Lighting Principles and CPTED: Can Lighting Deter Crime?

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Mesa Police Department
Functions of Lighting

- Safety
- Identification
- Beautification
- Attraction
- Recreation
Successful Outdoor Lighting Design Should…

- Enhance the safety of people and security of property
- Maintain suitable aesthetics
- Fit within a budget for equipment, installation, and maintenance
Security Lighting Considerations

• Enable People to Take Action at a Distance
• Protect Property
• Combating Glare
• Light Sources and Levels of Illumination
Can You See Danger Ahead?
Can You See Danger Ahead?
Is Your Property Safe?
Is Your Property Safe?
Key Factors for Quality Lighting

- Light Source
- Color Rendition
- Uniformity
- Glare
- Light Trespass
Lighting Sources

- Incandescent
- Fluorescent
- Mercury Vapor
- Low Pressure Sodium
- High Pressure Sodium
- Metal Halide
Lighting Fixtures

- Flood Light
- Wall Pack
- Decorative Post Top
- Cobra Head
- Mast Mount Cutoff
# Color Rendition and Identification

Lighting Sources Affect the Way Color Appears

<table>
<thead>
<tr>
<th>Lighting Source</th>
<th>Color Rendition and Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incandescent</td>
<td>Good color rendition but inefficient</td>
</tr>
<tr>
<td>Fluorescent</td>
<td>Excellent color rendition and efficient, but temperature sensitive</td>
</tr>
<tr>
<td>Mercury Vapor</td>
<td>Poor color rendition and slow starting</td>
</tr>
<tr>
<td>Low Pressure Sodium</td>
<td>NO color rendition but most efficient, least polluting to night sky</td>
</tr>
<tr>
<td>High Pressure Sodium</td>
<td>Poor color rendition in red and blue but efficient</td>
</tr>
<tr>
<td>Metal Halide</td>
<td>Good color rendition and efficient</td>
</tr>
</tbody>
</table>
Incandescent
Mercury Vapor
Low Pressure Sodium

San Jose, CA
High Pressure Sodium

Sacramento, CA
Color Rendition

Low Pressure Sodium

High Pressure Sodium

Metal Halide
Uniformity: Is the Lighting Even?

Poor

Good

Very Good

Excellent
Glare: Defeating the Purpose of Light
Controlling Light Trespass

Cutoffs

Shield
Can Lighting Deter Crime?
Density Map of Streetlights and Residential Burglaries
Density of Sector 6 Streetlights in 2002
Density Map of Streetlights and Vehicle Burglaries
Density Map of Streetlights and Auto Thefts

Auto Theft

City Lights
Density Map of Streetlights and Vehicle Burglaries
Density Map of Streetlights and Residential Burglaries

- Residential Burglaries
- City Lights
## Case Studies of Deterrent Effects

<table>
<thead>
<tr>
<th>Location</th>
<th>Pre-Lighting Calls for Service</th>
<th>Post-Lighting Calls for Service</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Broadway Triangle</strong></td>
<td>1/1/03 – 7/21/03 = 1323</td>
<td>1/1/04-7/21/04 = 1110</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Stockton Blvd Shopping Center</strong></td>
<td>5/1/03 – 11/1/03 = 191</td>
<td>5/1/04-11/1/04 = 121</td>
<td>37%</td>
</tr>
<tr>
<td><strong>MLK Library</strong></td>
<td>5/1/03 – 2/28/04 = 7</td>
<td>10/1/04-2/28/05 = 3</td>
<td>57%</td>
</tr>
</tbody>
</table>
Kahn Hing Market
6400 Stockton Boulevard

- SMUD Lighting Survey with Police
- Owner puts SMUD/PD suggestions into action
- CFS Reduced 37%

Decreased Activities:
- Prostitution
- Loitering
- Abandoned Vehicles
Lighting

Pre-Existing

• 8 mast mounted 400 watt high pressure sodium flood lights on 4 poles

Added Lighting

• 12 mast mounted 750 watt metal halide flood lights on 3 poles
• Poles relocated to provide uniform lighting throughout property
SMUD helps bring light to Stockton Boulevard corridor

Stockton Boulevard has long been known as one of Sacramento's most crime-ridden corridors. Prostitution and drug dealing were widespread in the evening hours.

Through its work with the Stockton Boulevard Partnership, SMUD is helping bring light to this historic business district. SMUD works closely with law enforcement officers and business owners to identify poorly lit areas and provide security lighting solutions.

The Stockton Boulevard Partnership was formed in 2001 to help businesses along the South Sacramento thoroughfare. Increased lighting is making a difference in reviving business along Stockton Boulevard, according to the Sacramento Police Department.

By working with business owners to improve lighting along the boulevard, SMUD is improving the commercial climate. Richard Greene, executive director of the Stockton Boulevard Partnership, said the improved lighting has reduced crime and increased sales among local businesses.

A SMUD energy specialist accompanies law enforcement on night ride-alongs, recommending different types of lighting and pointing out SMUD utility poles that are well-positioned to help illuminate a dark area. For landlords and business owners, the increase on their electric bills is a small price to pay for a safer business climate.

SMUD also works closely with business partnerships on Florin Road and on Franklin Boulevard, and assists the Sacramento Public Library in improving lighting and security at the library system's 28 branches.

Sometimes the simplest solutions are the best solutions. Since criminal activity thrives in the shadows, increased lighting reduces crime. SMUD's work with business partnerships and the Sacramento Public Library is making a positive difference in the community.
Stockton Blvd Shopping Center CFS

# of Calls

<table>
<thead>
<tr>
<th></th>
<th>6 Months Prior to Lights</th>
<th>6 Months After Lights</th>
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</thead>
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<td>Stockton Blvd Shopping Center CFS</td>
<td>191</td>
<td>121</td>
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Broadway Triangle

- City and SHRA install historic acorn lights
- Lights supplement existing Cobra head lights
- CFS reduced 16%

Decreased Activities:
- Loitering on corners
- Prostitution activity
- Vagrancy rate
Lighting

Pre-Existing

• 40 Cobra Head street lights ALL located on Broadway
• 13 SMUD safety lights around boundaries of triangle

Added Lighting

• 120 Historical ornamental streetlights throughout the neighborhood side streets and Broadway
LEGEND:
- PROJECT BOUNDARY
- EXISTING STREETLIGHT
- NEW HISTORICAL ORNAMENTAL STREETLIGHT
- EXISTING SMUD SAFETY LIGHT

BROADWAY CORRIDOR (OAK PARK)
STREET LIGHTING
OAK PARK “TURN ON THE LIGHTS” CELEBRATION!

DATE: July 21, 2003

7:00 p.m.
Neighborhood Get Together
(Enjoy friends, neighbors, and light refreshments)

8:30 p.m.
“Turn on the Lights” Ceremony

The “Turn on the Lights” Ceremony will take place at 2708 37th Street (at the vacant lot between 2nd and 3rd Avenues on 37th Street).

Join your Councilmember and:

- Sacramento Housing & Redevelopment Agency
- City’s Department of Public Works
- Oak Park Business Association

Please RSVP to Chris Pahule with SHRA at 916/440-1399 extension 1442.
Broadway Corridor
37th St and 4th Ave
Martin Luther King Jr. Library
7340 24th Street

- P.D. CPTEDs on all libraries
- SMUD lighting surveys on all libraries
- Libraries implement P.D. and SMUD suggestions
- CFS reduced 57%

Decreased Activities:
- Loitering
- Vandalism
- Vagrancy
Lighting

Pre-Existing
• Mast flood lights in parking lot
• Mast cutoff lights along north pathway
• Sign lighting

Added Lighting
• Increased wattage in pre-existing mast flood lights
• 10 canopy packs
• 3 wall packs
6 Months Prior to Lights
# of Calls
7

6 Months After Lights
# of Calls
4
City of Sacramento
Neighborhood Lights
Cobra Head
Retrofitted Cobra Head
Shielded Cobra Head
Fluorescent
Performance Post Top
Performance Post Top
Performance Post Top
Refractor Basket
Refractor Basket
Decorative Post Top
Metal Halide
High Pressure Sodium
Shielded Decorative Post Tops
Shielded Decorative Post Top
Double Cobra Heads - High Pressure Sodium
Double Cobra Heads – Mercury Vapor
Stockton Boulevard Lighting
Stockton Blvd and Lemon Hill
Wall Pack – Metal Halide
Wall Pack – Metal Halide
Roof Mounted Flood Light
Low Wattage High Pressure Sodium
Bull Horn Mast Mount
Yard Lamp with Two Halogen Spot Lights
Yard Lamp – Mercury Vapor
Yard Lamp – Mercury Vapor
Miscellaneous Lighting