Converting Your City to LED Streetlights

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CITY OF PHOENIX
Research: Improved visibility / vision impaired
Reduced crime

reduced crime
Recent price/performance = never a better time
Research: Avoid blue range of color temperature (CCT) to reduce city-glow.

<table>
<thead>
<tr>
<th>Atmosphere</th>
<th>Warm</th>
<th>Neutral</th>
<th>Cool</th>
<th>Natural</th>
<th>Daylight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kelvin</td>
<td>2700K</td>
<td>3000K</td>
<td>3500K</td>
<td>4100K</td>
<td>5000K</td>
</tr>
<tr>
<td>Atmosphere</td>
<td>Soft, Comfortable, Relaxing</td>
<td>Efficient, Balanced</td>
<td>Clean, Efficient</td>
<td>Bright, Simulates Outdoors</td>
<td>Crisp, Refreshing, Energetic</td>
</tr>
</tbody>
</table>

Phoenix Streetlight LED Standard 4000K
Research: Choose a fully shielded fixture to be “Dark-Sky Friendly”
Research: Choose a fully shielded fixture
Research: Heat Sink is important in hot climates
Operate normally in 122F temperatures

Thermal simulation of heat-sink design
Currently may not be cost effective if infrastructure exists.

**BUT** it might be beneficial in remote locations where it is expensive to install new electricity source.

*Example:*

*Install Solar Light:*  $10,000 per pole  
  versus $3,500 for utility pole?

*(Ongoing energy costs not a significant factor at $35/year).*
HPS Maintenance cost:
• Fixture + labor cost to replace
• 5-year life = 20% replaced every year
• Lane closure inconvenience
• Costs of resident call-in of outages

LED = 90% drop in maintenance costs?
10-year+ warranties available
• Warranty = fixture provides > 70% light output
• Material cost might be $250 versus labor $50?
• Likelihood of supplier in business in 10 years?
• Warranty for equivalent or better fixture?

Note:
• If only a small number of current LEDs, may wish to replace all fixtures so easier to track warranty?
APS provides true credit:
  • kWh savings = billed kWh savings
  • APS also provides DSM incentives
  • Utility benefits if light output declines over time

SRP’s new rate does not fully recognize savings
  • 0-75 system watts = 25 kWh/month
  • 76-139 system watts = 50 kWh/month
  • 140-208 system watts = 75 kWh/month
  • 209-278 system watts = 100 kWh/month
  • 279-348 system watts = 125 kWh/month

***SRP has also said may only give credit if metered.
Other beneficial specifications

Examples:
• Off-State Power Consumption < .5W
• 20-year life Photo Cell
• Minimum Power Factor of .90
• Surge Protection
• Capture GIS data for all installed lights
• Traffic Control
• Testing

Recycling:
• Accept proposals for cost saving from recycling
Other possible Value Add for LED Lights

- Wifi (Perhaps in downtown?)
- Cameras (loitering, car counting, car speeds)
- Parking Monitoring (or taxi queue length)
- Gunshot Monitoring
- Auto-Dimming
- Outage Detection
- Event Counting
- Temperature Sensors
- Dynamic Lighting Control
RFP solicited **Vendor & third party financed** options to be compared with **city-funded** options.

**Business Case is viable when**

- $ Annual Energy Savings > repayments
- Warranty longer than payback
- Results in $ savings every year
- Savings to general fund

Cash flow model showed $800,000 savings per year for 15 years (on estimated pricing)
Possible Sources of Funds

- General Obligation Bonds
- “Green Bonds”
- Qualified Energy Conservation Bonds (QECBs)
- Vendor or Third Party
RFP closed June 11:
- Proposal evaluation has begun
- Separate evaluation for Financing & Value Adds
- Recommendation to Council in Sept/Oct

**Key Action:**
Bulk pricing in this RFP probably far better than what other municipalities could obtain on their own.

Good opportunity to bring this to your Councils.