

AGENDA

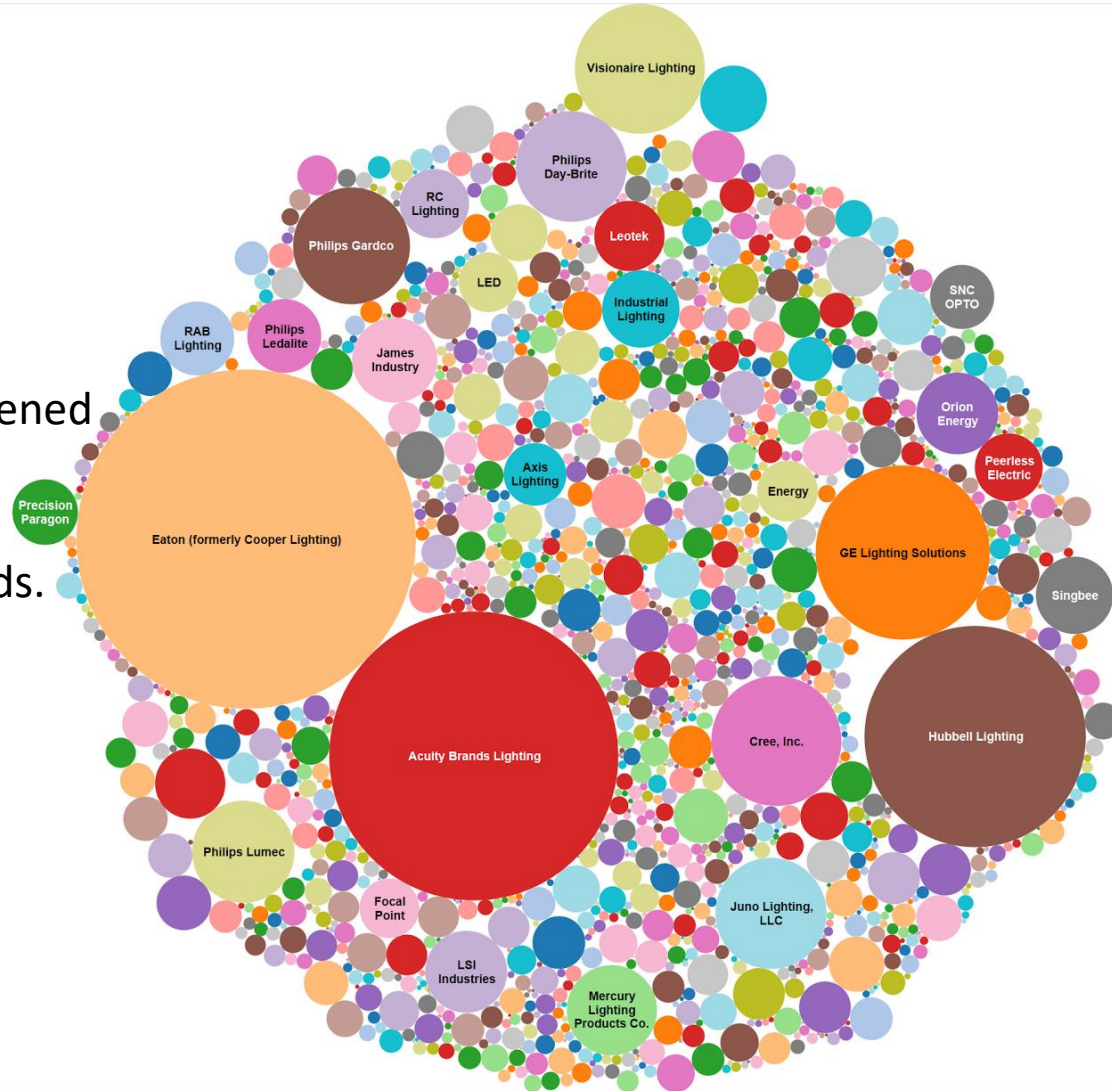


- Industry Growth
- Innovative Solutions
- Challenges & Lessons Learned

INDUSTRY GROWTH



- **Crowded Market = Competitive Market**
- LED adoption has opened the market to new technology and procurement methods.
- **Market Size:**
- 2010 : \$3.8 billion
- 2017 : \$33.1 billion
- By 2020 : \$54 billion



about Manufacturer Name. Size shows sum of Number of Records. The marks are labeled by Manufacturer Name. The view is filtered on Manufacturer Name, which keeps 1,500 of 1,500 members.

WHAT TO DO



- Evaluation of product is critical. Cutting or bleeding edge.
- Generating energy savings secondary to proper application.
- Increased number of manufactures = more innovative solutions quicker to market.



THREE INNOVATIVE SOLUTIONS

Innovative Audits

Lighting solution accuracy is dependent on good data. Satisfied customer is one who understands the scope of work clearly.

Retrofit w/ Adv. Controls

Kits with integral controls made for retrofits.

- Integrated
- Distributed Wireless
- Ability to Load Shed
- Analytics
- Color Tunable

Street & Area Ltg.

Advance controls for outdoor lighting so easy you should do it?

INNOVATIVE AUDITS & DEVELOPMENT

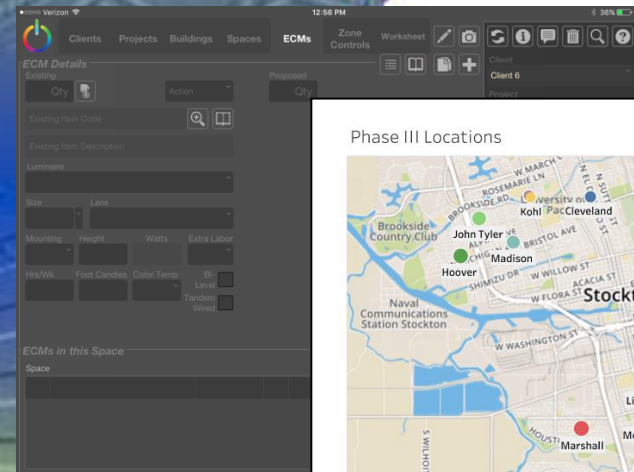


Auditing tools help expedite development and reduce risk.

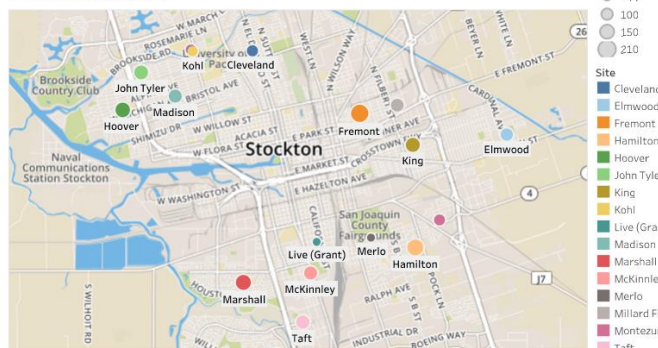
- The best lighting projects always have the best audits.

- Disseminating information so that everyone understands what's in scope.

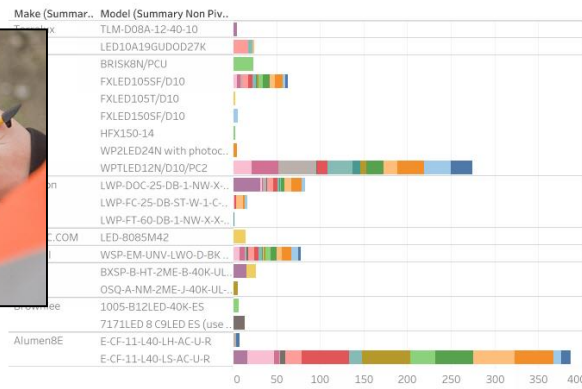
- Data Visualization



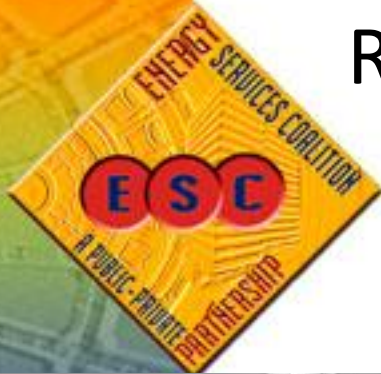
Phase III Locations



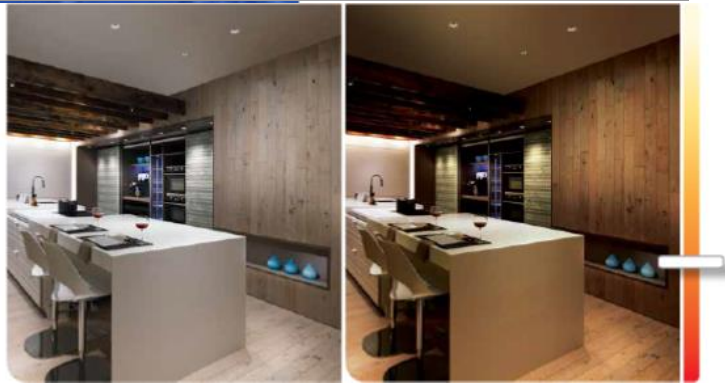
Phase III Addresses



RETROFIT W/ ADVANCED CONTROLS



INTELLIGENT



Balancing cost of controls with lighting upgrades

- Retrofit to TLED's with integral controls (occupancy & daylighting)
- Tunable White Retrofit Kits (not just new fixtures)
- Retrofit Kits with Networked Systems
- Wireless Distribution with EMS Integration
- Net Zero Strategies - Load Shedding w/ Retrofits



BACnet



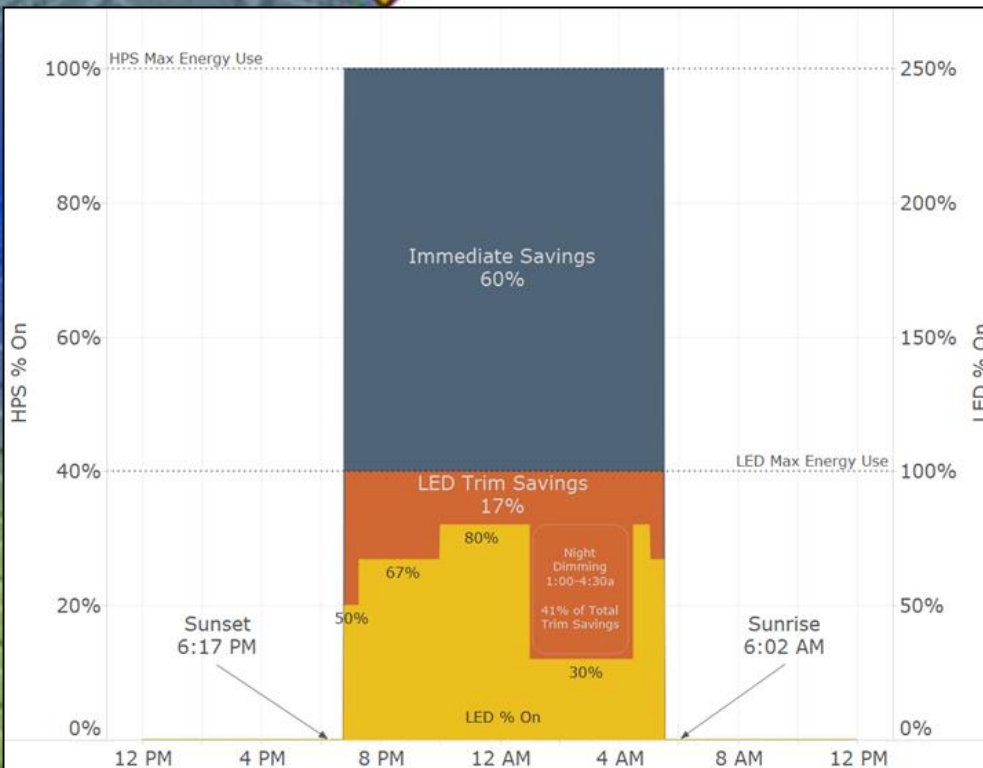
STREET & AREA LIGHTING



- 50-60% energy savings in the city's energy cost of operating street lights
- Significant operational and maintenance savings through longer life lamps
- Continuity and consistency of infrastructure is established along with opportunity to plan for future maintenance and growth
- New fixture life-cycles expected at 20-25 years
- Assumes end of life is at 70% light output (lights won't all go out at once)
- A chance to inventory your existing lighting systems
- ROI and IRR are typically positive



WHY CONTROLS?



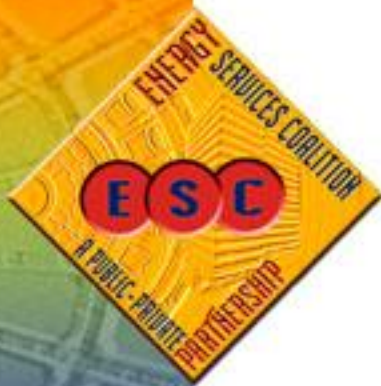
ADDITIONAL ENERGY SAVINGS

- Lumen Maintenance
- Dimming Schedules
- Adjust Light Levels for Traffic Conditions
- Tunable White for Outdoor Lighting
 - White Bear Lake, MN
- Adjustable Distribution

OTHER BENEFITS?

- Intelligent streetlight grid
- Deploy sensors on the lighting network
- Air pollution, noise pollution, weather stations, seismic sensors
- Copper wire theft detection
- Cameras powered by streetlight circuit
- Parking spot availability notification
- EV charging service
- WiFi enabled city
- Integration to other city infrastructure (eg: AMI/AMR meters, DAS for first responders)





THREE INNOVATIVE SOLUTIONS

Innovative Audits

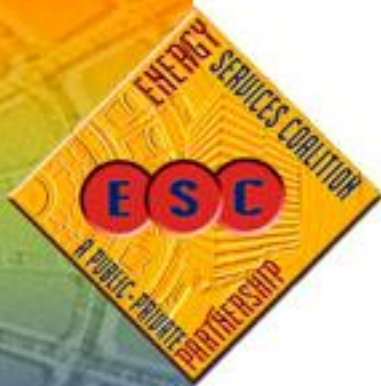
1. On site audit durations much longer.
2. Using new technology requires training and management.
3. Additional cost to deploy new technology.

Retrofit w/ Adv. Controls

1. Solutions are not always comprehensive.
2. Additional development and design time needed to specify product correctly.
3. Energy savings calculations difficult to stipulate. M&V Plan should include both data logger deployment and power measurements.
4. Scalability

Street & Area Ltg.

1. Sequence installation to enable immediate controllability
2. Warmer color temperature in pedestrian-dominant locations
3. Site safety plan important for various streetscapes
4. Dimming capabilities are important for commissioning
5. Communication plans are important for public constituents
6. Rate Schedules play into what you'll see in terms of savings



HERE TO HELP @ ESC

**Darren Smith,
BDM**

29 years in selling
lighting solutions to
both public and private
sector clients

darrens@nwedison.com
[m](mailto:darrens@nwedison.com)

425-420-0613

**Ross Pearson,
Sales**

Expertise in quick
procurement and
installation of payback
driven lighting projects

rossp@nwedison.com

425-443-3036

**Ashli Bush PE,
Solar**

Professional Engineer
with 5+ years
developing
conservation measure
for ESPC projects

ashlib@nwedison.com

425-638-2307