ENERGY CONSIDERATIONS
Lighting Energy in California

**Street Lighting**
- No statewide energy standards
- Standards city-by-city, utility by utility sometimes exist

**Building Lighting**
- Title 24 Part 6 § 132,147
- Affects
  - Area lighting
  - Façade lighting
  - Entrance lighting
  - Special needs
Trends

- Community choice aggregation
- Community buy-back of street light assets from utilities
- CEC LED upgrade 1% interest for 15 years, up to $3 million
- Street light incentives from IOU’s and big muni’s
HISTORIC CONSIDERATIONS
Lighting pole history

Historic Poles and Luminaires
- Rare
- Not valid unless truly authentic
- Often supplemented with overhead lighting

Quasi-historic districts
- May have been started relatively recently
- Adds to the charm
- Suggests authenticity
- Begs for continuation despite problems
ENVIRONMENTAL CONSIDERATIONS
# Lighting Zones

<table>
<thead>
<tr>
<th>LZ0</th>
<th>Wilderness</th>
</tr>
</thead>
<tbody>
<tr>
<td>LZ1</td>
<td>Rural + Parks</td>
</tr>
<tr>
<td>LZ2</td>
<td>Suburban + Neighborhoods</td>
</tr>
<tr>
<td>LZ3</td>
<td>Urban</td>
</tr>
<tr>
<td>LZ4</td>
<td>Limited areas of high light levels</td>
</tr>
</tbody>
</table>
ECONOMIC INCENTIVES
Examples

• Los Angeles LED program (250,000 heads) saves $7m per year in electricity and $2.5m per year in maintenance
• Davis LED program (2,600 heads) saves $1.5m over 15 years
• Both programs paid off in ~7 years
PG&E Examples

• Change to LS-2 Schedule (lower rates, based on actual energy)
• Rebate typically $60 per head replaced
What Can Go Wrong

• Poor lighting quality
• Rush to a solution
• Uniformity, no differentiation, no sense of place
• No improvements, just replacements
Cost Effective, Useful or?

- Ron Gibbons, FIES Director of the Center for Infrastructure Based Safety Systems at the Virginia Tech Transportation Institute (VTTI) says that at 200 per point, not enough energy will be saved to make adaptive lighting cost effective.
- No IES practices or protocols for adaptive lighting.
- Security of the IOT is poor and likely to stay that way (US DOD).
Good Uses of Adaptive Lighting

- Bright hours and dim hours, vary by day and season
- Change of spectrum
- Response to authority need
THE MAKING OF PLACE
Basic Lighting Quality Outdoors

- Minimize glare
- Eliminate light trespass
- Get the color right
- Uniformity is boring and not completely necessary
- Buildings are part of the streetscape
  - Street level lighting and signs
  - Facades
Color: HPS vs. 4K LED or Induction

- 2100K
- 2700K
- 4000K
Street Lighting Quality

- Sidewalks are very important
- Intersections are important
- Middle of the street is not quite as important?
Creating Place
Memphis Main St.
Section Through Main St.
QUESTIONS?
jbenya@benyaburnett.com