



DEPARTMENT OF GENERAL SERVICES

BIENNIAL PERFORMANCE AUDIT REPORT

Fiscal Years Ended June 30, 2018 and 2017

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Honorable Joan M. Pratt, Comptroller
and Other Members
of the Board of Estimates
City of Baltimore, Maryland

Executive Summary

We conducted a Biennial Performance Audit of selected performance measures of the Department of General Services (DGS) for the fiscal years (FYs) ended June 30, 2018 and June 30, 2017.

The objectives of our performance audit were to:

- Determine whether DGS: (1) met its performance measure targets; and (2) has adequately designed internal controls related to the selected performance measures.
- Follow-up on prior findings and recommendations included in DGS' previous Biennial Performance Audit Report, dated December 29, 2017.

According to the FY 2017, 2018, 2019 and 2020 Agency Detail Board of Estimates Recommendations (Budget Books), the three selected performance measure targets were not met. As a result, we did not validate the accuracy of performance measure results. However, we evaluated the processes and the design of internal controls for the selected performance measures. The review indicated the following internal control design deficiencies for Service 731.

- *% of Work Orders Closed On Time:* The Facilities Management Division has corrective maintenance¹ work order processes and practices; however, these processes and practices are not formally documented in policies and procedures. Without formal policies and procedures, the Facilities Management Division does not have reasonable assurance the work order transaction data is reliable, and operations are effective and efficient. Formal policies and procedures promote compliance, accountability, consistency and sustainability.

¹ Corrective maintenance is the process of fixing things that are broken or not performing well. Repairs to elevators, electrical equipment (lights), and plumbing related repairs are examples of corrective maintenance.

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- *% of Preventative Maintenance Out of Total Work Orders*²: Actual results were overstated for FYs 2018 and 2017 by reporting 72 percent and 58 percent, respectively. The overstatements occurred because DGS was not consistently using the functionality available in Archibus³ to indicate whether work orders were for corrective or preventative maintenance services. As a result, DGS cannot accurately measure the efficiency of corrective and preventative maintenance services provided to City agencies and tenants.
- Timeliness metrics under Service 731: The data utilized to capture Service 731 performance measure timeliness metrics results in inflated targets. The Facilities Management Division uses the Archibus timestamp as the completion date; however, there is a lapse between the date a work order is actually completed vs. when the building supervisor marks the job complete in Archibus. As a result, the target calculation averages can be incorrectly skewed and work orders that may not have been completed timely can be incorrectly reflected as being completed timely.

Of the five prior year recommendations that were followed up during this Biennial Performance Audit, four recommendations, or 80 percent, were fully implemented and one recommendation, or 20 percent, was partially implemented. This recommendation was related to Service 189 – Fleet Management’s *Average Miles Per Gallon of Fuel Consumed Per Vehicle*. According to DGS, the 2019 ransomware attack continues to have an impact on the reliability of the “Quarterly Report on Vehicle Consumption”. The DGS confirmed that corrective actions related to the recommendation of establishing a notifications system for irregular fuel consumption had not been implemented.

To improve the accountability of the performance measures, we recommend the Director of DGS implement recommendations made in this report.

We wish to acknowledge DGS’ cooperation extended to us during our audit.

Respectfully,



Josh Pasch, CPA
City Auditor
Baltimore, Maryland
December 31, 2019

² This performance measure is not in our audit scope; however, we expanded the audit scope after we received the supporting documentation for the *% of Work Orders Closed On Time*. The support showed this performance measure was possibly overstated.

³ Archibus is a software package utilized by multiple divisions within DGS. Archibus provides a sustainable system which assists business processes along with providing accurate data to senior staff in order to make managerial decisions. Over 60,000 work orders are managed through the Archibus system which consists of building information, maintenance costs and problem types that are associated with over 200 buildings.

Background Information

I. Department of General Services

The DGS is responsible for fleet management, facilities maintenance, and capital design and construction. As the backbone of all City operations, the DGS ensures that agencies have the vehicles and equipment needed to provide services to the City's residents, and that they can operate out of clean, safe, and high-quality work and service locations.

II. Services

The following services are responsible for the performance measures included in the current Biennial Performance Audit.

- **Fleet Management Services (Service 189):** This service is responsible for the purchase, outfitting, and maintenance of vehicles and other equipment used by City agencies. Teams of highly trained maintenance workers and body shop technicians maintain over 5,600 pieces of motorized equipment including police cruisers, fire apparatus, Inner Harbor water skimmers, lawn mowers and more. Operations take place at the Central garage and several substations throughout the City.
- **Facilities Management Division (Service 731):** This service is responsible for providing maintenance and repair to over 500 municipal buildings. The 82 core buildings, owned by the Mayor and City Council, comprise over 4.7 million square feet of workspace. The tenant agencies include most departments of City government. The DGS maintains 45 buildings through an Internal Service Fund (ISF), including the recently added historic properties. Agencies occupying buildings supported by the ISF are charged rent on a square foot basis. The remaining 22 buildings, including currently surplus schools, are funded directly through the General Fund. The DGS is actively engaged with partners to identify opportunities for alternative uses for the surplus schools.
- **Capital Projects Division (Service 734):** This service is provided by the DGS Capital Projects Division, which is responsible for the planning, design, and construction, and / or renovation or alteration of capital improvements to City facilities from inception to completion. The costs of this service are largely supported through transfers from the capital budget.

III. Selected Performance Measures

We judgmentally selected three performance measures of DGS which are summarized as follows.

Table I

Summary of Selected Performance Measures' Targets and Actuals as Reported in the Budget Books for Fiscal Years 2018 and 2017

Service	Performance Measure	2018		2017	
		Target	Actual	Target	Actual
189	Average Miles per Gallon (MPG) of fuel consumed per vehicle	9	NA ¹	10	4
731	Percentage of work orders closed on time	80	66	81	68
734	Percentage of projects with change orders that exceed construction contingency	10	63	10	44

Note: ¹ N/A because this performance measure was no longer reported in the Budget Books after FY 2017.

Source: FYs 2017, 2018, 2019, 2020 Budget Books

Objectives, Scope, and Methodology

We conducted our performance audit in accordance with *Generally Accepted Government Auditing Standards*, except for peer review requirements. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The objectives of our performance audit were to:

- Determine whether DGS: (1) met its performance measure targets; and (2) has adequately designed internal controls related to the selected performance measures.
- Follow-up on prior findings and recommendations included in DGS' previous performance audit report, dated December 29, 2017.

The scope of our audit is three performance measures (see Table I on previous page) reported for the periods of FY 2018 and FY 2017.

To accomplish our objective for the percentage of work orders closed timely, we interviewed key individuals to obtain an understanding of internal controls. Key individuals interviewed included the Chief of the Facilities Maintenance Division and the information technology manager responsible for developing the Archibus software program for processing work orders. We also discussed the dispatch, assignment and completion processes with the Facilities Maintenance Division's primary dispatcher for work orders and a Facilities Maintenance Division Public Building Manager responsible for at least ten downtown buildings. Those buildings include, but are not limited to the Benton Building, the Cummings Building, and the Baltimore City Police Department Headquarters Building. Support for the reported timeliness of work orders was obtained from the Director of the DGS Business Process Improvement Office. We compared this data to the agency detail data for two performance measures within Facilities Maintenance Division that included corrective and preventive work orders closed on time.

To accomplish our objectives for the percentage of projects with change orders that exceeded the construction contingency target of ten percent, we met with the Chief and Construction Projects Supervisor of the Major Project Division for two of the capital projects that exceeded the target in FY 2017 and discussed the related processes, procedures and controls.

SECTION I

Findings and Recommendations

Finding #1: Formal policies and procedures for processing corrective maintenance work orders need to be developed and implemented.

The Facilities Management Division has corrective maintenance work order processes and practices; however, these processes and practices are not formally documented in policies and procedures. For example:

- **Routing Work Orders:** There is no formal list of responsible personnel to whom the dispatcher would route work order requests. These personnel receiving work order requests could include a building repair supervisor, building project coordinator, public building maintenance coordinator, or public building manager. Therefore, when a work order is created in the Archibus system, the Facilities Management Division dispatcher routes it to responsible personnel based on the dispatcher's knowledge and experience. The personnel receiving work order requests are responsible for assigning the work order to themselves or to a technician.
- **Closing and Completion of Work Orders:** There are no established guidelines for maintaining documentation⁴ for completed work orders or for recording the work order completion date. Therefore, documentation supporting the repair performed was not always maintained and the completion dates were not recorded consistently when the work was completed.
- **Tracking Work Orders:** There are no established guidelines for measuring the timeliness of work orders assigned or completed. Specifically, the Facility Management Division has not established standards for measuring how long it should take to assign a work order (work order received date vs. work order assigned date) and complete a work order (work order assigned date vs. work order completion date) based on the problem type.
- **Monitoring Work Orders:** There are no established guidelines for supervisors and management to periodically (e.g. monthly or quarterly) review outstanding work orders to manage workload and identify backlogs or recurring issues.

Without formal policies and procedures, the Facilities Management Division does not have reasonable assurance the work order transaction data is reliable, and operations are effective and efficient. Formal policies and procedures promote compliance, accountability, consistency and sustainability.

⁴ In some instances, the completion date recorded was based on a phone call from a technician.

A reason for not having formal policies and procedures may be that the majority of Facilities Management Division's personnel responsible for the work order processes have been in their respective positions for an extended period of time and understand the processes. Management has historically followed unwritten but known work order processes and practices.

According to the *Standards for Internal Control in the Federal Government* issued by the Comptroller General of the United States (Green Book), management:

- "Should implement control activities through policies."
- "Documents in policies the internal control responsibilities of the organization."
- "Communicates to personnel the policies and procedures so that personnel can implement the control activities for their assigned responsibilities."
- "Periodically reviews policies, procedures, and related control activities for continued relevance and effectiveness in achieving the entity's objectives or addressing related risks."

Recommendation #1:

We recommend the Director of DGS develop and implement formal (written, approved, dated) policies and procedures to include, but not be limited to, work order creation, routing, execution, tracking, monitoring and reporting of results.

Finding #2: Two performance measures under Service 731 are not accurate.

The Service 731’s *% of Preventative Maintenance Out of Total Work Orders* actual results were overstated. Specifically, based on the problem types identified for maintenance work orders in FYs 2018 and 2017, the supporting documentation showed the majority of completed work orders appeared to be corrective maintenance, rather than preventative maintenance⁵. However, according to the Budget Books for FYs 2018 and 2017, the Facilities Management Division overstated actual results by reporting 72 percent and 58 percent, respectively (see Table II). As a result, DGS cannot accurately measure the efficiency of corrective and preventative maintenance services provided to City agencies and tenants.

Table II

Comparison of the Service 731’s Two Performance Measures

Service	Performance Measure	FY 2018		FY 2017	
		Target	Actual	Target	Actual
731	Percentage of work orders closed on time	80	66	81	68
731	% of Preventative Maintenance Out of Total Work Orders	48	72	37	58

Source: FYs 2017, 2018, 2019, 2020 Budget Books

Although Archibus has the functionality to segregate work orders by either preventative or corrective, and has well-established definitions built into the system’s logic, DGS has not consistently used this functionality when updating work order details. The supervisor’s Work Order Update screen within Archibus contains a “Cause Code” field that designates the work order as either corrective or preventative. However, the option to make this designation is not currently a required field and is frequently overlooked when a supervisor updates the status of work orders.

According to the *Guide to Performance Measure Management* 2012 Edition, March 2012 Report No.12-333, performance measurement serves a number of external, as well as internal, agency purposes. Performance measures are integrated into the City’s external accountability and final decision-making systems. Successful agencies are also able to use performance information to effectively and efficiently monitor their operations.

⁵ Preventive maintenance refers to regular, routine maintenance to help keep equipment up and running, preventing any unplanned downtime and expensive costs from unanticipated equipment failure.

Recommendation #2:

We recommend the Director of the Department of General Services develop procedures to identify and report timeliness standards separately for the two types of maintenance.

Finding #3: The data utilized to capture Service 731 performance measure timeliness metrics results in inflated targets.

The Service 731's performance measure, *% of Work Orders Closed On Time* does not rely on an established set of standards to determine work orders closed on time. Instead, the Facilities Management Division establishes the target annually by calculating an average of the time it took to complete all similar work orders during the FY. However, the dates used to calculate the targets do not necessarily represent the actual completion date of the work order. For example, a supervisor manually entered the finished date for Work Order 129062 as December 14, 2019 in the Archibus Date Finished field⁶. However, the reports used to calculate the targets rely on the Archibus completed timestamp of December 26, 2019, which is the date when the supervisor reviewed and indicated the work order as being completed.

Although using the Archibus timestamp as the completion date is a more effective control, there is a lapse between the date a work order is actually completed vs. when the building supervisor marks the job complete in Archibus. As a result, the target calculation averages can be incorrectly skewed and work orders that may not have been completed timely can be incorrectly reflected as being completed timely.

Data integrity is defined as all the risks associated with the authorization, completeness and accuracy of business transactions as they are entered into, processed by, summarized by, and reported by the various network-enabled systems deployed by the organization.

According to the Green Book, management designs appropriate types of control activities in the entity's information system for coverage of information processing objectives for operational processes. For information systems, there are two main types of control activities: general and application control activities.

“Application controls, sometimes referred to as business process controls, are those controls that are incorporated directly into computer applications to achieve validity, completeness, accuracy, and confidentiality of transactions and data during application processing. Application controls include controls over input, processing, output, master file, interface, and data management system controls.”

⁶ Without the management's periodic review, management cannot assure whether correct completion dates are entered in this data field.

Recommendation #3:

We recommend the Director of the Department of General Services:

- Re-evaluate the current data capturing processes for establishing targets; and
- Develop objective targets for each category of problem type to effectively measure the efficiency of maintenance personnel.

SECTION II

Implementation Status of Prior Audit Findings and Recommendations

Table II

Summary of Implementation Status of Audit Findings and Recommendations from the Performance Audit Report for Fiscal Years Ending 2016 and 2015 for Service 734 – Design and Construction - Major Projects Division

No.	Finding Summary	Recommendation	Management’s Self-reported Implementation Status	Auditor’s Assessment
1	<p>The DGS did not meet its FYs 2016 and 2015 performance measure targets for the percent of construction completed within budget. The actual amounts reported in FYs 2018 and 2017 Budget Books were 83 percent and 91 percent respectively. However, based on the information provided by DGS, the actual amounts for FYs 2016 and 2015 should have been reported as 75 percent and 71 percent, respectively. According to DGS, for unknown reasons, the actual amounts reported in the City’s Budget Books for FYs 2016 and 2015 were incorrect and overstated. The DGS has identified several causes why projects are not completed within budget and has grouped those causes into two categories: 1) unanticipated field conditions; and, 2) changes in scope (changes in the using agency’s programmatic requirements, needs, or use of the space).</p>	<p>Continue implementing the corrective action plan to reduce the percent of projects that exceed the established budgets. The corrective action plan includes, in part:</p> <ul style="list-style-type: none"> • Performing detailed assessments before design / construction starts; • Reducing design project costs by performing in-house design; • Coordinating with other City agencies to develop a process to identify the best qualified contractors for the projects; and, • Reducing costs by establishing the design cost prior to work being initiated. 	<p>Building assessment is routine part of proposals provided by outside design consultants and when appropriate, incorporated into task. Major Projects Division hired a licensed mechanical engineer who performs in-house review of mechanical designs and consults on building mechanical systems. Major Projects Division, along with other divisions of other public works agencies, collaborated and consulted with Office of Boards and Commissions to revise rules / process for contractor and consultant performance evaluations. Construction estimates are now a routine component of the design consultant’s scope of work.</p>	<p>Implemented.</p>

Table III

Summary of Implementation Status of Audit Findings and Recommendations from the Performance Audit Report for Fiscal Years Ending 2014 through 2011 for Service 189 – Fleet Management

No.	Finding Summary	Recommendation	Management’s Self-reported Implementation Status	Auditor’s Assessment
1	<p>Although fuel consumption information is available for each vehicle, there is no specific process in place to monitor or review the usual patterns, especially high consumption that could result from pilferage. For example, the Fire Department has over 370 vehicles, but we saw no evidence that fuel consumption is monitored, reported or reviewed. In addition, auditors found that although there are limits on the quantity of fuel per transaction and the number of transactions per day, there are no limits on the quantity of fuel assigned a specific vehicle or equipment every month or quarter.</p>	<p>Ensure MPG Information is Reported for each vehicle. The Auditor recommended that a process be put in place whereby actual MPG information is monitored for each vehicle in the fleet on a periodic basis. This information could be compared with the standards established by the manufacturer and with results achieved in previous periods. User agencies would have an internal process to identify and investigate instances of unusually high or low fuel consumption and, where necessary, take corrective action. It could also be used in the process of identifying old / inefficient assets that could be replaced or disposed.</p>	<p>The “Quarterly MPG” report name was changed to the “Quarterly Report on Vehicle Fuel Consumption” report to more accurately reflect the data found in the report. This report is accessible to all agencies. Due to the ransomware attack all report servers are not fully operational and may result in missing data in some instances.</p>	<p>Not Implemented.</p> <p>Management self-reported that the recommendations were not implemented. As a result, auditors did not evaluate the implementation status of this prior finding and recommendations. However, due to the high risk of the fuel consumption controls, auditors will follow-up on this finding and recommendations in the next biennial audit, which will be performed in Calendar Year 2021.</p> <p>According to DGS, the 2019 ransomware attack continues to have an impact on the “Quarterly Report on Vehicle Consumption”. The DGS confirmed that corrective actions related to establishing an alert system for irregular fuel usage had not been implemented.</p>

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No.	Finding Summary	Recommendation	Management's Self-reported Implementation Status	Auditor's Assessment
2	There do not seem to be actions in place to incentivize or penalize the agencies to bring overdue vehicles or other assets for preventive maintenance.	Implement Penalties for Overdue Preventive Maintenance (PM). The Auditors recommended General Services to ensure all overdue PM is properly reported to agencies to ensure that they can schedule the PM as soon as possible. The Auditors also recommended implementing penalties to drivers / agencies that do not come in for PM. Also, consider cancelling or limiting use of fuel cards for vehicles that exceed PM by a set parameter.	Although the authorization to cut-off fuel to agency vehicles for overdue PMs has not been sanctioned by City Hall, the number of overdue PMs has significantly decreased due to Fleet Management's increased efforts to reach out to agencies for newly purchased vehicles.	Implemented.

Table IV

Summary of Implementation Status of Audit Findings and Recommendations from the Performance Audit Report for Fiscal Years Ending 2014 through 2011 for Service 731 – Facilities Management

No.	Finding Summary	Recommendation	Management’s Self-reported Implementation Status	Auditor’s Assessment
1	For the 15 buildings selected for testing, the Auditors found instances where the buildings were occupied, but there were no lease agreements in place.	Ensure that lease agreements are in place for all tenants occupying buildings managed by the DGS.	As of the start of FY 2020, DGS’ Facilities Management Division has agreements or other arrangements in place that define the relationship between the tenant and landlord in 94 percent of its occupied spaces. There are currently 107 active leases or other agreements for 114 spaces in our 63-property portfolio. In the remaining spaces, there are currently three vacant spaces and four that are in negotiations at the Real Estate Office or are pending Council or BOE review and approval.	Implemented.

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No.	Finding Summary	Recommendation	Management’s Self-reported Implementation Status	Auditor’s Assessment
2	For the 15 buildings selected for testing, the Auditors found instances where the buildings were occupied, but there were no lease agreements in place.	Implement a process to ensure that the list of tenants in each of the 63 buildings managed by the DGS is kept updated and complete.	<p>As of July 1st, 2019, 100 percent of the 63 DGS managed properties have profiles on the Archibus platform.</p> <p>56 (or 89 percent), include a lease profile with any available agreements or tenant information.</p> <p>The remaining properties are either vacant or are pending the receipt of the agreement from Real Estate Office or the Board of Estimates. Profile data for these properties may include CADD Drawings, tenant bio, facility assessment data, and work order history. In order to fully populate the lease module, Facilities Management is working with the Real Estate office of the Comptroller to provide any documents or data which is not routinely kept in our offices to complete the lease profile on each building.</p>	Implemented.

Management's Response

Date: December 31, 2019

To: Josh Pasch, City Auditor

Subject: Management Response to Audit Report:

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Our responses to the audit report findings and recommendations are as follows:

Recommendation # 1

We recommend the Director of DGS develop and implement formal (written, approved, dated) policies and procedures to include, but not be limited to, work order creation, routing, execution, tracking, monitoring and reporting of results.

Management Response/Corrective Action Plan

Agree **Disagree**

DGS Facilities Management agrees with the overall recommendation to implement formal policies and procedures governing the creation, routing, execution, tracking, and monitoring of work orders and the reporting of results. DGS wishes to provide clarification on several points within the recommendation:

- **Routing Work Orders:** While there is little turnover in the shops and functions managing the groups, we concede that posting more publicly, the responsible dispatch list can improve communications, transparency, and risk mitigation.
- **Closing Work Orders:** We agree that incorporating documented and widely available Standard Operating Procedures for the division will be helpful. DGS Facilities Management is in the process of developing SOPs for the completion of work orders by all technicians, especially those outside the current mobile maintenance program.
- **Tracking and Monitoring Work Orders:** DGS recognizes the interest in a segment analysis of the work order data and believes it could be useful for management purposes. Based on this, DGS will explore opportunities to incorporate this level of the measure into tracking and monitoring. For the period covered in this audit, the department had the regular and established practice of monitoring both the status of critical work orders and overall durations and longstanding open work orders.

Implementation Date

DGS will aim to implement corrective measures for this finding within approximately 180 days (6 months) of the issuance of this report.

Implementation Date: July 1, 2020

Responsible Personnel: Terrel Chesson, Division Chief

Recommendation # 2

We recommend the Director of the Department of General Services develop procedures to identify and report timeliness standards separately for the two types of maintenance

Management Response/Corrective Action Plan

Agree **Disagree**

DGS Facilities Management agrees with the recommendation to fine-tune communication on performance measures, but would stop short of changing the name (and therefore the parameters) of the current measure. DGS would point to the response in Finding #3, *Data Accuracy of Work Order Target Calculations*, as a determinant of the agency’s ability to appropriately identify performance targets. From there, DGS will work to develop appropriate procedures for reporting timeliness standards.

Implementation Date

DGS will aim to implement corrective measures for this finding within approximately 270 days (9 months) of the issuance of this report.

Implementation Date: September 1, 2020

Responsible Personnel:

Terrel Chesson, Division Chief

Recommendation # 3

We recommend the Director of the Department of General Services:

- Reevaluate the current data capturing processes for establishing targets; and
- Develop objective targets for each category of problem type to effectively measure the efficiency of maintenance personnel.

Management Response/Corrective Action Plan

Agree **Disagree**

DGS recognizes the potential benefits of further segment analysis of the work order data and believe it could be useful for management purposes, especially as it relates to performance of different parts of the work order life cycle.

The Facilities Maintenance Division has also, over the past year, reached out to various universities and research institutions for assistance in developing a model for the following: Understanding the factors in our operation with the strongest predictive power for when a group or individual work order will exceed historical durations so that we can implement target prescriptive actions,

- Quantifying the impact of specific vacancies on work order performance--not only duration but also cost, and
- Developing specific standards based on the most appropriate similarly featured entities to the agency, to establish a multi-year benchmarking system that expands or contracts with the conditions of the changes in the building portfolio, changes in capital spending and changes in staffing levels.

Implementation Date

September 1, 2020

Responsible Personnel

Terrel Chesson, Division Chief