The Office of the City Auditor has established the Trust & Innovation Portal (TIP) in order to enhance trust by safeguarding public monies and resources and holding City officials and employees accountable as stewards. TIP is an online tool accessible at beverlyhills.org/TIP designed to encourage residents and employees to:

1) Share innovative ideas about improving City services; and

2) Report suspected cases of improper activity in City operations.

Residents and employees can also offer suggestions or make reports by emailing TIP@beverlyhills.org or by calling 310-288-2TIP (310-288-2847). All emails and calls will be treated with the utmost confidentiality.
December 30, 2019

Honorable Mayor and City Council
City of Beverly Hills, California

Transmitted herewith is the Performance Audit of the City’s Fire Hydrant Inspection, Maintenance, and Repair Operations. The Results in Brief is presented on page 1. Management’s response to our audit recommendations can be found after page 13 of the report.

We would like to thank the City of Beverly Hills’ Public Works Department management and staff, as well as representatives from other City departments for their assistance and cooperation during this audit. All of their valuable time and efforts spent on providing us information are greatly appreciated. The audit consultant responsible for this audit report is Matthew E. Helm.

Respectfully submitted,

Eduardo Luna
City Auditor

cc: George Chavez, City Manager
    Nancy Hunt-Coffey, Assistant City Manager
    Shana Epstein, Director of Public Works
    Gilbert Borboa Jr, Assistant Director of Public Works/Utilities
    Gregory Barton, Fire Chief
    Laurence Wiener, City Attorney
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Results in Brief

Fire hydrants are the above-ground components of a water distribution system, which provide access to a community’s water supply for many purposes, including firefighting. Fire hydrants, among other reasons are used; 1) for flushing water mains in order to maintain water quality in areas where water use is minimal; 2) to periodically test the system for compliance with fire flow requirements; 3) as temporary water supply connections in the event of water main breaks between hydrants; 4) and for insertion of cameras to inspect the interior of water mains without having to take the main out of service. Accordingly, it is imperative that fire hydrants are maintained in a manner that ensures the hydrants will operate properly when needed. The risk mitigation provided by a fully functional water distribution system, including the fire hydrant system, highlights the need for a well-developed fire hydrant inspection, maintenance, and repair program.

The City of Beverly Hills (City) is responsible for the maintenance and operation of over 1,300 public fire hydrants within the City’s water system. We conducted a performance audit of the City’s general fire hydrant inspection, maintenance, and repair operations to determine the efficiency and effectiveness of the City’s efforts.

A critical aspect of the City’s fire hydrant program is maintaining accurate location information for each fire hydrant located within the City’s water system. We found that the City has effectively identified and verified information on each fire hydrant asset within its area of responsibility. We also found that the City has developed and promulgated work instructions for fire hydrant inspection, maintenance, and repair that are substantially consistent with industry standards, such as guidance set forth by the National Fire Protection Association. Our direct field observations and interviews with City staff indicate that fire hydrant inspection, maintenance, and repair is currently conducted in a manner that is consistent with established work standards. However, we also conclude that there are opportunities to improve controls over the fire hydrant program through more systematic supervisory review of field crews’ work to ensure quality and completeness of fire hydrant inspection, maintenance, and repair operations.

In addition to maintaining accurate and complete location information on fire hydrants within the City’s water system, the City should maintain accurate data on fire hydrant inspection, maintenance, and repair issues identified by deployed field crews to ensure that issues are systematically and fully addressed. In January 2019, the City established a process for field crews to identify and log fire hydrant maintenance and repair issues. However, our review noted various discrepancies in the data collection processes that should be addressed. We conclude that the City’s fire hydrant program would be enhanced by establishing a more systematic process and developing work instructions to ensure that all fire hydrant maintenance and repair issues are addressed and data are accurately recorded.

A final focus point for our review was to determine whether the City is effectively identifying and managing costs associated with the fire hydrant program, and whether the City is optimizing the use of available resources to carry out program responsibilities. We found that the City

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1 The City’s water system encompasses all fire hydrants within Beverly Hills city limits, and also includes a portion of West Hollywood. There are approximately 1,366 fire hydrants within the City’s area of responsibility, of which 1,163 fire hydrants are located within the City, and 203 are located within the City’s area of responsibility in West Hollywood.
maintains adequate information on direct labor costs associated with the hydrant program. However, nearly 66 percent of fire hydrant inspection, maintenance, and repair is conducted using overtime labor rates, which substantially increases the cost to the City and its residents. While the City is effective in identifying labor costs with the program, it is currently unable to identify the direct inventory costs of parts and materials for the fire hydrant program, which impedes effective management and program oversight. According to City officials, the estimated implementation date of an inventory management system to address inventory internal control issues is early 2021. In addition to reviewing costs associated with the fire hydrant program, we identified opportunities to maximize the use of available staff resources by combining certain tasks of the City’s water valve maintenance efforts with the fire hydrant program tasks. Combining these tasks would allow for the more efficient deployment of work crews, minimize disruption to residents where valve and fire hydrant work is conducted, provide for more systematic supervisory review of field crews efforts, and potentially reduce the use of overtime for the fire hydrant program.

We made four recommendations to address the issues outlined above, and the City agreed to implement all four. In fact, the City has already commenced implementing portions of several of the recommendations in this report. The City’s responses to our recommendations are included after page 13 of this report.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require 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 believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.
Background

Fire hydrants are critical to the preservation of public safety in relation to fire protection. In addition, these essential infrastructure assets provide a means for line flushing and testing of the hydraulic distribution capabilities of water systems. Accordingly, the inspection, maintenance, and operation of fire hydrants are of utmost importance.

The City of Beverly Hills (City) is responsible for the maintenance and operation of over 1,300 fire hydrants located throughout the City’s water system, which includes fire hydrants located in a portion of West Hollywood. Within the City, the Public Works Department’s Water Distribution Division (Water Distribution Division) has primary responsibility for overseeing fire hydrant maintenance and repair operations.

There are two primary aspects of fire hydrant maintenance. First, hydrants must be flow tested to determine that there is sufficient water pressure supplied to each hydrant within the system. Standards for flow testing are set forth by the Insurance Standards Office, the American Water Works Association, the National Fire Protection Association, and the State Water Resources Control Board. These standards, as well as City policy guidance, require that all hydrants in the City’s system be flow tested once every three years. Currently, the City retains a contractor to conduct flow tests on approximately 75 percent (1,029) of the City’s hydrants, while Water Distribution Division staff conduct flow tests on the remaining 25 percent (343) of the hydrants.

The second key aspect of maintaining the City’s fire hydrant system is the routine inspection, preventative maintenance, and repair of the hydrants. Water Distribution Division staff are primarily responsible for these activities. Currently, the City has an internal goal of inspecting every fire hydrant in the system annually. This goal is based on industry guidance, and is not subject to any regulatory requirement. The City implemented its current process for fire hydrant inspection, maintenance, and repair in January 2019.
Audit Results

Finding 1: Although the City Maintains Accurate Locational Data and Has Established Inspection, Maintenance, and Repair Procedures for Fire Hydrants, the Program Would Benefit by Implementing More Systematic Supervisory Review Procedures

Accurate locational data for fire hydrants is critical for an effective inspection, maintenance, and repair program. We found that the City has implemented effective efforts using consultants and City staff to identify and verify the locations of fire hydrants within the City’s areas of responsibility. Additionally, the City has developed and promulgated work instructions for fire hydrant inspection, maintenance, and repair that are substantially consistent with industry standards, such as guidance set forth by the National Fire Protection Association. Our direct field observations and interviews with City staff indicate that fire hydrant inspection, maintenance, and repair is currently conducted in a manner that is consistent with established work standards. However, we also conclude that there are opportunities to improve controls over the fire hydrant program through more systematic supervisory review of field crews’ work to ensure quality and completeness of fire hydrant inspection, maintenance, and repair operations.

The City Has Developed and Maintains Comprehensive Locational Data on Fire Hydrants Within the City’s Areas of Responsibility

Not only is accurate locational data important for an effective fire hydrant inspection, maintenance, and repair program, it is a critical operational need for fire department crews. Our review of available data and interviews with City officials indicates that the City has undertaken comprehensive efforts to identify and verify the location of all public fire hydrants within the City’s areas of responsibility. According to City staff, efforts to compile comprehensive locational Geographic Information System (GIS) data began in 2010 when the City retained a consultant to identify and provide geopositioning coordinates for each fire hydrant in the City’s system.\(^2\) Subsequently, City staff verified the work completed by the consultant and updated the data. City staff indicated that verification efforts included crosschecking the consultant’s GIS data with aerial photographs, and, when necessary, deploying staff to the field to visually verify fire hydrant locations. Currently, staff within the Department of Public Works GIS group continuously update and verify fire hydrant locational data as needed.

The City Has Developed Processes and Work Standards for the Fire Hydrant Program that Are Consistent With Industry Standards

The Public Works Department’s Water Distribution Division (Water Distribution Division) issued various work standards for fire hydrant installation, inspection, and repair in September 2015. The work standards include specific procedures for each task, describe required equipment and personnel classifications to complete each task, and provide guidelines on general time requirements. We found that these work standards are substantially consistent with industry guidelines set forth by the National Fire Protection Association and the American Water Works Association. Importantly, interviews with City work crew staff and our on-site observations of field crews indicate that crews understand the work standards and conducted fire hydrant

\(^2\) A Geographic Information System (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data.
Supervisory Review of Fire Hydrant Inspection, Maintenance, and Repair Could Be Improved by Strengthening Program Internal Controls

While the City developed and promulgated industry-consistent work standards for its fire hydrant program, we found that more systematic supervisory review of fire hydrant inspection, maintenance, and repair tasks could improve the program. General frameworks for internal controls, such as those set forth by Committee of Sponsoring Organizations' (COSO) Internal Control – Integrated Framework and the U.S. Government Accountability Office’s Standards for Internal Control in the Federal Government, hold that management is responsible for monitoring and evaluating the results of their internal control systems. Accordingly, systematic supervisory review is critical to this monitoring requirement. Enhanced supervisory review of the fire hydrant program’s field tasks would help ensure that crews are completing work in accordance with work standards, and would aid management in identifying problem areas and opportunities to improve the efficiency and effectiveness of the program.

According to the current Water Systems Supervisor, direct supervisory inspection of crews’ fire hydrant inspection, maintenance, and repair consists of daily debriefings with staff about issues identified in the field. We noted that approximately 65 percent of fire hydrant inspection, maintenance, and repair work is conducted by employees on overtime due to a variety of reasons, including competing priorities and limited staff resources, and the need to conduct work in high traffic areas outside of normal working hours to ensure crew safety and minimize traffic disruption. Additionally, the work is generally performed outside of normal working hours when supervisors are not on site. While debriefings are important communication touch points between supervisors and field staff, direct supervisory observation of staff work and periodic spot checks of completed work would enhance internal controls over the fire hydrant program.

Recommendation 1: In order to strengthen internal controls over the City’s fire hydrant inspection, maintenance, and repair operations, the Water Distribution Division should establish processes and procedures that include periodic direct supervisory review to ensure field crews’ work is completed in accordance with existing work standards.

Finding 2: Data Collection and Data Management for Fire Hydrant Inspection, Maintenance and Repair Operations Could Be Improved

Collecting and maintaining data on fire hydrant inspection, maintenance, and repair operations is critical to ensuring issues identified by field crews are systematically and fully addressed in a timely manner. According to the Water Systems Supervisor who manages the fire hydrant program, the current process requiring field crews to log fire hydrant inspection, maintenance, and repair issues was implemented in January 2019. Prior to 2019, the Water Distribution Division had no established formal process for documenting fire hydrant maintenance and repair issues. The current process requires field crews to note any maintenance and repair issues in a paper log book and then transfer the information to an electronic spreadsheet. Our review of a sample of field crew-identified issues noted several instances where identified issues were not

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3 The use of overtime for fire hydrant inspection, maintenance, and repair operations is discussed in more detail in Finding 3. See page 7.
addressed, or the disposition of the identified issue was not recorded. We conclude that the
City’s fire hydrant program would be enhanced by establishing a more systematic process and
developing work instructions to ensure that all fire hydrant maintenance and repair issues are
addressed and data are accurately recorded.

Data Collection and Data Management Processes Could Be Improved to Ensure Fire Hydrant
Inspection, Maintenance, and Repair Issues Are Addressed in a Timely Manner

The Water Distribution Division took an important step in establishing data collection processes
for fire hydrant maintenance issues where no processes previously existed; however, we
observed opportunities for improvement to ensure collection of more complete data on field
activities, and, importantly, to ensure that issues identified in the field are resolved in a timely
manner. General principles for internal control emphasize the importance of data and
information management as a key component of monitoring activities. More specifically, the
American Water Works Association sets forth guidance for record keeping associated with fire
hydrant maintenance that emphasize the importance of recording data on fire hydrant repairs,
including the nature of the required repair and how and when the repairs are completed. The
American Water Works Association guidance notes that maintaining these types of data are
critical to assessing whether recurring problems are associated with a particular hydrant or type
of hydrant, and, as such, are an important management tool for a meaningful fire hydrant
inspection program.

We reviewed the field crew paper log book and associated electronic spreadsheets and
determined that data were generally accurately transcribed from the paper log to the electronic
spreadsheet file. However, our field inspections found instances where issues identified by field
crews had not been resolved, or an issue had been resolved with no corresponding entry to
close out the completed work. Specifically, we conducted on-site inspections of 25 hydrants for
which field crews had noted maintenance or repair issues. We found that 9 of the issues were
not resolved and 16 of the issues had been resolved but not closed out in either the paper or
electronic spreadsheet file.

Based on our field observations and interviews with staff, we determined that field crews had
differing practices on the types and amount of data logged while conducting fire hydrant
inspections. Additionally, in instances where field crews identify and log maintenance or repair
issues with fire hydrants, there is currently no formal process for supervisory review of those
entries to ensure that issues are subsequently addressed. Further, there is no current
requirement for field crews to make a closing entry to indicate when a repair has been
completed. Given the importance of data as a management tool, more consistent processes for
data collection would enhance the City’s fire hydrant inspection, maintenance, and repair
operations.

Recommendation 2: The Water Distribution Division should add to existing work standards or
develop a separate work standard for data collection related to fire hydrant inspection,
maintenance, and repair activities. The standard should, at a minimum, set forth requirements to
log the inspection date, fire hydrant location and other key identifying information, a description
of the maintenance issue required or description of the repair issue completed at the time of
inspection. The work standard should also establish a process for logging closing entries when
repairs are completed. In instances when field crews identify an issue that cannot be resolved at
the time of inspection, the work standard should include a process for assigning field crews to resolve previously identified issues.

Finding 3: The City Should Take Steps to Optimize Operations and Minimize Costs Associated with the Fire Hydrant Inspection, Maintenance, and Repair Program

We found that the City maintains adequate information on direct labor costs associated with the fire hydrant program; however, nearly 66 percent of fire hydrant inspection, maintenance, and repair is conducted at overtime labor rates, which substantially increases the cost to the City and its residents. While the City is effective in identifying labor costs with the program, the City is currently unable to identify the direct inventory costs of parts and materials for the fire hydrant program, which impedes effective management and program oversight. Committee of Sponsoring Organizations’ (COSO) Internal Control—Integrated Framework and the U.S. Government Accountability Office’s Standards for Internal Control in the Federal Government, hold that management should maintain and utilize information pertinent to the performance of programs as part of management’s monitoring responsibilities. According to City officials, implementation of an inventory management system is underway to address inventory internal control issues, and the estimated implementation date is early 2021.

While reviewing costs associated with the fire hydrant program, we identified opportunities to maximize the use of available staff resources. Combining the City’s water main valve maintenance tasks with the fire hydrant program tasks to more efficiently deploy work crews, minimize disruption to residents where valve and fire hydrant work is conducted, provide more systematic supervisory review of field crews’ efforts, and potentially minimize the use of overtime for the fire hydrant program.

The City Currently Conducts Most Fire Hydrant Inspection, Maintenance, and Repair Work Using Overtime

Between January 1, 2019 and June 30, 2019, the City used 1,322 total staff hours for fire hydrant inspection, maintenance, and repair, of which 66 percent (875 hours) was conducted at overtime pay rates. Based on City payroll data and reviews of worklogs, we estimate that the City’s direct wage costs for the fire hydrant inspection program totaled approximately $55,700 for the January 1, 2019 to June 30, 2019 review period, of which approximately $41,400 was overtime pay.

Standards of internal control note that a critical management function is to monitor and control operational costs to ensure that program activities are conducted in an efficient and effective manner. According to the Water Distribution Division management, the Water Distribution Division must use overtime to meet the goals of the fire hydrant program due to a variety of factors, including competing priorities and limited resources. The Water Distribution Division is responsible for a broad portfolio of activity, such as installing water service for commercial and residential properties, repairing water main breaks, inspecting and maintaining water main valves throughout the city, and overseeing all aspects of customer water meter operations. Additionally, the Water Distribution Division management noted that it is sometimes necessary for crews to work overtime on nights or weekend hours to inspect fire hydrants located in areas

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4 Currently, overtime pay rates for Water Distribution staff are paid at one and a half times the employee’s base hourly rate.
of the City that are congested with automobile traffic during normal hours of business in order to ensure crew members’ safety and minimize traffic and other disruption to residents and visitors.

The City is Currently Unable to Determine Inventory Costs for the Fire Hydrant Inspection, Maintenance, and Repair Program

While the City is effective in identifying direct labor costs with the fire hydrant program, it is currently unable to identify the direct inventory costs of parts and materials for the program. As a result, the City is unable to determine total costs associated with the fire hydrant program, which impedes effective management and program oversight and is inconsistent with standards of internal control. Additionally, we found that the Public Works Department lacked sufficient general physical controls over the storeroom where hydrant and other materials used for water operations are maintained.

The Public Works Department was unable to provide summary information on the type, quantity, and costs of materials used for the fire hydrant program due to a lack of an inventory information system that allows for ongoing and real-time tracking of inventory levels. While the focus of our review was specific to the fire hydrant program, the lack of inventory data is generally problematic for a number of reasons, as it prevents the City from:

1) Recording and monitoring material costs of the program;
2) Ensuring that work crews have the type and quantity of materials necessary to complete assigned work in stock;
3) Monitoring usage of materials to determine whether a type of material is being used excessively (which may be the result of a product defect); and
4) Monitoring and detecting theft or other types of inventory shrinkage.

Additionally, our inspection of the storeroom where fire hydrant and other parts are stored, as well as interviews with staff, indicated that physical controls over the storage space were limited. According to staff interviews, all water operations crews had access to the storeroom’s doors and a roll-up loading dock door using their employee keycards, and crews had access to the storeroom when storeroom staff were not present throughout the day and after-hours. During the period of our review, the department made log sheets available to staff to record types and numbers of parts removed from the storeroom when storeroom staff were not present; however, the use of the log sheets is inconsistent. Loosely controlled physical access to the storeroom impedes accurate inventory recordkeeping and can result in inventory shrinkage through theft or breakage.

We discussed our observations regarding inventory internal controls with Public Works management. Management is aware of the issues and is taking steps to address them. Specifically, the City is implementing an enterprise-wide asset management system known as Infor, an important component of which is an inventory management module. According to Public Works staff, implementation of the inventory management module is scheduled to begin in early 2020, and will ultimately allow the City to effectively monitor and control inventory issues raised in this report. Additionally, Public Works filled a Storeroom Supervisor position in August 2019, which had been vacant since October 2015. Public Works management noted that a key

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5 A 2007 report from the Matrix Consulting Group entitled Assessment of the Public Works and Transportation Department: City of Beverly Hills, California noted issues regarding the lack of an inventory management system and loose physical internal controls over inventory.
focus for the Supervisor is to establish stronger general controls over inventory, including inventory information management and physical controls over the storeroom.

**Recommendation 3:** The Public Works Department should provide updates to City Council and the City Manager on the status of the implementation of the inventory management module as part of all general updates on the implementation of the enterprise-wide asset management system, Infor. The updates should include the status of the Public Works Department’s efforts to establish stronger physical controls over inventory, as well as current efforts to strengthen inventory information management over the interim period before the inventory management module is fully implemented.

**The City Should Optimize the Use of Available Staff Resources by Consolidating Fire Hydrant Inspection, Maintenance, and Repair Duties With Water Main Valve Maintenance and Repair Duties**

The Water Distribution Division could dispatch crews more efficiently by combining inspection duties for fire hydrants and water main valves. Water main valves and fire hydrants are generally co-located throughout each zone in the City’s water system, although there are significantly more water main valves than fire hydrants. Pursuant to State regulations, the City is required to maintain each water main valve in the City’s water system once every three years. As per the Water Distribution Supervisor, water main valve maintenance is usually conducted during standard hours of operation—generally not using overtime—and utilizes essentially the same equipment, vehicles, and staff used for fire hydrant maintenance. As noted previously, fire hydrant inspection, maintenance, and repair efforts are carried out mostly on overtime hours. Additionally, while water main valve crews are dispatched systematically to each water zone to perform maintenance, fire hydrant crews determine which fire hydrants to examine based upon a paper log book showing fire hydrants that have yet to be inspected. As a result, water main valve crews may be dispatched to a water zone during standard operating hours, and then return to the same zone later in the day to perform fire hydrant inspections.

We examined worklog data and conducted interviews with staff to determine whether opportunities existed to more efficiently utilize staff resources by combining water main valve maintenance duties with fire hydrant inspection tasks. Our review of worklogs for both fire hydrant inspection and water main valve maintenance for the period covering May 1, 2019 to May 31, 2019 found that Water Distribution Division crews maintained 22 water main valves within a specific zone (Zone 8) during that period. During the same period, but on different days of the month, the same crews performed 13 fire hydrant inspections in the same zone.
Based on our examination of the sample period and discussions with Water Distribution Division staff, we conclude that the City could optimize operations with existing resources by consolidating water main valve and fire hydrant tasks within specified crews, and by systematically dispatching crews to service all water main valves and hydrants in a designated zone before moving to the next zone. In our view, consolidating these responsibilities could:

1) Provide for more efficient and systematic crew dispatch;
2) Minimize vehicle wear and tear by requiring fewer vehicle miles;
3) Potentially reduce the need for overtime;
4) Minimize disruption to residents and traffic patterns by deploying work crews to a specified area and divert or control traffic in order to conduct both work tasks; and
5) Facilitate supervisory oversight over work performed by field crews by providing supervisors consolidated information and greater visibility of which crews were assigned to which zones and when.

It is important to note that the number and frequency for water main valve maintenance and fire hydrant inspections differ. There are approximately 4,900 water main valves within the City’s water system, as compared with about 1,300 fire hydrants. Water main valves are to be inspected once every three years, per State requirements. Fire hydrant inspection frequency is not subject to any regulatory requirement, but are to be inspected annually, per an internal departmental goal and industry guidance. Based on our discussions with Public Works and Fire Department staff, we believe that the City could still maintain adequate coverage over both lines of effort by consolidating dispatch in the manner noted above. Additionally, the City’s current vendor contract requires that the vendor’s crews perform basic fire hydrant inspection tasks and report any fire hydrant issues encountered during contracted fire-flow testing responsibilities, as outlined in the background section of this report. Ensuring that those responsibilities continue to be carried out by the vendor would help mitigate any associated risk of shifting fire hydrant inspection to a three-year inspection cycle, rather than the current annual goal.

**Recommendation 4:** The Water Distribution Division should consolidate efforts for water main valve maintenance and fire hydrant inspection maintenance and repair within the same dispatched work crews. Crews should be dispatched systematically to designated water zones within the City, with the intent of completing all water main valve maintenance and fire hydrant inspection tasks in the specified zone before deploying to the next zone. Additionally, the City should ensure that any future contract with a vendor for fire flow testing should require the vendor perform basic fire hydrant inspection tasks as part of fire flow testing, and provide a mechanism for them to report back to the City with the results of the fire hydrant inspections.
Conclusion

Fire hydrants are critical components of the City’s water system that are used for several important purposes, including firefighting. Accordingly, it is imperative that the City maintains its fire hydrants in a manner that ensures that the fire hydrants will operate properly when needed. The risk mitigation provided by a fully functional water distribution system, including the fire hydrant system, highlights the need for a well-developed fire hydrant inspection, maintenance, and repair program.

We found that the City has taken important steps in ensuring that its fire hydrant inspection, maintenance, and repair operations substantially comport with industry guidance, and has been effective in ensuring that the City maintains an accurate locational inventory of fire hydrants within the City’s areas of responsibility. However, we also identified areas where the City could improve various internal controls over the fire hydrant program—including costs, supervisory oversight, and data collection and management. Finally, we found that there are opportunities to potentially capture efficiencies by combining fire hydrant program tasks with water main valve maintenance tasks.
**Recommendations**

**Recommendation 1:** In order to strengthen internal controls over the City’s fire hydrant inspection, maintenance, and repair operations, the Water Distribution Division should establish processes and procedures that include periodic direct supervisory review to ensure field crews’ work is completed in accordance with existing work standards.

**Recommendation 2:** The Water Distribution Division should add to existing work standards or develop a separate work standard for data collection related to fire hydrant inspection, maintenance, and repair activities. The standard should, at a minimum, set forth requirements to log the inspection date, fire hydrant location and other key identifying information, a description of the maintenance issue required or description of the repair issue completed at the time of inspection. The work standard should also establish a process for closing logged entries when repairs are completed. In instances when field crews identify an issue that cannot be resolved at the time of inspection, the work standard should include a process for assigning field crews to resolve previously identified issues.

**Recommendation 3:** The Public Works Department should provide updates to the City Council and the City Manager on the status of the implementation of the inventory management module as part of all general updates on the implementation of the enterprise-wide asset management system, Infor. The updates should include the status of the Public Works Department’s efforts to establish stronger physical controls over inventory, as well as current efforts to strengthen inventory information management over the interim period before the inventory management module is fully implemented.

**Recommendation 4:** The Water Distribution Division should consolidate efforts for water main valve maintenance and fire hydrant inspection maintenance and repair within the same dispatched work crews. Crews should be dispatched systematically to designated water zones within the City, with the intent of completing all water main valve maintenance and fire hydrant inspection tasks in the specified zone before deploying to the next zone. Additionally, the City should ensure that any future contract with a vendor for fire flow testing should require that the vendor perform basic fire hydrant inspection tasks as part of fire flow testing, and provide a mechanism for them to report back to the City with the results of the fire hydrant inspections.
Appendix I: Objectives, Scope, and Methodology

In accordance with the City Auditor’s FY 2019 Audit Work Plan, we performed an audit of the City of Beverly Hills’ (City’s) fire hydrant inspection, maintenance and repair operations. The scope of the review covered operations in effect from January 1, 2019 to June 30, 2019 in order to focus on the City’s current processes for fire hydrant operations. Our objectives were to:

1) Evaluate whether the City maintains accurate locational data on fire hydrants, and whether the City has developed and promulgated work instructions for fire hydrant operations;
2) Assess the City’s effectiveness in collecting and managing fire hydrant inspection data to ensure that issues are systematically and fully addressed; and
3) Assess the City’s effectiveness in managing fire hydrant program costs and optimizing the use of available resources to carry out program responsibilities.

To carry out our objectives, we performed the following audit procedures:

1) Reviewed applicable laws, policies, procedures, work instructions, and industry guidance;
2) Reviewed GIS data on fire hydrants and water main valves;
3) Interviewed management, supervisory, analytical, and field staff in several departments;
4) Conducted ride-alongs with field crews and conducted on-site inspections; and
5) Reviewed available fire hydrant program budget, payroll, and inventory data.

We conducted this performance audit in accordance with generally accepted government auditing standards. 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.
Date: December 16, 2019
To: Eduardo Luna, City Auditor
From: Shana Epstein, Director of Public Works, Gil Borboa, P.E., Assistant Director of Public Works, Utilities
Subject: Management Response to the City Audit of Audit of Fire Hydrant Inspection, Maintenance, and Repair Operations

This memorandum is intended to provide Management’s response to the Audit Report entitled “Performance Audit of Fire Hydrant Inspection, Maintenance, and Repair Operations” conducted by the City of Beverly Hills’ Office of the City Auditor.

The Performance Audit comprised a review of the City’s general fire hydrant inspection, maintenance, and repair operations to determine the efficiency and effectiveness of the City’s efforts.

**RECOMMENDATION 1:** In order to strengthen internal controls over the City’s fire hydrant inspection, maintenance, and repair operations, the Public Works Department’s Water Distribution division should establish processes and procedures that include periodic direct supervisory review to ensure field crews’ work is completed in accordance with existing work standards.

**MANAGEMENT RESPONSE:** Management agrees with this recommendation. Supervisory review of completed hydrant maintenance activities will be improved through a more consistent follow-up with crew leaders performing the activities in the field. Currently, the crew leads and Water Supervisor perform as-needed spot and periodic quality assurance of hydrant maintenance work on an as-needed basis. With the advent and implementation of the full-scale Infor Work Order and Asset Management System, the hydrant maintenance activities will be tracked electronically and a more consistent follow-up of the field work can be managed and tracked going forward.
RECOMMENDATION 2: The Public Works Department's Water Distribution division should add to existing work standards or develop a separate work standard for data collection related to fire hydrant inspection, maintenance, and repair activities. The standard should, at a minimum, set forth requirements to log the inspection date, fire hydrant location and other key identifying information, a description of the maintenance issue required or description of the repair issue completed at the time of inspection. The work standard should also establish a process for logging closing entries when repairs are completed. In instances when field crews identify an issue that cannot be resolved at the time of inspection, the work standard should include a process for assigning field crews to resolve previously-identified issues.

MANAGEMENT RESPONSE: Management agrees with this recommendation. Full development and deployment of the Department’s Work Order and Asset Management Program (Infor) will create a digital platform to prevent a work order from being closed out without having addressed and resolved all issues identified by field crews. As of December 10, 2019, the water asset management information requirements have been reviewed with Infor consultants and internal staff, including hydrant maintenance monitoring, workflow, and data needs. Development of Infor to support Water Operations is currently underway and the anticipated go-live date is slated for mid-year 2020.

RECOMMENDATION 3: The Public Works Department should provide updates to City Council and the City Manager on the status of the implementation of the inventory management module as part of all general updates on the implementation of the enterprise-wide asset management system, Infor. The updates should include the status of the Public Works Department’s efforts to establish stronger physical controls over inventory, as well as current efforts to strengthen inventory information management over the interim period before the inventory management module is fully implemented.

MANAGEMENT RESPONSE: Management agrees with this recommendation. Annual updates are provided to the Public Works Commission; the most recent update was provided at the December 12, 2019 Commission meeting. Asset management system updates specific to the Water Operations is also tied to recommendations outlined in the Matrix audit report study, which is reported annually to the Public Works Commission. Furthermore, annual updates are provided to the City Council as part of the Council’s priority-setting sessions. Periodic updates on selected Department projects are provided.
to the City Manager’s office at bi-weekly project review meetings, including the status of the inventory management module as part of all general updates on the implementation of the enterprise-wide asset management system. The inventory management module of Infor is currently slated for future implementation and development; it is the Department’s goal to get all Public Works-related operations to record work in Infor. Prior to building out the inventory management module, staff is reviewing access control to the existing inventory area.

RECOMMENDATION 4: The Public Works Department’s Water Distribution division should consolidate efforts for main water valve maintenance and fire hydrant inspection maintenance and repair within the same dispatched work crews. Crews should be dispatched systematically to designated water zones within the City, with the intent of completing all water main valve maintenance and fire hydrant inspection tasks in the specified zone before deploying to the next zone. Additionally, the City should ensure that any future contract with a vendor for fire flow testing should require the vendor perform basic fire hydrant inspection tasks as part of fire flow testing, and provide a mechanism for them to report back to the City with the results of the fire hydrant inspections.

MANAGEMENT RESPONSE: Management agrees with this recommendation. Efficiencies can be attained by coordinating and combining valve maintenance and hydrant maintenance within any specific maintenance zone in the City. This recommended action of combining valve exercising and hydrant maintenance activities has already been implemented by staff effective December 1, 2019. In the event the City desired to retain vendor services to perform combined valve exercising and hydrant maintenance, a meet and confer process with the appropriate employee bargaining unit will likely be required.

Currently, staffing and resource limitations create competing priorities for allocating staff for the myriad of field operations including service installations for new development, as well as responding to emergency main break and repair situations. Management is working toward a shift to requiring developer-installed new services. If implemented, this will further free up staff resources from performing additional preventative maintenance within a zone. Regarding currently utilized vendor services for fire flow testing, direction to report any hydrant maintenance issues is informally issued to the vendor at project start-up; any future contracts will include explicit instructions for what, when and how to report any hydrant issues which become evident during the vendor-provided hydrant flow-testing process.