



THE CITY OF SAN DIEGO

## M E M O R A N D U M

DATE: February 12, 2020

TO: Kris Michell, Chief Operating Officer

FROM: Erik Caldwell, Deputy Chief Operating Officer, Smart and Sustainable Communities

SUBJECT: Smart Streetlight Costs

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Per your request, this memorandum provides information related to expected costs for the smart streetlight project. While the need for additional funding to support the smart streetlight project was addressed in the Five Year Financial Outlook, this memo provides additional information to help with upcoming budget decisions related to this project.

### **Background**

On December 13, 2016, City Council approved an agreement with General Electric (GE) to upgrade a portion of the City's streetlighting infrastructure with light-emitting diode (LED) retrofits and sensor technology from GE. As part of the Council action, a \$30.23M loan was approved to fund the streetlight and sensor equipment and installation. Approximately, \$19M of the \$30.23M loan funded adaptively-controlled LED retrofits exclusively. These LED retrofits would have occurred even if the City had chosen not to move forward with the sensor component of the project as lighting upgrades are part of the City's ongoing efforts to reduce our energy costs across our network of more than 60,000 streetlights citywide. The remaining \$11M funded the purchase and installation of 3,200 smart streetlight sensors. The loan repayment, approximately \$2.3M per year for 13 years, was expected to be covered by the energy savings received by replacing inefficient lighting fixtures with the adaptively-controlled LED fixtures.

### **Project Transition**

In July 2018, the smart streetlights project and the supporting staff were transferred from the Environmental Services Department (ESD) to the newly-formed Sustainability Department. Sustainability leadership determined that, due to a lack of oversight and proper due diligence coupled with limited technological expertise of existing project staff, critical deficiencies had developed within the program. The absence of project management fundamentals (e.g., record keeping, risk management, communication protocols) and the inability to realize the expected benefits from the sensor deployment with assigned project staff were identified as the two highest priority deficiencies. As an immediate restorative action, the project was transferred to a new, interim project manager in the Sustainability Department in Fall 2018 to address the project management deficiencies. In Spring 2019 and

Summer 2019, two new program managers with expertise in energy efficiency project management and sustainability technology deployments and application, respectively, were hired and assigned to the project. It is important to note that there has been a change in senior leadership in ESD since this project transitioned to the Sustainability Department.

**Costs**

Soon after joining the City, these new managers conducted a comprehensive project review. This review challenged all pre-existing assumptions related to the project. As a result of this review, errors and missing information were uncovered in the projected energy savings calculations and projected ongoing operational costs associated with the project.

The chart below provides a high-level overview of our updated assessment related to project costs:

	5 Year Forecast - FY21	Current FY 21 Estimate	Increased Cost
Unrealized Energy Savings	\$ -	\$ 800,000	\$ 800,000
Additional Energy Expenses	\$ -	\$ 700,000	\$ 700,000
Operational Expenses	\$ 2,273,100	\$ 2,191,000	\$ (82,100)
<b>Total</b>	<b>\$ 2,273,100</b>	<b>\$ 3,691,000</b>	<b>\$ 1,417,900</b>

The fiscal year 2021 – 2025 Five Year Outlook outlined \$2,273,100 in anticipated additional expenses related to the smart streetlight program. Projected expenses have increased to \$3,691,000 in FY 21 due to updated energy savings projections related to lighting, unanticipated additional energy expenses, and unplanned operational expenses.

**Energy Savings**

Actual energy savings are anticipated to be far less than what was projected. When the new lighting is fully installed, energy savings from the lighting replacement is projected to be approximately \$800K/year less than when the agreement was initially executed (\$1.5M/year now compared to initial projections of \$2.3M/year projected at project development). This reduction in energy savings is a result of the actual savings from the new lights being lower than projected due to an overestimation of the energy usage of the lights to be replaced during the initial calculations. Additionally, the expected total number of LED retrofitted lights to be installed is 40% below what was projected (8,600 vs the projected 14,000) due to higher than expected installation costs.

To address these issues, the Sustainability Department is working with the Department of Finance to budget the funding needed in future years to ensure the loan repayment is provided for and will explore options to either extend the payback period of the loan to reflect the updated estimated energy savings. We will continue to monitor and adjust projections and the project moves toward completion.

**Unanticipated Additional Energy Expenses**

Historically, the City has paid SDG&E a fixed charge per streetlight for energy usage which is based on estimated usage versus the actual amount of energy used. By dimming the LED lights and adjusting their hours of operation based on seasonal conditions the City anticipated a reduction in actual energy usage as a result of streetlights. In anticipation of this capability, SDG&E created a new rate structure for streetlights based on actual metered energy usage versus estimates. Although the new rate structure enabled savings on the LED

lighting energy usage, a separate rate was subsequently established by SDG&E for ancillary devices on streetlights, which include the sensors. As a result, the City must pay \$700K/year for energy costs to power the sensors in FY21, increasing to \$900K in FY22.

#### **Unplanned Operational Expenses**

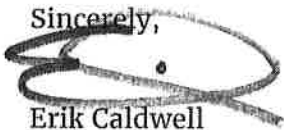
Costs to operate and maintain the smart streetlights and sensors were not planned for when the agreement was executed. Annual costs to operate and maintain the upgraded lights and sensors include:

- a. \$1.4M/year for API hosting in FY21, increasing to \$1.9M/year in FY22 (per node cost from \$360-\$667/node)
- b. \$345K/year for data connectivity in FY 21, increasing to \$485K/year in FY22 (lump sum data contract with AT&T)
- c. \$360K/year in Light Grid Hosting in FY21
- d. \$36k/year in data analyses and application development
- e. \$50k/year for repair/maintenance costs

To address these issues, we have worked with Current (GE has since sold this business line to Current) to lower the costs of the API hosting from the original quoted amount. We have also worked with AT&T to lower the cost of the data plan needed to transmit the data. For FY20, we are working with contributing departments to absorb these costs in their current budgets. For FY21, we are working with the Department of Finance and contributing departments to budget for these ongoing costs. We will present a revised contract with Current to City Council prior to the end of this fiscal year that clarifies these costs and payment mechanisms.

Overall, we are closely monitoring the program to ensure we have identified all deficiencies within the project. We are establishing long-term cost projections and budget mechanisms to ensure transparency and accountability of the costs associated with the project. To further reduce cost, we will aggressively renegotiate our contractual relationship with GE Current. Finally, we have expanded the staff involved in the project to include additional oversight and expertise as appropriate. We continue to identify sensor use cases and support efforts to further sensor data use oversight.

Sincerely,



Erik Caldwell

Deputy Chief Operating Officer Smart and Sustainable Communities Branch

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