

Lighting Beyond the Bulb



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Energy Services Coalition
5th Annual Market Transformation Conference
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Light is OSRAM

Our Agenda

1. The LED revolution
 2. Lighting Controls and LMS
 3. Intelligent Light
 4. Light by Design
 5. Q&A
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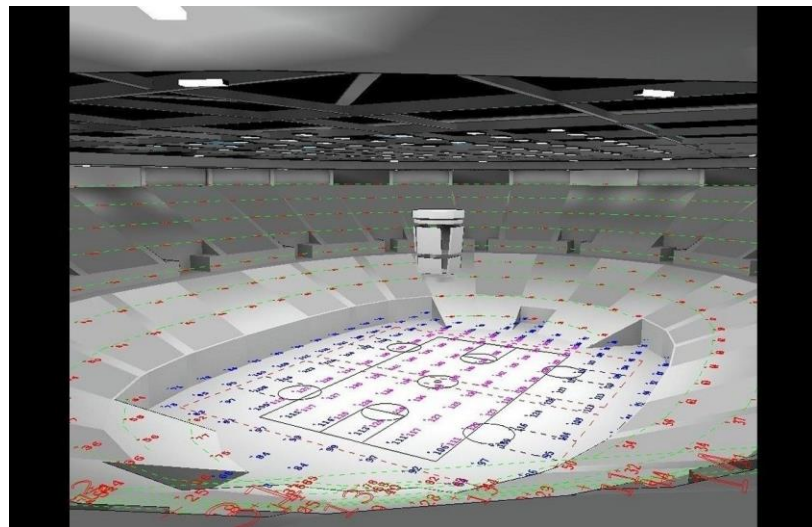
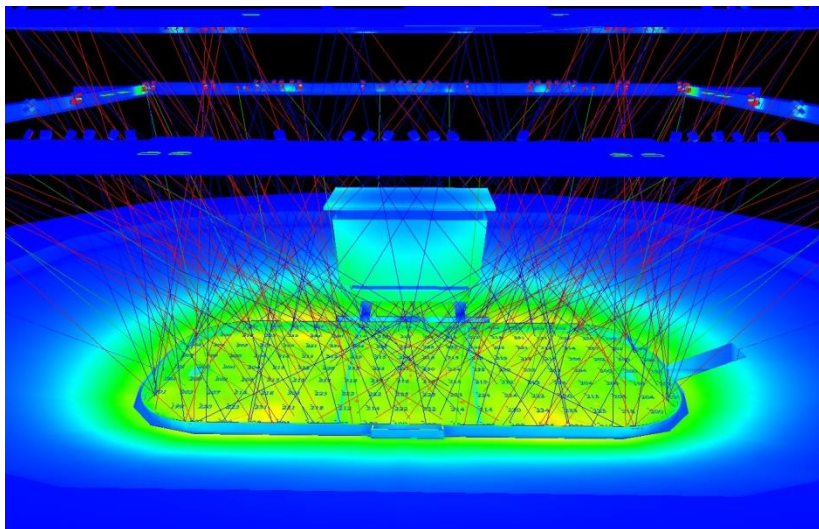
The LED Revolution

LED's / Solid State Lighting is taking over the world - Why.....?

- Longer Life
 - 50,000 – 100,000 hours
- Higher Efficacy – Lumens per Watt
- Controllability and Flexibility
 - Fully dimmable
 - No warm up / restrike time
- Better control of the lit area
 - Optics vs reflectors
- 50% energy savings vs traditional light sources
- Embedded technologies (Smart Luminaires)



Sportslighting



- Fully dimmable
- Up to 30% reduction in fixtures possible
- Approximately 40% reduction in connected load / Luminaire
- Optics and color temp are superior to traditional light sources

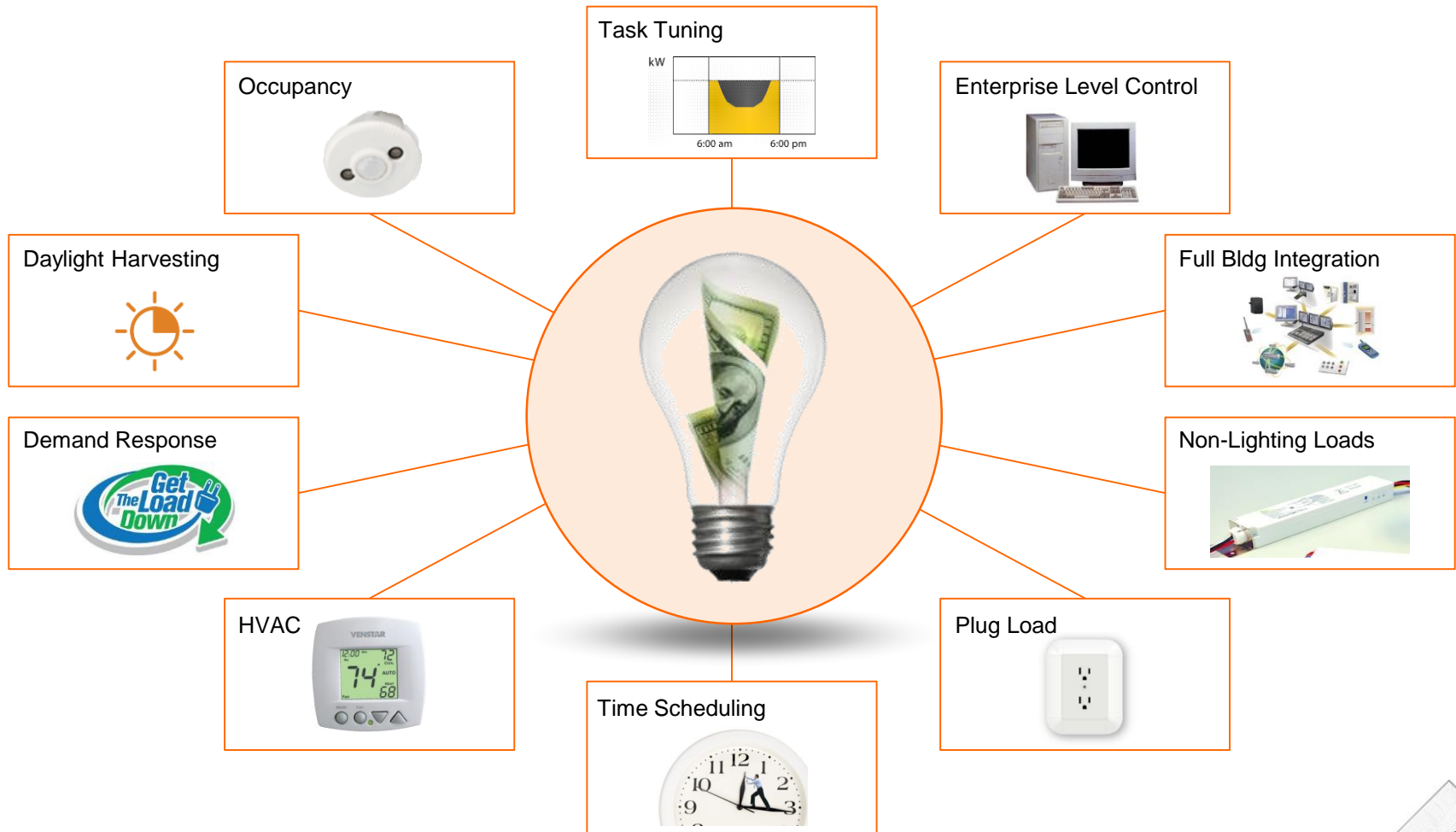


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Lighting / Energy Management Strategies



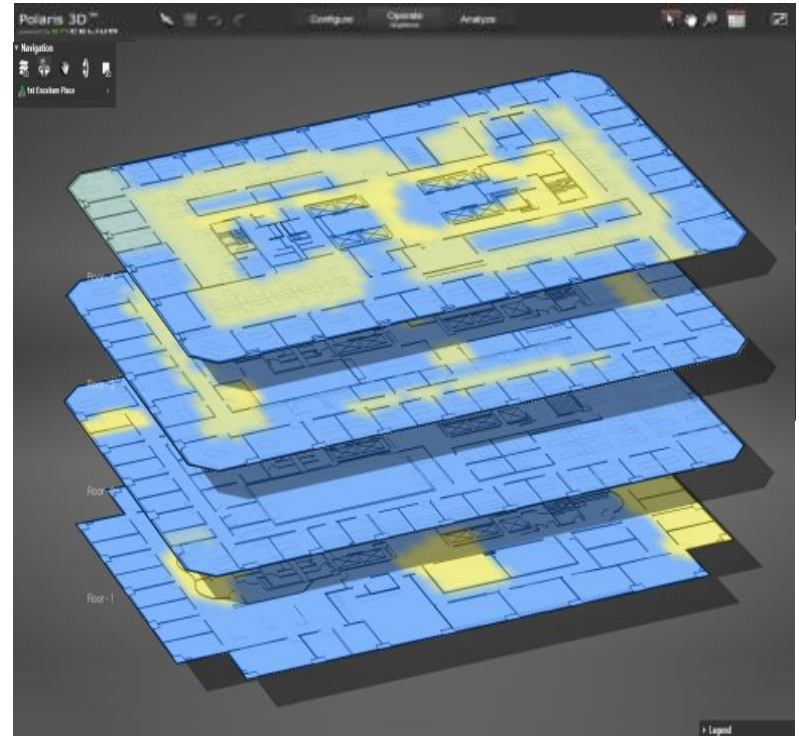
Single Point Area-Wide Control: Cloud-based 3D interfaces

Cloud-based interface replaces current panel-level, DOS based systems, which may no longer be supported

Benefits of the LMS solution

- 1 Each floor has its own layer that allows the user to see each individual control point, edit its properties, or assign new commands
- 2 Staff are now able to navigate through their entire facility in a multi-floor view allowing for faster and easier navigation, from anywhere in the world

All functionality can be enabled through wired and wireless solutions depending on customer requirements and preferences.



Full Building Control: Uniform, high quality look incl. dimming capability and fixture-level control

Typical installation

Typical installations will have both zonal and single fixture level controls based on needs throughout a building. Occupancy, time scheduling, and daylighting are the most common strategies but modern LMS systems also allow for multi functional savings opportunities.

Benefits of the LMS solution

- 1 Lighting scenes for all areas will be set by the staff
- 2 Providing for uniform look
- 3 Taking advantage of dimming capability and fixture-level control
- 4 For pinpoint control within a single area/fixture

Example

Different departments with different working conditions and times can be managed to optimize energy savings and working environment.



Stairwell Wireless Solution: Occupancy status based dimming – up to 70% less energy consumption

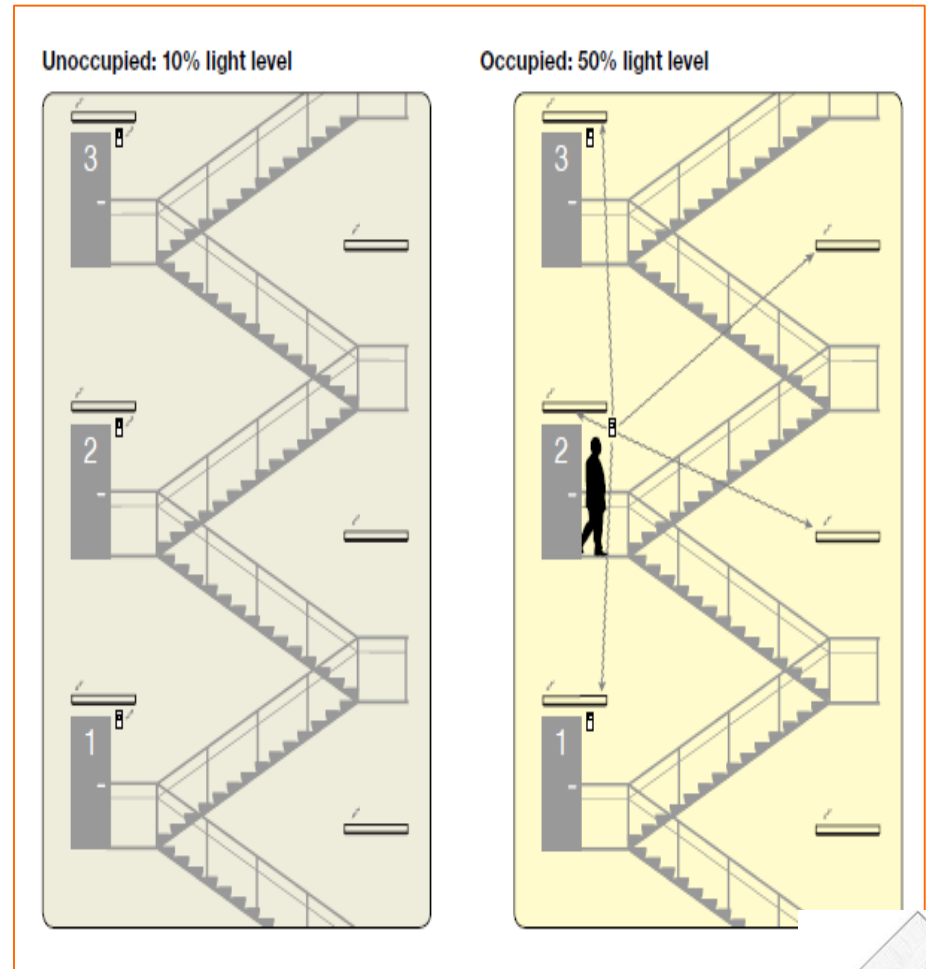
Typical installation

Two-lamp, 32WT8 or HID/Incandescent stairwell fixtures. It is common for all existing fixtures to burn at full illumination 24/7 regardless of the stairwells occupancy status.

Benefits of the LMS solution

Replacement with intelligent two-lamp 28WT8 or LED stairwell fixtures, with an integrated dimmer that will dim fixtures to 20% when stairwells are not in use

! Controllable stairwell fixtures will save up to 70% in energy consumption, compared to current use.

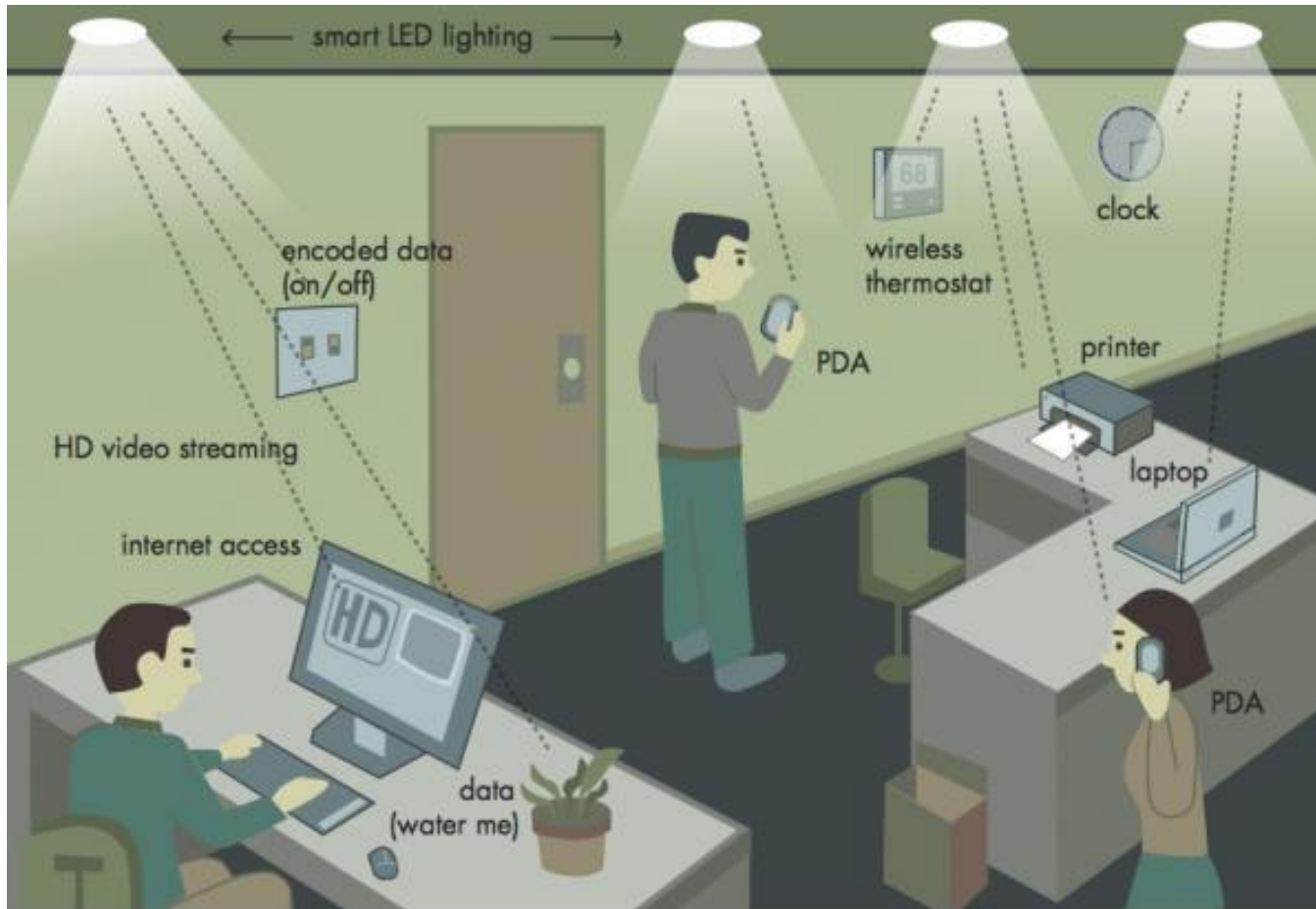


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Smart as a....."Lightbulb" ??



Lights are everywhere we are.

How do we get more out of them than just light?



The “Smart” Luminaire

- From **Smart Buildings** to **Smart Cities** the LED is the enabler of choice
 - Lights are virtually everywhere humans are
- So what is a smart Luminaire? It comes out of the box:
 - Controllable
 - Able to communicate
 - Able to collect data
 - Able to provide services
- It is a living piece of the IoT (Internet of Things)



Lets see some examples:

Light levels are commensurate with the activity taking place

Control and Communicate



Hallways are lit at 100%

- Students are passing between classes
- There is an after hours event
- Safety and comfort are critical
- Occupancy/activity is high

Others:

Cafeterias
Gymnasiums
Auditoriums
Locker rooms



Hallways are lit at 60% (or less)

- Classes are in progress
- It is after hours –
 - janitorial activities
 - low occupancy.
- 40% or more energy savings are being realized



Data Collection

- Temperature
 - Overheat conditions in computer lab = alarm/email
 - Central plant failure = alarm before pipe damage occurs
- Occupancy / Presence
 - Conf Room and common area utilization data and times
 - Off hours occupancy and times
- Video
 - Parking lots
 - Exterior areas
 - Pools – safety
- If the sensor technology exists the “smart” LED luminaire can collect the data and communicate it to those who need to know.



Data is Empowering!!



Services and Enhancements from Smart Light

- **Light Positioning (LiPOS)**

- Smart phone app acts like a GPS
 - Directions to the clients office
 - Nearest restroom
 - Closest open parking spot
 - Closest exit or handicap accessible entrance



- **Tuneable white light:**

- Light color adjusts to the circadian rhythms
 - Warmer vs Cooler light
- Testing vs instruction
- AM vs PM
- Artificial Daylight
- Productivity



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It's really not the same old Lightbulb

LED

- Point/directional light source
- Optics direct the light
- Little color shift over life
- Higher efficacy (LPW)



Traditional

- 360° light source
- Reflectors
- color shift
- Normal LPW



So don't treat it that way!

Don't put a square peg in a round hole

Office photometric analysis

AREA - C

Label	Symbol	Qty.	Description	LLF	Lum. Lumens	Lum. Watts
A	□	313	NEW OSIL LED 2X2 RETROFIT (AREA C)	0.950	3416	35
B	□	48	PREVIOUSLY INSTALLED 2X2 LED RETROFIT (AREA C)	0.950	3416	35

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
AREA-C01	Illuminance	Fc	58.61	75	18	3.26	4.17
AREA-C02	Illuminance	Fc	45.20	64	25	1.81	2.56
AREA-C03	Illuminance	Fc	49.50	67	25	1.98	2.68
AREA-C04	Illuminance	Fc	44.33	62	30	1.48	2.07
AREA-C05	Illuminance	Fc	32.50	40	21	1.55	1.90
AREA-C06	Illuminance	Fc	45.33	63	31	1.46	2.03
AREA-C07	Illuminance	Fc	40.73	54	26	1.57	2.08
AREA-C08	Illuminance	Fc	44.79	64	15	2.99	4.27
AREA-C09	Illuminance	Fc	34.50	44	25	1.38	1.76
AREA-C10	Illuminance	Fc	37.00	53	23	1.61	2.30
AREA-C11	Illuminance	Fc	23.00	29	18	1.28	1.61
AREA-C12	Illuminance	Fc	25.00	28	22	1.14	1.27
AREA-C13	Illuminance	Fc	45.33	60	31	1.46	1.94
AREA-C14	Illuminance	Fc	45.67	61	29	1.57	2.10
AREA-C15	Illuminance	Fc	43.47	62	25	1.74	2.48
AREA-C16	Illuminance	Fc	44.87	63	26	1.73	2.42

Area	Total Watts	LPD
21316	12635	0.59

OSRAM-SYLVANIA
2X2 LED RETROFIT



REVISIONS

FIXTURE TYPE:
2X2 RECESSED 2X2 TROFFER LED RETROFIT - OSRAM SYLVANIA

CEILING TYPE:
2X2 GRID DROP CEILING

CEILING HEIGHT:
CEILING HEIGHT @ 9'-0"

MOUNTING HEIGHT:
MOUNTING HEIGHT @ CEILING HEIGHT

REFLECTANCE:
A & S 2

NOTES:

LIGHT LEVELS WERE CALCULATED AT 4' X 5' INTERVALS AT 2'-6" ABOVE FINISHED FLOOR.

NO CURBLES, DESKS OR FILE CABINETS WERE ADDED TO THE CALCULATION AS OBSTRUCTIONS. LIGHT LEVELS WILL BE LOWER THAN SHOWN IN THESE AREAS. ONLY FULL WALLS AND COLUMNS WERE ADDED.

ONLY 2X2 RETROFIT KITS WERE INCLUDED IN THE CALCULATION. NO OTHER CONTRIBUTING LIGHTING WAS ADDED.

ANY CHANGE IN THE FIXTURE SPECIFICATION, LAMP TYPE OR ALTERATION TO THE DESIGN, CAN LOWER PROPOSED LIGHT LEVELS.

DRAWING FOR PHOTOOMETRIC USE ONLY, NOT TO BE USED FOR CONSTRUCTION.

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OSRAM SYLVANIA

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Lighting & Control Design
200 Midway Park Drive, Middletown, NY 10940
(845) 344-4117 1-800-914-6325
(845) 342-0540 www.sylvania.com

PROPOSED

CLIENT NAME:

ADDRESS:
OFFICE: HOFFMAN ESTATES, IL

DATE: 11-16-16

DESIGNED BY: A.J.U. DRAWN BY: M.J.F.
PROJECT NO: PH-3

50% reduction in energy

0% reduction in fixtures

22% more illumination

Total reduction including Controls 62%



FOR AREA-B, REFER TO SHEET PH-C2.

AREA-C LIGHTING PLAN
PHOTOMETRIC DRAWING



Gymnasium

Full lighting model (not a photo)



40 - 400W MH lamps
16,000W total load
Not dimmable
25min warm up time



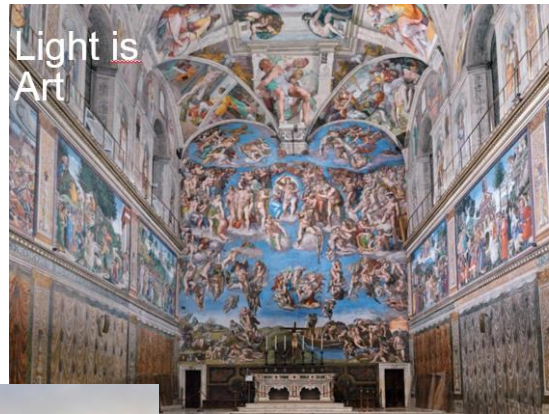
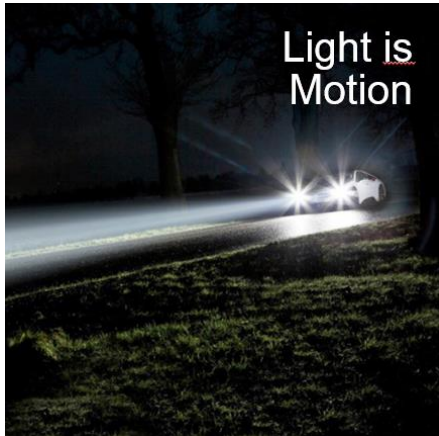
30 - 250W LED Gym fixtures
7,500W total load (53% reduction)
Fully dimmable
Instant on
30% increase in light levels

Bottom Line

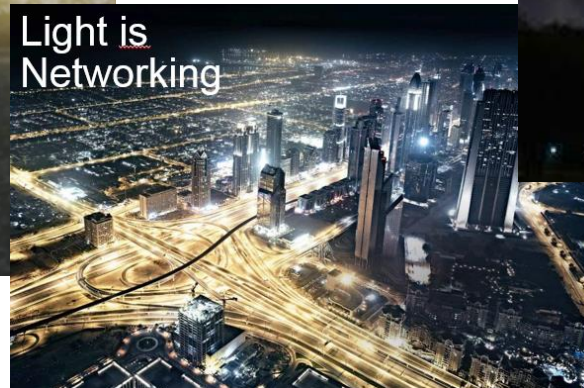
- You get more for your \$\$ now than just staying out of the dark.
 - Energy \$\$
 - Controllability and flexibility
 - Quality of the environment
 - Data to help manage your space
 - Full interaction with your other building systems
- Consider the full range of capabilities LED's and controls can provide and make sure your lighting solution delivers all of them that are valuable to your space.
- Work with lighting solutions providers that are able to consult with you on the total package and will value engineer to your needs.



Light is . . .



OSRAM



The image shows a large, modern building with a glass facade at night. The building is illuminated from within, and the OSRAM logo is prominently displayed on the glass in large, orange, illuminated letters. The sky is dark, and the building's structure is visible against the light.

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LIGHTING SOLUTIONS

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