CITY OF SAN MATEO

City Hall
330 W. 20th Avenue
San Mateo CA 94403
www.cityofsanmateo.org

Agenda Report

Agenda Number: 11 Section Name: {{section.name}} File ID: {{item.tracking_number}}

TO: City Council

FROM: Drew Corbett, City Manager

PREPARED BY: Public Works

MEETING DATE: September 03, 2019

SUBJECT:
High Voltage and LED Streetlight Conversion – Program Update

RECOMMENDATION:
Confirm staff recommendation to utilize energy efficient light emitting diode streetlights with the high voltage circuits conversion program.

BACKGROUND:
The Public Works Department oversees the citywide light emitting diode (LED) streetlight conversion program, which replaces all City-maintained streetlights with LED fixtures. Compared to traditional streetlights, LED fixtures have multiple benefits, including reduced energy consumption, decreased lighting pollution, more directional lighting, and reduced maintenance needs. The use of LED lighting also helps the City meet sustainability goals and is a key component in the City of San Mateo's Energy Efficiency Program Plan, which was adopted in 2014, and the Climate Action Plan, which was adopted in 2015 and is updated annually.

The LED conversion program has been implemented through a series of incremental phases. The first 200 streetlights were converted to LED in 2013, followed by another 600 streetlights in 2014. Following an evaluation period and public hearing process with the Public Works Commission, an additional 4,500 streetlights were converted through the Citywide LED Conversion Phase I and Phase II Projects during 2016. As of 2017, all City streetlights that could be converted were converted to 4000 kelvin LED fixtures. This included approximately 1,000 pedestrian-scale streetlights throughout the entire City. This left approximately 500 streetlights on 18 high-voltage (HV) streetlight circuits that could not be converted to LED fixtures. HV circuits contain two types of streetlights: standard (cobrahead) streetlights, which are around 25-30 feet high and are intended to light both sidewalk and roadway, and pedestrian-scale streetlights, which are around 14 feet high and primarily intended to light sidewalk areas for pedestrians.

HV streetlight circuits were common in the mid-20th century, but many have been replaced with modern circuits due to problems with reliability and maintenance caused by deterioration of equipment. In order to operate, these circuits rely on antiquated PG&E transformers and switches. The HV circuits are prone to outages, which can take weeks to resolve because the PG&E HV equipment is difficult to procure, parts for the lights are no longer manufactured. which has resulted in staff purchasing from ebay or other sources, and wiring faults are time consuming for staff to locate and repair. In some cases, a short circuit can cause overheating, which may create hazardous conditions. The conversion of HV circuits to lower voltage power will improve safety, reduce maintenance needs, and reduce the potential for future streetlight outages.

The replacement of all remaining HV circuits was added as a City Council priority in the fiscal year 2017-18 budget and is being managed by the Public Works Department under the High Voltage Streetlight Conversion Program (HV Program). During 2018, the first HV Program project started construction replacing two HV circuits and sixty-eight cobrahead

streetlights to 4000 kelvin fixtures as part of the Los Prados High Voltage Conversion Project. Public Works is currently in construction to replace another two circuits as part of the Baywood High Voltage Conversion Project, which has seventy-seven pedestrian scale streetlights. Consistent with the previous project, the streetlights are planned to be replaced with brighter LED fixtures to provide increased illumination to closer meeting the Illuminance Engineering Society's (IES) recommended values, but unlike the Los Prados project that replaced cobrahead streetlights, the Baywood High Voltage Conversion Project will be replacing pedestrian-scale lighting, which is the first project to do so in the HV Program. Pedestrian-scale lighting in the Baywood neighborhood adjacent to this project was previously upgraded to 4000 kelvin LED fixtures as part of the Citywide LED Conversion Phase 1 and Phase 2 projects.

Newer LED technology enables staff to utilize LED fixtures that better match the color temperature of the existing lights. The high-pressure sodium fixtures remaining throughout the City produce a yellowish-orange color temperature that results in poor color rendition making it difficult to differentiate colors and compromises visual clarity. The San Mateo Police Department prefers lighting to provide good color rendition and has indicated a preference for a lighting color temperature such as the cobrahead street lights used in the Los Prados project and the other 5,300 street lights that have already been converted.

In preparation for the commencement of construction of the Baywood project, Public Works conducted a pilot installation of two LED light fixtures to determine which fixture's color temperature more closely matched the color temperature of existing fixtures. Approximately 1,100 notices were mailed to the affected properties within the neighborhood. From that notification, 27 residents signed up to be advised of the field test. Nineteen residents provided their response to the field test, with some supporting the increased illumination provided by the new LED streetlights. However, most residents who responded expressed a preference for maintaining the existing lower level of illumination of the existing pedestrian-scale streetlights.

The illumination provided by the existing pedestrian streetlights does not meet current IES standards and engineering best practices for installation of streetlights. A lighting evaluation shows that the existing pedestrian streetlights provide an average of 40% of the ground-level illumination when compared to the proposed LED streetlights. Because of the large spacing between the existing streetlights, installation of the proposed LED streetlights would still leave areas with illumination levels substantially less than what is required for new developments within the City.

Staff recommends continuing replacement of HV streetlight circuits with lower voltage circuits using LED fixtures (2700 kelvin). Doing this improves illumination levels following IES recommended values while trying to as closely as possible to maintain existing color temperature. Should Council want to match existing illumination levels and color temperature in pedestrian-scale lighting being converted, staff would recommend temporarily pausing the HV conversion project so additional study could be done on achieving this.

BUDGET IMPACT:
The Baywood High Voltage Streetlight Conversion project is funded by Project #460040 High Voltage Conversion Program.

ENVIRONMENTAL DETERMINATION:
This project is categorically exempt from CEQA as an "existing facility," because it consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use. (CEQA Guidelines Section 15301.)

NOTICE PROVIDED
All meeting noticing requirements were met.

ATTACHMENTS
None

STAFF CONTACT

Jeffrey Tom, Associate Engineer
jtom@cityofsanmateo.org
(650) 522-7575

Jay Yu, Engineering Manager
jyu@cityofsanmateo.org
(650) 522-7323

Matthew Zucca, Deputy Director
mzucca@cityofsanmateo.org
(650) 522-7308