RESPONSIBILITY

Business • Community • Environment

2015 U.S. DOE SSL Technology Development Workshop

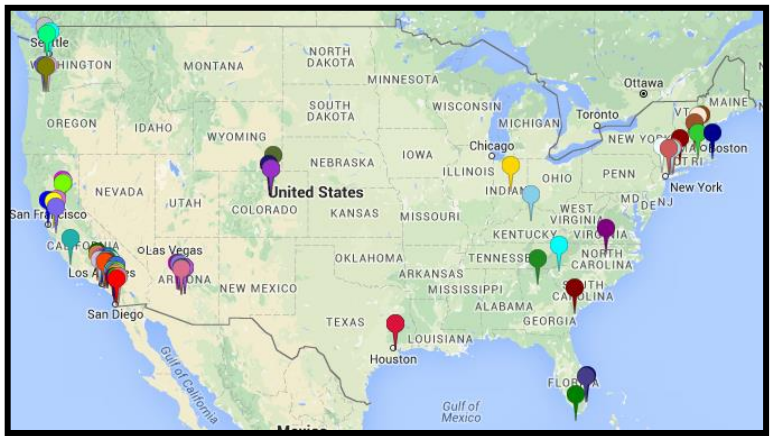
November 17, 2015

RE THINK NEW STORE

KIMCO™ REALTY

Kimco Overview

- We are a publicly traded real estate investment trust (REIT) headquartered in New Hyde Park, NY who owns and operates over 700 neighborhood and community shopping centers across 39 states
- We are responsible for providing safe, efficient, and aesthetic lighting for approx. 175 million square feet of parking area (over 3,000 football fields)
- Outdoor lighting electricity is one of our largest operating expenses at approximately $25,000 per site annually
- We are four years into a national lighting controls program we call “Gateway” (~350 sites) and one year into an LED retrofit initiative we call “Illumi-Nation” (~100 sites)



Goals of Our Lighting Program

1. To enhance the safety, security, and curb appeal of our shopping centers through improved lighting quality
2. To reduce electricity consumption by 30-60% at the majority of our centers through LED upgrades and an additional 10-30% through controls
3. To develop an expandable technology platform that maximizes operational effectiveness and provides valuable services to our tenants and customers

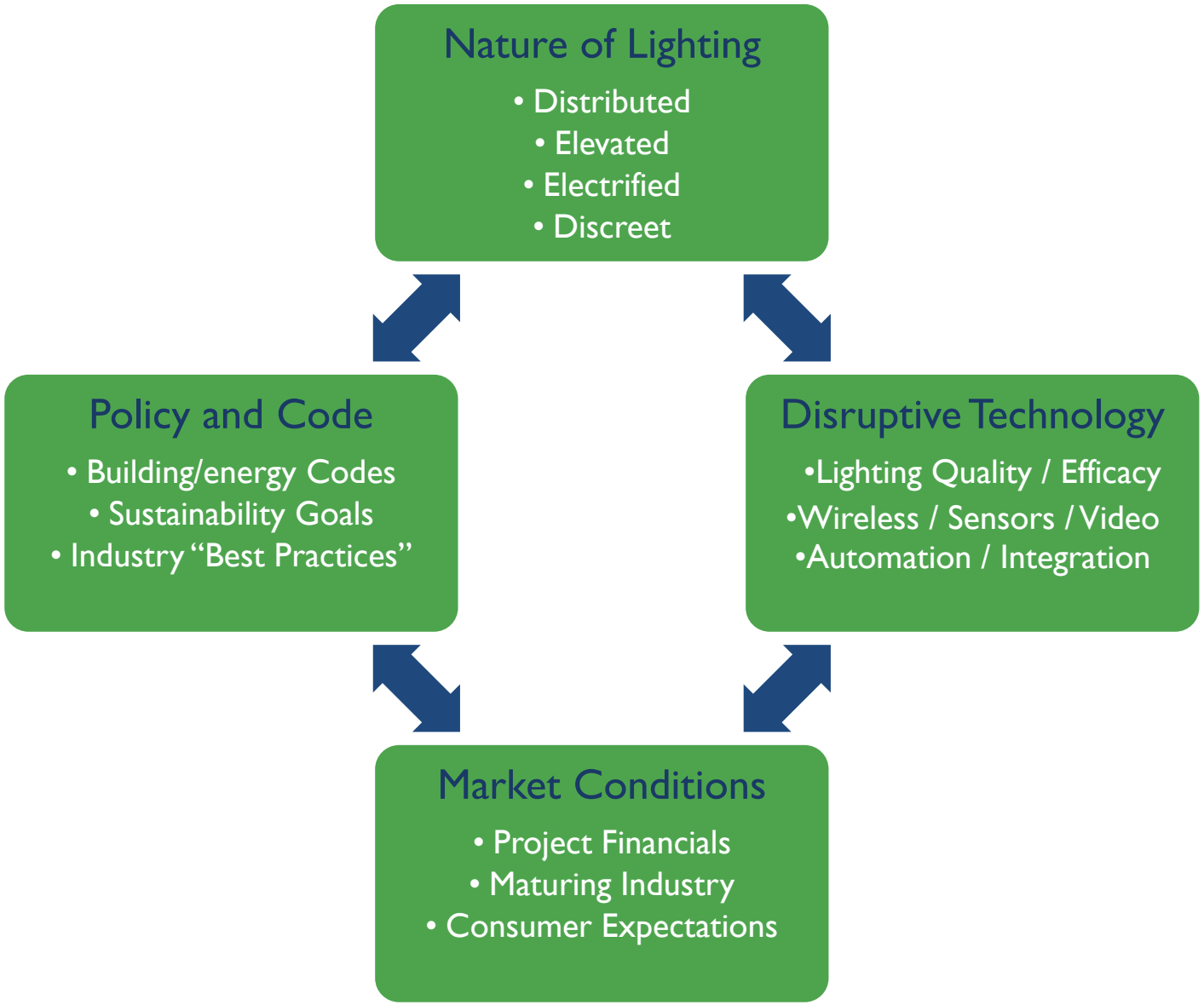
The Changing Paradigm at Kimco

The *disruptive* technology of SSL and connected lighting systems is causing a *paradigm shift*. We are beginning to see lighting in a different "light." Our outdoor lighting systems are no longer viewed primarily as a fixed utility expense. Rather, they are *investments* that enhance our property with the potential of providing *valuable services* for us and our customers.

High performance SSL luminaires have wetted our appetite for *better lighting quality* which is quickly becoming a *best practice* and even a necessary customer amenity. They have also provided a major advancement in our *energy performance* and sustainability goals.

Lastly, these luminaires integrated with a growing number of sensors, controllers, and software applications are forming a *technology platform*. A platform that is just now opening the door to the *endless possibilities* of what we can do with distributed intelligence suspended in the air across our properties.

Key Drivers Behind the Paradigm Shift



Where Might This New Paradigm Take Us?

What would *YOU* do with an integrated network of lights, cameras, speakers, microphones, sensors, processing power, and data storage discreetly distributed at 30 feet across your property…or across your city?

Here is just a sampling….

- Energy Optimization
- Fault Detection
- Managed Maintenance
- Operational Awareness
- Active Deterrence
- Security Surveillance
- Environmental Monitoring
- Life Safety
- Early Warning
- Parking Management
- Business Intelligence
- Way Finding
- WiFi Hotspot
- Entertainment

Impacts on Project Planning

- Project stakeholders are more numerous and diverse (e.g. property management, IT, security, marketing, etc.)
- Financial analysis is no longer based merely on energy savings and maintenance savings but also includes other potential hard and soft benefits (e.g. reduced crime, reduced staffing, business intel., etc.)
- Design process is more customized and goes beyond lighting to other technology selection and infrastructure considerations. This may require a multi-disciplinary collaboration between designers, IT consultants, suppliers, and installers.
- Code compliance and city approvals are more complex and time-intensive as new technology and practices bring officials into uncharted territory

There are more cooks in the kitchen…

Impacts on Project Implementation

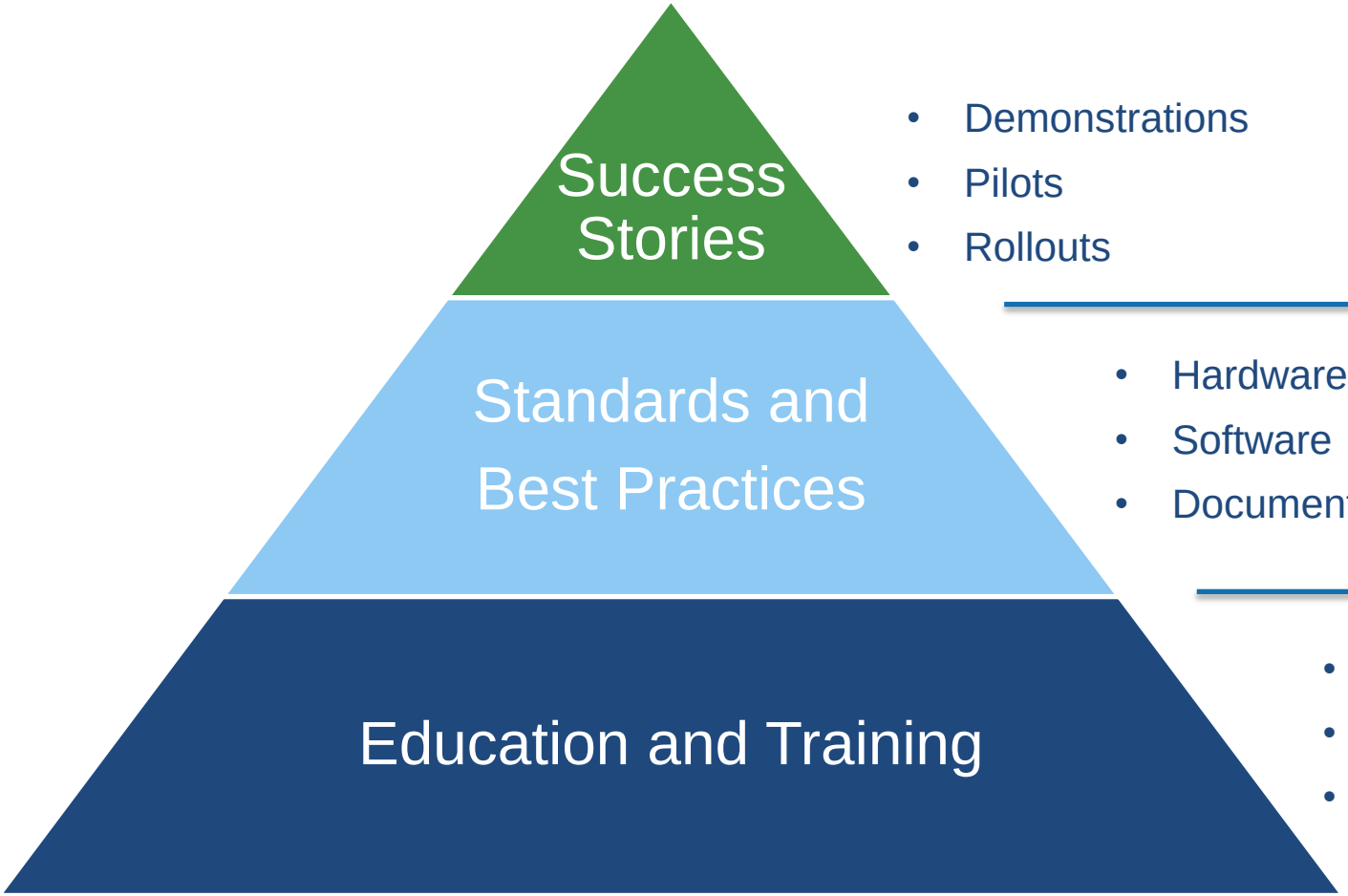
- Evaluation and selection of suppliers now requires a long-term strategic perspective. Rather than a one-time exchange; it will likely be an ongoing partnership and may include a managed services agreement. Pilots and proofs of concept are needed as much as ever but are more complex and expensive.
- Installation may be more complex and less familiar which may require training and multidisciplinary teams. Coordination and collaboration among multiple vendors requires better planning and communication.
- Operation and maintenance must mature from the traditional "replace upon failure" to active management of the technology platform to realize the benefits. Diagnosing problems is more complex with more components and layers involved.

Can we have our cake and eat it too?

Challenges and Lessons *Being* Learned

1. **Project Evaluation and Approval**
   a) Communicating the total value proposition beyond energy and maintenance savings to include curb appeal, security, safety, and operational effectiveness
   b) Finding champions and successful pilots early to build confidence / momentum
   c) Accounting for utility incentives – can't budget for them unless they are bankable.
   d) Educating stakeholders on new technology and benefits (cities, tenants, internal)
2. **Technology and Design**
   a) Establishing new design methods that account for LED's strengths (not one-for-one)
   b) Keeping up with new product developments a.k.a. "drinking from the fire hydrant"
   c) Integrating with legacy systems to provide a simple, seamless user experience
   d) Developing a "runway" for expansion, enhancement, and avoiding single-source scenarios
3. **Implementation and Operation**
   a) Finding vendor partners that are knowledgeable, experienced, trustworthy, and collaborative
   b) Defining standardized processes, documentation, and QC protocols
   c) Overcoming unforeseen costs and schedule delays due to complexity
   d) Diagnosing and servicing more complex systems
   e) Training users on new systems and features in order to achieve full range of benefits

How Do We Accelerate this Paradigm Shift?



- Demonstrations
- Pilots
- Rollouts

- Hardware
- Software
- Documentation

- Owners
- Vendors
- City Planners

Contact Information

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Additional Slides for Reference

Pilot Project Highlight: 280 Metro Center

- Pilot project with LED fixtures, wireless controls, and integrated video. Conducted in Fall of 2014 in Colma, CA.
- Replaced 74 qty. 400W and 14 qty. 250W MH fixtures with 80 qty. dimmable 217W LED fixtures
- Demand reduced from 39.7 kW to 17.4 kW (56% savings)
- Wireless control nodes on each fixture with embedded PIR motion sensor (additional 20-30% savings)
- Average light level from 0.5 FC to 2.8 FC
- Max/average ratio from 16.6 to 2.6
- Integrated 360° IP cameras to control lighting based on late night entrance, provide surveillance, and analyze traffic patterns

Pilot Project Highlight: 280 Metro Center

Events for Dimming V3

Custom - Sunrise at 6:45 AM Sunset at 7:39 PM

Update Events for this Profile

Weekday Events | Weekend Events

☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri ☑ Sat ☑ Sun

Enable Event	Astronomical Time Adjustments	Time	Action	Options
☑ Diagnostic Event Enable Current Measurement		11 : 50 AM PM		
Disable / Time of Day / Astronomical Time	0.0 Hours Before After; Sunrise Sunset	07 : 39 AM PM	Output 5.0V	Photocell Motion
Disable / Time of Day / Astronomical Time	0.5 Hours Before After; Sunrise Sunset	08 : 09 AM PM	Output 0-10V	Photocell Motion
Disable / Time of Day / Astronomical Time	0.5 Hours Before After; Sunrise Sunset	12 : 00 AM PM	Output 5.0V	Photocell ☑ Motion
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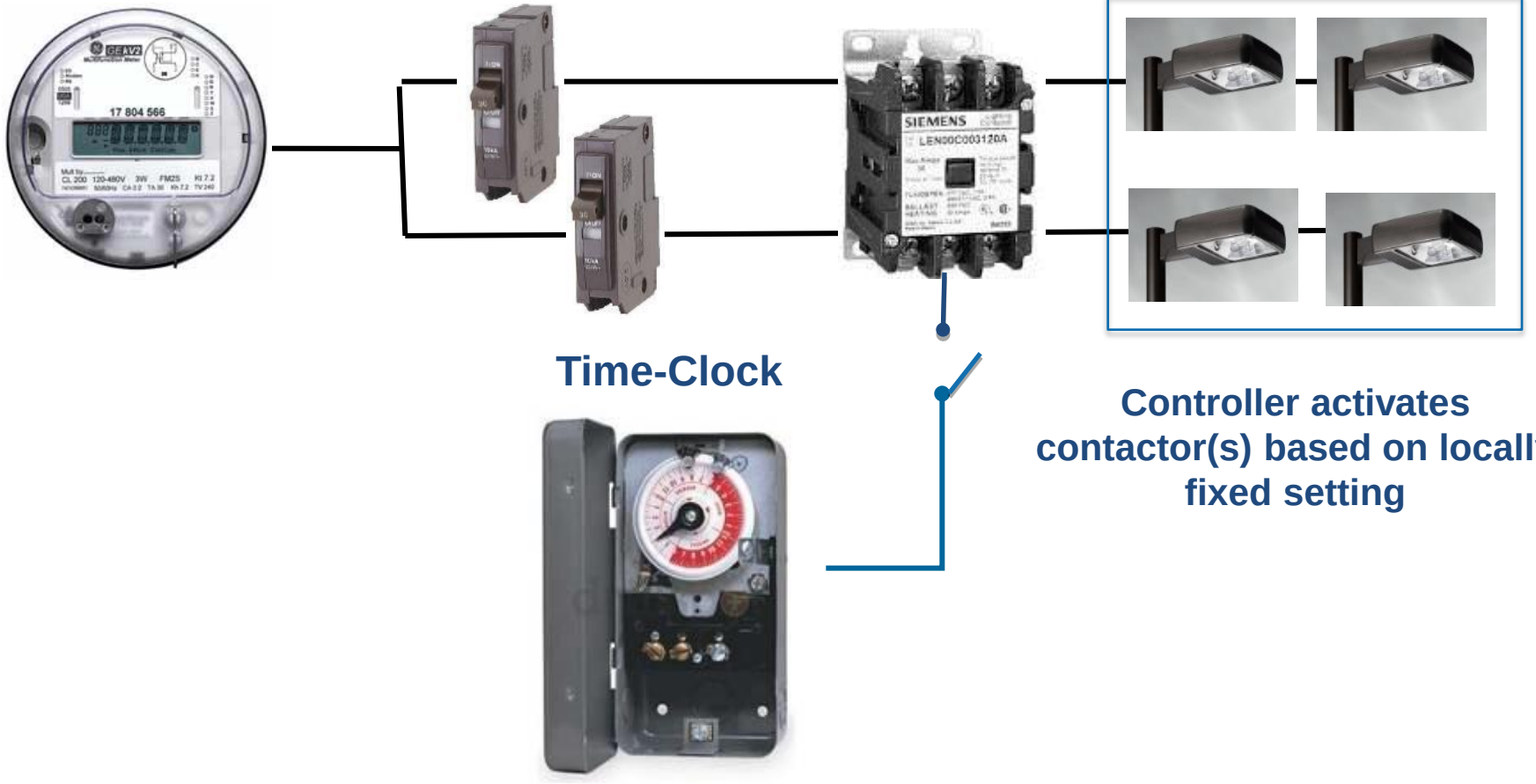
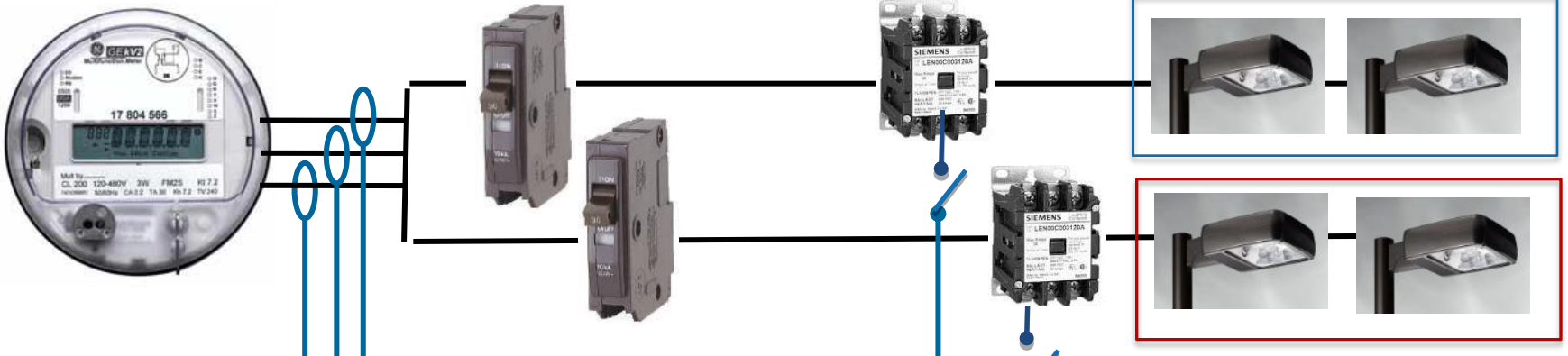
Disable / Time of Day / Astronomical Time	0.5 Hours Before After; Sunrise Sunset	06 : 00 AM PM	Output 0-10V	Photocell Motion
Disable / Time of Day / Astronomical Time	0.5 Hours Before After; Sunrise Sunset	06 : 15 AM PM	Output 5.0V	Photocell Motion
Disable / Time of Day / Astronomical Time	0.0 Hours Before After; Sunrise Sunset	06 : 45 AM PM	Output 0.0V	Photocell Motion
Disable / Time of Day / Astronomical Time	0.5 Hours Before After; Sunrise Sunset	12 : 00 AM PM	Output 0-10V	Photocell Motion

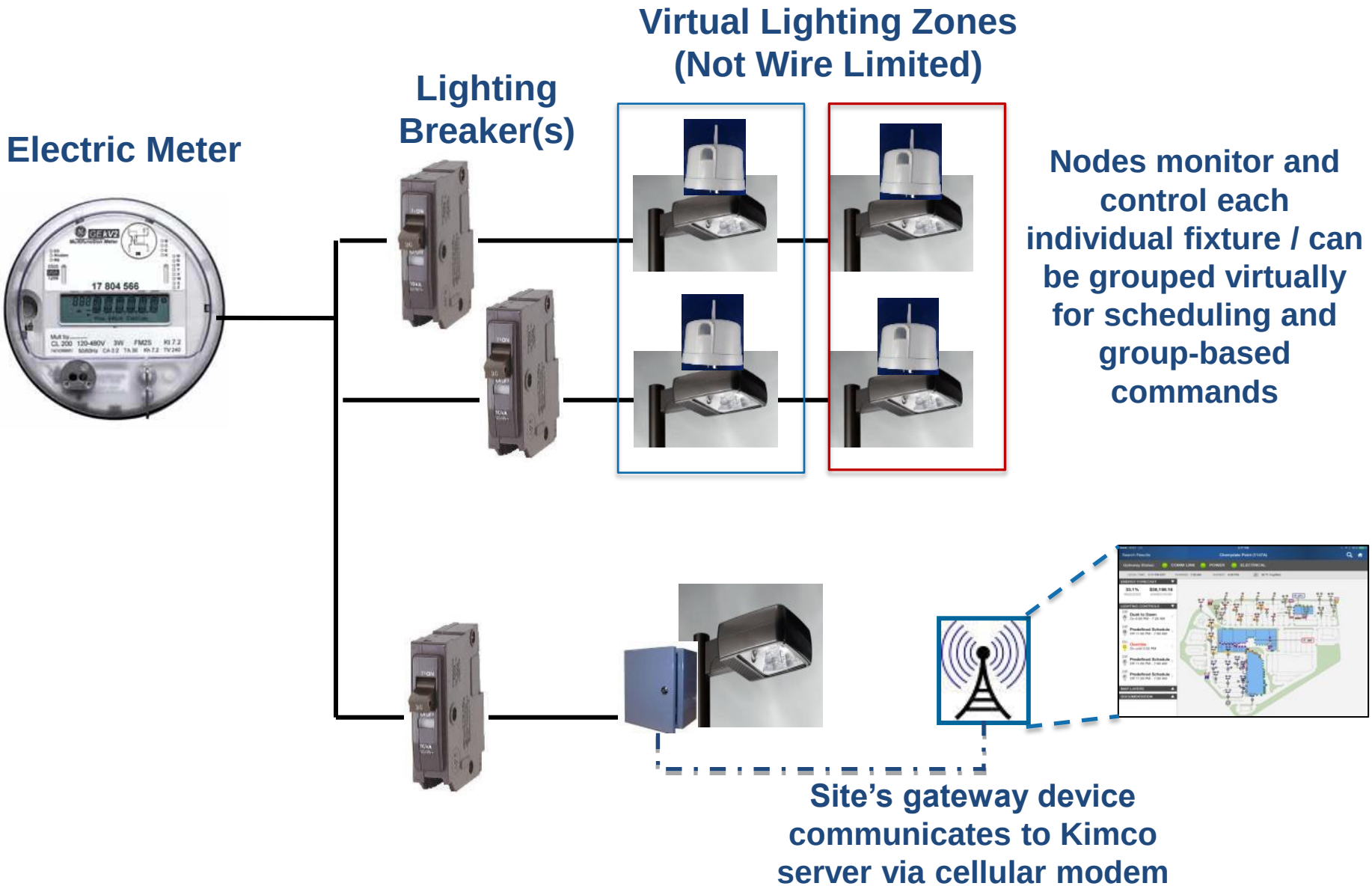
Past Lighting Control Configuration



Present Lighting Control Configuration



Future Lighting Control Configuration



Kimco Lighting Controls Timeline

	Long Past (Before '01)	Recent Past ('01-'11)	Current ('11-'15)	Future
Controller Hardware	Mechanical	Digital Proprietary	Digital Open Source	Digital Connected
User Interface	Physical	Non-Graphical Web	Graphical Web and Mobile	Graphical Web and Mobile
Level of Control	Whole Site	Whole Site	Zone	Fixture
Level of Monitoring / Energy Reporting	None	None	Whole Site	Fixture
Scheduling Capability	Static On/Off	Adjustable On/Off	Adjustable On/Off	Event-based On/Off and Dimming
Diagram