

# Campus Lighting Strategies

Last updated: 03/30/11

# Brody Complex Renovations

## Energy-efficient lighting design

**The following efficient lighting concepts are being incorporated into the project:**

- All lighting is being replaced in rooms, corridors, crawl spaces, mechanical and electrical rooms, stairs and janitor closets
- Compact fluorescent lighting will be used in place of incandescent
- The corridors will have bi-level lighting (50% to 100%) 32W T8 lighting with motion sensors
- T8 vs. T5 have been analyzed for a typical student room, and the results showed minimal energy savings with T5
- Walkway lighting is proposed to be retrofitted with LED or induction lighting with motion sensors



## What are common lighting energy saving projects at MSU?

- T12 32W fluorescent lamp/ballast to T8 32W fluorescent lamp/ballast
- ASHRAE/LEED lighting energy reductions – Lighting Energy Density (W/SF)
- Occupancy sensors
- Controls – Time of day scheduling with timers or through the BAS (Building Automation System)
- Photo controls or daylighting
- T8 32W fluorescent lamps to 30W, 28W, or 25W T8 fluorescent lamps
- HID (High Intensity Discharge) to T8 or T5 fluorescent lighting fixture conversions
- HID dimming
- Reflectors
- New lighting technologies – LED (Light Emitting Diode), Induction lamps
- Incandescent lamps to CFL (Compact Fluorescent Lamps)

# What is MSU doing now?

- **T12 32W fluorescent lamp/ballast to T8 32W fluorescent lamp/ballast**
  - MSU has been changing out the T12 lamps/ballasts over the last decade
  - Academic areas: Complete
  - Residential and Hospitality Services: In progress
- **ASHRAE/LEED lighting energy reductions – energy density (W/SF)**
  - MSU Construction Standards since 2006 require 29% reduction from ASHRAE
- **Occupancy sensors**
  - Included in MSU Construction Standards since 2006

# What is MSU doing now? (cont....)

- **Controls**
  - TOD (Time-of-day) scheduling with timers or through BAS
    - BAS is already performing TOD controls in several buildings
    - PROJECTS UNDERWAY
      - Spartan Stadium Concourse Lighting
- **Photo controls or daylighting**
  - PROJECTS UNDERWAY
    - Spartan Stadium Concourse Lighting – Implementing daylighting for north/south ends

## What is MSU doing now? (cont....)

- **T8 32W fluorescent lamps to 30W, 28W, or 25W T8 lamps**
  - Energy savings can be realized
    - Examining foot candle levels, ballast compatibilities, diminished lamp performance, lamps costs, maintenance issues of inserting a 32W lamps back into fixture
    - **PROJECTS UNDERWAY**
      - Trials underway at the Manly Miles Building and Physical Plant EAS office
- **HID to T8 or T5 fluorescent lighting fixture conversions**
  - T5 and T5HO work good for gymnasiums and high ceilings
    - **PROJECTS COMPLETED**
      - IM West, Pavilion Exhibit Area (lighting energy costs were reduced by 46%)

# What is MSU doing now? (cont....)

- **HID dimming systems**

- Energy savings can be realized (10%) by reducing voltage to the HID fixtures
  - Parking Ramp #5 has a HID dimming system in place
  - PROJECTS UNDERWAY
    - Examining Parking Ramp #5 lighting options

- **Reflectors**

- Energy savings by simply removing lamps and adding reflectors (4 lamps to 2 lamps)
- Concerns include ease of retrofits, costs, fixture/reflector long-term issues, ballast losses, adequate lighting levels, limitations of fixtures to retrofit
- Large-scale implementation in question
- Trial underway in EAS basement corridor – scheduled for December

# How is MSU doing? (cont ...)

- **New lighting technologies**

- LED

- Researching LED recessed can downlight fixtures, T8 LED tube light trials walkway lighting, garage lighting, sconce lighting
    - LED exit sign in Construction Standards, evaluating more LED standards
    - Projects include: Vet Med, Intl Center, Spartan Village walkway trials

- Induction lamps

- Researching various manufacturers
    - Trials underway on campus

- **Incandescent lamps to fluorescent lamps**

- Majority of incandescent lamps replaced with CFL, limited usage on campus
  - Incandescent lamps will no longer be available within a few years



# Summary

Retrofit T12 to T8	Conversion/Retrofit Fluorescent 32W to 25W lamp	Retrofit T8 to T5	Two-level lighting with motion
			HID dimming
<ul style="list-style-type: none"> <li>• General Fund buildings complete</li> </ul>	<ul style="list-style-type: none"> <li>• Testing in progress, study to identify/measure locations applicable</li> </ul>	<ul style="list-style-type: none"> <li>• Not recommended for retrofit, limited applications</li> </ul>	<ul style="list-style-type: none"> <li>• Recommend two-level lighting with motion controls in parking garages, parking lots, cooling tower lights (better for security cameras)</li> </ul>
<ul style="list-style-type: none"> <li>• RHS &amp; Athletic facilities in progress</li> </ul>		<ul style="list-style-type: none"> <li>• Need correct fixture with optics</li> </ul>	<ul style="list-style-type: none"> <li>• 10% energy reduction</li> </ul>
LED Down light	Controls	LED Fluorescent	Reflectors
<ul style="list-style-type: none"> <li>• Evaluating LED down lights for revisions to Construction Standards</li> </ul>	<ul style="list-style-type: none"> <li>• Occupancy/motion sensors, Photocell</li> </ul>	<ul style="list-style-type: none"> <li>• Still in development</li> </ul>	<ul style="list-style-type: none"> <li>• Works best in over lit areas</li> </ul>
<ul style="list-style-type: none"> <li>• Investigating retrofits kits</li> </ul>	<ul style="list-style-type: none"> <li>• Time of Day/Astronomical Calendar</li> </ul>	<ul style="list-style-type: none"> <li>• Trial in EAS and Comp Center</li> </ul>	<ul style="list-style-type: none"> <li>• Prismatic lens only</li> </ul>
			<ul style="list-style-type: none"> <li>• Trial underway at Physical Plant</li> </ul>