

# OUTDOOR AREA LIGHTING

Best Practices in Southeastern PA



# Let's Compare the Technologies

- ▣ LED
- ▣ Ceramic Metal Halide
- ▣ HPS
- ▣ Pulse Start Metal Halide
- ▣ Probe Start Metal Halide
- ▣ Mercury Vapor
- ▣ Induction



# Comparison

Type of Lamp	Lumens per watt	Average Lamp Life (Hours)	CRI
Incandescent	8 – 25	1,000 – 2,000	100
Mercury Vapor	13 – 48	1,200 – 24,000	49
Fluorescent	33 – 77	10,000 – 30,000	70 - 90
Metal Halide	60-100	10,000 – 15,000	64
High Pressure Sodium	45-110	12,000 – 24,000	24
Low Pressure Sodium	80-180	10,000 – 18,000	-44
LED	60 – 200	50,000 – 100,000	70 – 90+



# Comparison

- ▣ LED CAN SAVE 40% - 60% ON ENERGY
- ▣ LED CAN REDUCE RELAMPING BY 4 - 5 TIMES
- ▣ DRIVER LIFE SHOULD EQUAL EXPECTED LED LIFE
- ▣ BETTER UNIFORMITY
- ▣ LONGER WARRANTIES
- ▣ CAN INCORPORATE CONTROLS



# Real Life



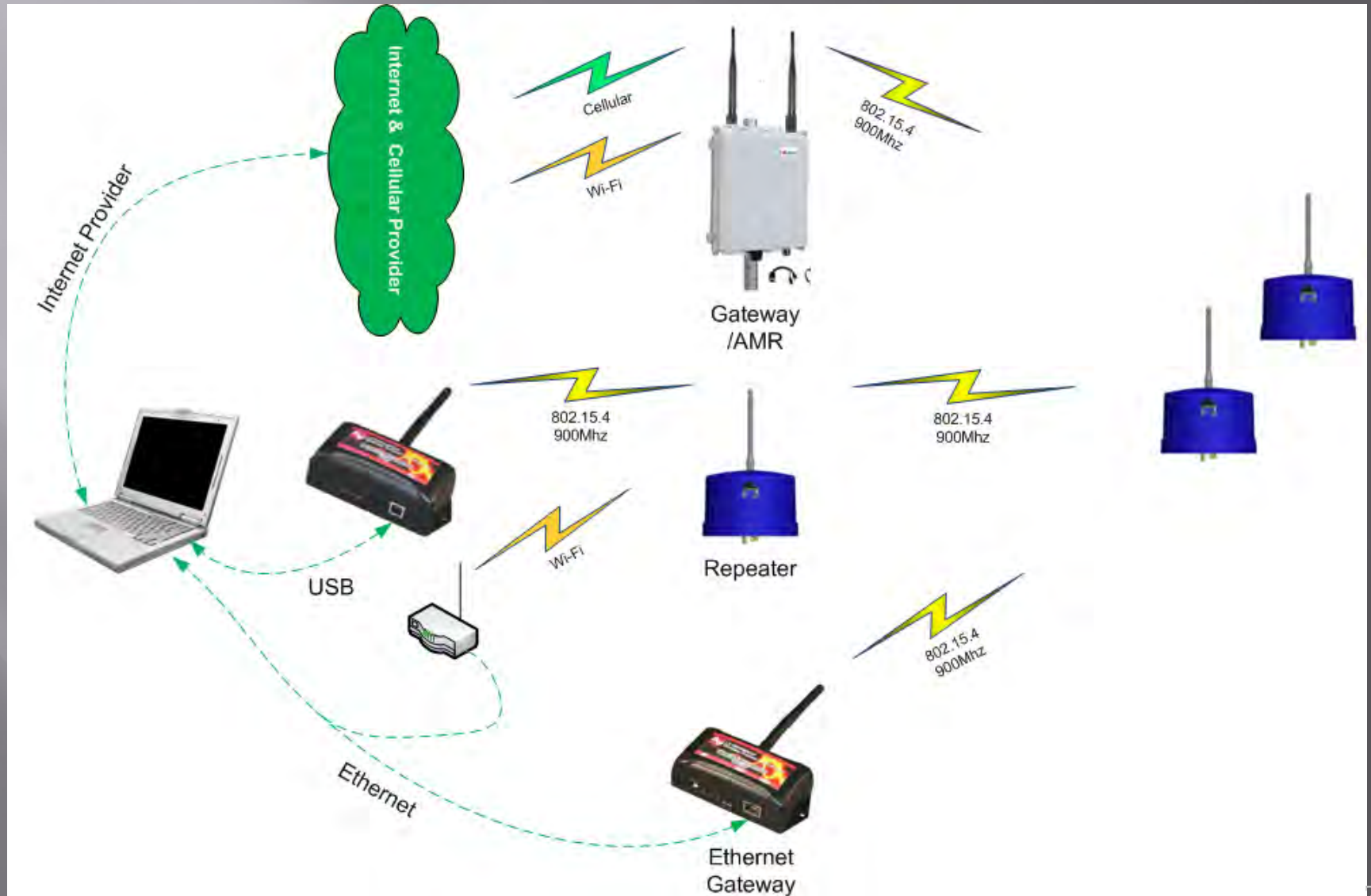
- ▣ HPS = 300 watts vs. LED = 140 watts
- ▣ 53% energy savings
- ▣ HPS 5 lamp changes over life
- ▣ Uniformity increased 2x

# Adding Controls Can Add Savings

- ▣ Simple on/off
- ▣ Dimming
- ▣ Monitor energy usage
- ▣ Be contacted via text messages/email for required maintenance
- ▣ Emergency flashing
- ▣ Occupancy control



# Typical Control Scenario



# Local Case Studies

- ▣ Bicentennial Garage, West Chester
- ▣ University of Pennsylvania
- ▣ Lower Southampton
- ▣ Wilkes-Barre
- ▣ Philadelphia Airport Cell Phone Lot
- ▣ Chester County Garage
- ▣ DOE Gateway



# Bicentennial Garage

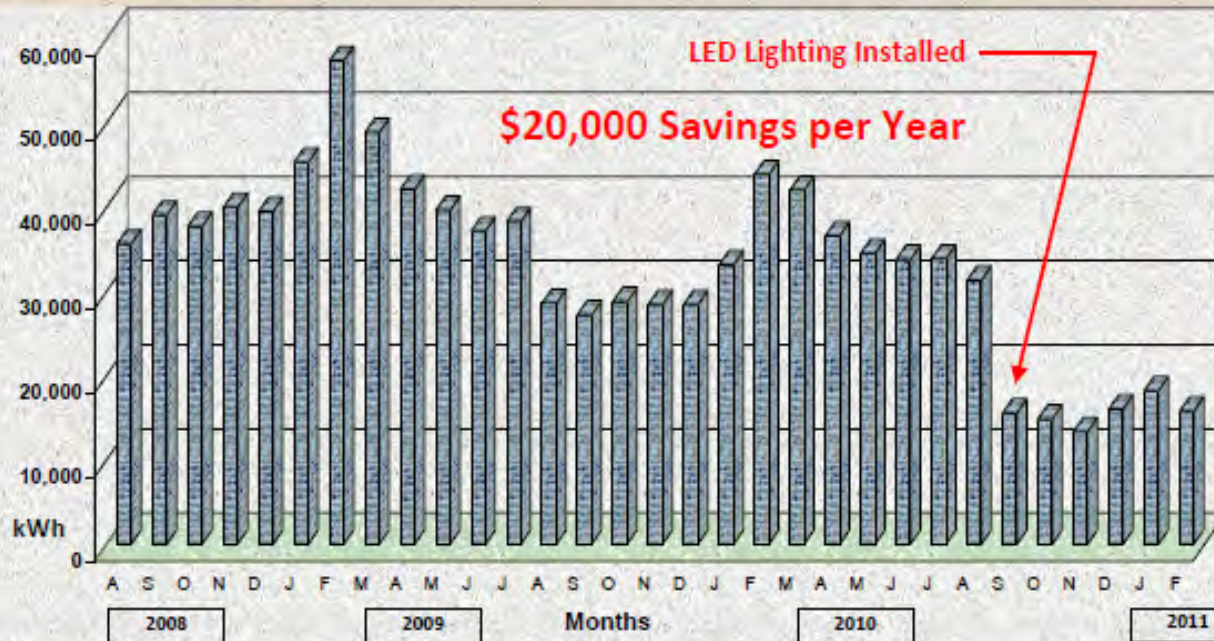


Borough of West Chester  
Chester County Pennsylvania

## Bicentennial Building LED Lighting Project

spitzle  
group

ARCHITECTURE  
PLANNING  
DESIGN



# University of Penn Garage



# University of Penn Garage



# University of Penn Garage



# Lower Southampton Street Lights



# Considering An Upgrade?



- ▣ Get a proposal that includes layout – you are probably over-lit
- ▣ Do not look at energy savings only, look at total cost of ownership
- ▣ Explore options for controls
- ▣ Incorporate the model lighting ordinance
- ▣ FIND A FRIEND



# Helpful Websites

- ▣ Municipal Solid State Street Lighting Consortium:

<http://www1.eere.energy.gov/buildings/ssl/consortium.html>

- ▣ Financial Analysis Tool:

<http://www1.eere.energy.gov/buildings/ssl/financial-tool.html>

- ▣ Model Lighting Specification:

<http://www1.eere.energy.gov/buildings/ssl/specification.html>

# Helpful Websites, Continued

- ▣ Model Controls Specification:  
<http://www1.eere.energy.gov/buildings/ssl/consortium.html>
- ▣ Gateway Demonstrations:  
[http://www1.eere.energy.gov/buildings/ssl/gatewaydemos\\_results.html](http://www1.eere.energy.gov/buildings/ssl/gatewaydemos_results.html)
- ▣ CALiPER:  
<http://www1.eere.energy.gov/buildings/ssl/caliper.html>



# Helpful Websites, Continued

- ▣ IESNA RP-8:

<http://www.eereblogs.energy.gov/tap/file.axd?file=2010%2F10%2FIESNA+RP-8-00.pdf>

- ▣ Model Lighting Ordinance (Dark-Sky):

<http://www.eereblogs.energy.gov/tap/file.axd?file=2010%2F10%2FIESNA+RP-8-00.pdf>

- ▣ LED City: <http://www.ledcity.org/index.htm>