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# PERFORMANCE AUDIT OF STREET LIGHT REPAIR

Standardized Operations, Analysis of  
Additional Performance Metrics, and  
Interdepartmental Coordination Can  
Improve the Delivery of Street Light  
Repair Services

Office of the City  
Auditor

City of San Diego



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## THE CITY OF SAN DIEGO

December 1, 2016

Honorable Mayor, City Council, and Audit Committee Members  
City of San Diego, California

Transmitted herewith is a performance audit report of Street Light Repair. This report was conducted in accordance with the City Auditor's Fiscal Year 2017 Audit Work Plan, and the report is presented in accordance with City Charter Section 39.2. The Results in Brief are presented on page 1. Audit Objectives, Scope, and Methodology are presented in Appendix B. Management's responses to our audit recommendations are presented after page 43 of this report.

We would like to thank staff from the Transportation and Storm Water Department and the Environmental Services Department for their assistance and cooperation during this audit. All of their valuable time and efforts spent on providing us information is greatly appreciated. The audit staff members responsible for this audit report are Nick Ketter, Arlys Erickson, and Kyle Elser.

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## Results In Brief

Street lights have been shown to improve traffic safety and pedestrian safety by allowing pedestrians and motorists to better see one another. Studies show that street lighting can reduce crash risk by anywhere from 14 percent to 30 percent. San Diego's approximately 60,000 street lights are an important part of the City's infrastructure and help provide personal security. The Street Division within the Transportation and Storm Water Department is responsible for repairing the City's street lights.

Based on our review, we found that Street Division's street light repair service does not operate efficiently. Specifically, the Division did not meet its one performance goal of repairing street lights in an average of 12 days or less during the past two fiscal years, and the information used to evaluate the goal was not reliable. Also, a lack of street light repair vehicles is hindering the efficiency of repairs. To improve efficiency, the Street Division should utilize additional metrics to help identify and correct inefficient operations and take action to increase the availability of operational repair vehicles.

We also found that street light repair operations are not fully standardized and the Division relies on employees' institutional knowledge because no documented street light repair policies or procedures exist. The Street Division can provide better street light maintenance services by establishing policies and procedures that standardize repair operations, developing procedures for prioritizing repairs by problem type, and ensuring electricians respond to service notifications in a geographically efficient manner. Also, utilizing field laptops would eliminate duplicate entries and paperwork. The Street Division should formally assess the feasibility of using portable electronic devices to eliminate the need for paper work orders.

Our review of inventory controls and accountability identified that the Street Division does not have any inventory records for street light replacements parts and materials, such as light bulbs, fixtures, and light poles. Without accountability for replacement parts and materials, Street Division cannot

develop an automatic reordering process that maintains an adequate inventory level, and it increases the risk of theft. As a result, repair crews may have to special order necessary parts and delay repairs until the appropriate parts and materials become available. Also, employees can only determine the availability of items if they physically go into the stockyard and locate the required item. To improve operational efficiency and reduce the risk of theft, Street Division should create inventory system controls to account for street light repair parts and materials, and develop inventory thresholds that will automatically trigger parts reordering in response to demand.

Additionally, we reviewed the street light asset data and found that it is inaccurate and incomplete. Inaccurate asset information about street lights negatively affects the efficiency of repair operations because repair personnel do not always have the correct information about street lights when they arrive on site for repairs. Inaccurate street light asset information also hinders any future efforts to develop preventative maintenance plans. We found that street light asset information is inaccurate because Street Division does not have policies, procedures, or manuals that establish controls for managing street light asset information. This is also due to significant staffing shortfalls. To ensure the City is maintaining an accurate inventory of street lights, the Street Division should establish operational guidelines for managing and continuously updating street light asset information, and prioritize hiring of asset management positions.

Finally, we found that the City has not developed a comprehensive plan addressing street light infrastructure challenges and department responsibilities. Two Deputy Chief Operating Officers and five Department Directors have responsibilities for street lights. Consequently, the management structure for street lights is complex. Effective management of street lights requires a high degree of interdepartmental coordination between the five Department Directors, and there are no City or Department directives requiring coordination efforts. Instead, coordination efforts are based on individual initiatives. The City's street light assets include hundreds of different fixture, lamp, and pole types

making repairs more difficult. Moving forward, comprehensive street light infrastructure planning and efforts to standardize fixture, lamp, and pole types could decrease the types of replacement parts and materials Street Division must keep on hand. The City should develop and document a street light management plan or memorandum of understanding that includes an overall vision for the long term management of street lights with clear responsibilities for future planning related to street light installation.

We made seven recommendations to improve the efficiency of street light repair operations, and management agreed to implement all of the recommendations.



# Background

**Introduction** Street lighting is an important part of San Diego’s infrastructure. Street lights improve traffic safety, pedestrian safety and visibility, and personal security by allowing pedestrians and motorists to better see one another. Research sponsored by the National Cooperative Highway Research Program shows that street lighting can reduce crash risk by anywhere from 14 percent to 30 percent.<sup>1</sup> The presence of street lights can also be helpful along streets adjacent to school grounds by minimizing school vandalism and improving security, since many school activities occur during nighttime hours.

**San Diego Street Lights** According to the Transportation & Strom Water Department (TSWD) adopted budget for FY 2017, San Diego has approximately 60,000 street lights in the public right-of-way. TSWD’s Street Division is responsible for the maintenance and repair of the City’s street lights. It is also responsible for repairing lights at City parks, parking lots, airports, and other facilities. **Exhibit 1** shows examples of some San Diego street lights.

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<sup>1</sup> The National Cooperative Highway Research Program is a collaborative research forum of the National Academies of Sciences, Engineering, and Medicine.

**Exhibit 1****Street Lights in San Diego**

Source: Google Maps.

The City's 2015 City Resident Survey found that more citizens were satisfied than dissatisfied with the availability of street lights in their neighborhood. Overall 52 percent of respondents reported they were satisfied with street light availability, while 32 percent were dissatisfied.<sup>2</sup> The street light availability question was part of the "Satisfaction with City Streets, Sidewalks, and Infrastructure" section of the survey. Resident satisfaction with streets, sidewalks, and infrastructure ranked lowest in the survey. However, the quality of the City's streets, sidewalks, and infrastructure ranked second only to police services for what residents felt were the most important City services.

**City Departments with  
Street Light  
Responsibilities**

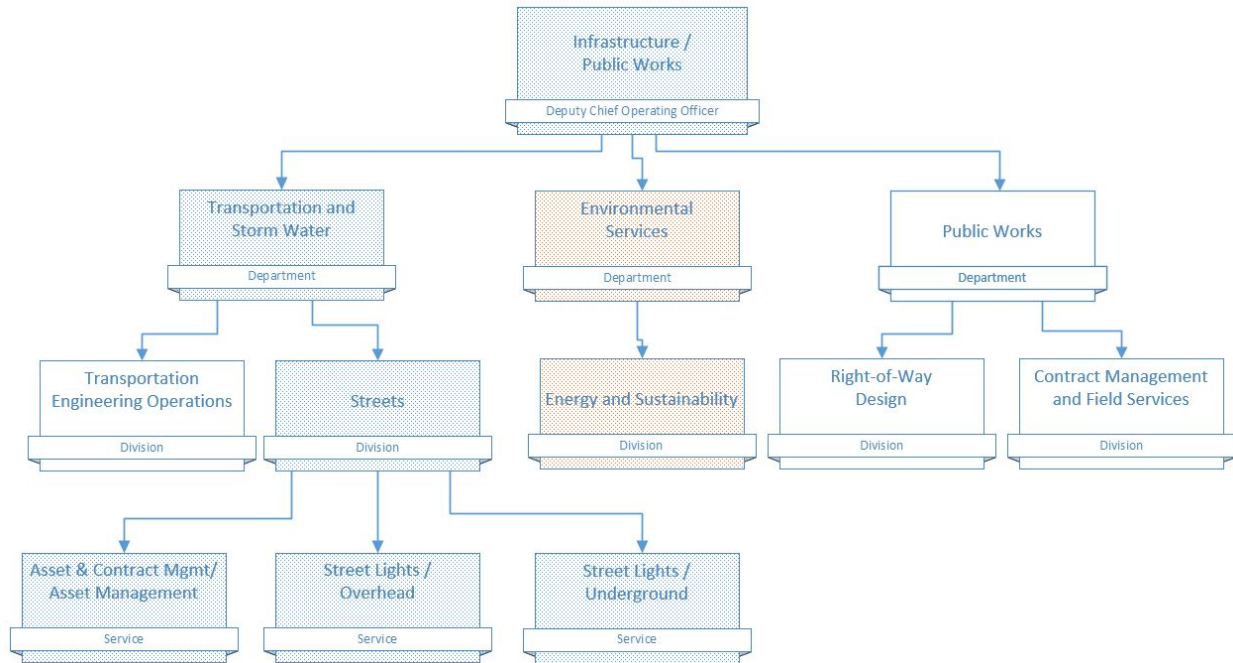
While TSWD is responsible for street light assets, other City departments are also involved in how the City manages its street light programs. As depicted in **Exhibits 2 and 3**, the responsibilities for street lights reside under two Deputy Chief Operating Officers and five Department Directors.

<sup>2</sup> After the responses "don't know" were excluded from the percentages, the remaining survey respondents were neutral.

- TSWD is the primary department responsible for the City's street light infrastructure. Street Light Overhead and Underground Services units within TSWD's Street Division maintain and repair street lights. Street Division's Asset and Contract Management section is responsible for maintaining the City's street light asset inventory (See **Exhibit 2** with blue speckled background).
- TSWD's Transportation Engineering Operations Division is responsible for investigating and responding to the need for new street lights (See **Exhibit 2** with clear background).
- The Public Works Department is responsible for the installation of new street lights that are Capital Improvement Projects (See **Exhibit 2** with clear background).
- The Environmental Services Department (ESD), Energy and Sustainability Division is responsible for managing projects to retrofit City street lights with energy efficient technology. (See **Exhibit 2** with red speckled background).
- The Parks and Recreation and Economic Development Departments are responsible for administering Maintenance Assessment Districts (MAD), some of which have street lights (See **Exhibit 3**). Street Division is responsible for repairing street lights within MADs.

**Exhibit 2**

**Infrastructure/Public Works Departments with Street Light Responsibilities**



Source: OCA analysis based on City organizational charts and interviews with department personnel.

**Exhibit 3**

**Neighborhood Services Departments Responsible for Administering MADs**



Source: OCA analysis based on City organizational charts and interviews with department personnel.

**San Diego's Street Light  
Repair Team**

Street light repair staff is managed by a Public Works Superintendent who oversees 27 full time employees that are responsible for repairing City streetlights, consisting of electrician supervisors, electricians, and utility workers. The TSWD recently received approval in the 2017 budget to hire one reimbursable electrician for MAD lighting repairs and to restore a previously reduced superintendent position to oversee street light and traffic signal repair.

**Overview of the Planned  
Infrastructure Asset  
Management System**

The City has been developing a citywide Infrastructure Asset Management (IAM) program that is scheduled for implementation in FY 2018. According to TSWD, the planned Citywide IAM system will improve the City's response to service requests by:

- Creating a central repository for service requests, eliminating the need to re-route complaints via phone, email, or interoffice mail;
- Creating a single inventory that is accessible by many departments; and
- Improving data collection and performance measurement by creating a uniform data collection and tracking process for all service requests.

TSWD's Street Division currently uses the SAP Synergy system, which is similar to the planned citywide IAM system.

# Audit Results

## ***Finding 1: Street Division Did Not Meet Its Street Light Repair Time Performance Goal***

During the audit, the Street Division had open service notifications for almost three percent of street lights in the right-of-way.<sup>3</sup> Delays in repairing street lights can reduce nighttime traffic safety and endanger public safety. We found that the Street Division's street light repair service does not operate efficiently. Two key issues related to repair efficiency and the division's ability to identify and correct operational issues are:

- Street Division did not meet its single performance goal of repairing street lights in an average of 12 days or less for the past two fiscal years; and
- Street Division's street light repair information is not reliable because the data contains errors.

Street Division cannot effectively analyze program performance because the division uses only one performance metric to evaluate operational effectiveness and efficiency. Additional metrics can help the division identify and correct inefficient operations. Also, a lack of street light repair vehicles is hindering the efficiency of repairs. We believe that increasing the percentage of operational vehicles and expediting the purchase of budgeted new vehicles will help improve repair efficiency.

### **The Street Division Did Not Meet the Performance Repair Goal of 12 Days in FY 2015 and FY 2016**

Street Division has only one metric for measuring street light repair time—the average number of days required to complete a repair. Street Division's performance goal, as established in the annual budget, is to maintain an average street light repair time of 12 days or less. However, Street Division did not meet its performance goal in the past two fiscal years. The actual repair time calculated by Street Division for FY 2015 was 17 days, and the actual repair time for FY 2016 was 16 days as reported in the City's adopted budget.

<sup>3</sup> Street Division reported 1,760 open service notifications, which is approximately 3 percent of the City's 60,000 street lights.

Using one metric to describe Street Division’s repair performance does not accurately reflect the complexity of the street light crews' repair responsibilities, and does not sufficiently reflect their performance.

As of October 25, 2016, the Street Division had 1,716 open service notifications, of which 1,223 were coded as “light out.” (See **Exhibit 4**) According to Street Division management, some of the 1,700 repairs may have been completed, but are not reflected in SAP data due to delays in entering completed service notifications.

**Exhibit 4**

**Open Service Notifications – October 25, 2016**

| Problem Description      | Open Work Orders |
|--------------------------|------------------|
| Shield Light             | 12               |
| Locate Underground       | 6                |
| Light Out                | 1,223            |
| Pole Knock Over/Damage   | 208              |
| Other Problem            | 181              |
| Day Burner               | 42               |
| Underground Damage       | 43               |
| SDG&E Electrical Repairs | 1                |
| Total                    | 1,716            |

Source: Street Division SAP service notification data.

Street Division managers also stated that service notifications increased from FY 2015 to FY 2016. Data provided by Street Division showed service calls increased by 47.5 percent.<sup>4</sup> Street Division managers attribute the increase in service notifications to the roll out of the City “Get-it-Done” application.

**The Streets Division Utilizes Only One Performance Metric to Measure Repairs**

Our review found that the actual repair time varied significantly based on the type of repair performed. Street Division data indicated that certain types of repairs can take a considerable amount of time longer than the Street Division reported average of 16 days. For example, the overall average of "pole

<sup>4</sup> Street Division Management reported that it received 1,722 service notifications for the period June 1, 2015 through November 21, 2015 and 2,614 service notifications for the period June 2, 2016 through November 21, 2016.

knockover/damage" repairs was 205 days.<sup>5</sup> Repairs classified under "spot lamping"<sup>6</sup> took an average of 50 days to repair.<sup>7</sup> Analyzing and reporting on additional metrics could help Street Division identify both positive and negative trends specific to different types of repairs.

Currently Street Division has 22 activity codes used to track street light repair types in SAP (See **Appendix C**). However, not all codes used by the Street Division relate directly to street light repair activities. **Exhibit 5** shows the seven codes which reflect activities related to the repair of lights.

**Exhibit 5**

**Street Light Repair Activity Codes**

| SAP Codes | Category of SAP Code Explanations          |
|-----------|--|
| 8404      | Spot Lamping                               |
| 8405      | Group Lamping                              |
| 8406      | Repair Street Light Standard Lumina        |
| 8407      | Repair Underground Cables/Conduit          |
| 8408      | Damage Repair Street Light Standard/Lumina |
| 8409      | Maintenance not otherwise Classified       |
| 8421      | Circuit Repairs                            |

Source: Street Division street light SAP codes.

The following is a summary of SAP codes that do not specifically reflect work completed by repair crews:

- One code was to record that no repair was required;
- Seven codes referred to the location of street lights and underground lines;
- Three codes referred to lighting upgrades;
- Two codes referred to special event lighting work; and
- The remaining two codes relate to the cause of required repairs.

These codes cannot be utilized as performance metrics for street light repairs because they describe the lighting

<sup>5</sup> The median repair time for "pole knockover/damage" was 80 days.

<sup>6</sup> Spot lamping is repairing one light fixture.

<sup>7</sup> The median repair time for "spot lamping" was 14 days.



circumstances or locations, such as holiday lighting or airport lighting, but do not capture the actual work performed.

**Street Division Street Lights Data Is Not Reliable**

Street Division also reported in the adopted FY 2017 budget that four months of FY 2016 data was removed from the calculated repair time because the data was potentially unreliable.<sup>8</sup> Our review of the data confirmed that Street Division repair data is not reliable. Of the 3,234 repairs captured in the system, 47 were repaired in a "negative" number of days. Furthermore, 106 fields were for traffic signal related repairs.

Some of the service notifications reflect repair times of several years. Street Division management explained that those anomalies may have been the result of technicians completing a repair without appropriate staff closing out the notification in SAP. For example when we reviewed the work order data provided by Streets Division, the first and second notifications showed repair times of nine years and fifteen years respectively (See **Exhibit 6**).<sup>9</sup>

**Exhibit 6**

**Service Notification Repair Anomalies**

| Repair Code | Description                            | Date Reported | Date Started | Date Finished |
|-------------|--|---------------|--------------|---------------|
| 8408        | Damage Repair Street Light Stand/Lumin | 9/10/2001     | 9/20/2001    | 9/20/2010     |
| 8406        | Repair Street Light Standard/Lumin     | 10/30/2001    | 1/29/2016    | 1/29/2016     |

Source: Street Division SAP data.

The paper copies of the street light repair service notification are returned to the supervisors after information is entered into SAP. The street light repair supervisors do not retain the copies in accordance with City of San Diego General Records Disposition Schedules for Records Common to City Departments and discard them based on limited available space.

One of the primary reasons why the Streets Division data may not be entirely reliable is that the Street Administrative Section does not have policies and procedures established to ensure

<sup>8</sup> Data removed from the calculation was from March 2016 to June 2016.

<sup>9</sup> The SAP download by activity code list was provided by Street Division personnel as of June 16, 2016.

standardized data entry and quality assurance for street light repair data. Inaccurate data hinders the Street Division's ability to identify trends related to repair performance.

**Best Practices Cite the Need for Specific, Measurable Goals**

The *Standards for Internal Control in the Federal Government*, states that management should define the objectives in specific and measurable terms so that performance toward achieving those objectives can be assessed. By linking objectives throughout the entity to the mission, management can improve the effectiveness and efficiency of program operations in achieving the mission. To provide oversight, management should establish activities to monitor performance measures and indicators. These may include comparisons and assessments relating different sets of data to one another so that analyses of the relationships can be made and appropriate actions taken.

**Street Light Repair as a Department Priority**

Since delays in repairing street lights can reduce nighttime safety, the three percent of street lights with service notifications should be a TSWD priority. According to the FY17 Adopted Budget, TSWD priorities include coordination of projects in the right-of-way, improving the quality of City streets and sidewalks, improving the storm water infrastructure, and the development of a multi-modal transportation network. Street lights are not specifically mentioned in any of the department's five "goals and objectives."

Street light repair is one of many competing priorities within Street Division. Additional internal metrics would enable staff to identify trends and specific causes that could improve efficiency.

While street light repair data was unreliable and the single performance metric was too broad to reflect the specific causes for Street Division missing the repair goal, we also determined there was no process developed for reviewing performance data to identify specific reasons for missing organization goals.

**Additional Factors Related to Repair Efficiency**

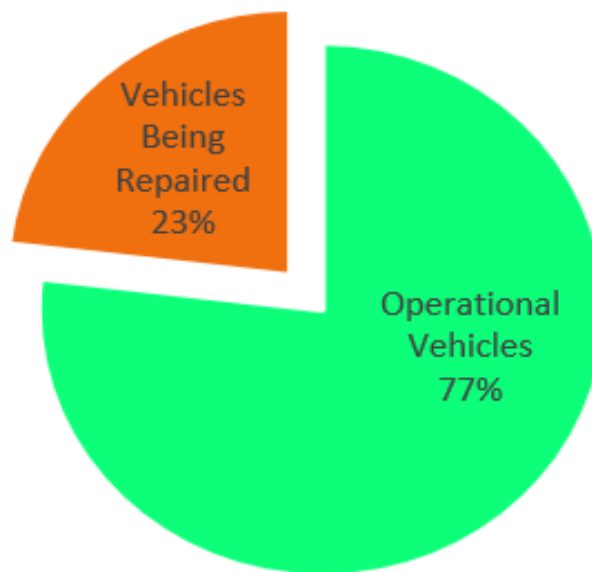
Street Division personnel believed a lack of street light repair vehicles hindered the efficiency of repairs. They cited occasions where three electricians were sent out to one repair job instead

of the required one or two employees due to a lack of vehicles. Street Division personnel started to keep a daily record of operational street light repair vehicles during the audit. The Division identified 22 vehicles dedicated to street light repairs for use by 27 street light repair positions. Of the 22 vehicles, 13 are scheduled for replacement in FY 2017 and FY 2018. According to a log maintained by Street Division managers, during the period of July 15, 2016 to October 15, 2016, the vehicles available for daily use ranged from a low of 15 to a high of 18 vehicles. Exhibit 7 depicts the vehicle records revealing that an average of 5 vehicles, or 23 percent, of the assigned vehicles were down daily for maintenance and repair during this period.

***Exhibit 7***

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**Street Light Repair Vehicles – July to October 2016**



Source: Street Division record of street light repair vehicles.

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We also identified four additional issues related to ineffective and inefficient operations that are described in the subsequent report findings.

**Recommendation #1**

**In order to effectively analyze repair performance and identify operational factors affecting street light repair times, the Street Division Deputy Director should complete the following actions.**

- Review and revise the categorization of street light repair data and develop measurable performance metrics to ensure the efficient repair of street lights;
- Develop a written quality assurance process for reviewing performance data to identify specific causes for missing any organizational goals. The process should also include actions required when goals are not met; and
- Establish a written policy for creating data reliability controls and implementation procedures providing oversight. (Priority 2)

**Recommendation #2**

In order to improve street light repair efficiency by increasing the percentage of operational vehicles and expediting the purchase of budgeted new vehicles, the Director of Transportation and Storm Water should provide workload information and vehicle needs to the Director of Fleet Operations to assist in developing priorities for vehicle availability and acquisition. (Priority 2)

## ***Finding 2: The Street Division Should Standardize Street Light Repair Operations***

The Street Division's street light repair operations are not fully standardized. While the street light repair process generally follows a set process, it relies on employees' institutional knowledge. The employees rely on institutional knowledge because there are no documented street light repair policies or procedures. The Street Division can provide better street light maintenance services by establishing policies and procedures that standardize repair operations, developing procedures for prioritizing repairs by problem type, and ensuring electricians respond to service notifications in a geographically efficient manner. Standardized policy and procedures can improve the quality of repair data and reduce repair time.

### **The Street Division's Repair Process**

Typically, either a citizen notifies the City that a street light requires repair, or a City crew will identify a street light that needs repair. When a citizen reports a problem, the Public Works Dispatch Center<sup>10</sup> processes a work order in SAP (service notification) for the Street Division. Street Division supervisors will process the work order if a City crew identifies the problem. Once the work order is recorded in SAP, a Street Division electrical supervisor distributes work to the street light repair crews.

While the street light repair process generally follows a standard process, several factors can impact the time it takes to repair a street light. Specifically, the time required to complete a street light repair depends in large part on the following factors:

- Whether the repair work requires an overhead or underground electrical crew;
- Whether the repair crew dispatched to diagnose the repair can complete the repair on the spot;
- Whether the Street Division has necessary repair parts and materials; and

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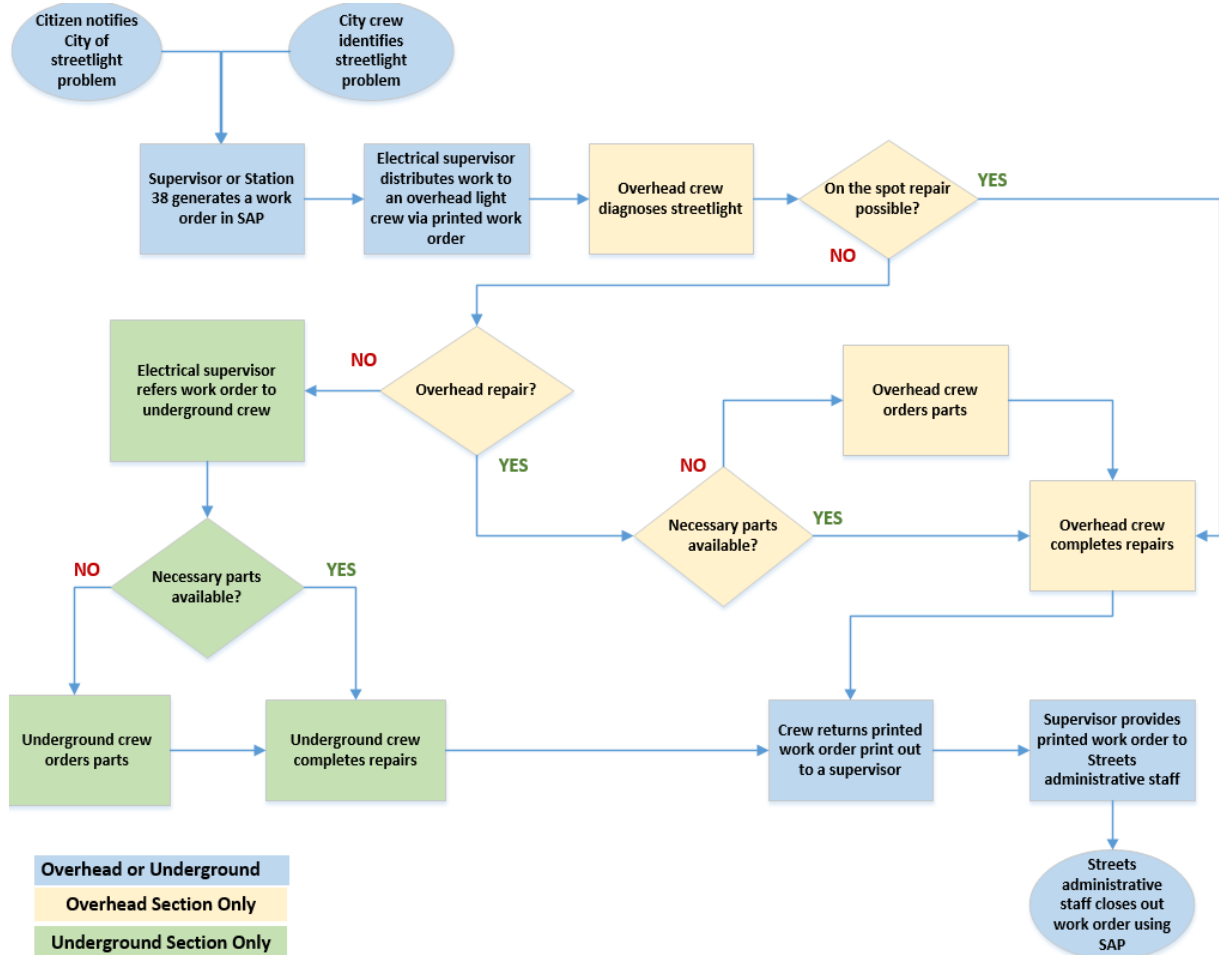
<sup>10</sup> The Public Works Dispatch Center (Station 38) is located at the Chollas Operation Station.

- The length of time necessary to receive a part that is on order.

See **Exhibit 8** below for a detailed flow chart showing the street light repair process and the factors affecting street light repair decisions.

**Exhibit 8**

**Process Flow for the Street Division’s Street Light Repair Process**



Source: OCA analysis.

**Street Light Repair Operations are Not Standardized**

The Street Division does not have a written process for the operation of its street light repair program. Specifically, the division does not have established procedures for prioritizing repairs, assigning work in a manner that is geographically efficient, and entering accurate street light repair work data into the automated system. Furthermore, the Street Division is not retaining operational records for street light repairs in accordance with City document retention guidelines, making certain reconciliation and quality control activities impossible.

The Street Division does not have policies and procedures for prioritizing or assigning street light repair work. While supervisors generally assign service notifications in the order they were received, supervisors can exercise discretion in how they distribute projects. For example, one supervisor explained that if a street light located in an area where elderly residents live requires repair, they could make that repair a priority because of safety issues.

**Benefits of Standardizing Processes**

The City could improve street light maintenance and repair services by developing policies and procedures that standardize the assignment of repairs by both City priority and geographic location. Managers can identify and institutionalize best practices by establishing a standardized work assignment process. Furthermore, a City study recommended changes to the way Street Division records repair information in SAP.<sup>11</sup> The study estimated Street Division could reduce repair times by three days if repair crews utilized field laptops, thereby eliminating duplicate entries, eliminating paperwork, and reducing frustration caused by the current paper based process experienced by both the repair crews and administrative personnel. The recommendation to utilize field laptops has not been implemented.

**State and Federal Program Management Guidance**

The California Controller's *Internal Control Guidelines for California Local Agencies*, and the General Accountability Office's (GAO) *Standards for Internal Control in the Federal*

<sup>11</sup> City staff from the Performance and Analytics Department completed an efficiency study in February 2016 with the goal of improving the street light repair process. The study estimated that the implementation of its recommendations would reduce lead time for street light maintenance by eliminating paperwork for repair crews, and would result in a 37 percent gain in administrative staff time per day.

*Government*, emphasize the need to document an organizational unit's policies. A unit should develop policies which consider both the objectives of the organization, and the risks related to operational processes. Policies and procedures should also address information processing to ensure controls are in place to check the accuracy of data entered into information systems, and the accuracy of reports derived from the system.

**Lack of Standardization  
Causes Data Reliability  
Issues**

Street Division's work order data does not accurately reflect actual repair times. Furthermore, because Street Division's processes for tracking street light repair data and entering the data into SAP is not fully standardized, data entry is prone to error in part because it relies on paper work order tracking and manual entry into SAP by clerks.

We could not conduct data reliability testing on repair data because the Street Division does not retain paper work orders in accordance with the City of San Diego General Records Disposition Schedules for Records Common to City Departments. Supervisors discard the paper work orders based on office space needs. As a result, we could not compare original forms to verify the accuracy of the repair data information recorded in SAP.

We could not evaluate actual operations against existing policies and procedures, because the Street Division does not have formal policies, procedures, or manuals that govern Street Division's street light repair operations. Street Division informed us that they have started to develop standard operating procedures.

**Recommendation #3**

**The Street Division Deputy Director should develop written policies and procedures for all street light repair operations to ensure:**

- **Standardized repair operations that include a prioritization methodology and geographic considerations; and**
- **Document retention procedures that comply with City retention policy. (Priority 2)**



**Recommendation #4**

**The Street Division should formally assess the feasibility of using portable electronic devices in order to eliminate the need for paper work orders, and collect street light data through an automated process to improve efficiency.  
(Priority 2)**

***Finding 3: Street Division Needs to Establish an Inventory of Replacement Parts and Materials to Improve Operational Efficiency***

The Street Division does not have any inventory records for street light replacement parts and materials, such as light bulbs, fixtures, and poles. Street Division reported that in FY 2016, the Division ordered street light replacement parts and materials at a cost of \$577,745. However, no active inventory log exists, and Street Division supervisors reported they are unable to review any records which allow them to track when employees are using inventory for repairs.

Without an active inventory log for replacement parts and materials, Street Division cannot develop an automatic reordering process that maintains an adequate inventory level. As a result, repair crews may have to special order necessary parts and delay repairs until the appropriate parts and materials become available. Electricians currently have to review the physical inventory in the storage yard to determine whether a necessary replacement part is available. If the part is not available, the division orders the necessary part and the electrician must wait for the part before they can complete the repair. Without any inventory records or logs, street light repair staff are unable to determine which replacement parts and materials are available.

**Parts and Materials  
Storage Areas**

During site visits of the street light storage areas we observed that the parts and materials storage areas were disorganized. We found parts and materials were stored in an old modular trailer, on an asphalt lot behind the offices, and in a dirt lot behind the fenced in portion of the Chollas Operations Yard. The parts and materials stored in the asphalt and dirt lots are continually exposed to the elements. **Exhibit 9** below shows storage conditions at the asphalt and dirt lots (For additional pictures see **Appendix D**).

**Exhibit 9****Inventory Storage Areas**

Source: OCA.

**Best Practices for  
Managing Physical  
Inventories**

The California Controller *Internal Control Guidelines, California Local Agencies*, and the GAO's *Standards for Internal Control in the Federal Government*, both establish the need for effective controls over physical assets. California Controller Guidelines state that local government agencies should establish policies and procedures that ensure assets are safeguarded against misuse or theft. That can include periodic physical inventories to ensure that records are accurate and any discrepancies are investigated and explained.

The GAO's *Standards for Internal Control in the Federal Government* highlight the need for similar best practices in order to mitigate fraud risk. Management should establish both physical controls, such as limited access to assets, and conduct periodic counts which compare asset counts to control records. Management should design control activities in response to the entity's objectives and risks to achieve an effective internal control system. Control activities are the policies, procedures, techniques, and mechanisms that enforce management's directives to achieve the entity's objectives and address related risks.

**The Lack of Parts and  
Materials Inventory  
Causes Inefficiencies and  
Internal Control  
Weaknesses**

Street Division has not established inventory control mechanisms for the parts and materials inventory, and has neither the records nor verification processes necessary to ensure proper inventory management.

Street Division relies on an ad-hoc ordering system as opposed to systematically ordering parts based on inventory needs. When parts are not available, technicians must return to the yard to obtain the part, or order the part, and then make additional trips to complete a street light repair. Without knowing how much inventory has been received, used for repairs, and is currently on hand, Street Division personnel cannot develop a system to reorder parts to keep minimum levels on hand.

No active inventory log exists, and Street Division supervisors reported they are unable to review any records which allow them to track when employees are using inventory for street light repairs. As a result, circumstances exist which provide anyone with access to the materials the opportunity to commit theft or fraud. One control in place to prevent theft or misuse is a security camera that covers the yard where the division keeps the inventory that could be used to identify nonemployees removing items from the storage area. Also, Street Division managers advised that some parts are locked in a modular trailer and accessible only to supervisors. While Street Division does not have inventory logs for replacement parts and materials, the TSWD Safety and Training Manager provided information that the City had recently enhanced physical security measures at the Chollas Operations Yard. Additional security upgrades are also planned for the site.

Periodic inventories are beneficial for organizations to identify what goods need to be ordered to ensure efficient operations are achieved. Additionally, periodic inventory shortages can help identify losses that could have resulted from theft or damaged materials.

Street Division management acknowledged that they would like to order more parts ahead of time, in a more systematic manner, to be better prepared for street light replacement and

repair needs. The Division intends to use the City's new IAM system to track the parts and materials inventory.

**Recommendation #5**

**In order to improve the operational efficiency of street light repairs and reduce the risk of theft, the Street Division Deputy Director should:**

- **Create an inventory to account for street light repair parts and materials;**
- **Establish inventory controls over parts and materials that encompass receipts, distribution, and periodic inventory of the items on hand; and**
- **Develop inventory thresholds that will automatically trigger parts reordering in response to demand.**  
(Priority 2)

***Finding 4: Street Division Needs to Update and Maintain the Street Light Asset Inventory Data to Ensure Repair Crews Have Accurate Information to Improve Repair Efficiency***

The Street Division's street light asset inventory data is inaccurate and incomplete. Inaccurate asset information negatively affects the efficiency of repair operations because repair personnel do not always have the correct information about a street light when they arrive on site for repairs. Inaccurate street light asset information will also hinder any future efforts to develop preventative maintenance plans.

Street light asset information is inaccurate because Street Division does not have applicable policies, procedures, or manuals that establish controls for managing street light asset information in SAP. The Street Division section responsible for maintaining and updating street light asset information has also faced a significant staffing shortfall. To ensure the City is maintaining an accurate inventory of street lights, the Street Division should establish operational guidelines for managing and continuously updating street light asset information in SAP.

**The City's Street Light Asset Inventory**

The Street Division's street light asset inventory did not list a type of lamp for 748 street lights, nor did it list a pole type for 9,268 street lights. Inaccurate information in Street Division's street light asset inventory records negatively affects the repair section efficiency by causing repair delays and increased repair times because street light repair personnel often make an additional trip to repair a street light.

There were also significant differences between asset information in SAP and a street light inventory developed by ESD. As of July 20, 2016, the City SAP asset inventory contained 54,432 street lights, while the asset inventory completed by an ESD contractor contained 61,146 street lights. We also identified several differences between Street Division's inventory, and the inventory conducted by an ESD contractor.

- The asset inventory completed by an ESD contractor did not include pole information.
- Street Division estimates that the City has approximately 100 different fixture types based upon staff's extensive experience installing and repairing fixtures across the City over the years. Although the audit team identified 1,320 fixture types based on the actual data in SAP, Street Division personnel attributed the difference to the Division not utilizing a standard nomenclature in SAP. The asset inventory completed by the ESD contractor contained 23 types of fixtures.

**Exhibit 10** shows examples of the many different types of San Diego street light poles and fixtures.

*Exhibit 10*

**Street Light Pole and Fixture Examples**



Source: OCA and Google Maps.

- The only inventory fields that were available for direct comparison were the types of lamps. ESD has completed projects to convert 35,000 existing street lights to induction technology and 3,600 street lights to light-emitting diode (LED) technology. However, neither inventory reflects completed retrofit projects. Specifically,

the two asset inventories showed variations in lamp types (See **Exhibit 11**).

### **Exhibit 11**

#### **Asset Inventory of Lamp Types**

| Type of Lamp         | Street Division Inventory | ESD Inventory     |
|----------------------|---------------------------|-------------------|
| Induction            | 15,011                    | 35,138            |
| High Pressure Sodium | 29,646                    | 7,263             |
| Low Pressure Sodium  | 6,844                     | 4,784             |
| LED                  | 205                       | 453 <sup>12</sup> |
| Metal Halide         | 924                       | 3                 |
| Mercury Vapor        | 147                       | 9                 |
| Incandescent         | -                         | 11                |
| Florescent           | 46                        | -                 |
| Quartz               | 16                        | -                 |
| Other                | -                         | 72                |
| Unknown              | -                         | 360               |
| Blank                | 748                       | 13,053            |

Source: OCA analysis of Street Division and ESD inventories.

The street light asset inventory does not contain sufficient information—such as dates of initial installation, or last maintenance—to develop preventative maintenance plans. Additionally, it does not identify key information such as specialty lights associated with maintenance assessment district information. The Government Finance Officers Association best practices highlight the need for continuous maintenance of assets. As the physical condition of infrastructure declines, deferring maintenance can increase long term costs, threaten public safety, and impact overall quality of life for residents. Currently the City only repairs a street light when it receives notification that a light requires repair or when a repair crew identifies a problem.

<sup>12</sup> During the audit, the ESD asset inventory data was updated to include 4,141 LED street lights.



**Infrastructure Asset  
Management Best  
Practices**

The Government Finance Officers Association best practice for asset maintenance and replacement recommends that local governments develop a policy to require a complete asset inventory. The association recommends that inventories contain the following essential information about an asset: engineering description, location, physical dimensions and condition, as-built documents, warranties, maintenance history, replacement costs, operating costs, usage statistics, book value, original useful life, and remaining useful life.

**The Division Lacks Asset  
Inventory Management  
Controls**

During the audit, we found that the Street Division had no applicable policies, procedures, or manuals that establish controls for managing street light asset information in SAP. The Street Division manager responsible for asset information management confirmed that the division has no standard operating procedures governing inventory verification and management. There is only a written procedure for adding new street lights into the SAP inventory.

Furthermore, the section of the Street Division which is responsible for updating the street light asset inventory has faced a significant staffing shortfall. The shortfall is affecting the Street Division's ability to consistently update street light asset information in SAP. According to the Street Division, four of the seven positions allocated to the section were vacant as of November 2016.<sup>13</sup> When the City installs new street lights, a Senior Engineering Aide is responsible for "energizing" lights, which is the process of notifying San Diego Gas and Electric Company that a new street light is ready to receive electricity.

The Senior Engineering Aide is also responsible for adding new street lights to the asset information system in SAP. According to the employee, energizing new lights and adding the information into SAP is their top priority. The lower priority is updating SAP information following street light conversions, where the City makes physical changes to an existing street light. This includes street light conversions for energy efficiency retrofit projects managed by ESD. The Senior Engineering Aide explained that they update street light asset information

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<sup>13</sup> Two of the vacant positions are intern positions.

related to conversions one-by-one, and only as time allows. According to Street Division management, the division has sought an information technology solution allowing for batch updates of energy efficiency retrofit data. However, Street Division has not had sufficient staff and information technology resources to develop such a program.

**Recommendation #6**

**To ensure the City has accurate asset data used for street light repairs, the Street Division Deputy Director should:**

- **Prioritize hiring of asset management positions;**
  - **Update street light asset information to include fixture and pole data needed to make street light repairs more efficient; and**
  - **Develop operational guidelines for updating street light asset data when the City makes modifications to assets, and if asset additions and removals occur.**
- (Priority 2)**

### ***Finding 5: San Diego Needs to Improve Street Light Planning***

The City has not developed a comprehensive plan addressing street light infrastructure challenges and department responsibilities. As shown in **Exhibits 2 and 3**, the responsibilities for street lights fall under two Deputy Chief Operating Officers and five Department Directors. Consequently, the management structure for street lights is complex. Effective management of street lights requires a high degree of interdepartmental coordination between the five Department Directors.

Directors from both TSWD and ESD acknowledged opportunities exist to more clearly define street light responsibilities to facilitate future planning and strategic implementation. Both of the Directors indicated that a memorandum of understanding and/or responsibility matrix would help facilitate the future planning process.

Coordination efforts are currently ad-hoc and based on individual efforts. Although ESD's Energy and Sustainability Division and Street Division managers stated they collaborated in 2015 prior to the decision to purchase the new LED lamp heads and fixtures, street light repair personnel stated that the fixtures were heavy. Repair personnel said they were required to take new LED lamp heads down to complete repairs instead of being able to repair the lamps in place, which is both a safety and efficiency issue.

As of July 20, 2016, the City inventory maintained by Street Division for street light assets contained hundreds of different fixture, lamp, and pole types. Moving forward, comprehensive street light infrastructure planning and efforts to standardize fixture, lamp, and pole types could decrease the types of replacement parts and materials Street Division must keep on hand.

**Additional Coordination and Planning is Necessary to Improve Future Efficiency**

TSWD has the primary responsibility for street light repairs. However, street light infrastructure projects are typically beyond TSWD control, including energy efficiency and street light retrofit projects, Capital Improvement Projects, and the establishment of MADs.

For example, the adaptive nodes being purchased and installed in conjunction with LED retrofitting create additional opportunities for the City to become more energy efficient. ESD reports the City has installed 3,600 adaptive nodes with the LED lights and plans to install another 14,000 in the summer of 2017.<sup>14</sup> The adaptive nodes provide monitoring capabilities for street light outages or lights that are on all day. The nodes also allow for dimming capabilities based on the time of day to increase energy efficiency.

In August 2016, Street Division sold new replacement parts that cost \$240,600 for only \$1,500 because the parts had become obsolete.<sup>15</sup> **Exhibit 12** shows auctioned items.

**Exhibit 12**

**New Lights Auctioned**



Source: Street Division auction documents.

<sup>14</sup> ESD estimates that the completed LED retrofit project saves the City \$254,000 annually. The planned retrofit project of an additional 14,000 lights will save the City and estimated \$2.4 million annually.

<sup>15</sup> City staff from the Performance and Analytics Department completed an efficiency study in February 2016 with the goal of improving the street light repair process. The study identified over 500 new replacement light parts for auction because they were obsolete.

Although TSWD and ESD managers collaborated last year on the decision to purchase the new LED lamp heads and fixtures, neither department has established plans to utilize the adaptive node capabilities. Also, specific warranty information for the LED fixtures installed was not available to street light repair personnel within the street light inventory which feeds the information into the repair work orders.

Since the City does not have a cohesive management structure that supports street light repairs, the Directors thought the current coordination situation could improve with a memorandum of understanding, responsibility matrix, or both. This would clarify roles and responsibilities of all City Departments involved with street lights. Both directors noted a matrix works well and could be referred to by departments to help carry out activities in a more efficient manner. Further, one director also noted that the document could be useful to inform City Council members of departments' street light management responsibilities.

**The Need for Strategic Planning**

According to the National Performance Management Advisory Commission, the performance management cycle for measurement and reporting should be based on continuous planning, budgeting, management, and evaluation. Strategic planning should systematically address an organization's purpose, internal and external environment, value to stakeholders, and it should be used to set an organization's long-term course. The Government Performance and Results Act says that strategic planning is "an opportunity to unify the management, employees, stakeholders, and customers through a common understanding of where the organization is going, how everyone involved can work to that common purpose, and how we will measure our progress and levels of success.

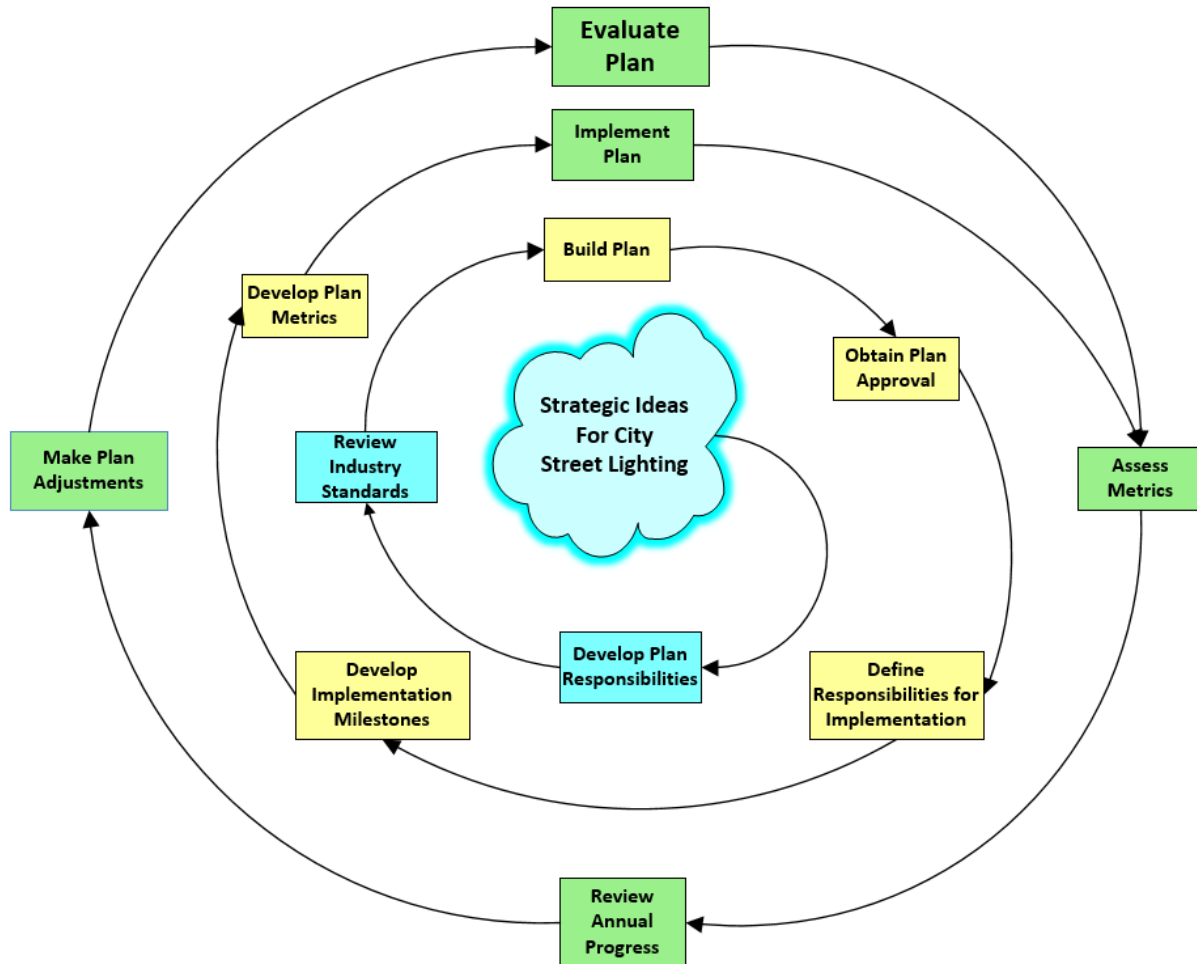
A strategic plan for street lights could include the following steps depicted by **Exhibit 13**.

- Take ideas, develop a plan, and review industry standards;

- Build plan, obtain plan approval, define responsibilities for implementation, develop milestones, and develop metrics; and
- Implement the plan and then continue to assess metrics, review annual progress, and make plan adjustments.

**Exhibit 13**

**Street Lighting Plan Process**



Source: OCA analysis based on the *GAO Standards for Internal Control in the Federal Government*, September 2014, and the *King County Strategic Planning Guidebook*, February 2016

According to the 2015 California Controller *Internal Control Guidelines for California Local Agencies* management should establish communication channels that: provide timely information, can be tailored to individual needs, inform employees of their duties and responsibilities, enable the

reporting of sensitive matters, enable employees to provide suggestions for improvement, provide the information necessary for all employees to carry out their responsibilities effectively, convey management's message that internal control responsibilities are important and should be taken seriously, and convey and enable communication with external parties.

The Government Finance Officers Association's best practice, *Framework for Internal Control: The Control Environment*, recommends that management develop organizational structures and ensure staff accountability by creating a formal organization structure for each of the departments. This includes:

- Requiring written procedures for important government processes;
- Developing flowcharts of each significant process;
- Maintaining electronic copies of process flow to facilitate updating;
- Identifying responsibilities for work flow approvals in their systems; and
- Making sure systems incorporate compensation controls.

**Recommendation #7**

**In order to improve street light management and maintenance, the Deputy Chief Operating Officer Infrastructure/Public Works, in conjunction with the Transportation and Storm Water Department and the Environmental Services Department, should develop and document a street light management plan or memorandum of understanding that includes an overall vision for the long term management of street lights, and clear responsibilities for future planning related to street light installation, energy efficiency for streetlight retrofits, and maintenance of street light infrastructure. (Priority 2)**

# Conclusion

The Street Division could operate more efficiently by redefining activity codes and developing measurable performance metrics and goals to specifically address each type of street light repair. The Division should develop a written process for reviewing performance data to identify specific causes for missing organizational goals and actions required when goals are not met. Further, in order to have sufficient vehicles for an efficient repair program, an acceptable percentage of available operational vehicles should be maintained by Fleet Services, and the delivery of budgeted vehicle purchases should be expedited.

The Street Division should standardize street light repair operations. The Division should develop written policies and procedures to ensure standardized repair operations that include prioritization methodology and geographic considerations, data reliability controls, and document retention procedures. The Division should also formally assess the feasibility of using portable electronic devices in order to eliminate the need for paper work orders and collect street light data through an automated process.

The Street Division should establish an inventory of replacement parts and materials to improve operational efficiency. The Division should create an inventory to account for street light repair parts and materials. The inventory should establish controls over parts and materials that encompasses receipts, distribution, and periodic inventory of the items on hand. The inventory should also include thresholds that will automatically trigger parts reordering in response to repair demand.

The Street Division also needs to update and maintain street light asset data to ensure repair crews have accurate asset information. To ensure accurate asset data is available, the Division should prioritize the hiring of asset management positions. The Division should also update street light asset information to include fixture and pole data needed to make



repairs, and develop operational guidelines for updating the data after the City makes changes or additions to the assets.

Lastly, the City needs to develop a comprehensive plan for street light management and maintenance because the management structure for street lights is complex, and encompasses multiple City departments. The Street Division currently maintains hundreds of different fixture, lamp, and pole types for repairs, and a comprehensive plan is needed which specifies street light management responsibilities to help ensure street light operations are more efficient in the future.

# Recommendations

We made seven recommendations to improve the efficiency of street light repair operations, and management agreed to implement all of the recommendations.

## **Recommendation #1**

In order to effectively analyze repair performance and identify operational factors affecting street light repair times, the Street Division Deputy Director should complete the following actions.

- Review and revise the categorization of street light repair data and develop measurable performance metrics to ensure the efficient repair of street lights;
- Develop a written quality assurance process for reviewing performance data to identify specific causes for missing any organizational goals. The process should also include actions required when goals are not met; and
- Establish a written policy for creating data reliability controls and implementation procedures providing oversight. (Priority 2)

## **Recommendation #2**

In order to improve street light repair efficiency by increasing the percentage of operational vehicles and expediting the purchase of budgeted new vehicles, the Director of Transportation and Storm Water should provide workload information and vehicle needs to the Director of Fleet Operations to assist in developing priorities for vehicle availability and acquisition. (Priority 2)

## **Recommendation #3**

The Street Division Deputy Director should develop written policies and procedures for all street light repair operations to ensure:

- Standardized repair operations that include a prioritization methodology and geographic considerations; and
- Document retention procedures that comply with City retention policy. (Priority 2)

- Recommendation #4** The Street Division should formally assess the feasibility of using portable electronic devices in order to eliminate the need for paper work orders, and collect street light data through an automated process to improve efficiency. (Priority 2)
- Recommendation #5** In order to improve the operational efficiency of street light repairs and reduce the risk of theft, the Street Division Deputy Director should:
- Create an inventory to account for street light repair parts and materials;
  - Establish inventory controls over parts and materials that encompass receipts, distribution, and periodic inventory of the items on hand; and
  - Develop inventory thresholds that will automatically trigger parts reordering in response to demand. (Priority 2)
- Recommendation #6** To ensure the City has accurate asset data used for street light repairs, the Street Division Deputy Director should:
- Prioritize hiring of asset management positions;
  - Update street light asset information to include fixture and pole data needed to make street light repairs more efficient; and
  - Develop operational guidelines for updating street light asset data when the City makes modifications to assets, and if asset additions and removals occur. (Priority 2)
- Recommendation #7** In order to improve street light management and maintenance, the Deputy Chief Operating Officer Infrastructure/Public Works, in conjunction with the Transportation and Storm Water Department and the Environmental Services Department, should develop and document a street light management plan or memorandum of understanding that includes an overall vision for the long term management of street lights, and clear responsibilities for future planning related to street light installation, energy efficiency for streetlight retrofits, and maintenance of street light infrastructure. (Priority 2)

# Appendix A: Definition of Audit Recommendation Priorities

## DEFINITIONS OF PRIORITY 1, 2, AND 3 AUDIT RECOMMENDATIONS

The Office of the City Auditor maintains a priority classification scheme for audit recommendations based on the importance of each recommendation to the City, as described in the table below. While the City Auditor is responsible for providing a priority classification for recommendations, it is the City Administration’s responsibility to establish a target date to implement each recommendation taking into considerations its priority. The City Auditor requests that target dates be included in the Administration’s official response to the audit findings and recommendations.

| Priority Class <sup>16</sup> | Description   |
|------------------------------|---|
| 1                            | Fraud or serious violations are being committed.<br>Significant fiscal and/or equivalent non-fiscal losses are occurring.<br>Costly and/or detrimental operational inefficiencies are taking place.<br>A significant internal control weakness has been identified. |
| 2                            | The potential for incurring significant fiscal and/or equivalent non-fiscal losses exists.<br>The potential for costly and/or detrimental operational inefficiencies exists.<br>The potential for strengthening or improving internal controls.                     |
| 3                            | Operation or administrative process will be improved.   |

<sup>16</sup>The City Auditor is responsible for assigning audit recommendation priority class numbers. A recommendation which clearly fits the description for more than one priority class shall be assigned the higher priority.

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# Appendix B: Objectives, Scope, and Methodology

**Objective** In accordance with the Office of the City Auditor's FY 2017 Work Plan, and per a request by Councilmember Sherman, we conducted a performance audit of the Street Division's street light repair program. The objective of this audit was to determine whether the City is repairing street light assets in an efficient and effective manner.

**Scope & Methodology** To achieve our audit objective, we:

- Interviewed managers and staff members from the Transportation and Storm Water, Environmental Services, Public Works, Park and Recreation, and Economic Development Departments to assess street light repair operations and responsibilities, and to solicit input on the City's street light infrastructure challenges;
- Reviewed Street Division performance goals and street light repair performance data from SAP to determine whether the division's performance goals are effective, and whether the division's performance data is reliable;
- Evaluated existing policies and procedures to determine whether the Street Division has documented and standardized street light repair operations;
- Conducted ride-alongs with repair crews, reviewed existing City process maps, and generated new process maps in order to define current street light repair processes;
- Conducted site visits of the City's Chollas Operations Yard to review the organization and storage conditions of the Street Division's parts and materials inventory;
- Assessed management controls for street light replacement parts and materials to determine whether the division can sufficiently track replacement parts and materials and ensure accountability;
- Evaluated management controls and SAP data related to the Street Division's street light asset information to assess whether the Street Division is effectively updating asset information and ensuring its accuracy; and

- Evaluated the City's coordination and planning efforts for street lights to determine whether those efforts adequately address street light infrastructure challenges.

We conducted this performance audit in accordance with generally accepted government auditing standards. These 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 the audit objectives.

## Appendix C: SAP Street Light Repair Codes

| SAP Codes | Category of SAP Code Explanations          |
|-----------|--|
|           |  |
|           | <b>Repair Types</b>                        |
| 8404      | Spot Lamping                               |
| 8405      | Group Lamping                              |
| 8406      | Repair Street light Standard Lumina        |
| 8407      | Repair Underground Cables/Conduit          |
| 8408      | Damage Repair Street Light Standard/Lumina |
| 8409      | Maintenance not otherwise Classified       |
| 8421      | Circuit Repairs                            |
|           |  |
|           | <b>No Repair Required</b>                  |
| 8412      | Service Call-No Trouble Found              |
|           |  |
|           | <b>Locating Underground Lines</b>          |
| 8402      | Underground Locating                       |
|           |  |
|           | <b>Locating Street Lights for Repair</b>   |
| 8403      | Patrolling Street Lights                   |
|           |  |
|           | <b>Locations of Light Repairs</b>          |
| 8420      | Maintenance of Airport Lighting            |
| 8442      | Park & Recreation Upgrades                 |
| 8443      | Park & Recreation Repairs                  |
| 8444      | City Parking Lots                          |
| 8419      | Repair Flood Lighting                      |
|           |  |
|           | <b>Lighting Upgrades</b>                   |
| 8428      | Street Light Conversion                    |
| 8423      | Improvement Projects                       |
| 8441      | Pole Attachments                           |
|           |  |
|           | <b>Special Events</b>                      |
| 8424      | Holiday Lighting                           |
| 8425      | Other                                      |
|           |  |
|           | <b>Cause of Repair</b>                     |
| 8426      | Vandalism Repairs                          |
| 8440      | Stolen Wire                                |

## Appendix D: Repair Materials and Parts Inventory Storage Area Conditions



New and used parts/materials comingled next to the dirt road behind the operations yard. Some are still in the wrapper.



Parts and materials stored in a disorganized fashion.





THE CITY OF SAN DIEGO  
M E M O R A N D U M

DATE: November 30, 2016  
TO: Eduardo Luna, City Auditor  
FROM: Paz Gomez, Deputy Chief Operating Officer, Infrastructure/Public Works  
SUBJECT: Management Response to Performance Audit of Street Light Repair

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The purpose of this memorandum is to provide Management's response to the Audit Report entitled "Performance Audit of Street Light Repair". The Audit's primary objectives were to:

- Determine if standardizing operations could improve the delivery of street light repair.
- Determine if additional performance metrics and analysis could improve the delivery of street light repair.
- Determine if increased interdepartmental coordination could improve the delivery of street light repair.

The Audit Report provided recommendations to enhance the overall efficiency and effectiveness of the City's street light repair process. Below are the Departments' responses to the Audit Recommendations.

**Recommendation 1:** In order to effectively analyze repair performance and identify operational factors affecting street light repair times, the Street Division Deputy Director should complete the following actions:

- Review and revise the categorization of street light repair data and develop measurable performance metrics to ensure the efficient repair of street lights.
- Develop a written quality assurance process for reviewing performance data to identify specific causes for missing any organizational goals. The process should also include actions required when goals are not met.
- Establish a written policy for creating data reliability controls and implementation procedures providing oversight. (Priority 2).

**Management Response:** We agree with the recommendation. The Transportation & Storm Water Department, Street Division, will review the categorization of the available street light repair data and revise as appropriate to improve the efficiency of repairs. Performance metrics and goals will be developed to achieve optimal effectiveness. Additionally, a quality assurance process will be developed to assist in identifying factors that contribute to any

missed goals, including controls for data reliability and program oversight. The current SAP-based Work Management System for street light repair is in the process of being integrated into the citywide Infrastructure Asset Management (IAM) San Diego project. The Department has been working closely with the IAM San Diego development team to ensure that the new Work Management System will possess the functionalities to support the necessary data analysis and management controls needed for efficient and effective street light repair operations. **Target Implementation Date: December 2017.**

**Recommendation 2:** In order to improve street light repair efficiency by increasing the percentage of operational vehicles and expediting the purchase of budgeted new vehicles, the Director of Transportation & Storm Water should provide workload information and vehicle needs to the Director of Fleet Operations to assist in developing priorities for vehicle availability and acquisition. (Priority 2)

**Management Response:** We agree with the recommendation. The Director of the Transportation and Storm Water Department will formally provide workload information and vehicle needs to the Director of Fleet Operations Department as recommended. Currently, the Transportation & Storm Water Department, Street Division, senior staff meets on a bi-weekly basis with the Director and senior staff of Fleet Operations Department to discuss vehicle repair status, prioritization of repairs, and status of pending vehicle acquisitions. The Department will continue to work with Fleet Operations Department on implementing this recommendation and to seek a schedule on vehicle acquisition. **Target Implementation Date: August 2017.**

**Recommendation 3:** The Street Division Deputy Director should develop written policies and procedures for all street light repair operations to ensure:

- Standardized repair operations that include a prioritization methodology and geographic considerations; and
- Document retention procedures that comply with City retention policy. (Priority 2)

**Management Response:** We agree with the recommendation. The Transportation & Storm Water Department, Street Division, will develop written Standard Operating Procedures to formally document the repair process. Additionally, Street Division will ensure that all street light repair documents will be retained in accordance with the City's Document Retention Policy. The Department has been working closely with the IAM San Diego development team to ensure the procedures will be incorporated into the new Work Management System.

**Target Implementation Date: December 2017.**

**Recommendation 4:** The Street Division should formally assess the feasibility of using portable electronic devices in order to eliminate the need for paper work orders, and collect street light data through an automated process to improve efficiency. (Priority 2)

**Management Response:** We agree with the recommendation. The Transportation & Storm Water Department, Street Division, has been working closely with the IAM San Diego development team to ensure that a mobile work management capability will be available with the new system. The mobile component is being developed and will be implemented as part of the IAM San Diego project, which is expected to be available when the system becomes operational in late 2017. This effort will require acquisition of mobile devices and training of staff for utilization. **Target Implementation Date: January 2018.**

**Recommendation 5:** In order to improve the operational efficiency of street light repairs and reduce the risk of theft, the Street Division Deputy Director should:

- Create an inventory to account for street light repair parts and materials;
- Establish inventory controls over parts and materials that encompass receipts, distribution, and periodic inventory of the items on hand; and
- Develop inventory thresholds that will automatically trigger parts reordering in response to demand. (Priority 2)

**Management Response:** We agree with the recommendation. The Transportation & Storm Water Department, Street Division, has been working with the IAM San Diego development team on developing a street light repair parts and material inventory. This will be implemented as part of the IAM San Diego project when the system becomes operational. The IAM San Diego project is programmed to include a robust automated inventory management tool with the capability of triggering automatic reorders when minimum supply thresholds are met. In the interim, Street Division will implement a limited inventory management solution for high-cost repair parts and material. **Target Implementation Date: December 2017.**

**Recommendation 6:** To ensure the City has accurate asset data used for street light repairs, the Street Division Deputy Director should:

- Prioritize hiring of asset management positions;
- Update street light asset information to include fixture and pole data needed to make street light repairs more efficient; and
- Develop operational guidelines for updating street light asset data when the City makes modifications to assets, and if asset additions and removals occur. (Priority 2)

**Management Response:** We agree with this recommendation. The Transportation & Storm Water Department, Street Division, has recently filled the newly created Project Assistant position, and interviews are being scheduled to fill the remaining vacancy in the Division's Asset Management Section. The Division has developed operational guidelines for updating streetlight asset data and will utilize these guidelines to perform more efficient updates to the City's street light asset inventory. Updating the street light asset inventory to include fixture and pole data will require extensive efforts and additional resources including conducting a comprehensive field survey. The Division will develop a plan to update the street light asset data and request appropriate resources through the budget process. Once completed, the updated street light asset data will be incorporated into the IAM San Diego citywide project. **Target Implementation Date: December 2018.**

**Recommendation 7:** In order to improve street light management and maintenance, the Deputy Chief Operating Officer Infrastructure/Public Works, in conjunction with the Transportation & Storm Water Department and the Environmental Services Department, should develop and document a street light management plan or Memorandum of Understanding that includes an overall vision for the long term management of street lights, and clear responsibilities for future planning related to street light installation, energy efficiency for streetlight retrofits, and maintenance of street light infrastructure. (Priority 2)

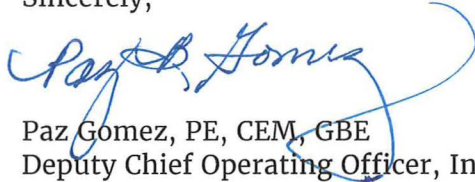
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Eduardo Luna, City Auditor

November 30, 2016

**Management Response:** We agree with this recommendation. The Deputy Chief Operating Officer, Infrastructure/Public Works, will work with the Transportation & Storm Water Department and the Environmental Services Department to develop a Memorandum of Understanding in compliance with this recommendation. **Target Implementation Date: June 2017.**

Sincerely,



Paz Gomez, PE, CEM, GBE

Deputy Chief Operating Officer, Infrastructure/Public Works

cc: Stacey LoMedico, Assistant Chief Operating Officer  
Mary Lewis, Chief Financial Officer  
Ronald H. Villa, Deputy Chief Operating Officer, Internal Operations  
Marshall Anderson, Director of Council Affairs, Office of the Mayor  
Rolando Charvel, City Comptroller  
Alia Khouri, Director, Fleet Operations Department  
Kris McFadden, Director, Transportation & Storm Water Department  
James Nagelvoort, Director, Public Works Department  
Mario Sierra, Director, Environmental Services Department  
Kenneth So, Deputy City Attorney, City Attorney's Office  
Monica Willian, Deputy City Attorney, City Attorney's Office  
Vic Bianes, Assistant Director, Transportation & Storm Water Department  
Kyle Elser, Assistant City Auditor, Office of the City Auditor  
Marnell Gibson, Assistant Director, Public Works Department and City Engineer  
Darren Greenhalgh, Assistant Director, Environmental Services Department  
Jack Clark, Deputy Director, Environmental Services Department  
Kristi Reeser, Deputy Director, Transportation & Storm Water Department  
Meya Alomar, Program Manager, Fleet Operations Department  
Lori Cosio-Azar, Program Manager, Environmental Services Department  
Erin Noel, Program Manager, Infrastructure Asset Management Program  
Nathan Patterson, Program Manager, Transportation & Storm Water Department