X	X		X		X		X				X	X	X		X	X	X	X		X	X				X		X	X	X		X	

Appendix C

Employee Turnover – Supporting Documentation

Appendix C-1
Summary of Key Facts

3,228 months of employee vacancies

(4/8/2011-10/17/2017)

Vacancies created by employee turnover resulted in gaps in DPW service. This gap adversely affected Public Works' Operations, Engineering, and Solid Waste core services and created opportunity costs throughout the DPW.

Employee vacancies provided saving to the city (the equivalent of opportunity cost to DPW) of approximately, $8,668,330 as a result of employee turnover.

The average months of vacancies and related opportunity cost over the 6.5 years was 497 months and $1.3M, respectively.

11 of 19

(4/8/2011-10/17/2017)

Number of service divisions in Public Works with insufficient numbers of skilled personnel to maintain operational tasks without placing additional demands on existing staff. This includes those divisions with turnover greater than 50%.

Work order Backlog Statistics

(7/1/2017-7/13/2018)

Street Maintenance Backlog
- 281 Linear feet of sidewalk
- 948 linear feet of curb & gutter
- 134 miles of Crack Sealing Primary Streets

Contractual Services Backlog
- 88 Cave-ins

Drainage Backlog
- 122,772 linear feet of ditch regraded annually (based on a 7 year cycle)
- 2,452 Pipewasher requests
- 71 Cave-ins (in-house)

Stormwater Backlog
- 1,000 Pipewasher Requests
- 2,679 linear feet of ditch regrading (based on 7 year cycle)
- 8 Cave-ins (in-house)

$3.6M Overtime

(FY2011-FY2017)
Various known expenses relative to employee turnover adversely impacted the city's effectiveness and efficiency of DPW Operational Service Delivery. The *cost of turnover* and *opportunity costs* were not tracked by the city, and therefore not included with this amount.

Operational Impact of Employee Turnover in DPW from the period beginning April 8, 2011 through October 17, 2017:

55.42%	Percentage of positions that experienced employee turnover in all 19 divisions (276/498 positions)
44.58%	Percentage of positions that retained employees in all divisions (222/498 positions)
73.33%	Percentage of MEO positions that experienced high frequency of employee turnover within five DPW Operations divisions. Those divisions were Street Maintenance, Bridges, Drainage, Traffic Engineering, and Storm Water (66/90 positions)
26.67%	Percentage of MEO positions which retained employees from April 8, 2011 through October 2017 (24/90 positions)
560	Cumulative number of times all DPW positions collectively turned over
178	Cumulative number of times MEO positions turned over
3,228 months vacant	Cumulative number of months DPW experienced vacancies across all divisions
1,117 months vacant	Cumulative number of months DPW experienced MEO vacancies which negatively impacted field operations

Financial Impact of Employee Turnover in DPW
from the period beginning April 8, 2011 through October 17, 2017 (cont'd):

$3.6 Million

DWP Overtime was approximately $3.6M incurred from FY2011 - FY2017 This amount includes after-hours emergency response times for on-duty officers.

The city also incurred additional cost each time MEO, Engineering, Waste Management Operators, and other technically skilled positions turned over. Industry standards rates turnover costs for lower level positions from 50% to as high as 150% of an employee's salary each time a position turns over. The percentage increases with higher level positions. This cost includes:[1]

- The cost of hiring a new employee including the advertising, interviewing, screening, and hiring.
- Lost productivity—it may take a new employee one to two years to reach the productivity of an existing person.
- Lost engagement—other employees who see high turnover tend to disengage and lose productivity.
- Customer service and errors—for example new employees take longer and are often less adept at solving problems.
- Training cost—for example, over two to three years, a business likely invests 10 to 20 percent of an employee's salary or more in training

Cost of turnover was unknown. The City did not track the turnover rate routinely, or the cost of turnover for each department to monitor employee retention.

Other adverse effects and hidden costs caused by employee turnover includes, but are not limited to:

- Increased risk to public safety and employee safety
- Increased work load for the remaining staff
- Lowered employee morale
- Loss of institutional knowledge
- Chronic staffing shortages and employee retention issues resulting from high employee turnover, delayed placement of vacancies, and a non-competitive pay structure
- Delays in service delivery and an increased backlog of work orders
- Shift in management's focus from DPW program goals and objectives to a constant focus on recruitment, hiring, and training
- Increase in contractor costs to augment the Operations and Engineering staff due to employee vacancies

---

$3.6 Million*

Estimated known overtime expenses relative to employee turnover in DPW from April 8, 2011 through October 17, 2017

This figure does not include the cost of turnover and the opportunity cost to the DPW

---

[1] In a recent article on employee retention, Josh Bersin of Bersin by Deloitte outlined factors a business should consider in calculating the "real" cost of losing an employee. These bullets were excerpts from Josh Bersin's article of employee retention.

Financial Impact of Employee Turnover in DPW from the period beginning April 8, 2011 through October 17, 2017 (cont'd):

$3.6 Million

DWP Overtime was approximately $3.6M incurred from FY2011 - FY2017
This amount includes after hours emergency response times for on-duty officers.

The city incurred additional hidden costs each time MEO, Engineering, Waste Management Operators, and other technical positions turned over. Industry standards rates turnover costs for lower level positions from a low of 50% to as high as 150% of an employee's salary each time a position turns over. The percentage increases with higher level positions. This cost includes:[1]

- The cost of hiring a new employee including the advertising, interviewing, screening, and hiring.
- Lost productivity—it may take a new employee one to two years to reach the productivity of an existing person.
- Lost engagement—other employees who see high turnover tend to disengage and lose productivity.
- Customer service and errors—for example new employees take longer and are often less adept at solving problems.
- Training cost—for example, over two to three years, a business likely invests 10 to 20 percent of an employee's salary or more in training

Cost of turnover was unknown. The City did not track the turnover rate routinely, or the cost of turnover for each department to monitor employee retention.

Other adverse effects and hidden costs caused by employee turnover includes, but are not limited to:

- Increased risk to public safety and employee safety
- Increased work load for the remaining staff
- Lowered employee morale
- Loss of institutional knowledge
- Chronic staffing shortages and employee retention issues resulting from high employee turnover, untimely hiring practices, and a non-competitive pay structure
- Delays in service delivery and an increased backlog of work orders
- Shift in management's focus from DPW program goals and objectives to a constant focus on recruitment, hiring, and training
- DPW was also experiencing an increase in contractor costs to augment the Operations and Engineering staff due to employee vacancies

$3.6 Million*

Estimated known expenses relative to employee turnover in DPW from April 8, 2011 through October 17, 2017

****This figure does not include the cost of turnover and opportunity cost to the DPW.***

[1] In a recent article on employee retention, Josh Bersin of Bersin by Deloitte outlined factors a business should consider in calculating the "real" cost of losing an employee. These bullets were excerpts from Josh Bersin's article of employee retention.

Appendix C-2 - Department of Public Works: Class B Commercial Driver's License (CDL) & Endorsement Agreement

Chesapeake VIRGINIA

Department of Public Works-Operations
925 Executive Boulevard
Chesapeake, Virginia 23320
(757) 382-3300

Department of Public Works: Class B Commercial Driver's License (CDL) and Endorsement Agreement

As per PW Regulation 109, the Department of Public Works encourages the following employees to earn a Class B Commercial Driver's License (CDL) with air brake endorsement.

- Employees hired as Laborer/Operators (original hire, promotion, demotion, transfer) or any other position hired conditionally with the requirement to successfully earn a Class B CDL with air brake endorsement within six months of hire.
- Existing Laborer and Waste Management Worker I positions.

While licensure may be a requirement of the position, participation in this program is voluntary.

Cost of $750.00 reflects in-house training and license fee.

Reimbursement - In the event the employee voluntarily or involuntarily separates from employment with the City for any reason, he/she is responsible for repayment of licensure as defined below.

Separation Date (from receipt of training)	**Repayment Amount**
1 - 90 calendar days	100% of $750
91 - 180 calendar days	75% of $750
181 – 270 calendar days	50% of $750
271 – 365 calendar days	25% of $750
365+ calendar days	0%

The Department reserves the right to withhold any leave payout due to the employee at the time of separation as full or partial repayment. Repayment of any balance is due within 45 days of separation. If repayment is not made within that time, the City will pursue collection as it does for any other debt. Failure to repay any monies owed may affect rehire eligibility status.

I accept the terms of this agreement as outlined above and agree to repay the Department should I separate from employment.

Employee Printed Name _____ Employee Signature _____ Date _____

Appendix C-3
Audit Analysis of Employee Turnover in MEO Positions
April 8, 2011 - October 17, 2017

Location 4103-41200 Pub Works Street Maintenance	56.36%	31/55
# of FT MTR EQUIP OPER Positior	33	
Turnover in MEO Positions	25	
% of Jobs Turned Over	75.76%	
Average Turnover - All MEO Pos.	2.24	
Average Turnover - MEO Pos. TO	2.96	
Total Turnover MEO	74	
Number of months vacant - MEO	506	

MEO	Total	TO	NTO	# Times
1	14	13	1	43
2	10	6	4	20
3	9	6	3	11
	33	25	8	74

Location 4105-41310 Pub Works Drainage	56.67%	17/30
# of FT MTR EQUIP OPER Positi	21	
Turnover in MEO Positions	14	
% of Jobs Turned Over	66.67%	
Average Turnover - All MEO Pos.	1.43	
Average Turnover - All MEO Pos.	2.142857	
Total Turnover	30	
Number of months vacant	172	

MEO	Total	TO	NTO	# Times
1	0	0	0	0
2	13	9	4	22
3	8	5	3	8
	21	14	7	30

Location 4106-41400 Pub Works Traffic Engineering	45.83%	21/48
# of FT MTR EQUIP OPER Positi	9	
Turnover in MEO Positions	7	
% of Jobs Turned Over	77.78%	
Average Turnover - All MEO Pos.	2.67	
Average Turnover - MEO Pos. TO	3.428571	
Total Turnover	24	
Number of months vacant	99	

MEO	Total	TO	NTO	# Times
1	3	3	0	14
2	5	4	1	10
3	1	0	1	0
	9	7	2	24

Location 4112 - 61000 Pub Works Storm Water	60.00%	45/75
# of FT MTR EQUIP OPER Positi	25	
Turnover in MEO Positions	18	
% of Jobs Turned Over	72.00%	
Average Turnover - All MEO Pos.	1.64	
Average Turnover - MEO Pos. TO	2.277778	
Total Turnover	41	
Number of months vacant	293	

MEO	Total	TO	NTO	# Times
1	11	10	1	26
2	6	3	3	5
3	8	5	3	10
	25	18	7	41

Location 4104-41210 Pub Works Bridges	53.66%	22/41
# of FT MTR EQUIP OPER Positions	2	
Turnover in FT MTR EQUIP OPER Positions	2	
% of Jobs Turned Over	100.00%	
Average Turnover - All FT MTR EQUIP OPER I	4.50	
Average Turnover - MEO Pos. TO	4.5	
Total Turnover	9	
Number of months vacant	47	

MEO	Total	TO	NTO	# Times
1	0	0	0	0
2	0	0	0	0
3	2	2	0	9
	2	2	0	9

Totals

Summary of MEO Turnover Analysis	
Total MEO Positions	90
Total Turnover	66
% Turnover	73.33%
Average Turnover - All MEOs	1.955556
Average Turnover - Turnedover jc	2.666667
Total Turnover	176
Number of months vacant	1117
Converted to years /12	93.08333

Tickmark Legend for tables:
MEO = The level of M Motor Equipment Operators
Total = The total of MEO's at each level
TO = Number of MEO positions that turnovere at each level
NTO = Number of positions that did not turnover
#Times = Represents the number of times positions turned over at each level.
Turnover in each division including MEO positions

Appendix C-4: DPW's Field Force Hiring Issues

Field Force Hiring Issues

As of 01/29/18

Laborer	1 vacancy being advertised
MEO 1	4 vacancies being advertised
	5 vacancies in the hiring process
	9
MEO 2	6 vacancies being interview for 01/30/18
	4 vacancies on hold for reclassifications
	10
MEO 3	1 vacancy I hiring process
	1 vacancy (trade with Traffic)
	2

In 2017 we held the following # of interviews:

Laborer	2
MEO 1	5
MEO 2	12
MEO 3	13

	FTES	EMPLOYEES	VACANCIES	RATE
BRIDGES	43.125	40.025	3.1	7.19%
STREETS	53	50	3	5.66%
DRAINAGE	29	27	2	6.90%
TRAFFIC OPS	33	30	3	9.09%
STORMWATER	102.63	91.625	11.005	10.72%
FACILITIES MAINT	24.375	22.875	1.5	6.15%
WASTE MANAGEMENT	78	77	1	1.28%

As of December 8, 2017 we had 63 vacancies total for an 87% fill rate.
* includes 5 positions pending re-classification

21

Source: Chart is courtesy of DPW Management

Appendix C-5: Comparison of hourly pay rates for Equipment Operators between Indeed.com, VDOT, and City of Chesapeake

Source	Location	Hourly Rate
Indeed.com	PORTSMOUTH-Equipment Operator	$21.65
Indeed.com	NORFOLK - Equipment Operator	$18.71
VDOT	Backhoe Operator	$18.59
VDOT	Asphalt Paver Operator	$18.52
Indeed.com	NATIONAL-Equipment Operator	$18.30
Indeed.com	VIRGINIA-Equipment Operator	$18.26
Indeed.com	NEWPORT NEWS-Equipment Operator	$18.16
Indeed.com	VIRGINIA BEACH-Equipment Operator	$18.07
VDOT	Bulldozer Operator	$16.85
City of Chesapeake	CITY OF CHESAPEAKE - MEO III	$15.19
Indeed.com	CHESAPEAKE-Equipment Operator	$14.85
VDOT	VDOT - front end loader operator	$14.27
City of Chesapeake	CITY OF CHESAPEAKE - MEO II	$14.18
Indeed.com	HAMPTON-Equipment Operator	$13.91
City of Chesapeake	CITY OF CHESAPEAKE - MEO I	$12.38

City of Chesapeake MEO 1, 2, and 3 positions rank among the lowest hourly rates in the Hampton Roads area.

Source: VDOT and Indeed.com websites and the City of Chesapeake

The data in the chart above is from Indeed.com, VDOT, and the City of Chesapeake. Indeed and VDOT data was compiled over two days 5/14/18 and 5/15/18. Indeed.com data includes both public and private positions.

Appendix C-6: Compensation Comparison for DPW Positions

The following tables show compensation comparisons for other DPW positions compared to similar positions offered by other localities as of May 2018. Please note that the following compensation comparison tables in Appendix C-6 rank compensation from the highest to lowest for the purpose of showing how Chesapeake salaries compare to the other localities as well as the Hampton Roads averages.

After the audit testing cutoff period, there were a few Waste Management Operators who took positions with Virginia Beach. The Waste Management Administrator resigned, and the Operations Superintendent retired after over 40 years of employment with the City.

Appendix C-6(1): Compensation Comparison between Chesapeake's Engineer II position and those of other cities in Hampton Roads as of 5/18/2018

Benchmark #	Locality	Benchmark Job Title	Locality Job Title	Rg Min	Rg Mid	Rg Max
475	SUFFOLK	ENGINEER II, CIVIL (STAFF)	Civil Engineer II	$ 62,561	$80,390	$98,219
475	VIRGINIA BEACH	ENGINEER II, CIVIL (STAFF)	Engineer II	$ 61,256	$77,646	$94,037
475	CHESAPEAKE	ENGINEER II, CIVIL (STAFF)	Engineer II	$ 57,908	$76,729	$95,549
475	NORFOLK	ENGINEER II, CIVIL (STAFF)	Civil Engineer III	$ 56,314	$74,195	$92,075
	Hampton Roads Average (including Chesapeake)			**$ 55,974**	**$73,682**	**$93,547**
	Hampton Roads Average (excluding Chesapeake)			**$ 55,588**	**$73,072**	**$93,147**
475	NEWPORT NEWS	ENGINEER II, CIVIL (STAFF)	Engineer II	$ 53,608	$74,567	$95,526
475	PORTSMOUTH	ENGINEER II, CIVIL (STAFF)	Civil Engineer	$ 44,199	$58,564	$85,878
475	HAMPTON	ENGINEER II, CIVIL (STAFF)	NO MATCH			
	Chesapeake vs. Hampton Roads Average (excluding Chesapeake)			**4.01%**	**4.77%**	**2.51%**
	Chesapeake vs. Hampton Roads Average (including Chesapeake)			**3.3%**	**4.0%**	**2.1%**

Source of data provided in Appendix C-6: Locality websites.

Appendix C-6(2) Compensation Comparisons between Chesapeake's Engineer III position and those of other cities in Hampton Roads (as of 5/31/2018)

Locality	Locality Job Title	Rg Min	Rg Mid	Rg Max
VIRGINIA BEACH	Engineer III	$ 71,032	$ 90,043	$109,054
SUFFOLK	Civil Engineer III	$ 68,973	$ 88,631	$108,288
CHESAPEAKE	Engineer III	$ 64,655	$ 85,668	$106,681
Hampton Roads Average (including Chesapeake)		**$ 62,337**	**$ 82,229**	**$104,572**
Hampton Roads Average (excluding Chesapeake)		**$ 61,874**	**$ 81,541**	**$104,150**
NEWPORT NEWS	Engineer III	$ 60,485	$ 84,138	$107,790
NORFOLK	Civil Engineer IV	$ 60,149	$ 79,109	$ 98,068
PORTSMOUTH	Senior Civil Engineer	$ 48,729	$ 65,784	$ 97,549
HAMPTON	NO MATCH			
Chesapeake vs. Hampton Roads Average (excluding Chesapeake)		**4.30%**	**4.82%**	**2.37%**
Chesapeake vs. Hampton Roads Average (including Chesapeake)		**3.6%**	**4.0%**	**2.0%**

Appendix C-6(3): Compensation Comparison between Chesapeake's Waste Management Administrator position and those of other cities in Hampton Roads as of 5/31/2018

Locality	Locality Job Title	Rg Min	Rg Mid	Rg Max
VIRGINIA BEACH	WM Administrator	$ 78,395	$ 99,382	$120,370
NORFOLK	Super WM	$ 72,930	$ 95,768	$118,606
NEWPORT NEWS	Administrator of Solid Waste	$ 72,592	$100,985	$129,377
CHESAPEAKE	WM Administrator	$ 71,599	$ 94,869	$118,139
HAMPTON	Solid Waste Management Superintendent	$ 67,619	$ 91,286	$114,952
Hampton Roads Average (including Chesapeake)		**$ 66,861**	**$ 88,998**	**$113,342**
Hampton Roads Average (excluding Chesapeake)		**$ 66,071**	**$ 88,020**	**$112,543**
SUFFOLK	General Services Super	$ 53,724	$ 71,625	$ 89,526
PORTSMOUTH	Managaer of WM	$ 51,166	$ 69,074	$102,426
Chesapake vs. Hampton Roads Average (excluding Chesapeake)		**7.72%**	**7.22%**	**4.74%**
Chesapake vs. Hampton Roads Average (including Chesapeake)		**6.6%**	**6.2%**	**4.1%**

Appendix C-6(4): Compensation Comparisons between Chesapeake's Waste Management Operations Superintendent position and those of other cities in Hampton Roads as of 5/31/218

Locality	Locality Job Title	Rg Min	Rg Mid	Rg Max
VIRGINIA BEACH	Super Waste Disposal	$ 64,355	$ 81,578	$ 98,800
NORFOLK	Asst. Super. WM	$ 60,149	$ 79,109	$ 98,068
Hampton Roads Average (excluding Chesapeake)		**$ 54,634**	**$ 72,047**	**$ 89,460**
Hampton Roads Average (including Chesapeake)		**$ 54,609**	**$ 72,071**	**$ 89,533**
CHESAPEAKE	WM Ops Superintendent	$ 54,482	$ 72,189	$ 89,896
NEWPORT NEWS	Asst. Admin of Solid Waste	$ 53,608	$ 74,567	$ 95,526
SUFFOLK	Refuse Supercisor	$ 51,470	$ 66,138	$ 80,806
HAMPTON	Solid Waste Collections Systems Supervisor	$ 43,588	$ 58,844	$ 74,099
PORTSMOUTH	NO MATCH	$ -	$ -	$ -
Chesapake vs. Hampton Roads Average (excluding Chesapeake)		**-0.28%**	**0.20%**	**0.49%**
Chesapake vs. Hampton Roads Average (including Chesapeake)		**-0.23%**	**0.16%**	**0.40%**

Source of data provided in Appendix C-6: Locality websites.

Appendix C-7: 2017 US Department of Labor, Bureau of Labor Statistics: Construction Equipment Operators

According to the Bureau of Labor Statistics, the average Median Pay in 2017 for Construction Equipment Operators was $46,080. The median hourly rate of pay was $22.15. The typical entry-level education required for these positions is a high school diploma or equivalent. The overall employment of equipment operators is projected to grow at 12 percent from 2016 to 2026, faster than the average for all occupations, yet varies across construction equipment operator occupations.[1]

UNITED STATES DEPARTMENT OF LABOR

BUREAU OF LABOR STATISTICS

Summary

Quick Facts: Construction Equipment Operators	
2017 Median Pay	$46,080 per year $22.15 per hour
Typical Entry-Level Education	High school diploma or equivalent
Work Experience in a Related Occupation	None
On-the-job Training	Moderate-term on-the-job training
Number of Jobs, 2016	426,600
Job Outlook, 2016-26	12% (Faster than average)
Employment Change, 2016-26	52,700

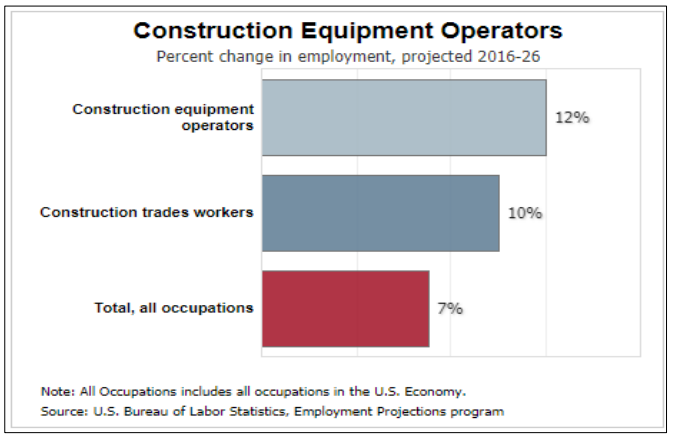
Work Environment

Construction equipment operators held about 426,600 jobs in 2016. Employment in the detailed occupations that make up construction equipment operators was distributed as follows:

Operating engineers and other construction equipment operators	371,100
Paving, surfacing, and tamping equipment operators	51,900
Pile-driver operators	3,700

The largest employers of construction equipment operators were as follows:

Heavy and civil engineering construction	29%
Specialty trade contractors	28
Local government, excluding education and hospitals	14
Mining, quarrying, and oil and gas extraction	6
Construction of buildings	5



[1] Bureau of Labor Statistics website as of 6/7/2018 (https://www.bls.gov/ooh/construction-and-

Source: US Dept. of Labor, Bureau of Labor Statistics website

Appendix C-8: City's MEO Advertisement for June 9, 2018 Hiring Event

Motor Equipment Operators

Keeping The City Moving Forward

Hiring Event - Join The Team

Come learn more about the Motor Equipment Operator I positions, participate in an interview, and possibly receive a conditional job offer on the spot. Operators use a variety of equipment to pave streets, perform cave-in repair, remove snow, maintain water lines, and much more. The City offers an outstanding benefit package and a supportive work environment, with hourly rates starting at $12.37 depending upon qualifications.

Saturday, June 9

9:00 a.m. until 1:00 p.m.

City Hall, 306 Cedar Road

Chesapeake, VA

Qualifications:

Completion of 10th Grade
3-Months of Related, Full-time Experience
Valid Driver's License
Driving Record in Compliance with City Standards
CDL or Ability to Obtain Within 6 Months

BEFORE Attending: You must complete the Motor Equipment Operator I (MEO Hiring Event) application (Requisition #20180188) at www.jobs.cityofchesapeake.net

Bring With You:

- Current Driver's License
- Contact Information for 3 Professional References (Name, Address, Phone Number)
- To expedite the recruitment process, applicants who reside outside of Chesapeake may bring a local background check. If you have an out-of state driver's license, please also bring a DMV Record (obtained on or after May 9, 2018).

For More Details

(757) 382-6492

Selection@CityOfChesapeake.net

Chesapeake VIRGINIA

The City of Chesapeake adheres to the principles of equal employment opportunity. This policy extends to all programs and services supported by the City.

Appendix C-9: Norfolk Naval Shipyard and City of Norfolk Advertisements For their prospective hiring events

Appendix C-10: DPW Operations' Vacancy Situation as of 6/13/2018
Number of Workforce Vacancies (Crew Leader Supervisor and below)

	Positions	Vacancies	CL vacancies	% Vacancies to Positions
Streets and Highways	45	14	1	31.1%
Stormwater	58	9	*1	15.5%
Drainage	27	5	1	18.5%

*According to DPW, Stormwater is about to experience a vacancy in a Crew Leader position soon.

Appendix C-11

DPW Performance Measures for Drainage, Stormwater, Streets & Maintenance, Bridges & Structures, and Contractual Services **(July 1, 2017 through July 13, 2018)**	
Drainage:	
# of work orders generated (All Classifications)	2,855
Linear feet of ditch cleared (Roadside)	881,314
Linear feet of ditch regrades annual Backlog based on 7 year cycle	122,772
Linear feet of ditches re-graded (Roadside)	21,907
Linear feet of pipes washed (All pipes washed)	61,529
Backlog of Pipewasher requests in Linear Ft	2,452
Total Cave-in Requests	537
Cave-ins repaired	466
# backlog of cave-ins (in house)	71
Stormwater Management Operations:	
# of stormwater service requests (All Classifications)	626
Linear feet of pipes washed (All pipes washed)	119,492
Backlog of Pipewasher requests	1,000
Linear feet of ditch cleared by crew	27,155
Linear feet of ditch regrades annual Backlog based on 7 year cycle	2,679
Linear feet of ditches re-graded	8,610
Cave-ins repaired (locations)	87
# backlog of cave-ins (in house)	8
Curb miles swept	11,626
Cycles Completed – Residential	5
Cycles Completed – Primary	3
Street Maintenance:	
# of work orders generated	6,312
Linear feet of sidewalks repaired	1,788
Linear feet of sidewalk backlog	281
Linear feet curb/gutter repaired	1,369
Linear feet of curb/gutter backlog	948
Backlog of Crack Sealing Primary Streets (Miles)	134
# of potholes repaired	11,776
Bridges & Structures:	
# of work orders generated	704
# of bridge openings	7,995

Bridges & Structures (Cont'd):	
# drawbridge malfunctions impacting traffic flow (over 1 hour duration)	6
Bridges/overpasses maintained (106 NBIS structures 6 Non NBIS structures)	106
Bridges/overpasses inspected as scheduled (41 inspections performed in house , 1 by Clark Nexsen)	100%
# structurally deficient bridges (Southgate, 22nd Street, Sunray, Upper Triple Decker, Middle Triple Decker, Centerville Turnpike, Oaklette, Old Mill Culvert, Rotunda, Indian Creek, Number 10 lane, Elbow Road Stumpy Lake bridge)	12
Bridge condition (good, fair, poor)	
Good	84
Fair	9
Poor	10
Unrated because 1st inspection VDOT has not posted sufficiency rating yet	3
# of vessels passed	14,529
Contractual Services:	
# of work orders generated	325
Cave-ins repaired	57
# backlog of cave-ins	88
**Data not yet available	

Appendix C-12: Three-Year Analysis of DPW Preventative Maintenance

Description	FY 13/14	FY 14/15	FY 15/16	3 yr Avg.
Total # of Pipes in the City (linear feet)	5,808,000	5,808,000	5,808,000	5,808,000
Total # of Pipes Washed (linear feet)	2,575	23,748	10,148	12,157
% Completed	0.04%	0.41%	0.17%	0.21%
Total # of ditches in the City (linear feet)	14,256,000	14,256,000	14,256,000	14,256,000
Total # of ditches cleaned (linear feet)	80,190	86,674	109,079	91,981
% Completed	0.56%	0.61%	0.77%	0.65%

1

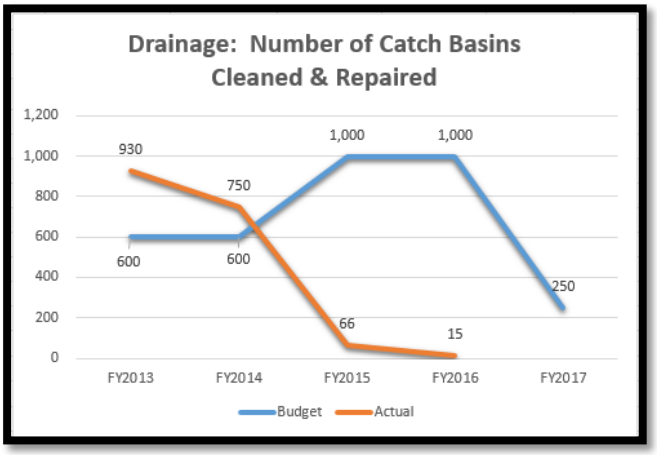
Note:

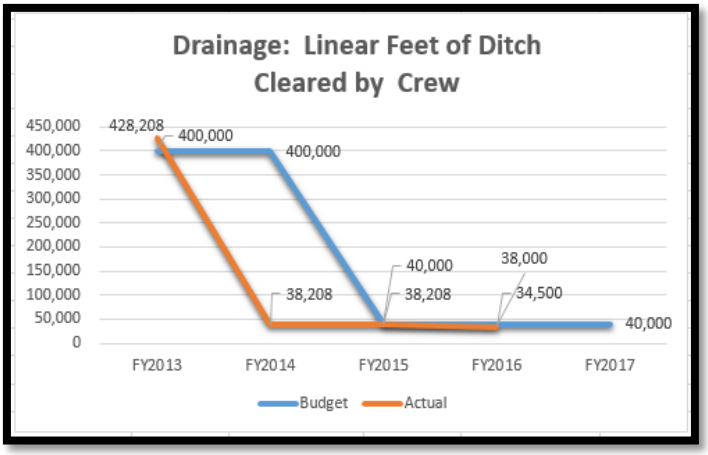
1

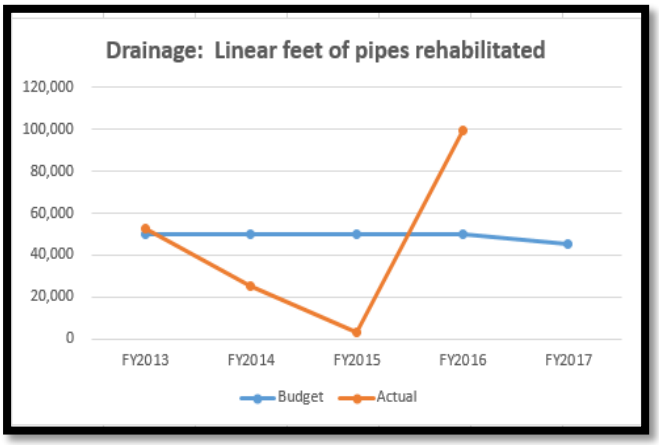
"The total number of ditches cleaned" in Exhibit X was a summation of three components from the City's Operating Budgets for applicable budget years. The three components follow:

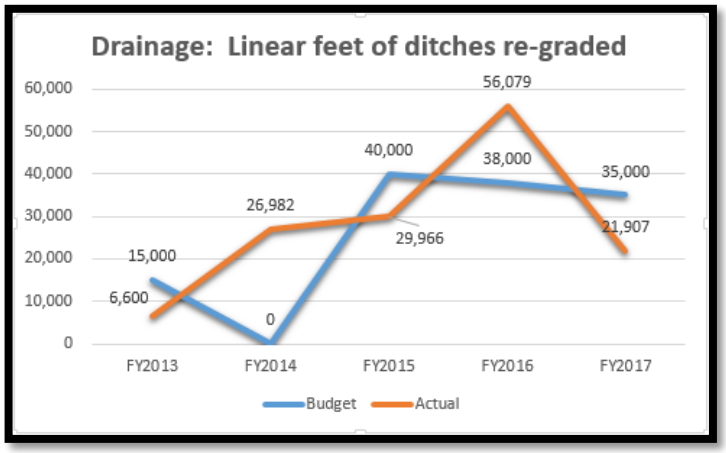
1. *Linear feet of ditches cleared by crew*
2. *Linear feet of ditches cleaned by 3rd party contractor*
3. *Linear feet of ditches regraded*

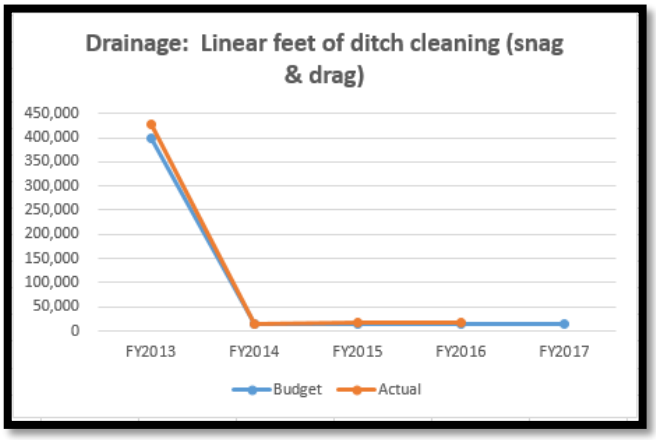
Appendix C-13:
Budget to Actual Comparisons of Drainage Performance Measures







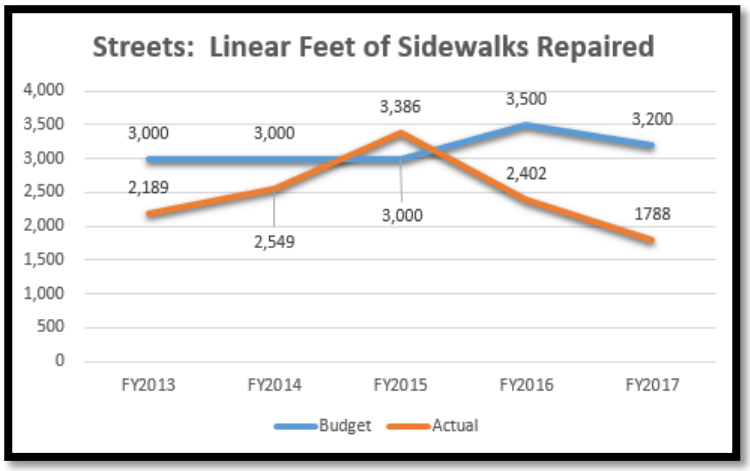


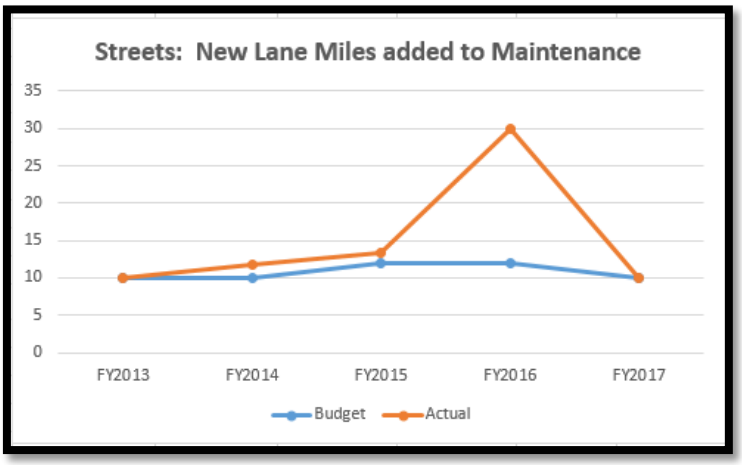


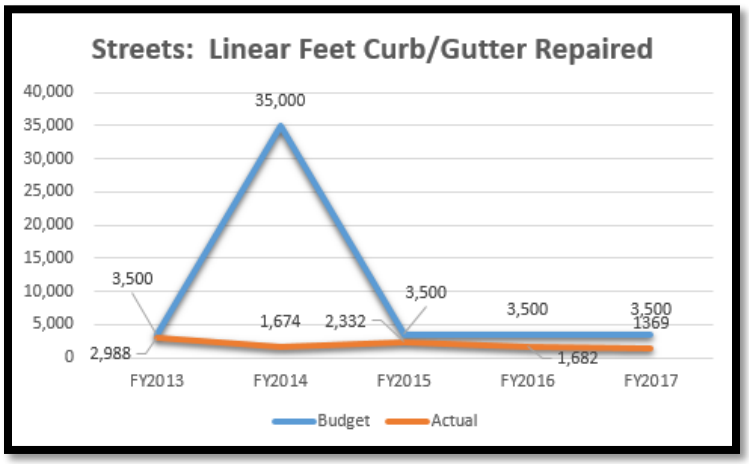
Customer complaints drove decisions on where to apply DPW's resources. The graphs show other areas impacted.

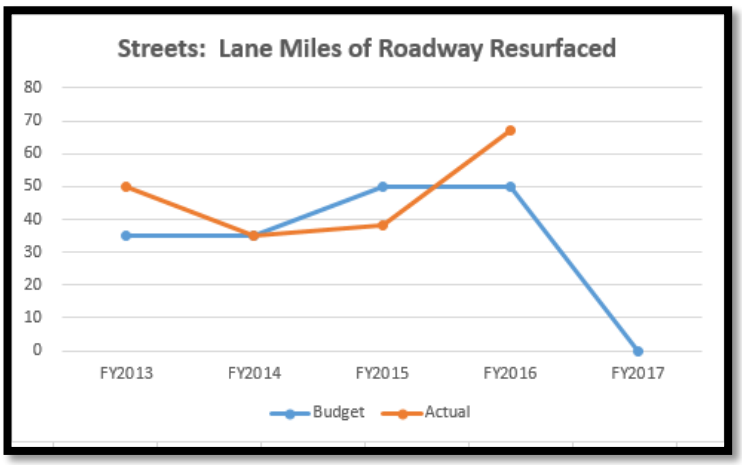
Source: Budget and Actual figures were taken from the City of Chesapeake Budget Reports. Some 2017 Data was not yet available at the time of this audit.

Appendix C-14:
Budget to Actual Comparisons of Streets Performance Measures



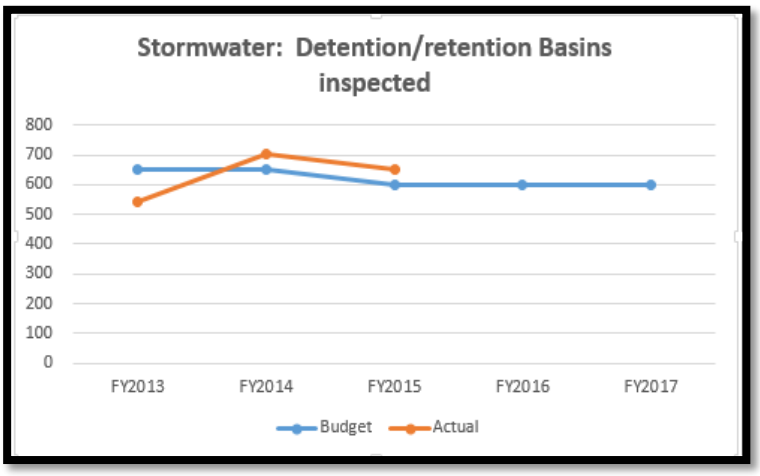


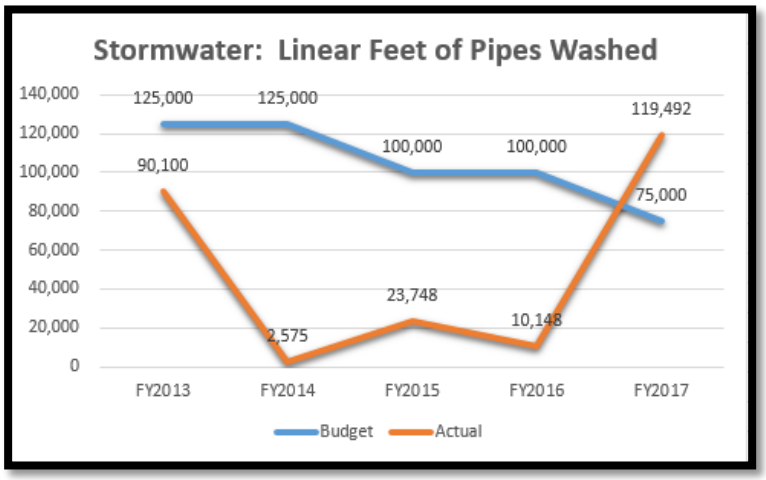


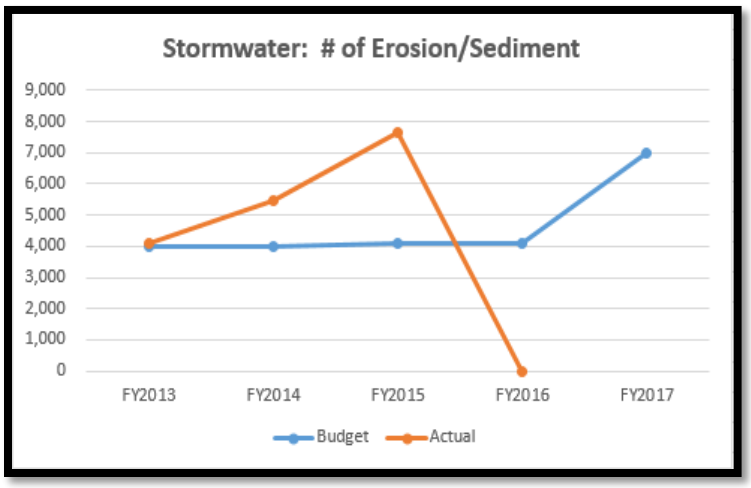


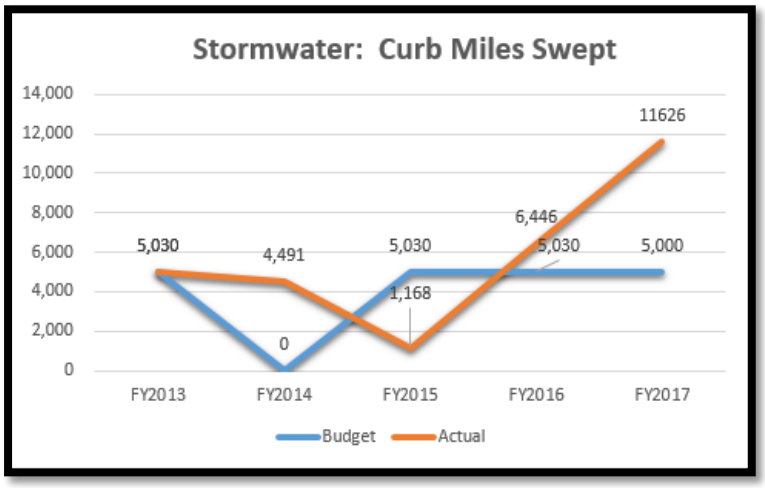
Source: Budget and Actual figures were taken from the City of Chesapeake Budget Reports

Appendix C-15:
Budget to Actual Comparisons of Stormwater Performance Measures









Source: Budget and Actual figures were taken from the City of Chesapeake Budget Reports

Appendix D

Monthly Revenues vs. Costs

Dominion Boulevard Veterans Bridge

Appendix D
Monthly Revenues vs. Costs – Dominion Boulevard Veterans Bridge
February to November 2017

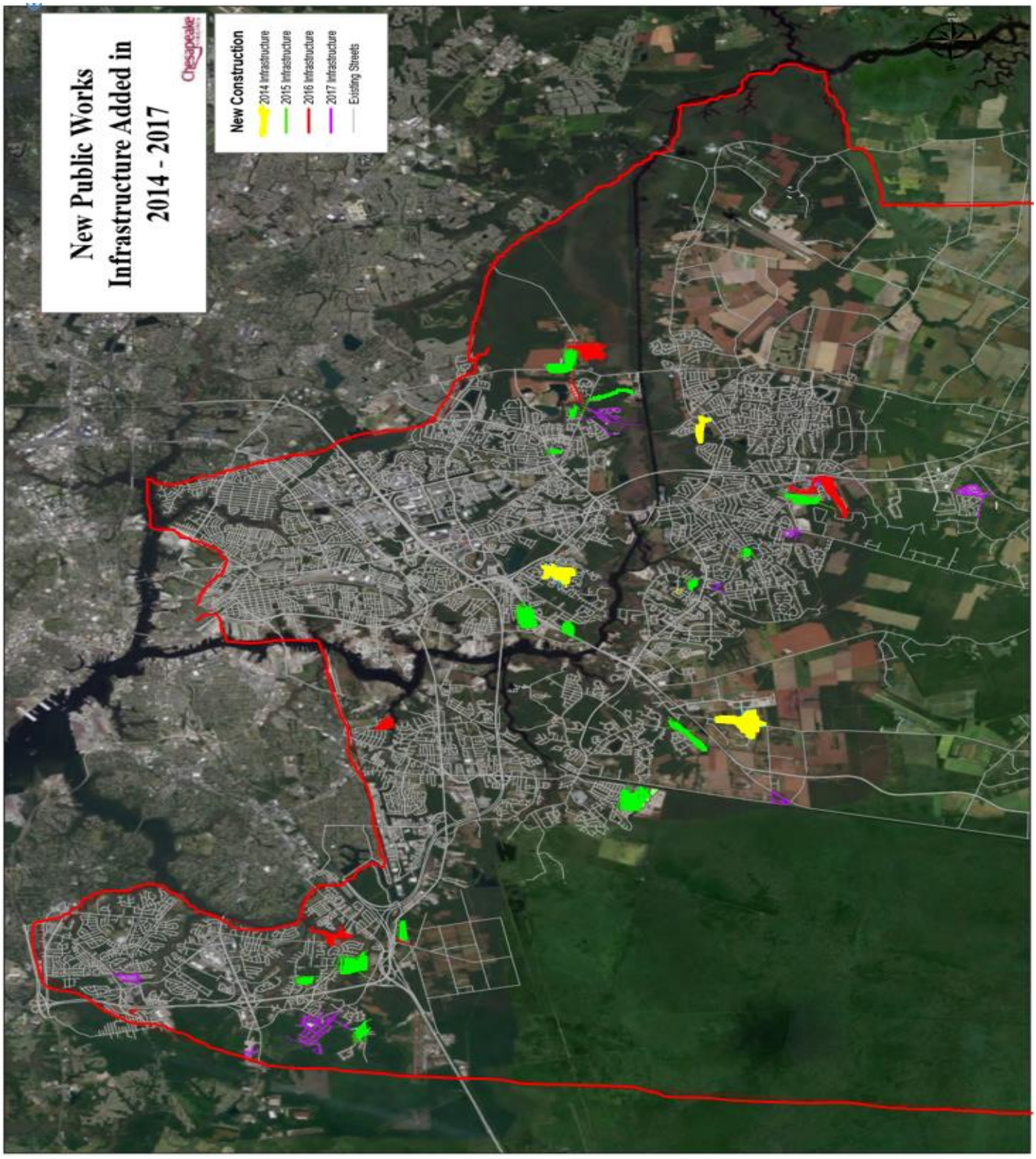
	Feb	Mar	Apr	May	Jun		Fiscal YTD 17		July	August	September	October	November		Fiscal YTD 18
Toll by Plate:															
Toll by Plate Revenue Collected	219.50	97,315.50	166,261.39	240,280.66	277,288.42		781,365.47		295,686.00	313,551.00	293,349.00	275,766.00	276,013.00		1,454,365.00
Cost to Collect	229,417.83	323,082.92	335,864.20	339,424.07	373,010.33		1,600,799.35		337,544.29	323,505.42	342,526.35	338,025.48	334,905.14		1,676,506.68
Cost to Collect Toll by Plate (Loss)	(229,198.33)	(225,767.42)	(169,602.81)	(99,143.41)	(95,721.91)		(819,433.88)		(41,858.29)	(9,954.42)	(49,177.35)	(62,259.48)	(58,892.14)		(222,141.68)
V Toll:															
V Toll Revenue Collected	22,209.00	38,629.00	38,145.00	41,334.00	42,548.50		182,865.50		42,108.00	41,249.00	42,245.00	43,673.00	42,326.00		211,601.00
Cost to Collect	43,305.56	62,870.99	62,977.33	64,016.34	64,888.94		298,059.16		63,919.44	63,328.86	63,896.09	64,212.79	63,777.54		319,134.72
Net V Toll Revenue (Loss)	(21,096.56)	(24,241.99)	(24,832.33)	(22,682.34)	(22,340.44)		(115,193.66)		(21,811.44)	(22,079.86)	(21,651.09)	(20,539.79)	(21,451.54)		(107,533.72)
Net Revenue for non EZ Pass Transactions (Loss)	(250,294.89)	(250,009.41)	(194,435.14)	(121,825.75)	(118,062.35)		(934,627.54)		(63,669.73)	(32,034.28)	(70,828.44)	(82,799.27)	(80,343.68)		(329,675.40)
EZ Pass:															
EZ Pass Revenue Collected	293,562.00	573,297.00	532,010.00	583,593.00	583,118.00		2,565,580.00		577,272.00	541,950.00	669,125.00	646,226.00	613,711.00		3,048,284.00
Cost to Collect	21,249.10	37,513.13	36,217.22	40,164.94	39,457.02		174,601.41		38,888.53	41,463.15	40,952.55	44,079.14	41,746.86		207,130.23
Cost to Collect EZ Pass Revenue	272,312.90	535,783.87	495,792.78	543,428.06	543,660.98		2,390,978.59		538,383.47	500,486.85	628,172.45	602,146.86	571,964.14		2,841,153.77

Appendix E

DPW City Infrastructure Growth Challenges

Appendix E-1: GIS Aerial View of New DPW Infrastructure Added in 2014-2017

The purpose of this picture is to show the growth of the DPW infrastructure over the last four years. Existing infrastructure prior to 2014 is highlighted in gray. DPW is required to maintain the newly added infrastructure while still maintaining the old. Due to limited resources, customer complaints drive decisions on where to apply DPW resources.



Source: Developed by Lance Brown, PWC's Senior GIS Analyst

Appendix E-2: Development and Permits' List of Chesapeake Locations with the New DPW Drainage Facilities and Stormwater Infrastructures

The old DPW infrastructure prior to 2014 is highlighted on Appendix E-1 in gray and the new infrastructure beginning in 2014 through the first half of 2017 are highlighted in various colors. These infrastructures were highlighted in Appendix E-1.

Planning Reference No.	Account Number	Subdivision Street Name
City of Chesapeake Streets, Drainage, and Stormwater infrastructure locations prior to 2014		
See streets and infrastructure highlighted in gray.		
2014 First Half		
140107	122004 01	Halstead Landing
140204	112004 01	Old Towne Terrace
140313	122027 01	Oak Bridge Farms
140508	112018 01	Elizabeth Street
2014 Second Half		
141015	132013 01	Charlton Drive Subdivision
141030	072052 12	The Estates of Grassfield Meadows, Phase 2
141211	112008 02	Ceterville Commons, Phase 2
2015 First Half		
150220	132023 01	Cumberland Farms
150210	122016 01	Dock Landing Raod Subdivision
150602	082007 01	Dominion Forest
150619	132038 01	Hanbury Woods
2015 Second Half		
150730	052064 01	Arlington Meadows
150910	062053 01	Culpepper Landing, Phase 1A
150910	062053 71	Culpepper Landing, Phase 1MX
150910	062053 02	Culpepper Landing, Phase 1B
2016 First Half		
170213	142008 11	Curling Property, Parcel AB Lots A1-A5
160609	132019 01	Charlestown Shores
160809	142046 01	Glen Landing
160811	132036 00	Calloway Avenue Road Improvements
2016 Second Half		
170601	102020 01	Benefit Meadows
161012	142056 01	Fieldstone, Phase 1 & Phase 2
161230	122021 02	Homestead at Bowers Hill, Phase 1, Section 2
170213	052015 01	Jolliff Woods, Section 6
2017 First Half		
170531	072012 21	Albemarle River, Phase 1A
170403	162026 01	Bella Manor
170602	152018 01	Boon Acres
161012	142056 01	Fieldstone, Phase 1 & Phase 2

Source: Development and Permits

Appendix E-3: DPW Operations IMS Infrastructure Information

Subdivision	Streets	IMS Street	PRESENT	SURFACE	PAVEMENT	FROM STREET		TO STREET		LENGTH	WIDTH
Halstead Landing	Bobby Ryan Way	BOBBY RYAN WY	72	92	72	ST BRIDGE	RD	WEST	END	1295	24
Old Towne Terrace	Hugh Lane	HUGH LN	84	92	84	BACK	RD	SOUTH	END	715	24
	Joan Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Oak Bridge Farms	Dissdale Ln	DISSDALE LN	65	80	68	WEST	END	PLANEFIELD	AV	1581	27
Elizabeth Street	Elizabeth Ave	ELIZABETH AV	63	92	63	BROAD	ST	SOUTH	END	456	20
Charlton Drive Subdivision	Charlton Dr	CHARLTON RD	73	88	80	DS@660S	CREEKVI	SOUTH	END	1283	19
The Estates of Grassfield	Majestic Ct	MAJESTIC CT	72	93	72	EQUISTRIAN	TR	WEST	END	758	24
Ceterville Commons, Phase 2	Appalachian BV	APPALACHIAN BV	86	92	86	CENTERVILLE TRN	PIKE	EAST	END	564	24
	Appalachian Ct	APPALACHIAN CT	74	88	78	APPALACHIAN	BV	SOUTH	END	2096	24
	Banff Ct	BANFF CT	77	81	77	APPALACHIAN	CT	EAST	END	554	24
	Allegheny Way	ALLEGHENY WY	77	89	77	BANFF	CT	TETON	CT	239	24
	Teton Ct	TETON CT	79	88	79	APPALACHIAN	CT	EAST	END	541	24
	Rockies Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cumberland Farms	Green Sea Trl	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dock Landing Road Subdivision	Emberhill LN	EMBERHILL LN	71	60	73	EAGLE HILL	DR	EAST END	END	1040	27
Dominion Forest	Monarch Reach	DESTINY WY	92	94	92	MONARCH	REACH	SOUTH	END	686	24
	Destiny Way	MONARCH REACH	73	93	73	SOUTH	END	CHERRYTREE	LN	931	27
Hanbury Woods	Newtown Lane	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Renwood Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Claremont Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Hanven Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Leyland Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Chaffins Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Queensbury Dr	QUEENSBURY RD	66	91	66	WEST	END	EAST	END	298	27
	Edinburgh Pkwy	EDIN BURGH PKWY	77	90	83	ST. BRIDGES	RD	NORTH	END	10923	43.5
Arlington Meadows	Penrose Ln	PENROSE LN	86	95	86	SOUTH	END	NORTH	END	834	24
	Waycroft Reach	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sybilla St	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Mill Creek Pkwy	Mill Creek Pkwy	57	68	64	CONSERVANCY	DR	GEO WASH HWY	HWY	4831	43.4
	Codorus St	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Robert Frost Rd	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Patrick Henry Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Dunmore Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Culpepper Landing Phase 1A	Beecher Stow St	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Farange Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Meanley Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Colonel Byrd St	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Conservancy Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Dodd Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Mercantile st	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Culpepper Landing, Phase 1MX	Conservancy Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Nesbit Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Shingle St	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Culpepper Landing, Phase 1B	Meanley Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Colonel Byrd St	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Beecher Stow St	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Dunmore Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Patrick Henry Dr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Robert Frost Rd	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sybilla St	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Curling Property, Parcel AB Lots A1-A5	Sign Pine Rd	SIGN PINE RD	55	81	58	BENEFIT	RD	DS@3000N	BENEFI	3000	18
	Benefit Rd	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Charlestown Shores	Kinderly Lane	KINDERLY LN	54	81	58	PVMT	CHANGE	SOUTH	END	475	27
	Stacey Place	STACEY PL	63	73	63	SOUTH	END	GASSETT	CT	541	27.4
Glen Landing	Glen Landing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Calloway Avenue Road	Calloway Ave	CALLOWAY AV	69	72	69	BAINBRIDGE	BV	WEST	END	420	16
Benefit Meadows	Benefit Rd	BENEFIT RD	78	95	80	WEST	RD	DS@1000E	CURLIN	4000	21
Fieldstone, Phase 1 & Phase 2	Fieldstone Run	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Ashlar Ln	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Gibraltar Ln	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Graphite Trail	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Silverton Way	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Stonetrail Run	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Carrera Ridge	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Travertine Way	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sandstone Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: DPW Operation's Infrastructure Info – IMS

Notes to column headings:

"Present" condition number represents the street's rank compared to all other streets within Chesapeake.
"Surface" condition number represents the ranking of the street's surface based on what is visible (i.e., cracks).
"Pavement" condition number represents the combination of various factors including but not limited to the surface, the weight that the road can handle, and what's beneath the road's surface.

Appendix E-3 (cont'd): DPW Operations IMS Infrastructure Information

Subdivision	Streets	IMS Street	PRESENT	SURFACE	PAVEMENT	FROM STREET		TO STREET		LENGTH	WIDTH
	Sapphire Rd	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Homestead at Bowers Hill, Phase 1, Section 2	Blacksmith Trail	BLACKSMITH TRL	85	74	86	BENEFIT	RD	SOUTH	END	2241	28.1
	Horseshoe Dr	HORSESHOE DR	73	73	76	BLACKSMITH	TRL	BLACKSMITH	TR	2129	27
Jolliff Woods, Section 6	Charlton Dr	CHARLTON RD	91	89	92	JOLLIFF	RD	DS@660S	CREEKVI	3072	19
Albemarle River, Phase 1A	Spanish Moss	SPANISH MASS DR	77	90	81	COPPERKNOLL	LN	BUTTS STATION	RD	1541	24
	Copper Knoll	COPPERKNOLL LN	73	86	76	EAST	END	SOUTH	END	2008	24
	Beagle Gap Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Fallen Leaf	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Taryn Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Bonnie View Arch	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bella Manor	Rosemarie	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Emilee	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Boon Acres	Benefit Rd	BENEFIT RD	73	89	77	DS@1000E TAFT	RD	SIGN PINE	RD	5408	21
Fieldstone, Phase 1 & Phase 2	Fieldstone Run	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Ashlar Ln	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Gibraltar Ln	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Graphite Trail	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Silverton Way	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Stonetrail Run	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Carrera Ridge	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Travertine Way	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sandstone Ct	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	Sapphire Rd	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: DPW Operation's Infrastructure Info – IMS