CALIFORNIA STATE UNIVERSITY
SAN MARCOS

Lighting Retrofit Project
Presented by Ed Johnson, Director Facility Services
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Background

The CSUSM campus is comprised of the following:

- 1,042,320 square feet
- 16 buildings
- 9,159 students
- 1750 faculty and staff with 72 million in payroll annually
Energy & Economics

- 1,170,000 kWh saved annually
- 331 kW saved
- Cost of construction was $1.7 million
- 34% of cost was for ESCO management fees
- 13 year payback without incentive
- Financed through UC/CSU partnership program
- $281,000 incentive funding from partnership
Lighting Strategy

- Cost effectively reduce energy and improve lighting quality through combining improved fixture design with 5,000 k lamps, 85 CRI, and LPF ballasts in fluorescent fixtures.
  - Option 1: replace fixtures (not cost effective)
  - Option 2: use retrofit kits and replace lamps and ballasts (barely cost effective)

- Eliminate LPS and HPS lamps, and replace with fluorescent.

- Add occupancy sensors where appropriate.
Lamps

Phillips TL850 Alto plus low mercury lamps

- 36 month warranty
- 5,000 k
- CRI 82
- 42,000 hours rated life
Ballasts

GE Ultramax and Ultrastart high efficiency

- Multi-voltage handles 120 to 277
- Anti-Striation Control
- Cold temperature starts at -20 degrees
- Low ballast factor .77
- 5 year warranty
- Ultramax in hallways
- Ultrastart in classrooms and offices
Retrofit Kit

A.L.P. Lighting
• Universal Adapter Bracket System
• Direct / Indirect Lighting
• Installs in 15 minutes
• Installed 2368 2X4 kits and 606 2X2 kits
Classroom Lighting

• Changed from 3 lamp to 2 lamp, and from 4100 k to 5000 k
• Reduced from 84 watts to 56 watts per fixture
• Changed from 33-55 FC to 20 – 25 FC

• High efficiency ballast upgraded Gen1 to Gen3, low ballast factor
• Direct / indirect
• Better light distribution
• No cave effect, reduced hot spots
Corridor Lighting

- Changed from 3 to 2 F32 or F17 lamps per fixture
- 2x2 F40 Utube
- Wall sconces similar issues
- 40 w BIAX to 2 (32w) or 1 (17w) F17
Stairwell Lighting

LaMar Occusmart

1 F32 on occupancy + 1 F17 emergency power
Office Lighting

- 5,000 k
- 17 FC to 25 FC fully lit
- 9 FC in this photo (preferred by users)
- Reduced from 84 watts to 56 watts per ceiling fixture
- 6 watt LED task lighting (only 16 requested)
Low Bays Lighting

Before

New Lighting
Outdoor Lighting

Before

New Lighting
Parking Lot Lighting

Before 250w LPS

New Lighting 3 T5 HO
Walkway Lighting

Before 150w HPS

New Lighting 42w CFL
Bollard Lighting

• Replaced 100w indirect HPF lamps with 25 watt CFL
Elevator

- Replaced 25 watt Halogen lamp with 1 watt LED lamp
- Hudnut 1 watt
Summary/Questions?