

## Learning Objectives

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At the end of the this course, participants will be able to identify and understand

1. City of Los Angeles Street Lighting LED Conversion Program
2. How Smart City solutions can be deployed utilizing street lighting poles
3. How street lighting poles have become the preferred infrastructure for Telecom/small cell deployments
4. How all of the above can be deployed in one infrastructure and deliver a Smart Connected City



Designers Light Forum

# Humble Street Lights... NO MORE

## Street Lighting LED and Smart Connected City Case Study

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March 13 2019

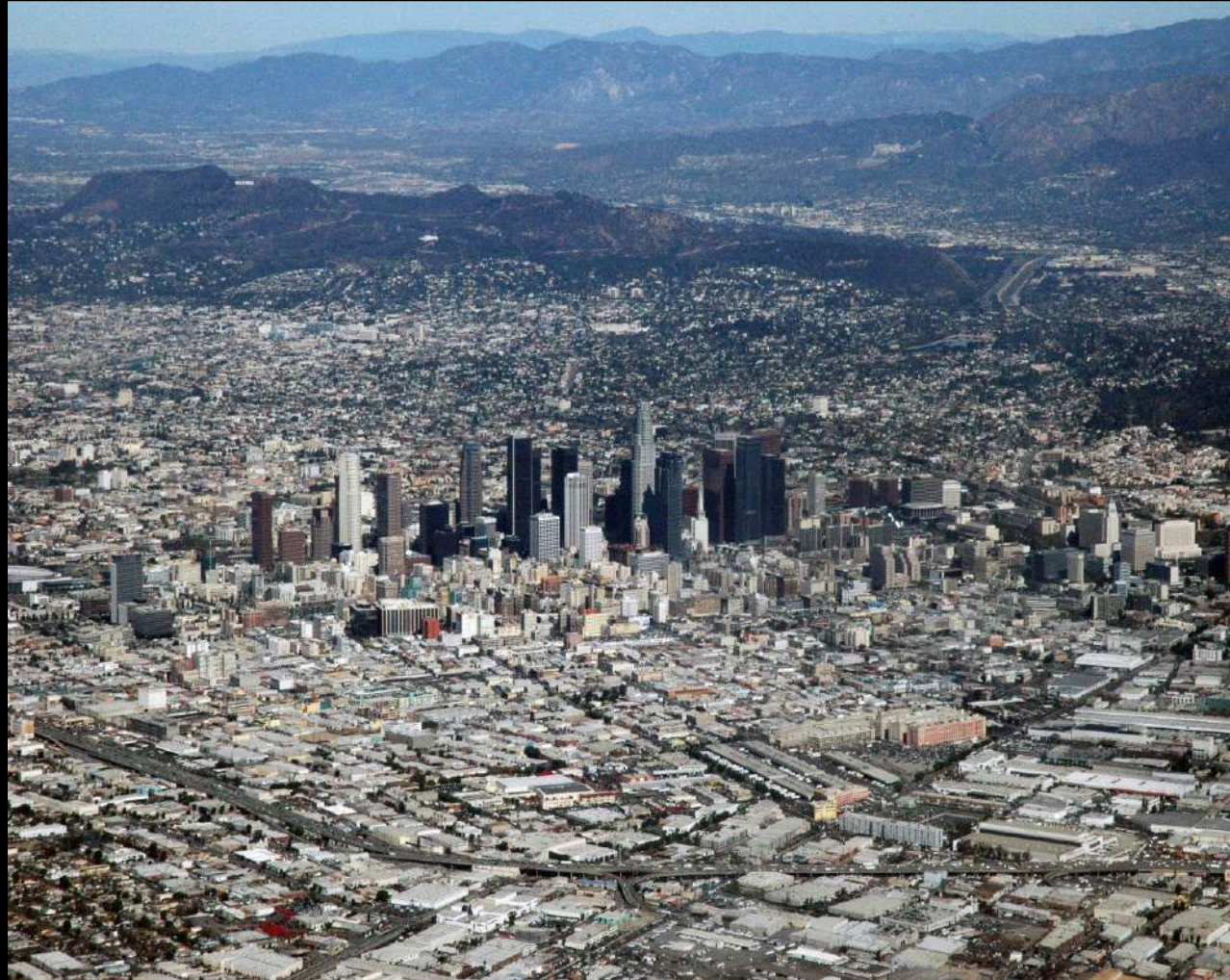


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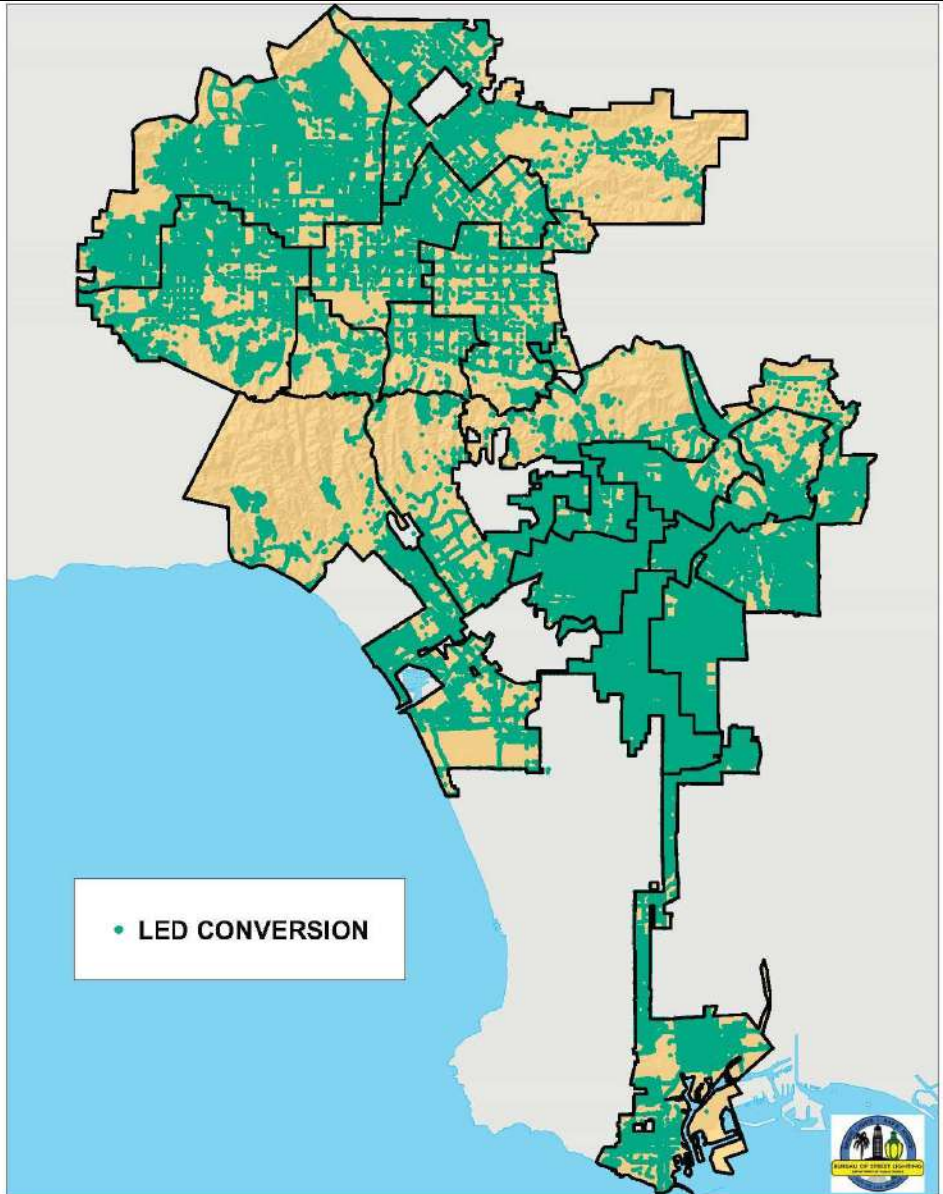
**Street Lighting  
LED  
Conversion  
&  
Smart City  
Connected**



- ✓ **2<sup>nd</sup> largest City in the USA**
- ✓ **472 sq mi**
- ✓ **6500 miles of streets**
- ✓ **Population of 4 Million**
- ✓ **\$8.1 Bi. City Budget for 2014**
- ✓ **Power Utility owned by the City**



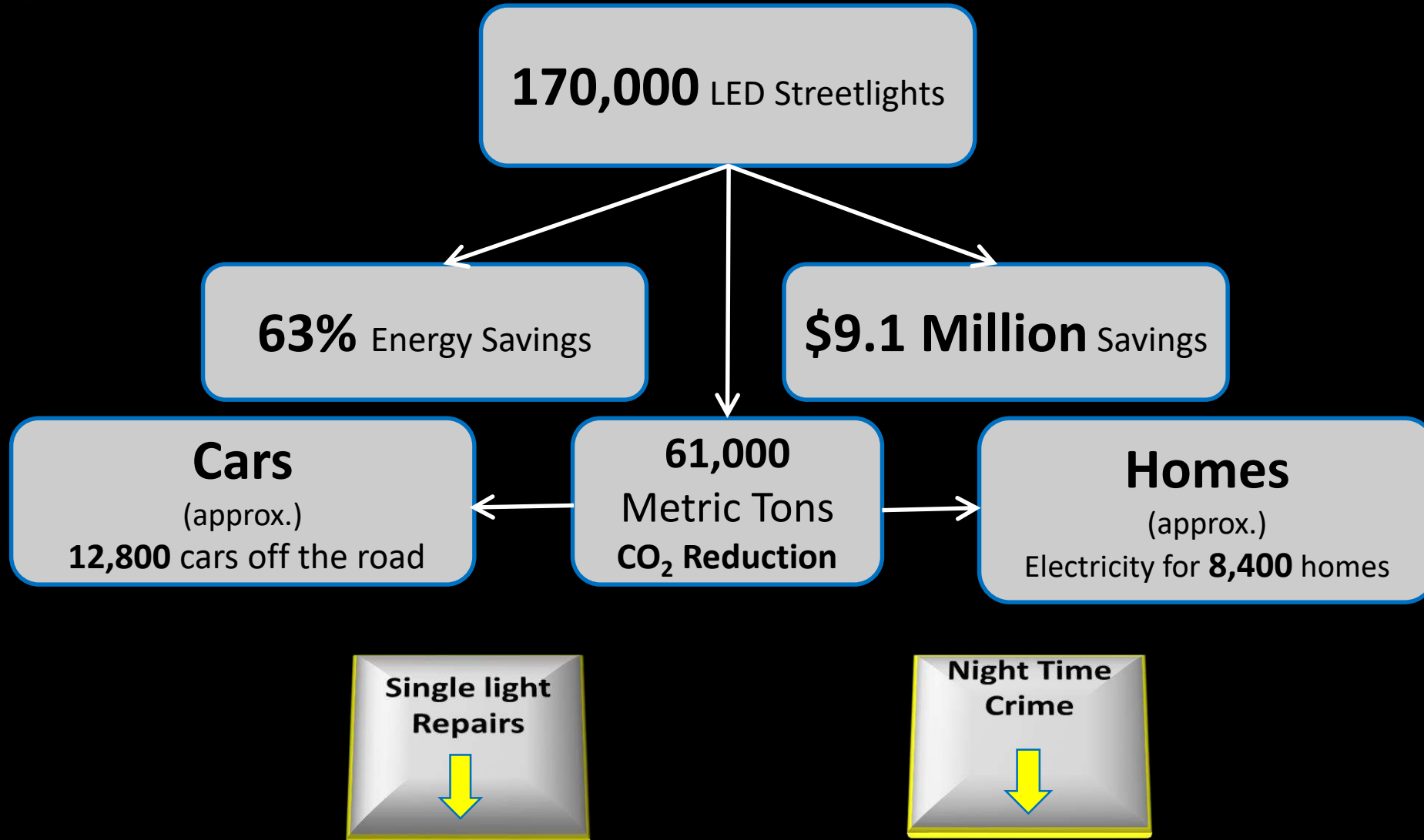




LED STREETLIGHT CONVERSIONS

LED Conversion of  
170,000  
streetlights in the  
City of  
Los Angeles

% 80



# Yearly Comparisons

## Local Street LED Fixture

### 2009

- Avg. Price = \$ 432
- Efficacy = 42 Lm/W
- Life = 80,000 hrs
- Warranty = 5 yrs

### 2010

- Avg. Price = \$ 298
- Efficacy = 61 Lm/W
- Life = 111,000 hrs
- Warranty = 6 yrs

### 2011

- Avg. Price = \$ 285
- Efficacy = 72 Lm/W
- Life >150,000 hrs
- Warranty = 6 yrs

### 2012

- Avg. Price = \$ 245
- Efficacy = 81 Lm/W
- Life >150,000 hrs
- Warranty = 7 yrs



## Yearly Comparisons

Local Street LED Fixture

### 2013

- Avg. Price = \$ 141
- Efficacy = 96 Lm/W
- Life > 150,000 hrs
- Warranty = 10 yrs

### 2015

- Avg. Price = \$ 130
- Efficacy = 96 Lm/W
- Life > 150,000 hrs
- Warranty = 10 yrs

## 2018

- Avg. Price = \$100 range
- Efficacy > 125 Lm/W
- Life > 100,000 hrs
- Warranty = 10 yrs

## Before and After Pictures of LED Program

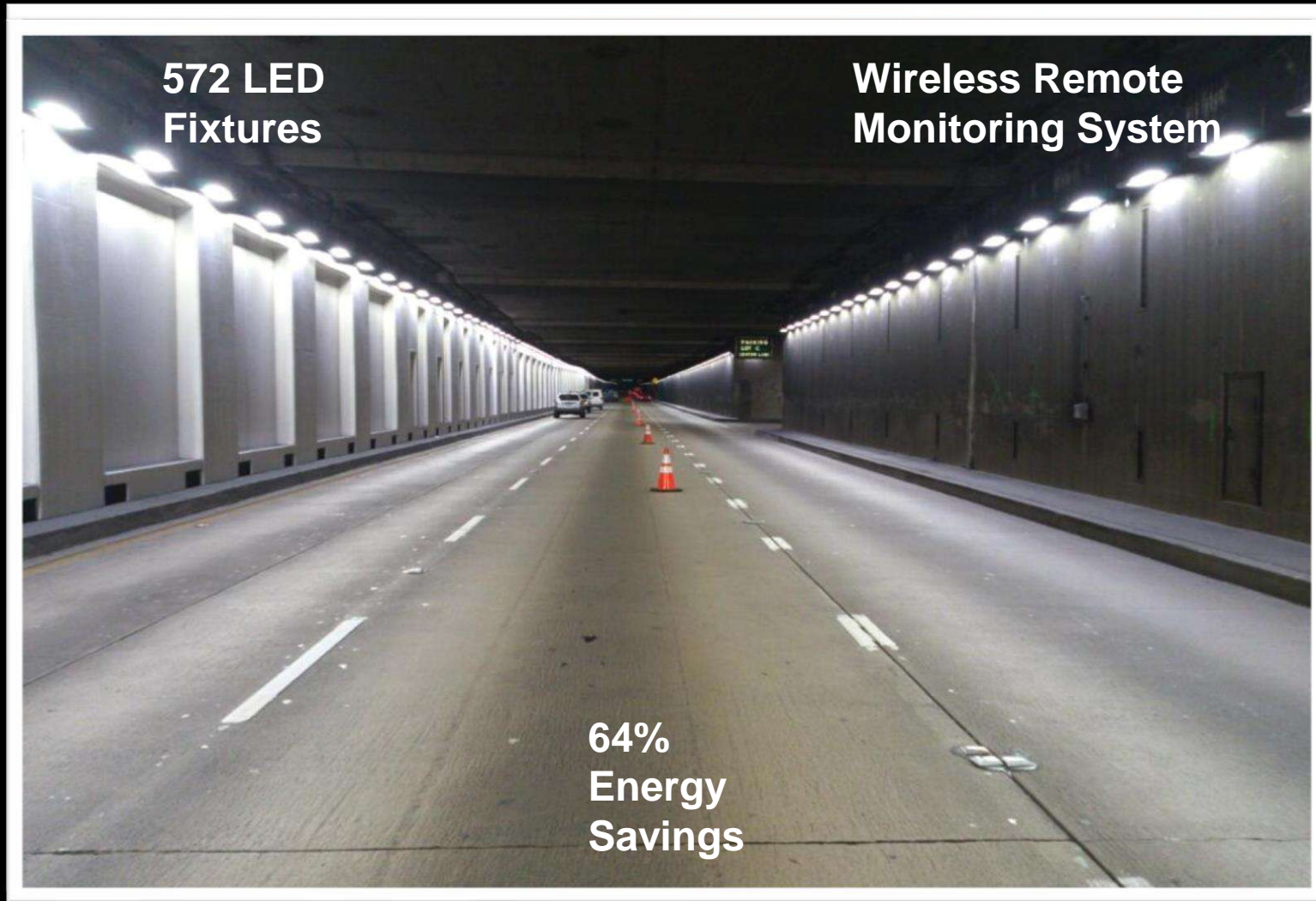




**62%  
Energy  
Savings**

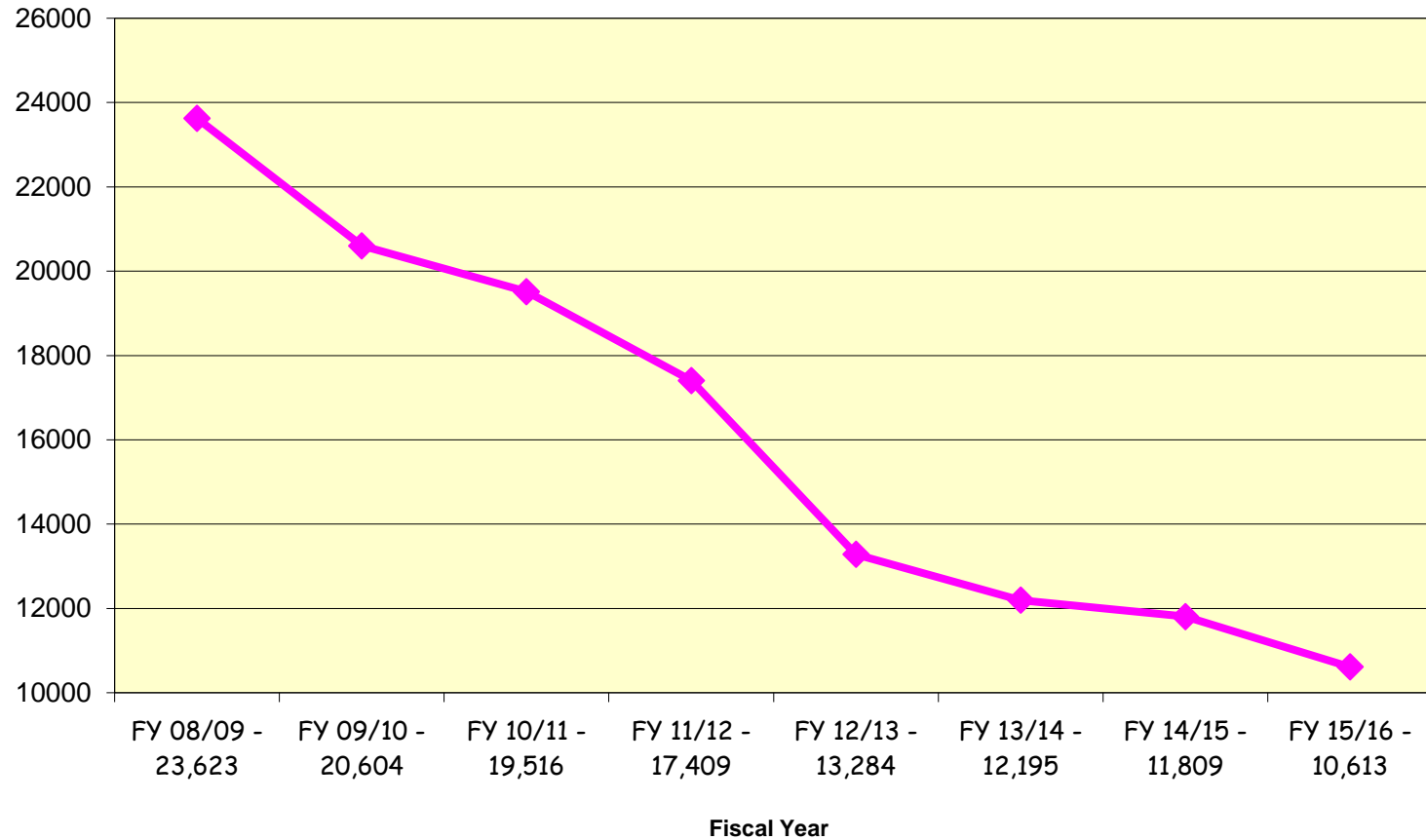


**73%  
Energy  
Savings**



# Maintenance Savings

## SINGLE LIGHT REPAIRS 2009 - 2016





## ***Remote Monitoring System/Controls***

*Leverage remote monitoring systems and on-board controls as an **Internet of Things** pathway*

- Expanding capability of street lighting infrastructure
- Connect sensors to luminaires
- Transmit other information
- Aggregate and share data
- Present via dashboards
- Generate reports via analytics





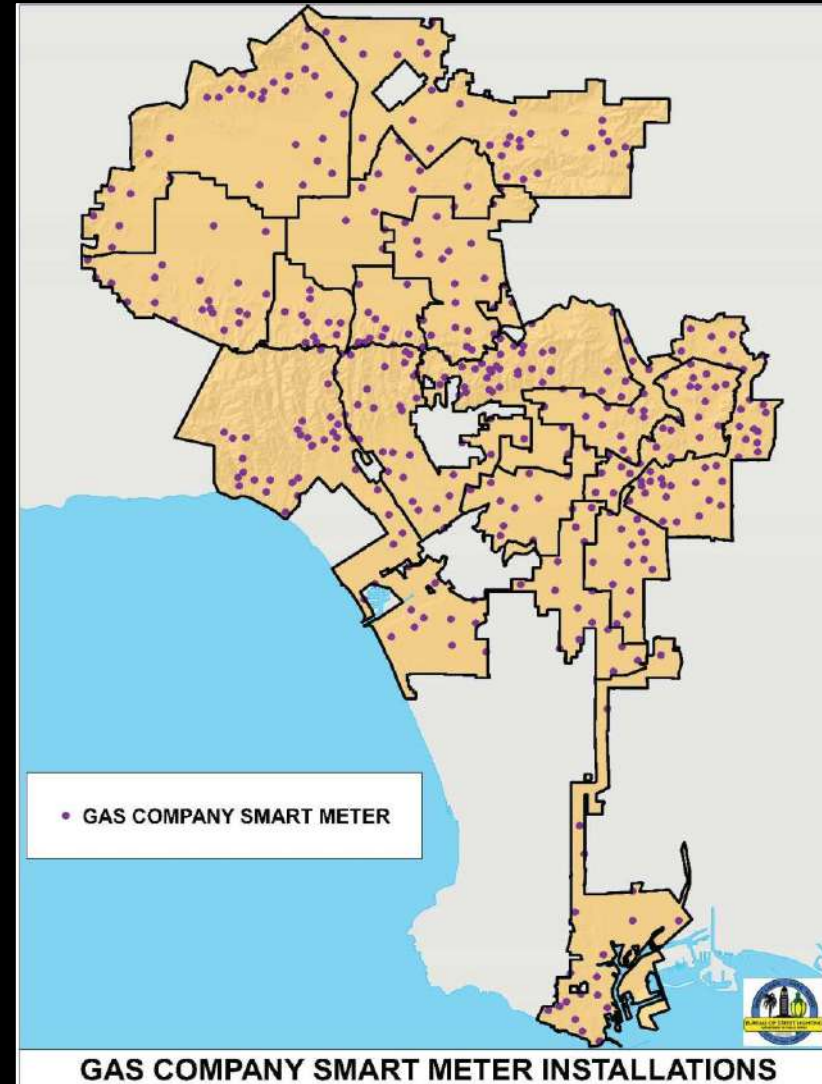
**Solar Powered Streetlights  
500 plus Citywide**



## Smart Meters

Gas Co

More than 400 Locations



## Security Cameras

- 109 cameras Installed
- Los Angeles Police Department



# Education® Smart City Solutions

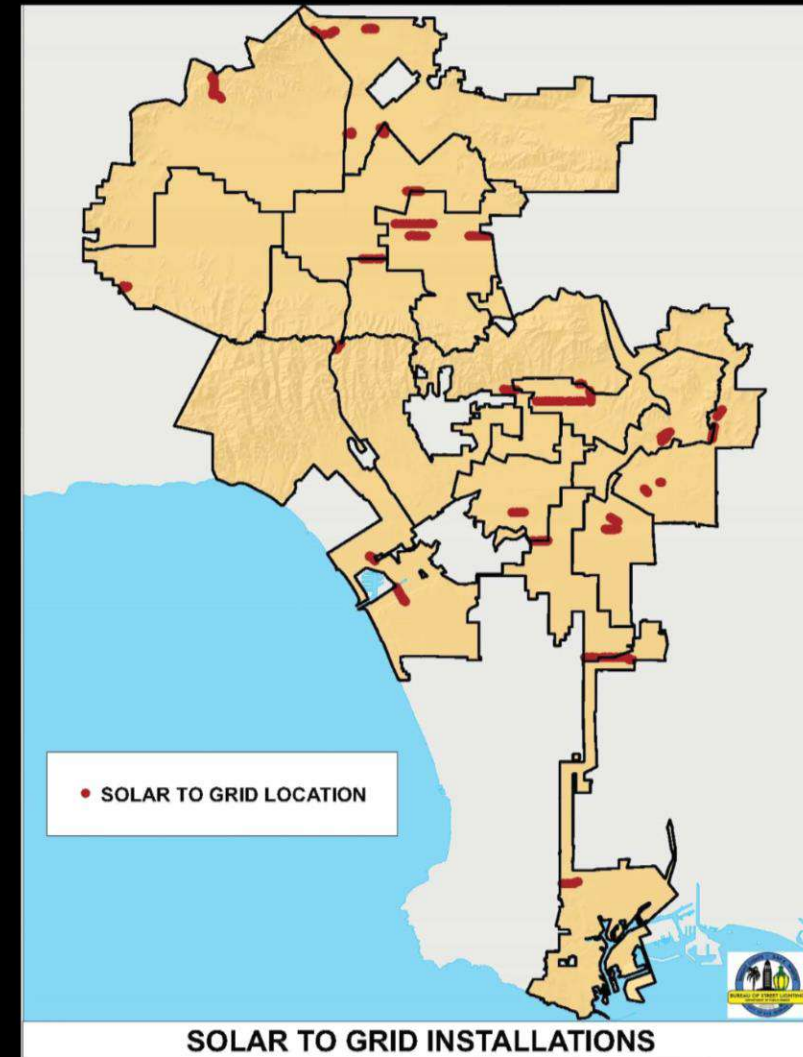
## Banners

Avg. 1,000 permits / year



## Solar to Grid

- 780 Units Installed
- Panel Size: 240W
- Avg. kWh Generated: 1kWh /day



## Streetlight / EV Charging Stations Integration

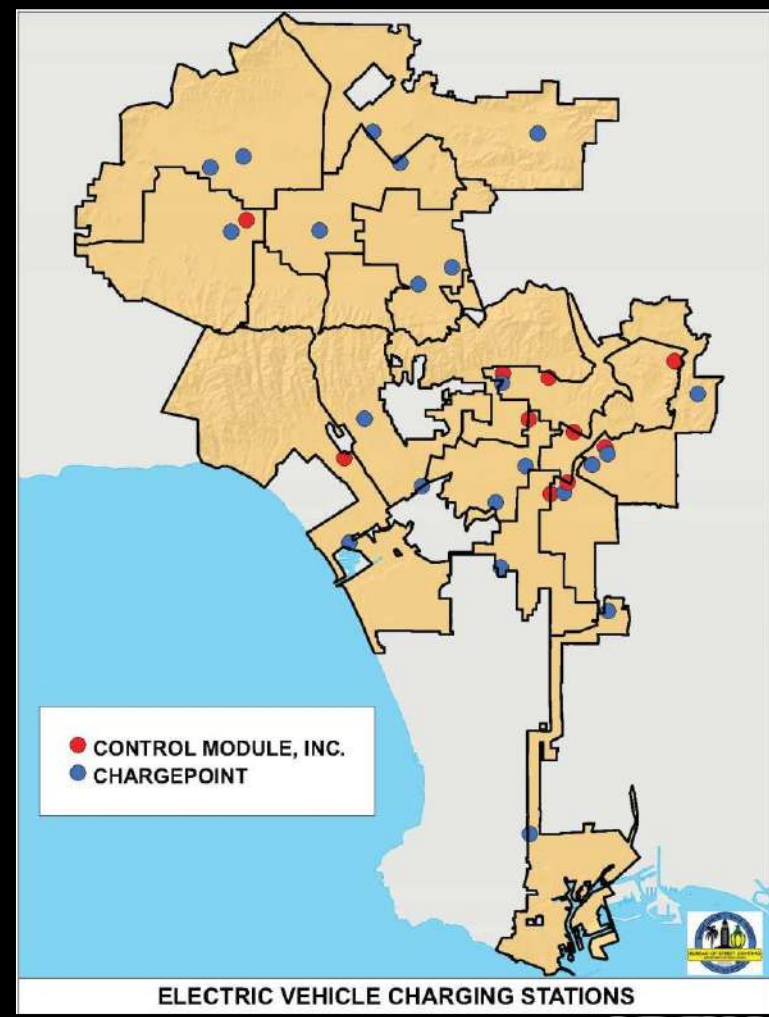


*“A Standardized, easily accessible and consumer friendly charging infrastructure is required. A good example of how this trend could succeed is the idea of integrating charging points in the existing streetlights.”*

President of the  
German Car  
Association

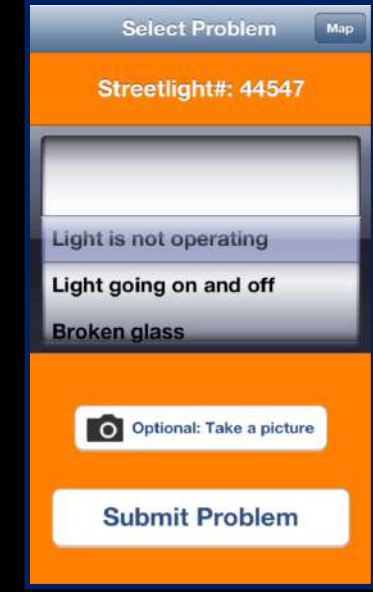
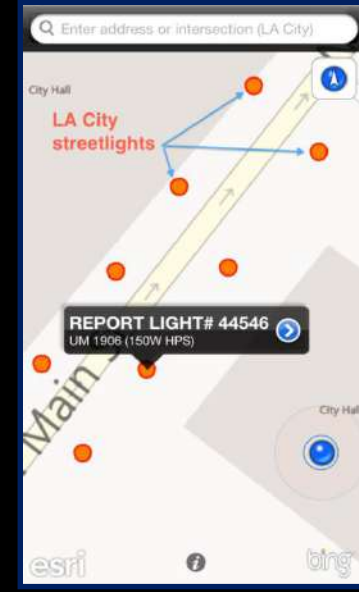
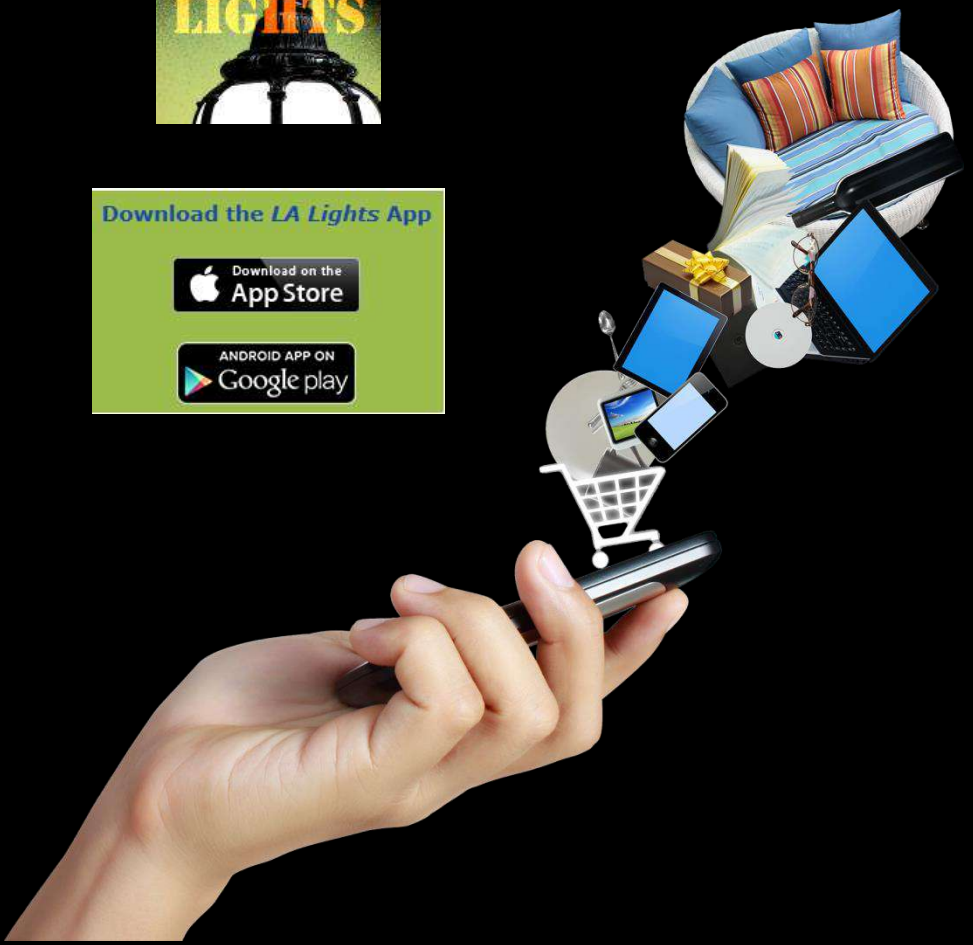
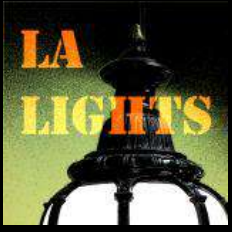


## Streetlight / EV Charging Stations Integration





## Mobile Apps



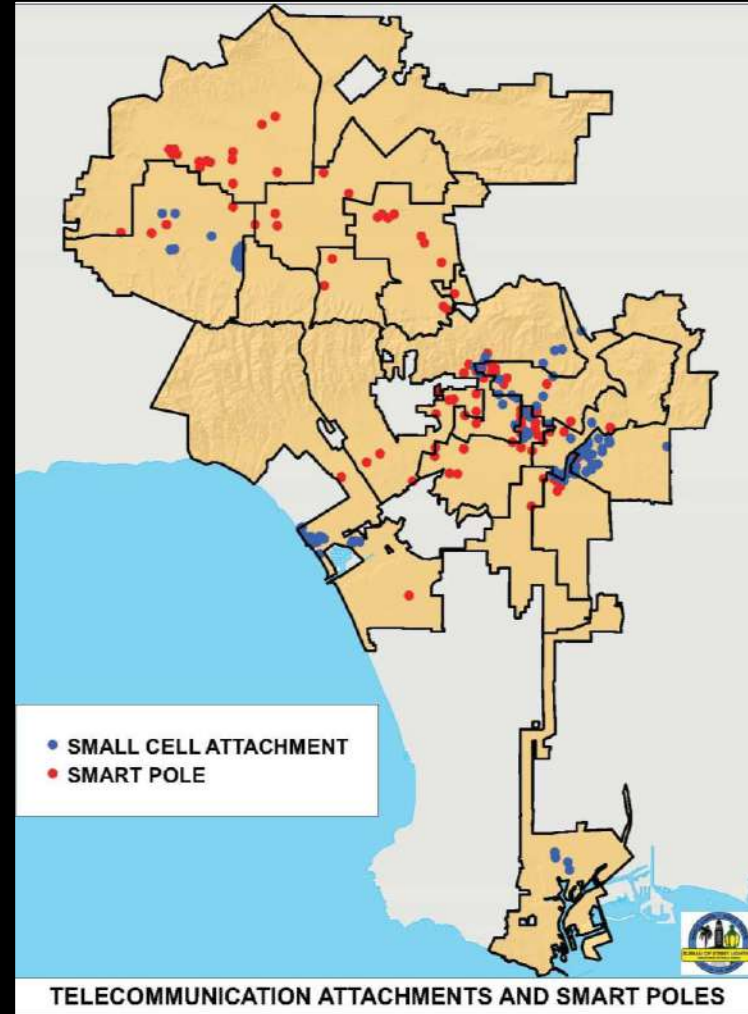
**Outages Reported by Mobile Apps :**  
**More than 25 percent of all service requests**

## Telecommunications Equipment

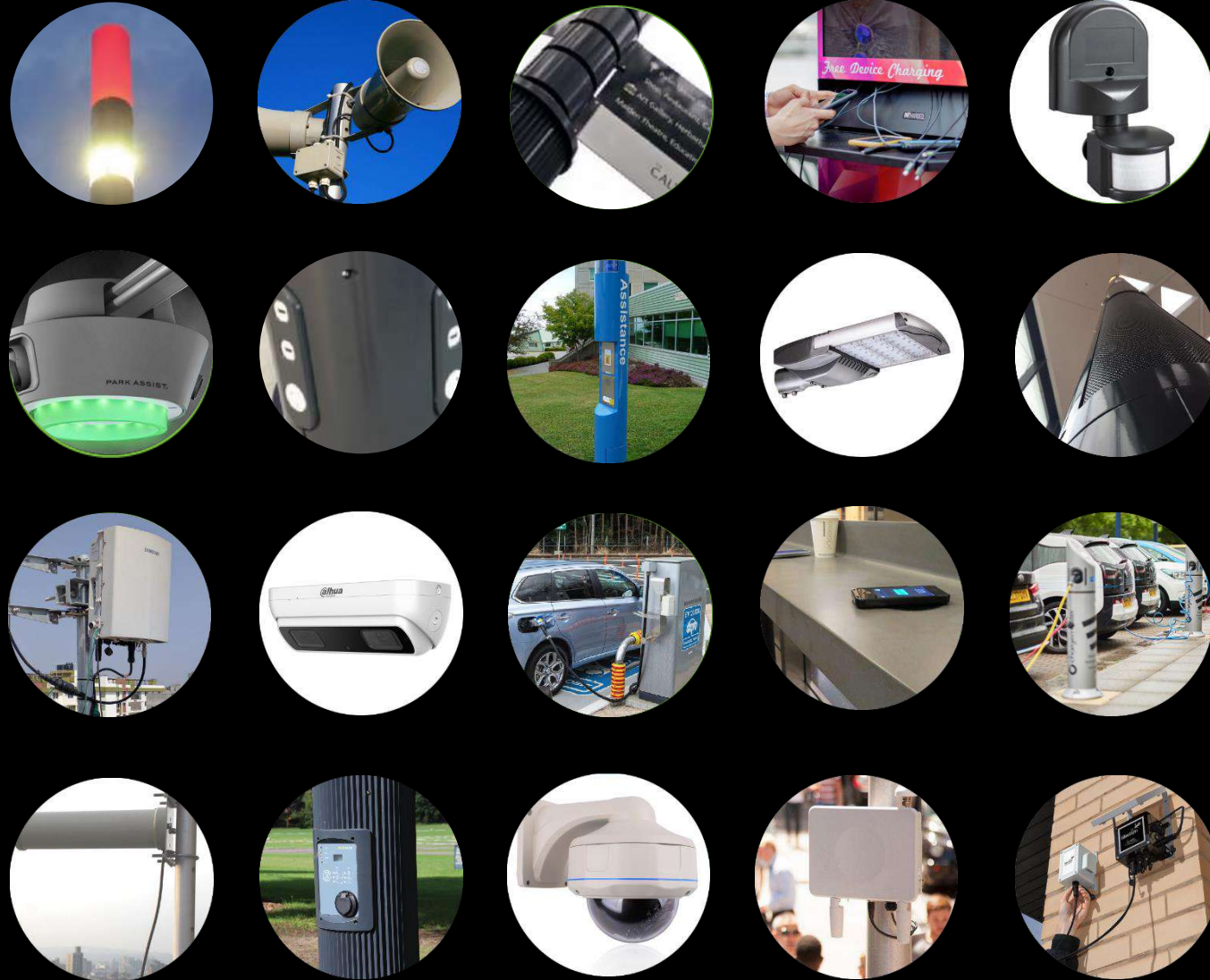
**SMART Poles**

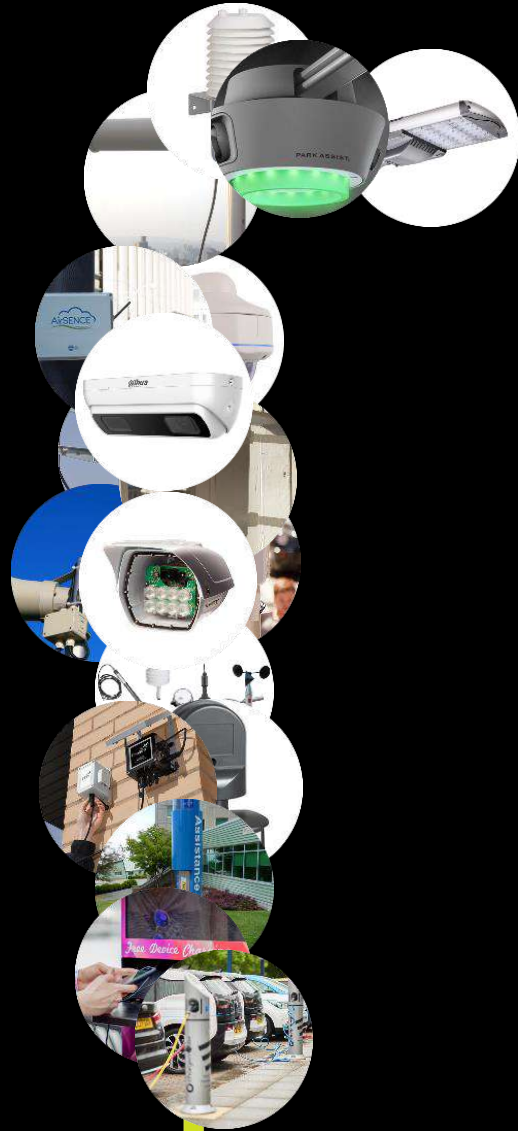


**CoLocation Poles  
w/Attachments**



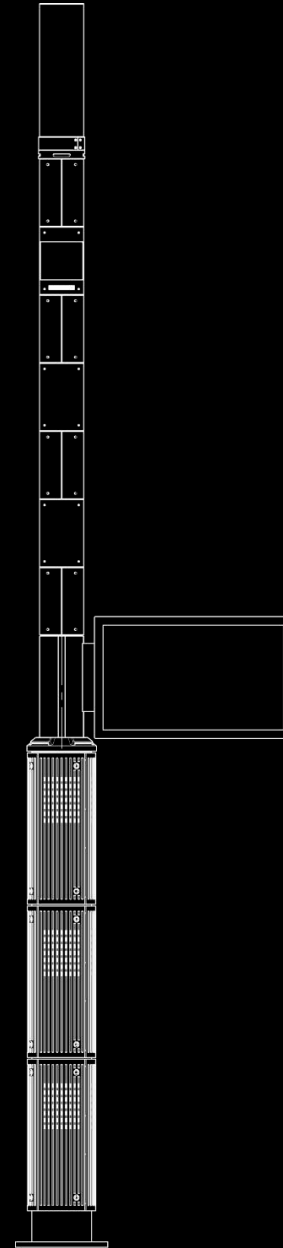
# education® SMART CITY = MANY CONNECTED DEVICES





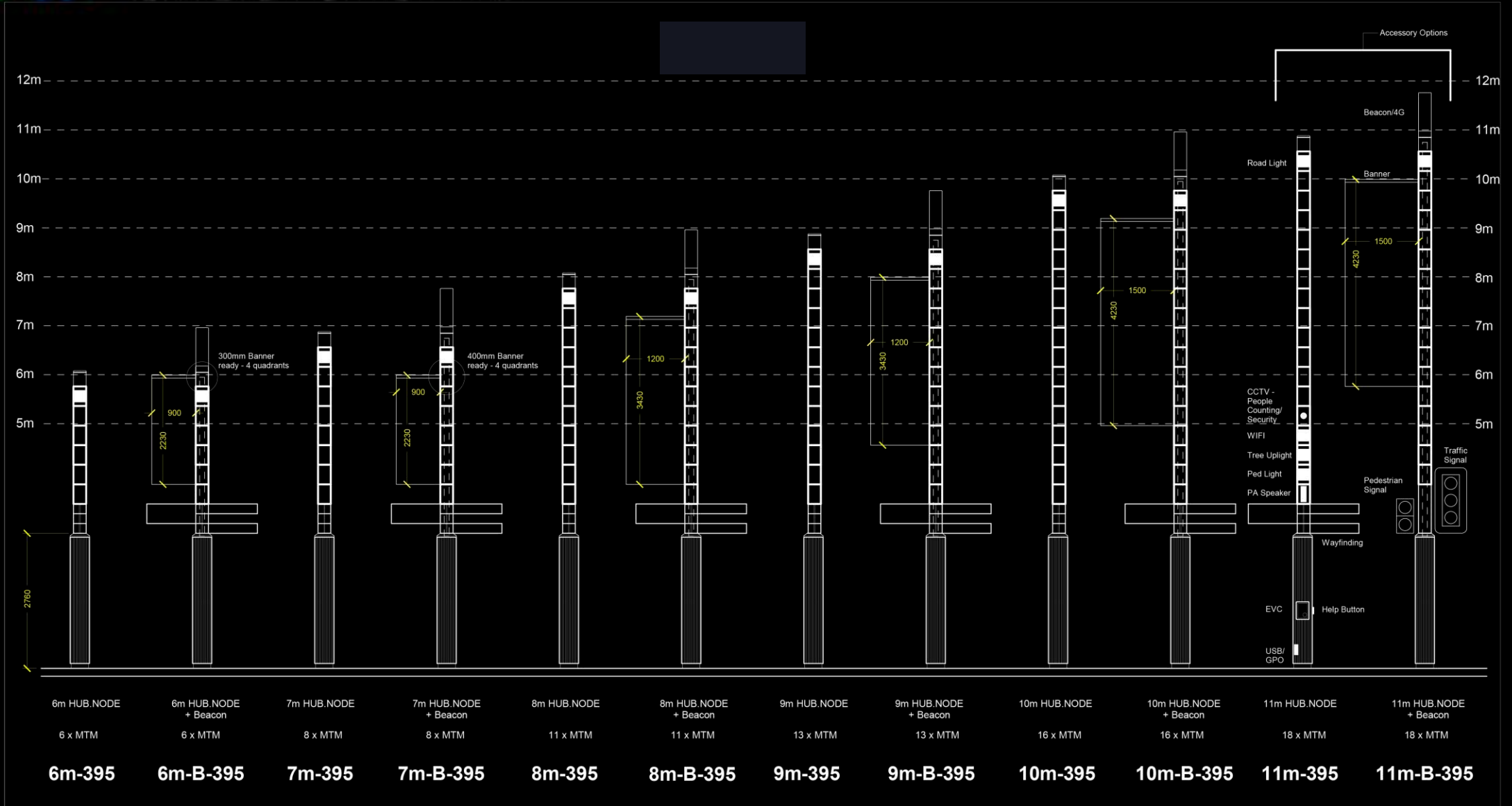


LEDucation®









## ENVIRONMENTAL NOISE SENSOR



## WI-FI



## LED LIGHTING



# SPEAKERS

# VISUAL DISPLAY SCREENS

# BEACON

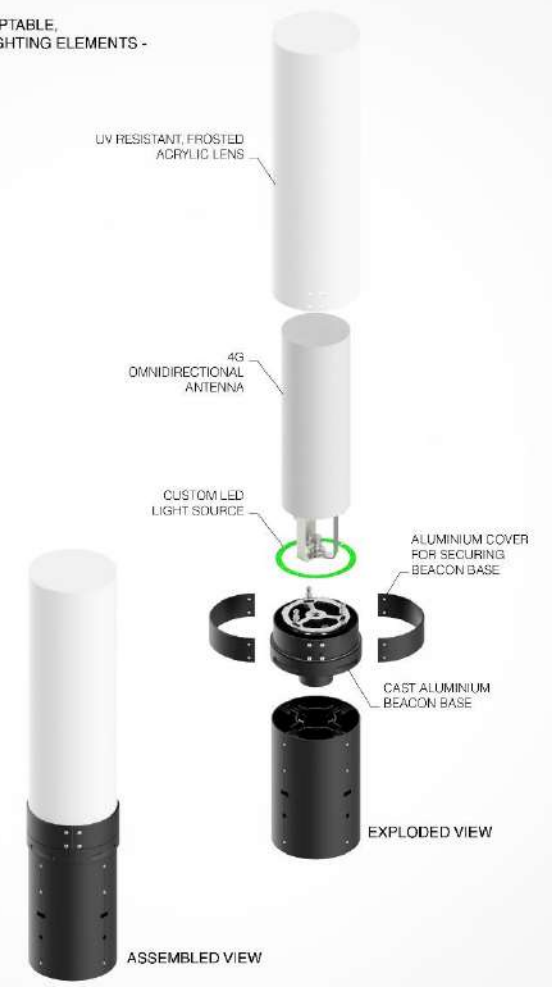
6.e  
SPEAKER AND/OR EMERGENCY  
NOTIFICATION SYSTEM



7.a  
VISUAL DISPLAY SCREEN



1.a  
ADJUSTABLE, ADAPTABLE,  
DIMMABLE LED LIGHTING ELEMENTS -  
BEACON LIGHT





# SMART CITY CONNECTED



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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



This concludes The American Institute of Architects Continuing  
Education Systems Course



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