



# Renewable Energy, Street and Sports Lighting, and Water Efficiencies in Your Community

June 24, 2025



The background of the slide is a photograph of a golf course. In the foreground, there is a well-maintained green lawn. In the middle ground, there are several large, leafy trees and a flagpole with an American flag and a black flag. In the background, there are more trees and a clear blue sky. The right side of the slide is covered by a semi-transparent white overlay containing the agenda text.

# Agenda

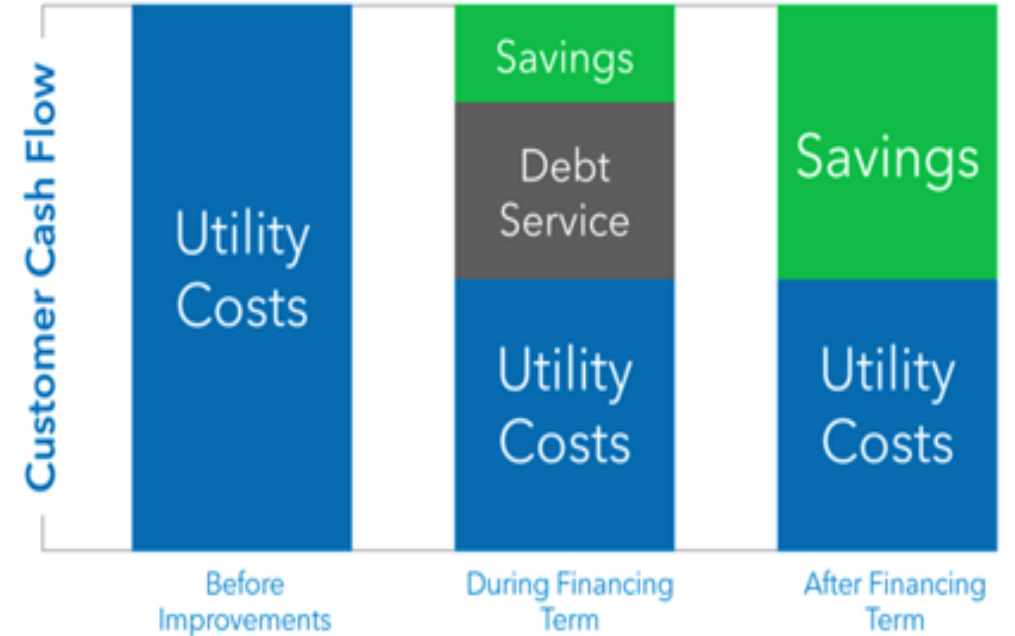
- 01** Introduction
- 02** Potential Project Cashflow
- 03** Solar/Sports Lighting
- 04** AMI
- 05** PV Solar
- 06** Water Production
- 07** Next Steps

# Introduction

## City of Fullerton key considerations

- Reviewed current city utility bills
- Performed site walks with city personnel at multiple site locations
- Engaged with staff on critical needs and considerations
- Investigated available ITC Incentives and rebates

## Guaranteed Energy Savings Approach

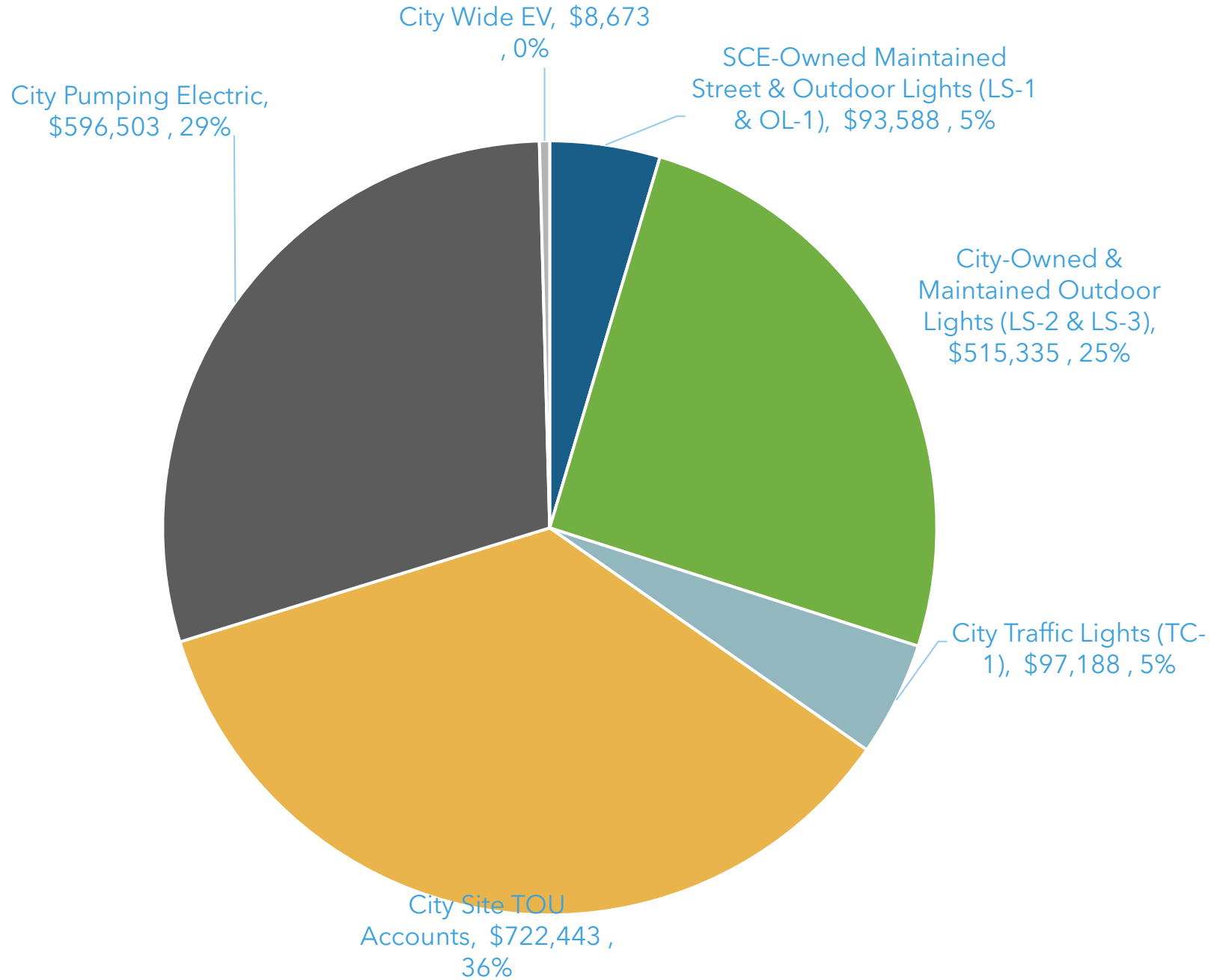


# Baseline Energy

**Total Electric Cost:** \$2,033,730

**Total Electric kWh:** 17,448,573

**Total Electric Accounts:** 189



# Preliminary Estimates - Implementation Cost

RECOMMENDATIONS	PRELIMINARY ESTIMATES	RECOMMENDATIONS	PRELIMINARY ESTIMATES
All Measure Upgrades	\$19.5M-22.5M	AMI Upgrades	\$42M
Solar Street*/Sports LED Lighting	\$7.5M-8.5M	Badger Meters w/ Cellular	
PV Solar	\$10M-11M	PPA Style Financing	
Water Production	\$2M-3M		
Implementation Savings		Implementation Savings	
20yr Total Savings (5% escalation + ITC)	\$33M	20yr Total Savings (3% escalation)	\$90M

\* 35% of Solar Streetlighting

# Solar Streetlighting and Sports LED Lighting

## Current Lighting Conditions

- Fullerton has inefficient HID and incandescent lighting at the numerous parks, sports fields as well as City-owned street lights throughout the City.

## Proposed Lighting Solution

- **Solar Streetlighting:** Where applicable, existing ornamental pole fixtures will be replaced with new Solar Streetlighting LED fixtures.
- **Sports lighting:** Existing sports lighting at Lions Field and Fullerton Sports Complex that are not currently LED will be replaced with new LED fixtures or retrofitted with LED lamps

## Potential Benefits

- ✓ Instant illumination vs. slow start-up of HID
- ✓ Brighter, improved color temperature for night safety
- ✓ 5x life of existing lamps, reduced outages and maintenance
- ✓ Short payback measure that will help pay for infrastructure improvement



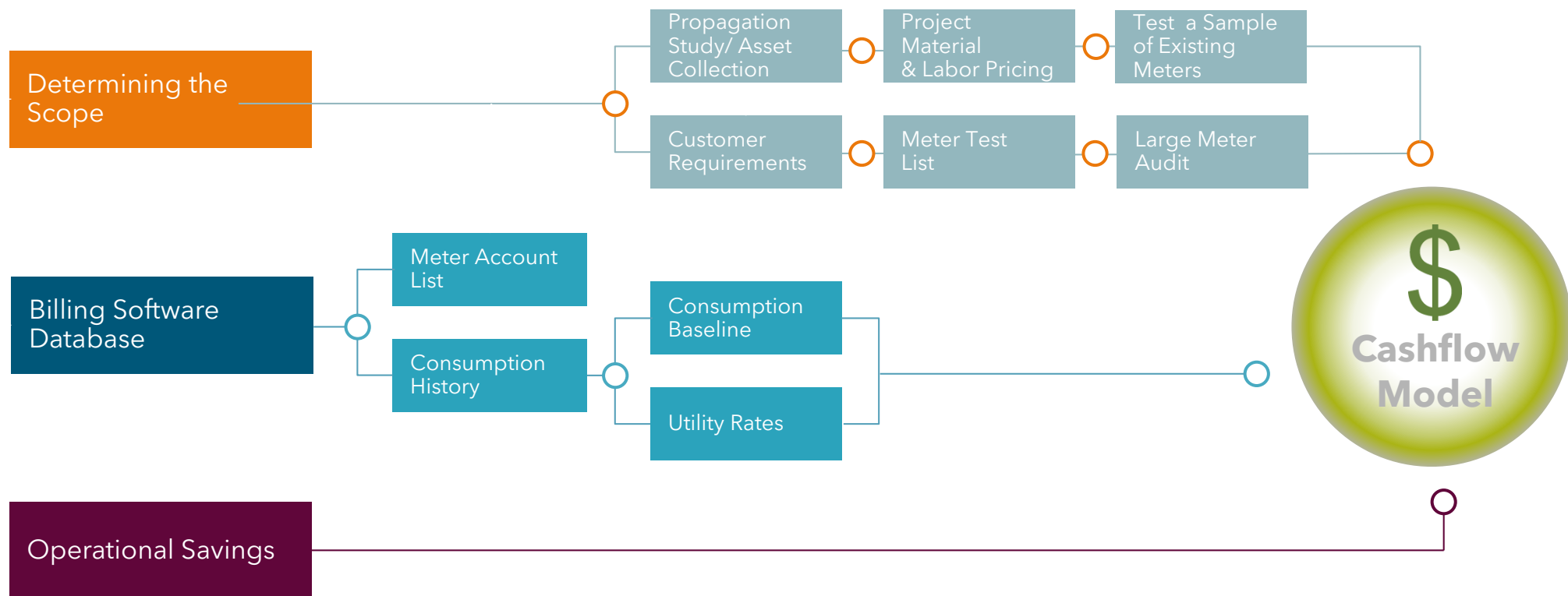
# Fullerton AMI Development

# of Meters: 32,210

Meter: Badger

AMI: Badger NaaS Cellular

Customer Portal: Badger EyeOnWater



# Funding Incentives

## • Charging and Fueling Infrastructure Discretionary Grant Program

- Competitive grant process for next four years.
- \$700M available in 2024 for two separate funding programs
  - National Electric Vehicle Infrastructure on Alternative Fueling Corridors
  - Community Fueling and Infrastructure Program

## • Inflation Reduction Act (IRA) Investment Tax Credits

- \$100,000 incentive for EV infrastructure in rural or underserved communities.
- Direct pay tax credit available to non-taxable entities that purchase zero emission vehicles.
- \$7,500 for vehicles with Gross Vehicle Weight Ratings (GVWR) of 14,000 lbs. or less.
- \$40,000 for vehicles with GVWR over 14,000 lbs.
- Direct pay applications can be submitted the following year of vehicle delivery.

\$0.25-\$0.35 per kWh  
SGIP



30%-50% off  
ITC/Elective Pay



\$80-107 per kW  
DSGS

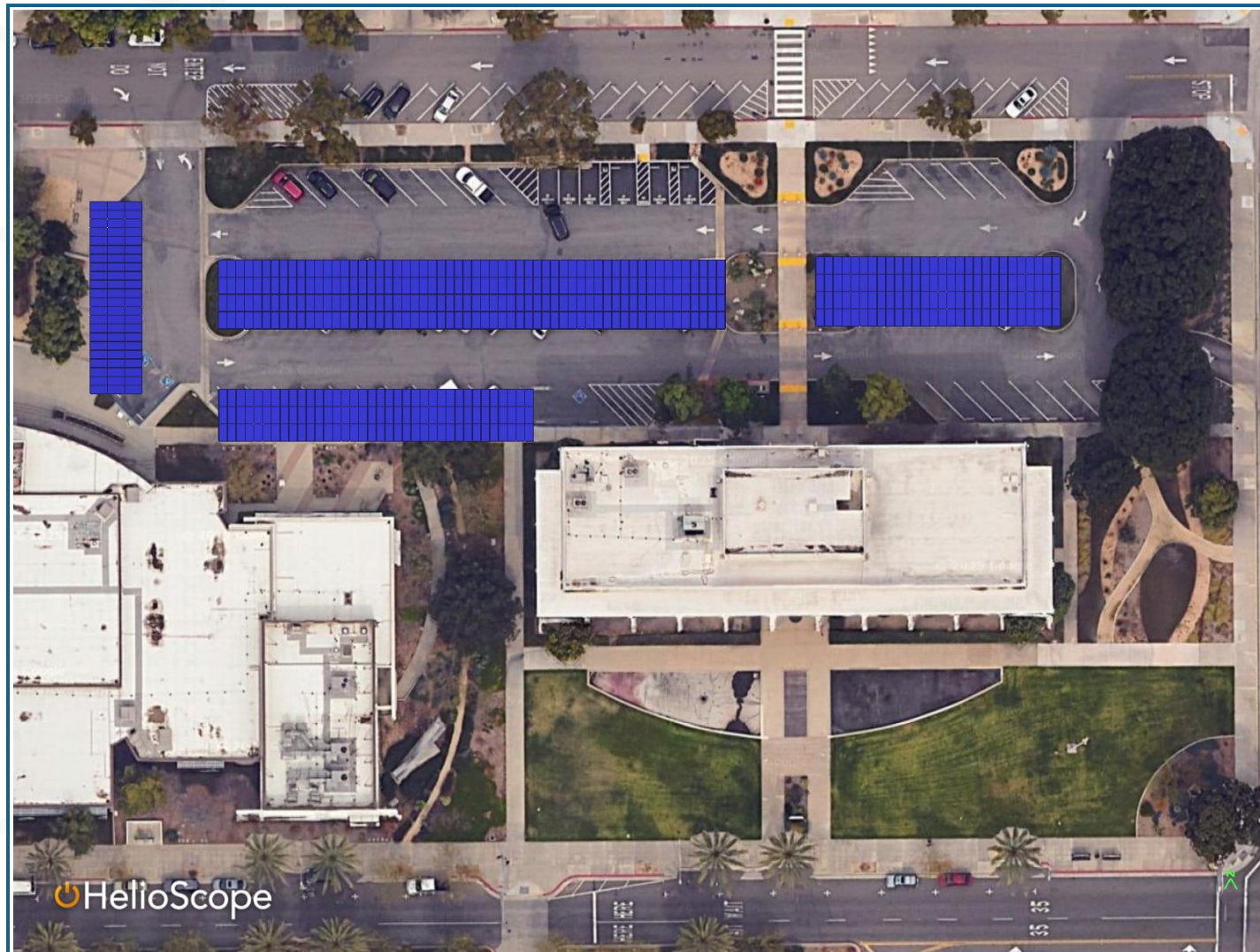


# PV Scenarios



- Standard NEM 3.0 Interconnections
  - Total Estimated System Size 2,057 kW-DC
  - Total Solar Production: 3,150,406 kWh
  - Utility Rate switch to TOUO-GS-2E for better energy savings
  - Based on 7 Site Locations

# City Hall



- 306 kW-DC
- Production - 477,691 kWh
- Acct # - 700636567796
- 303 W COMMONWEALTH AVE
- Allocated Capacity - 306 kW
- Offset 59%
- Standard NEM 3.0 interconnection

Solar Layout  
City of Fullerton  
303 W Commonwealth Ave, Fullerton, CA 92832

Date: 11 - June - 2025

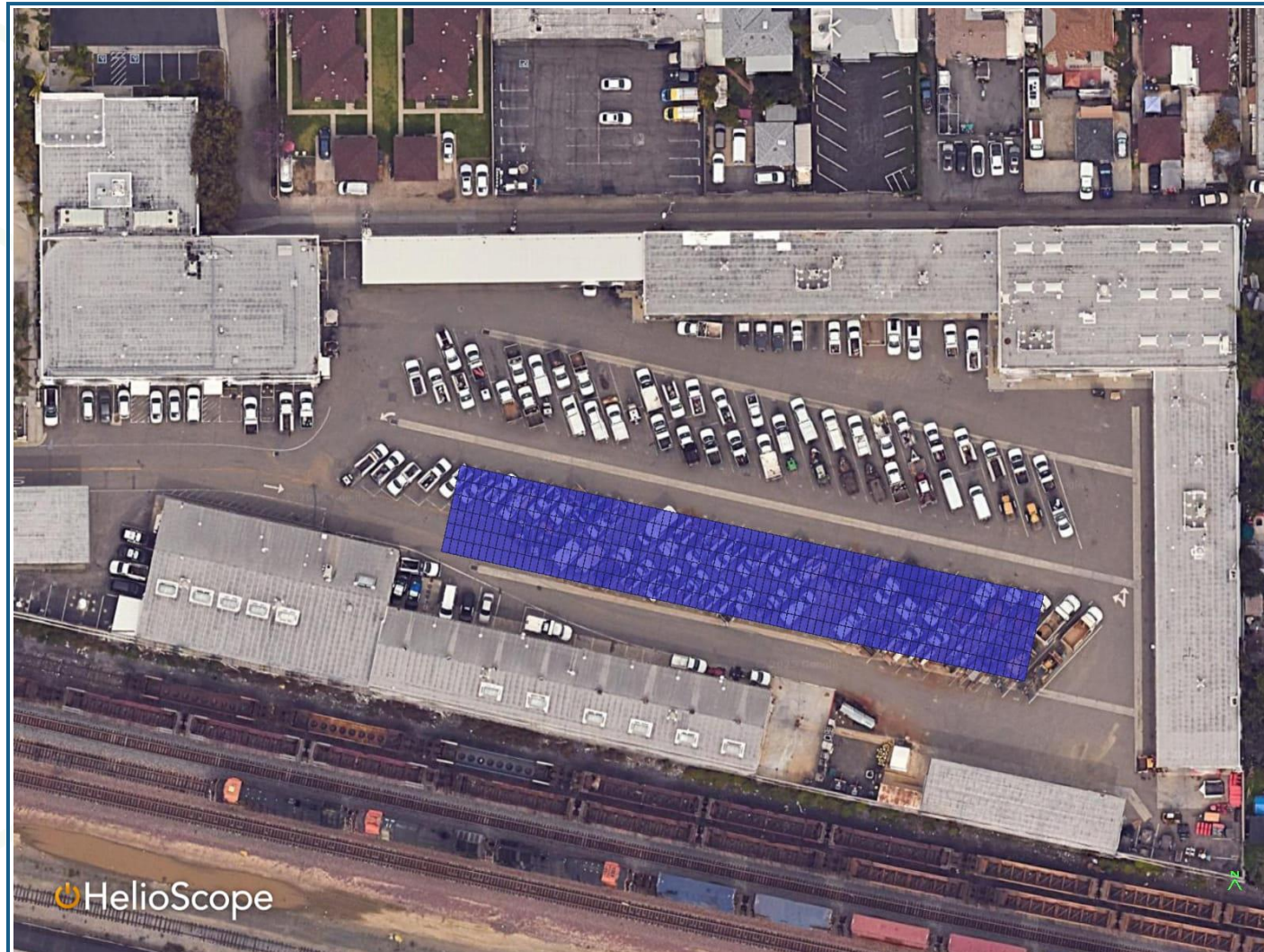
# Water Irrigation



- 460 kW-DC
- Production - 663,022 kWh
- Acct # - 700636594169
- 1500 N ACACIA AVE
- Allocated Capacity - 460 kW
- Offset 51%
- Standard NEM 3.0 interconnection

Solar Layout  
City of Fullerton  
303 W Commonwealth Ave, Fullerton, CA 92832

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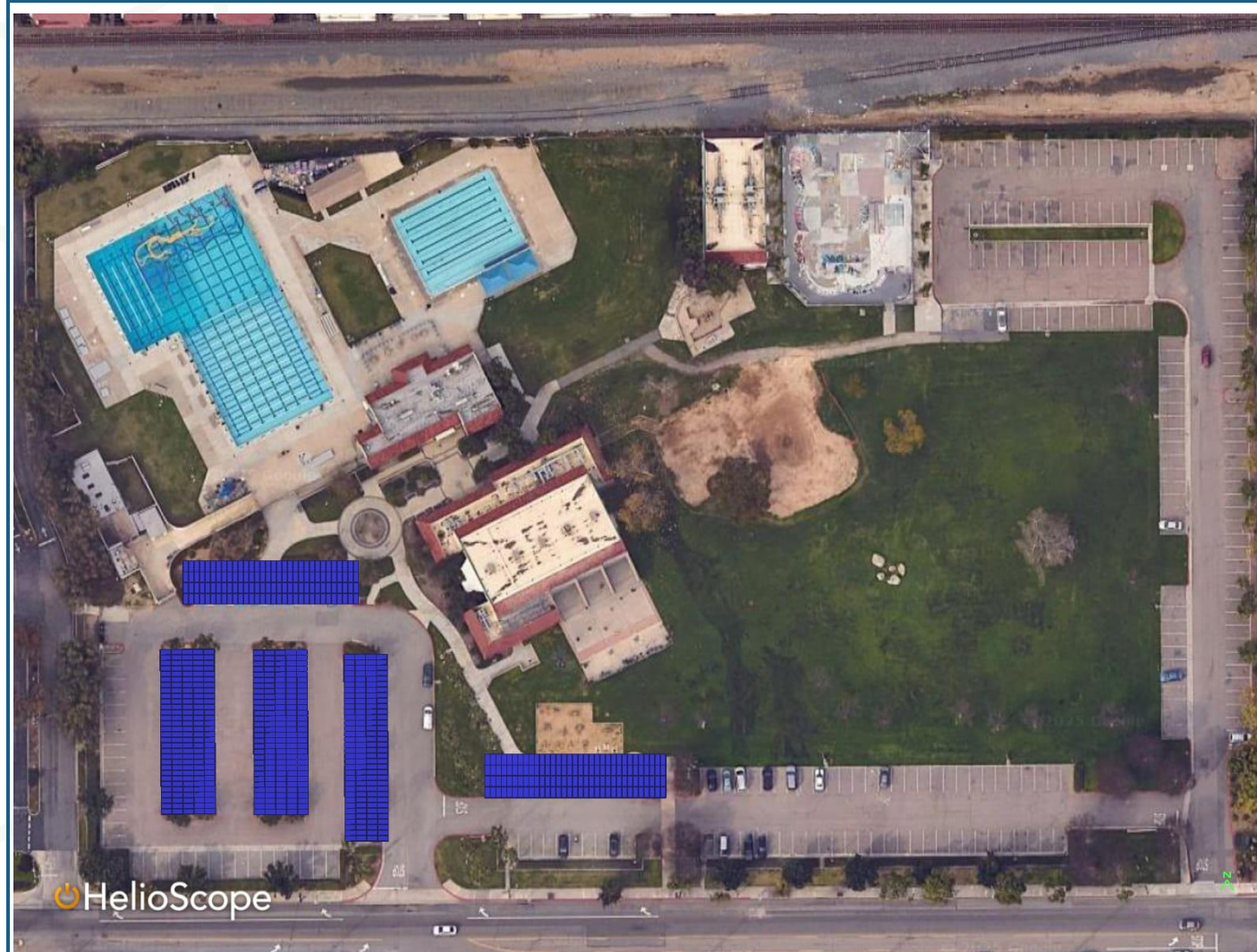


- 283 kW-DC
  - Production - 446,081 kWh
  - **Generating Acct # - 700636570123**
  - **1580 W COMMONWEALTH AVE**
- Allocated Capacity - 283 kW
- Offset 66%
  - Standard NEM 3.0 interconnection

Solar Layout  
City of Fullerton  
1580 W Commonwealth Ave, Fullerton, CA 92833

Date: 11 - June -  
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# Independence Park



- 410 kW -DC
  - Production - 624,903 kWh
  - **Generating Acct # - 700636650147**
  - **801 W VALENCIA DR**
- Allocated Capacity - 410 kW
- Offset 63%
  - Standard NEM 3.0 interconnection

Solar Layout  
City of Fullerton  
801 W Valencia Dr, Fullerton, CA 92832

Date: 11 - June -  
2025

# Community Center Pool

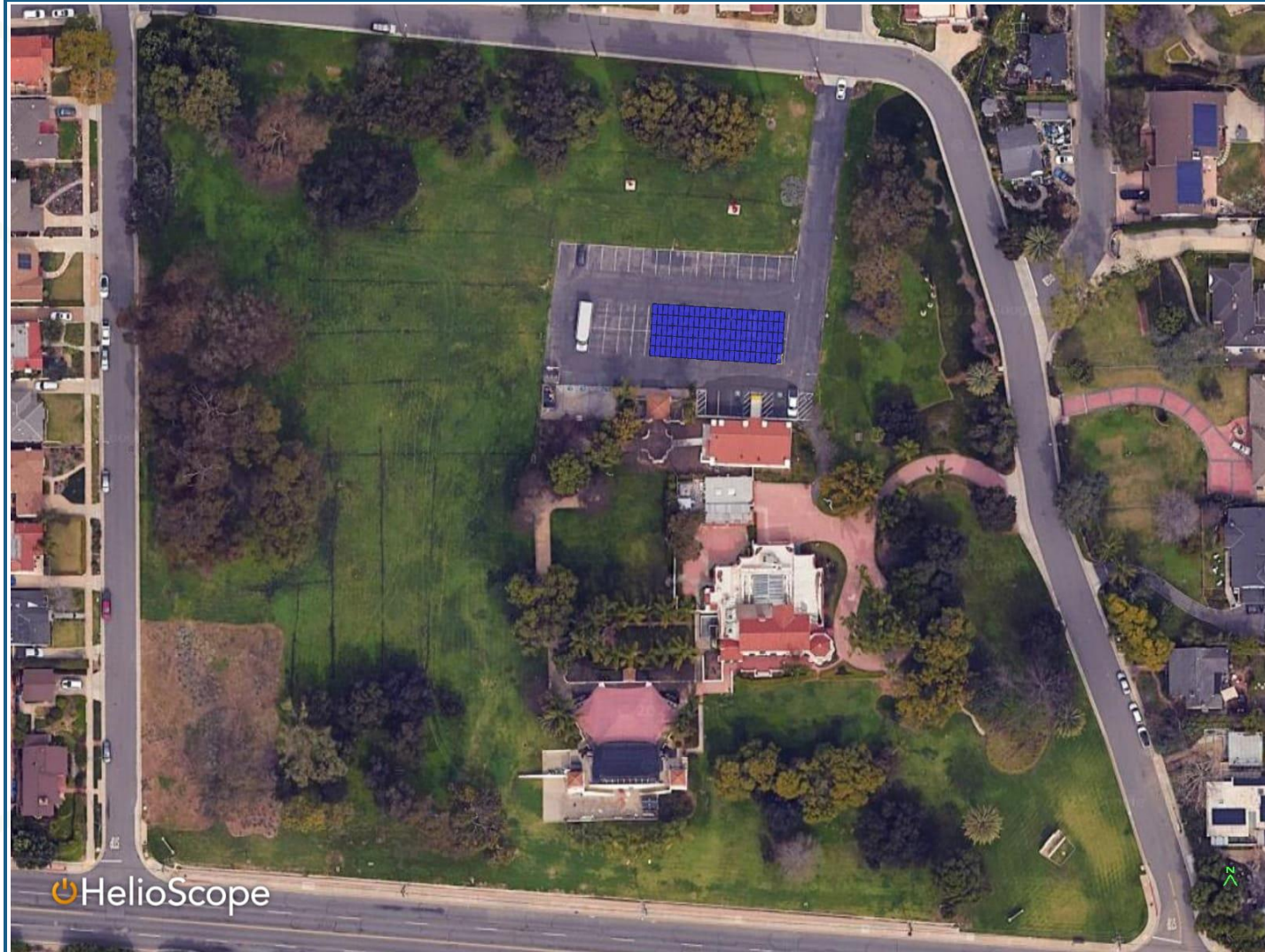


- 452 kW-DC
- Production - 710,281 kWh
- Acct # - 700800871046
- 340 W COMMONWEALTH AVE
- Allocated Capacity - 452 kW
- Offset 65%
- Standard NEM 3.0 interconnection

Solar Layout  
City of Fullerton  
340 W Commonwealth Ave, Fullerton, CA 92832

Date: 11 - June -  
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# Culture Centre

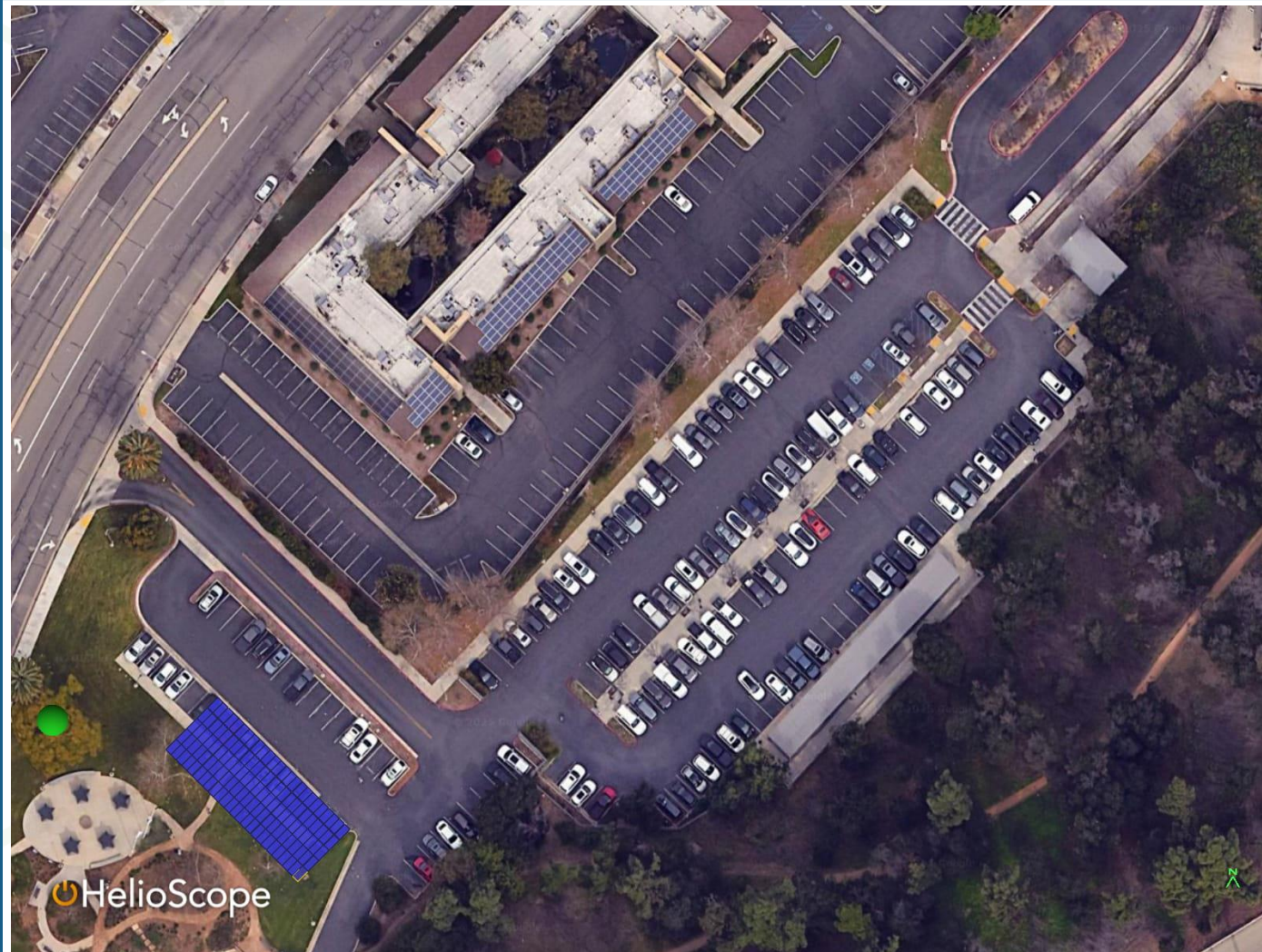


- 73 kW-DC
- Production - 114,803 kWh
- **Generating Acct # -700636713502**
- **1201 W MALVERN AVE**
- Allocated Capacity - 73 kW
- Offset 63%
- Standard NEM 3.0 interconnection

Solar Layout  
City of Fullerton  
1201 W Malvern Ave, Fullerton, CA 92833

Date: 11 - June - 2025

# Lions Field



- 73 kW-DC
  - Production -113,625 KWh
  - **Generating Acct # - 700800871046**
  - **1440 BREA BLVD A**
- Allocated Capacity - 73 kW
- Offset 65%
  - Standard NEM 3.0 interconnection

Solar Layout  
City of Fullerton  
1440 N Brea Blvd, Fullerton, CA 92832

Date: 11 - June -  
2025

# Water Production

## Well Sites

Currently, there are about one dozen water production wells at the City of Fullerton. During the site visit, only Airport Well 9, Kimberly Well 1 and Well 3A were in operation while the other wells were off-line under repair or being upgraded with water treatment systems.



## Proposed Solutions

**Pump replacement:** This measure proposes to replace old inefficient well pump with high-efficient pump.

**Pump VFDs:** Throughout the life the wells, pump operations will change leading them to operate at inefficient points. Variable speed controls (VFD) allow adjustment of the pump speeds to operate at its optimal point in the efficiency curve reducing its hp per gpm.


**Optimal pump schedule:** Pumping during on-peak electric periods can cost over twice as much as pumping during other periods. This measure will program the SCADA to avoid on-peak pumping.

## Potential Benefits

- ✓ Pump energy efficient operation and energy savings
- ✓ Extends life the pump and motor
- ✓ Motor soft start and stop

# Next Steps





Thank You, Any Questions?

Jaime Casal  
Sr. Project Developer  
907-251-9202  
[jcasal@veregy.com](mailto:jcasal@veregy.com)

# Appendix

- A - Meter Technology Overview
- B - Endpoint Types

## Meter Technology Overview

- Mechanical (positive displacement, multijet, turbine, propeller, compound, etc.)
  - Pros: Lower first cost, no meter battery, registers may have battery.
  - Cons: Limited 98.5% accuracy flow range, accuracy tends to decline with age/"mileage", limited register resolution (100's or 1000's gallons or cubic feet),
  - Typical ¾" PD disc meter: 98.5% accuracy from 0.75 gpm to 35 gpm, Accuracy warranty for 5 years or 750,000 gallons.
- Electronic
  - Pros: No moving parts, higher maintained accuracy across wider flow range, high accuracy at extend low flow, longer warranty (10 to 20-years), high register resolution (0.1 to 1 gallons), alarms (no flow, reverse flow, empty pipe, tamper, etc.).
  - Cons: Higher cost, meter & register require battery.
  - Technologies
    - Electromagnetic
      - Uses voltage created by conductor (water) flow through a magnetic field to measure velocity and calculate water flow.
      - Typical ¾" meter: 98.5% accuracy from 0.18 gpm to 35 gpm. 97% accuracy at 0.11 gpm.
    - Ultrasonic
      - Sends ultrasonic signals are sent consecutively in forward and reverse direction of water flow. Water velocity (and flow) is calculated based on the time difference between the forward and reverse signals. The greater the water flow, the greater the time difference.
      - Typical ¾" meter: 98.5% accuracy from 0.10 gpm to 35 gpm. 95% to 97% accuracy at 0.05 gpm.

# EndPoints

Neptune R900



Sensus 510M Smartpoint



Itron 500W Gen5



Aclara Water MTU



Badger Orion LTE-M

