



**CITY OF FULLERTON  
INFRASTRUCTURE AND NATURAL  
RESOURCES ADVISORY COMMITTEE**

**INFRASTRUCTURE DATA SHEET**

Date: February 2020

**Asset: STREET LIGHT SYSTEM**

**Asset Description:** Street lights adjacent to, and illuminating City public streets. The majority of street light systems were designed and installed decades ago and are now obsolete. Southern California Edison (SCE) provides the power to the street light systems with the City owning and maintaining the poles, fixtures, conduit and wiring from the SCE power source and transformers.

City owned lighting circuits and fixtures can no longer be reliably and cost effectively operated and maintained. According to SCE, transformer manufacturers are no longer willing to produce and sell the Regulated Output (RO) transformers which the high voltage street light system relies on. Also, the original design utilized mercury vapor (MV) lamps which are now unavailable and banned due to environmental and safety concerns. In the 1980's the lamps were replaced with high pressure sodium vapor (HPSV) lamps, which do not have the same electrical performance characteristics as MV lamps. This causes increased failure of the SCE owned RO transformers due to increased in-rush current as street lights are turned on each night. This older technology is also based on series circuit wiring between the lamp fixtures and the SCE transformer. Modern street light designs and equipment rely on parallel circuit wiring. To make the switch to modern street light technology, not only do the SCE transformers need to be replaced (by SCE), but the City owned circuit wiring and light fixtures must also be replaced.

City has contracted with a consultant to review all street lights to verify ownership, type of electrical system (low or high voltage), type of existing light fixture, and convert low voltage light fixtures to LED fixtures.

**Asset Components:**

- Street Lights
  - Verified City owned = 5,851
  - To be Determined = 931
- Electrical System Type
  - High Voltage = 922
  - Low Voltage = 3,509
  - To be Determined = 2,351
- Light Fixture Type
  - Converted to LED = 3,509
  - Non-LED = 3,493

**Asset Needs:**

- Conversion of street lights on high voltage system to new, upgraded electrical system.
- Conversion of remaining light fixtures to LED.

In May 2019, the City and SCE met to discuss several basic options to address the high voltage system issues. Each option has advantages and disadvantages.

OPTION 1: Outsource --- SCE takes over ownership and maintenance of the street light system completely, including fixtures, poles, and circuit wiring. SCE will install LS-1 street lights, including wood street light poles and overhead wiring. LS-1 flat rate plan of approximately \$10-\$15/month per street light.

- Advantages
  - Lowest upfront short term cost to the City
  - Limited long term labor required for maintenance
  - Limited long term inventory required
  - Utilizes energy efficiency technologies
- Disadvantages
  - Highest long term cost due to increased SCE rates and fees
  - Energy usage cost savings are not passed to the City
  - Fullerton becomes completely reliant on SCE performance, yet retains all of the public accountability for performance
  - Poles must be replaced with SCE LS-1 street light poles, typically wooden
  - Overhead wiring is required, which will not be popular or well received by the public

OPTION 2: No outsourcing --- Fullerton replace outdated circuit wiring and fixtures while SCE replaces their transformers. LS-2 flat rate plan of \$5-\$8/month per street light.

- Advantages
  - Fullerton retains control of street light operation, maintenance, and reliability
  - Lower long term cost due to continued lower SCE rates and fees
  - Utilizes energy efficient technologies, so resulting City electricity usage is drastically reduced and SCE expense are reduced
  - SCE metered service will continue to vary to Fullerton's advantage between metered and cut-flat service and rates
  - Common approach by other cities
- Disadvantages
  - Highest upfront short term cost to the City
  - Long term labor remains a requirement for maintenance
  - Limited long term inventory remains a requirement for maintenance

OPTION 3: No outsourcing --- Utilize series to multiple (STM) transformers, which allows conversion of an existing street light fixture using LED lamps.

- Advantages
  - Low upfront cost to the City
  - Work can be completed by City personnel
  - SCE metered service will continue to vary to Fullerton's advantage between metered and cut-flat service and rates
  - Immediate reliability and maintenance improvement to remaining existing lighting systems as equipment, transformers, and light fixtures are retired and brought into SCE and City inventories.
  - A slow and planned migration to the modern solution can be managed by the City, targeting high priority street light circuits first
- Disadvantages
  - Not a true energy efficient solution so limited electrical usage cost savings
  - The electrical system will not be upgraded, so this is likely an extended temporary solution

#### Short Term Recommendation

- Confirm the validity of SCE presented options and solutions, and research to see what other feasible options exist:
- Invite street light manufacturers to make presentations to the City. These lighting experts will willingly come educate City personnel on this issue.

- Contact other cities to determine how they have addressed this issue. Especially important to obtain feedback from cities both inside and outside SCE territory.

#### Medium Term Recommendation

- Perform detailed cost evaluations of the identified feasible options. Include life cycle and energy efficiency cost savings, as well as labor and equipment costs.

#### Long Term Recommendation

- Hire a consulting firm who specializes in street light design. Their task should be to evaluate City options previously identified, confirm assumptions and calculations, and advise if there are other feasible options that were not considered.
- Make a decision and recommendation to the City Council

Approximate Total Current Need: Estimated \$35 million to replace the existing high voltage systems

Allowable Funding Sources: General Fund, Gas Tax

#### Current Annual Funding:

- \$0 for replacement of existing high voltage street light systems
- Approximately \$700,000 of Gas Tax for maintenance/repairs, electricity costs and staff.
  - Approximately \$550,000 to \$600,000 is for electricity costs

#### Typical Annual Maintenance/Improvements:

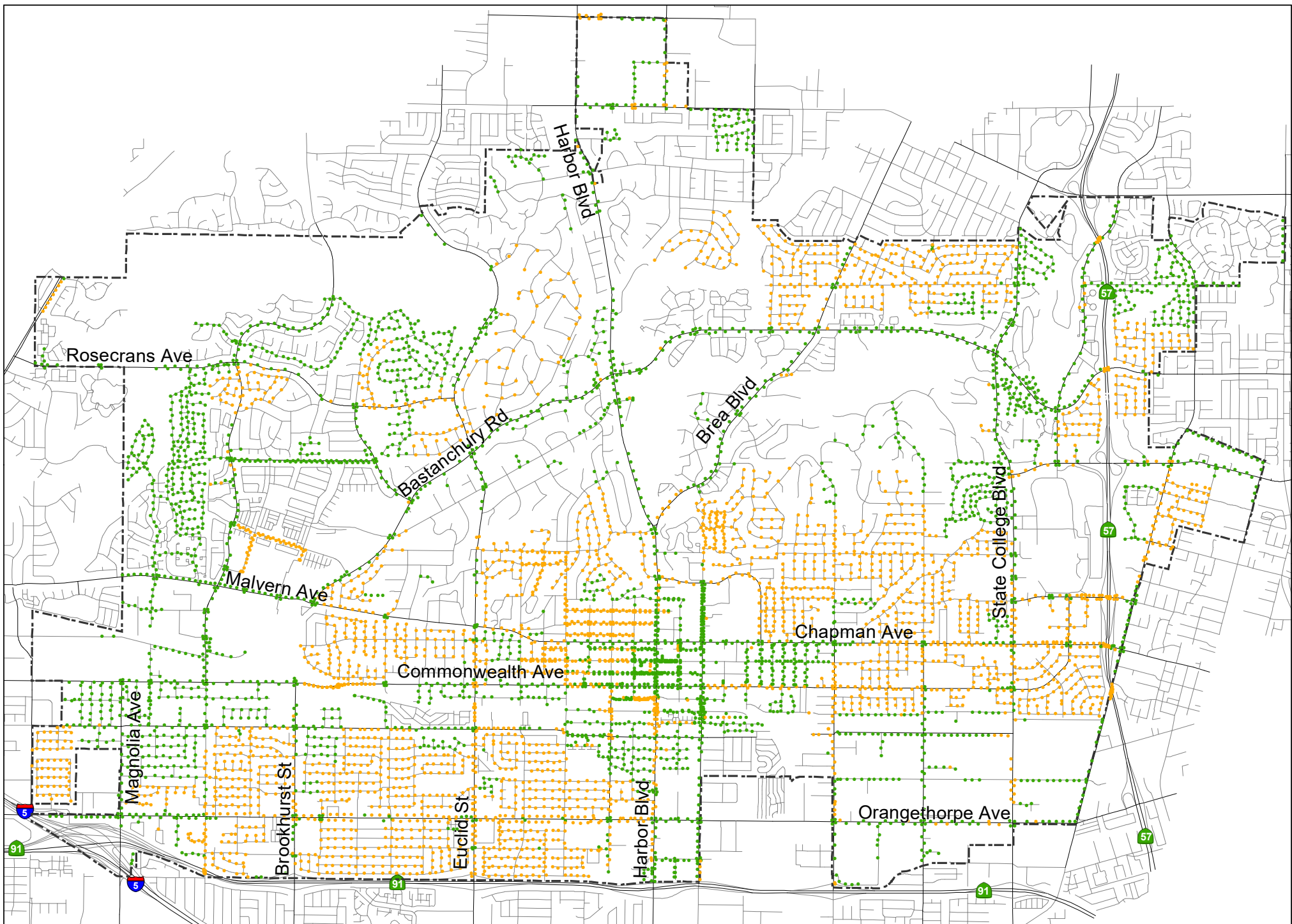
- Replacement of fixtures as needed
- Upgrade of any remaining non-LED fixtures (low voltage system only)
- Repair of street lights knocked down (accidents, etc.)
- Repair of damaged conduit and wiring
- Coordination with SCE for transformer failures or circuit failures

#### Recommended Strategy & Associated Costs:

- Install new, empty conduit and pullboxes as part of street rehabilitation projects for future conversion of high voltage system.
  - Estimated average cost per project is \$50,000
  - Assume 2 to 3 projects per year
- Determine preferred option to address high voltage system needs
  - Determine funding for high voltage system conversion.
  - Conversion is estimated at \$10,000 to \$15,000 per pole for an estimated total of over \$35 million.
- Complete conversion within 5 year period
  - \$35M total cost / 5 years = \$7M per year

#### Recommended Additional Annual Funding:

**None at this time.** Although the Committee is not recommending the funding for Street Light System in the total annual funding need calculation in this report, such need should not be overlooked. It will be one-time expense, not annual, as the City may explore some financing options such as I-Bank loans.



# City Street Lights

LED ●  
Other ●