About Howard
In 1968, a young Billy W. Howard, Sr. left his successful career at General Electric to return to his native Mississippi and create his own company, Howard Industries. Over the last four decades and with the assistance of his wife, Linda, Howard Industries has grown to become a billion dollar company consisting of four separate divisions plus a Wholly-owned subsidiary, Howard Transportation.

Howard Power
The Electrical Power Products Division of Howard Industries is a leading manufacturer of electrical distribution equipment used by electric utility companies, and by commercial and industrial companies worldwide. Our products include distribution transformers, power transformers, voltage regulators, switching/sectionalizing cabinets, junction boxes, and transformer components.

Howard Lighting
Howard Lighting Products offers lighting products including lamps, ballasts, and fixtures. Our lamp offering includes linear fluorescent, compact fluorescent, high intensity discharge (HID), and LED lamps. Our ballast offering includes electronic and magnetic HID ballasts. Our fixture line includes HID, fluorescent and LED fixtures from floods, highbays, sports lighters, and wallpacks to Utility Cobra heads, NEMA heads and Compact floods. Howard Lighting continually updates our product line to meet the ever-changing demands of the market. We sold our first LED fixtures back in 2007 and in several cases are now in our 4th generation of product.

Howard Technology Solutions
Howard Technology Solutions strives to bring to market cutting-edge, reliable, high-quality technology equipment at affordable prices. Whether selling our own Howard manufactured products such as desktops, notebooks, servers, digital signage solutions and self-service kiosk or partnering with other leading technology innovators such as Panasonic®, Fujitsu, and Motion®, you can be sure when you buy from Howard, you are getting the most for your technology dollars.
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Regional Territories for Utility Sales Managers
Howard Lighting
Utility HID and LED Products
**Howard Lighting** offers the following utility lighting products:

- **LED NEMA/Security**
- **LED Roadway**
- **LED Floods**
- **LED Retrofit Lamps**
- **Long Life Photo Controls for LED**
- **HID Lamps**
- **HID NEMA/Security**
- **HID Cobra Heads**
- **HID Floods**
LED
Utility Lighting Products
# L400 Series

**L401/L402 Models**

**LED Street and Area Light**

## Standard Features:
- 7-pin photo control receptacle (per ANSI C136.41)
- Stand along 10kV/10kA surge suppression device
- Terminal block accepts 14-6 AWG conductors
- Two bolt mounting accommodates 1 ¾” to 2” arm
- Integral tilt adjustment steps ± 5 degrees
- Tool-Less entry
- Input voltage: 120-277v, 50/60Hz
- Power Factor: > 0.9 at full load and THD < 20% at full load
- Operating Temperatures -40C to +50C
- UL Listed
- DLC Listed
- Ten (10) Year Warranty

## Ordering Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Options</th>
<th>Power</th>
<th>Color</th>
<th>Distribution</th>
<th>Control Options</th>
<th>Finish</th>
<th>Input Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>L401</td>
<td>L: No Photocontrol*&lt;br&gt;LC: With Long Life Photocontrol</td>
<td>25W</td>
<td>30K 3000K 40K 4000K*</td>
<td>T2: Type 2&lt;br&gt;T3: Type 3&lt;br&gt;T5: Type 5</td>
<td>10: 0-10V Dimming*</td>
<td>GR: Gray*&lt;br&gt;WH: White&lt;br&gt;BL: Black&lt;br&gt;BR: Brown</td>
<td>M: 120-277VAC*</td>
</tr>
<tr>
<td>L402</td>
<td>65W</td>
<td>80W</td>
<td>100W</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

*Standard Configuration*
## L400 Series

### L403/L404 Models

**LED Street and Area Light**

**Standard Features:**
- 7-pin photo control receptacle (per ANSI C136.41)
- Stand along 10kV/10kA surge suppression device
- Terminal block accepts 14-6 AWG conductors
- Four bolt mounting accommodates 1 ¾” to 2” arm
- Integral tilt adjustment steps ± 5 degrees
- Tool-Less entry
- Input voltage: 120-277v, 50/60Hz
- Power Factor: > 0.9 at full load and THD < 20% at full load
- Operating Temperatures -40°C to +50°C
- UL Listed
- DLC Listed
- Ten (10) Year Warranty

### Ordering Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Options</th>
<th>Power</th>
<th>Color</th>
<th>Distribution</th>
<th>Control Options</th>
<th>Finish</th>
<th>Input Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>L403</td>
<td>L: No Photocontrol*&lt;br&gt;LC: With Long Life Photocontrol</td>
<td>120W</td>
<td>30K: 3000K&lt;br&gt;40K: 4000K*</td>
<td>T2: Type 2&lt;br&gt;T3: Type 3&lt;br&gt;T4: Type 4&lt;br&gt;T5: Type 5</td>
<td>10. 0-10V Dimming*</td>
<td>GR: Grey&lt;br&gt;WH: White&lt;br&gt;BL: Black&lt;br&gt;BR: Brown</td>
<td>M: 120-277VAC*&lt;br&gt;H: 347-480VAC</td>
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<tr>
<td></td>
<td></td>
<td>180W</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>150W</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>240W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L404</td>
<td></td>
<td>120W</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>180W</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>150W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>240W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Standard Configuration

<table>
<thead>
<tr>
<th>Model</th>
<th>LEDs</th>
<th>LED Current</th>
<th>System Watts</th>
<th>Dist Type</th>
<th>30K (3000K, 70CRI)</th>
<th>40K (4000K, 70CRI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>48</td>
<td>0.7A</td>
<td>120W</td>
<td>T2</td>
<td>11732 3 0 3 110</td>
<td>13168 3 0 3 110</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T3</td>
<td>11805 3 0 3 110</td>
<td>13251 3 0 3 110</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T5</td>
<td>12248 3 0 0 115</td>
<td>13748 3 0 0 115</td>
</tr>
<tr>
<td></td>
<td>1.0A</td>
<td></td>
<td>180W</td>
<td>T2</td>
<td>16520 3 0 3 103</td>
<td>18542 3 0 3 103</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>T3</td>
<td>16027 3 0 3 100</td>
<td>17989 3 0 3 100</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T5</td>
<td>16475 4 0 1 103</td>
<td>18492 4 0 1 103</td>
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<td></td>
<td>64</td>
<td>0.7A</td>
<td>150W</td>
<td>T2</td>
<td>15131 3 0 3 113</td>
<td>16984 3 0 3 113</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T3</td>
<td>15535 3 0 3 116</td>
<td>17437 3 0 3 116</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T5</td>
<td>15278 4 0 1 114</td>
<td>17148 4 0 1 114</td>
</tr>
<tr>
<td></td>
<td>1.0A</td>
<td></td>
<td>240W</td>
<td>T2</td>
<td>21717 3 0 3 102</td>
<td>24376 3 0 3 102</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T3</td>
<td>22127 3 0 3 103</td>
<td>24837 3 0 3 103</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T5</td>
<td>21803 5 0 1 102</td>
<td>24473 5 0 1 102</td>
</tr>
</tbody>
</table>

### Additional Features:
- Ten (10) Year Warranty

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**Utility Lighting Products**

12
Adjustable Output Unit - AOU

Benefits
- Works with standard 0–10 V dimming drivers.
- Doesn’t consume power.
- Costs associated with stocking multiple SKUs can be minimized if ordered with this option (option “U” for MHB series). Fixtures can be converted for lower Lumen/Wattage unit by selecting appropriate settings.
- The unit can be utilized to achieve higher efficacies by reducing LED drive current.

Description
AOU is a passive dimmer that can be used with 0–10V capable dimming drivers. It can be easily adjusted with a flat-blade screwdriver. Approximate wattage settings are shown in the table below. The unit comes factory set at "#8" which is the maximum output level. The unit consumes no standby power and can be removed to convert the luminaire to standard 0–10V dimming.

Dimensions: Length: 2.0”, Width: 1.3”, Depth: 0.8”

AOU Position Selector Guide –

<table>
<thead>
<tr>
<th>Position</th>
<th>#8</th>
<th>#7</th>
<th>#6</th>
<th>#5</th>
<th>#4</th>
<th>#3</th>
<th>#2</th>
<th>#1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimming Voltage (V)</td>
<td>&gt;10</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Input Power* (in percentage of original power)</td>
<td>100%</td>
<td>92%</td>
<td>81%</td>
<td>70%</td>
<td>59%</td>
<td>49%</td>
<td>39%</td>
<td>28%</td>
</tr>
</tbody>
</table>

*Input power provided for estimation purposes only. Actual usage may vary by ±3%.

Wiring Schematic
AOU (Adjustable Output Unit)

This accessory will be offered as an option for LED fixtures standard with 0-10v dimming drivers. This allows an inexpensive way to tune down LED fixtures to lower light levels and wattages (8 positions/options). This AOU will be located inside the fixture and can be adjusted with a screwdriver.

The following preliminary data below is an example of the lumen and wattage variables when used on our L404L150W40K LED Roadway Fixture (all eight settings are shown):
### L400 SERIES - ADJUSTABLE OUTPUT UNIT

#### Lumen Output

<table>
<thead>
<tr>
<th>Model</th>
<th>1000</th>
<th>1200</th>
<th>1500</th>
<th>1800</th>
<th>2100</th>
<th>2400</th>
<th>3000</th>
<th>3600</th>
</tr>
</thead>
<tbody>
<tr>
<td>L401</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>L402</td>
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</tr>
<tr>
<td>L403</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>L404</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

#### Input Wattage

<table>
<thead>
<tr>
<th>Model</th>
<th>1000</th>
<th>1200</th>
<th>1500</th>
<th>1800</th>
<th>2100</th>
<th>2400</th>
<th>3000</th>
<th>3600</th>
</tr>
</thead>
<tbody>
<tr>
<td>L401</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L402</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L403</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L404</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

L401, L402, L403, and L404 Models

Select control option "AO" on L400 Series specsheet

AOU is easily adjusted with a flat-blade screwdriver. Approximate lumen and wattage values are shown in the tables below. The unit comes factory set at "8" which is the maximum output level. The unit consumes no standby power and can be removed to convert the luminaire to standard 0-10V dimming.

**Benefits:**

- Allows maintenance departments to carry less inventory through reduced number of unique models.
- The unit can be utilized to achieve as high as 145LPW.
NEW “Night Owl” Security/NEMA Head

The NO1 will be our 2nd generation of our LED NEMA Head/Security light. The NO1 is a energy saving as well as cost effective solution to replace 100w and 150w HID NEMA Heads. To access the driver compartment, surge suppressor, terminal block and mounting brackets; there is a tool-less entry door that opens from the bottom side of the casting/housing. The optical compartment will be IP66. An optional tool-less refractor will be available as an option. The casting has an integral tilt-adjustment (+ 5 degrees), seven (7) pin photo control receptacle and two bolt mounting that accepts 1-1/4” to 2” tenon/arm.

Other Features of NO1

• Three station terminal block for up to #6 AWG
• 0-10v dimming driver
• Standard with 10kV/10kA surge protection
• Optional 20kV/20kA surge protection
• Standard 4000K (optional 3000K)
• Type V light distribution
• Two (2) wattage options
  • 50w to replace 100w HID
  • 70w to replace 150w HID

Available now!
LED Security/Area
DTDU Series Dusk-to-Dawn Utility

Features
- High-powered LEDs
- 35W replaces existing 70W HID
- 48W replaces existing 100W HID
- Tool less entry
- Easy Installation
- Hardware Included
- Listings: UL and cUL Listed for outdoor

Specifications
- Die cast aluminum housing
- Gray powder coat finish
- PEC receptacle
- Stainless steel latch springs
- Wire tether
- UV stabilized acrylic prismatic refractor
- 4100K / 80 CRI
- 50,000 hour life
- 120-277v
- 10kV surge protection (standard)
- Type 5 distribution
- Bug Rating; B1-U2-G1
- 5-year warranty

<table>
<thead>
<tr>
<th>Model #</th>
<th>Watts</th>
<th>Lumens</th>
<th>CCT</th>
<th>Lm/W</th>
<th>Recommended Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTDU35LED41MV</td>
<td>35</td>
<td>3,638</td>
<td>4100K</td>
<td>102</td>
<td>70W HID</td>
</tr>
<tr>
<td>DTDU48LED41MV</td>
<td>48</td>
<td>4,411</td>
<td>4100K</td>
<td>92</td>
<td>100W HID</td>
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</tbody>
</table>
HI-LL (LED Photo Controls)
HI-LL will be a line of photo controls to offer with our LED fixtures and sell alone.

Features:
- The HI-LL is specifically designed to provide long life, enhanced light sensitivity, and superior surge protection when used with LED luminaires.
- Filtered silicon light sensor – sensitive to Sunlight but not LED.
- Sealed relay
- 4 MOVs each rated for 1280 Joules/40,000 Amp
- Base gasket is a continuous used temperature of 105C
- 3-6 second turn-off delay
- Up to 200 amp inrush
- Temp range: -40 to +70 C ambient
- ROHS compliant
- Meets ANSI C136.10
- Voltage 105 to 305 VAC, 60Hz
- Load rating: 1800VA driver or ballast load
- Black cover standard, other colors optional (Metal cap standard on 20 year model)

Model Information:

<table>
<thead>
<tr>
<th>LONG LIFE CONTROL</th>
<th>VOLTAGE</th>
<th>TURN ON LEVELS (1.5 ratio)</th>
<th>COVER COLOR</th>
<th>WARRANTY TERM</th>
<th>FAILURE MODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI-LL</td>
<td>127: 120 -277 VAC</td>
<td>15: 1.5fc (ANSI Standard)</td>
<td>BK: Black</td>
<td>12: 12 year</td>
<td>Blank: Fail ON</td>
</tr>
<tr>
<td></td>
<td>480: 347-480 VAC</td>
<td>10: 1.0fc</td>
<td>BU: Blue</td>
<td></td>
<td>F: Fail OFF</td>
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<tr>
<td></td>
<td></td>
<td>26: 2.6fc (IES)</td>
<td>GN: Green</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Available now!
Howard Lighting’s “New” 3rd generation LED Flood for Utility Applications

Our “NEW” Utility Flood (UF) offers utility customers the ability to stock one LED fixture to replace 250w, 400w and 1000w HID floods. The following is a quick wattage and lumen reference for our “NEW” Utility Flood (UF) with our AOU (Adjustable Output Unit).

<table>
<thead>
<tr>
<th>Input Watts</th>
<th>Optic</th>
<th>AOU Setting</th>
<th>4000K (CCT)</th>
<th>3000K (CCT)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lumens</td>
<td>Lm/W</td>
</tr>
<tr>
<td>72</td>
<td>7x6</td>
<td>1</td>
<td>13000</td>
<td>180.56</td>
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<tr>
<td>98</td>
<td>7x6</td>
<td>2</td>
<td>15800</td>
<td>161.22</td>
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<td>124</td>
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<td>151</td>
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<td>180</td>
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<td>5</td>
<td>23100</td>
<td>128.33</td>
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<td>211</td>
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<td>242</td>
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<tr>
<td>271</td>
<td>7x6</td>
<td>8</td>
<td>30400</td>
<td>112.18</td>
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</tbody>
</table>
UF (Utility Flood)

Our new UMF is designed to replace 250w, 400w and 1000w HID floods. Our 3rd generation of utility LED flood will come standard with our AOU (adjustable output unit), which will allow flexibility of wattage and lumens needed to replace existing HID floods (250w – 1000w). This will allow the need to only stock one fixture for your flood lighting applications.

Features:
- Solid die-cast aluminum housing
- Maximum wattage **271 watts @ 30,400 lumens** (replace 1000w HID)
- Option for **AOU**, for selecting lower wattages below 271 watts
  - AOU setting #5, **180w @ 23,100 lumens** (replace 400w HID)
  - AOU setting #2, **98w @ 15,800 lumens** (replace 250w HID)
- To be UL listed
- To be DLC listed
- Two (2) mounting options:
  - Large wrap around Yoke
  - Slip fitter that fits 2-3/8” to 3” O.D. tenon
- Distribution 7x6 beam spread
- 20kV surge protection standard
- 5 year warranty
- Standard multi-volt (120-277v) with 7 pin photo receptacle

Available: February 2018
Wireless Controls/Sensor Nodes

Currently all Howard Lighting fixtures with seven (7) pin photo control receptacles are set up to accept any of the various manufacturers that offer wireless controls. We are currently forming relationships with several of these vendors and have the ability to quote wireless systems now with several of the wireless control providers. For more information and details contact your Howard Lighting representative.

Target release date: Available now with several wireless vendors
LEDMR (LED Mogul Retrofit)
LEDMR is designed as an energy saving LED replacement for retrofitting HID post top fixtures.

Key products for this family are:

• **LEDMR-4040-MV**, which is 40 watts and designed to replace a 100 watt HID lamp. This product offers 65.2% energy savings over its HID replacement.

• **LEDMR-4050-MV**, which is 50 watts and designed to replace a 150 watt HID lamp. This product offers 70.0% energy savings over its HID replacement.

Features:
• Solid die-cast aluminum housing
• UL listed
• DLC listed
• Driver is fully sealed with heat sink silicone
• 5 year warranty
• Standard multi-volt (120-277v)
• Other applications:
  • Wallpacks
  • Garage Lights
  • Flood Lights
**LEDMEDR** (LED Medium Base Retrofit)

LEDMEDR lamps are designed as an energy saving LED replacement for retrofitting HID post top fixtures that use low wattage small glass envelope HID lamps.

**Key products for this family are:**
- **LEDMEDR-4015-MV**, which is **15 watts** (1950 ±200 lm) and designed to replace a **50 watt** HID lamp. This product offers 75.4% energy savings over its HID replacement.

- **LEDMEDR-4019-MV**, which is **19 watts** (2470 ±200 lm) and designed to replace a **70 watt** HID lamp. This product offers 76.2% energy savings over its HID replacement.

- **LEDMEDR-4024-MV**, which is **24 watts** (3120 ±200 lm) and designed to replace a **100 watt** HID lamp. This product offers 79.1% energy savings over its HID replacement.

**Features:**
- Solid die-cast aluminum housing
- UL listed
- DLC
- Driver is fully sealed with heat sink silicone
- 5 year warranty
- Available in 4000K and 3000K
- Standard multi-volt (120-277v)
**LEDMXR** (LED Mogul Base Retrofit with NO Uplight)

LEDMXR lamps are designed as an energy saving LED replacement for retrofitting HID post top fixtures that use low wattage small glass envelope HID lamps.

**Key products for this family are:**

• **LEDMXR-4027-MV**, which is **27 watts** (2900 ±200 lm) and designed to replace a **100 watt** HID lamp.

• **LEDMXR-4036-MV**, which is **36 watts** (3900 ±200 lm) and designed to replace a **150 watt** HID lamp.

• **LEDMXR-4045-MV**, which is **45 watts** (4900 ±200 lm) and designed to replace a **175 watt** HID lamp.

• **LEDMXR-4054-MV**, which is **54 watts** (5900 ±200 lm) and designed to replace a **200 watt** HID lamp.

**Features:**

• Solid die-cast aluminum housing
• UL listed
• DLC
• Driver is fully sealed with heat sink silicone
• 5 year warranty
• Available in 4000K and 3000K
• Standard multi-volt (120-277v)
• Reduced Uplight, base down
LED Bullet Flood

Features:
- Available in two (2) wattages: 44w and 75w (replace 100w and 150w HID fixtures)
- Tempered glass lens, thermal shock and impact resistant.
- Low-copper, aluminum die-cast housing and lens frame.
- Dark bronze polyester powder-coat finish.
- UL/cUL listed, suitable for wet locations
- 5-year warranty

Markets for this product (area lighting and lighting flag poles):
- Municipal Utilities
- Investor Owned Utilities
- Co-op’s
- DOT’s
- Schools
- City, County, State and Federal buildings
Howard Lighting offers additional LED products for various applications at Utility facilities

LED high bay to replace HID or Fluorescent products

LED T8 lamps to replace fluorescent T8’s

LED wall packs: LWP, MWP, MLWP, MCWP, VL and MINILWPP

LED canopy fixtures: LSC and LMC

LED floods: FLL and SLF
Howard Lighting
Future LED Products for 2018
SGN (LED Sign Lighter)

SGN is an energy saving LED replacement for HID Sign Lighters used to illuminate highway signs, billboards, building facades and corporate logo signs.

Features:
- Solid die-cast aluminum housing
- Tool-less entry for easy access to the electrical compartment
- Dual pipe/arm mounting clamps for 1-1/4” round arm or 1-1/2” square arm
- +0/-5 degree vertical adjustment
- 3G vibration tested per ANSI C136.31
- Tempered glass lens
- 120v-277v driver or optional 347-480v driver
- Current selector for 350mA, 530mA, 700mA or 1050mA
- 10kV/10kA surge protection
- Terminal block for #2-#14 AWG
- Bubble gage for leveling
- Working temp.: -40 to +40°C
- CCT: 4000K, CRI > 70
- UL Listed
- 5 Year Warranty

Wattage and lumens
- 40 watts @ 350mA and 4200 lm
- 60 watts @ 530mA and 6082 lm
- 80 watts @ 700mA and 7538 lm
- 130 watts @ 1050mA and 10345 lm

Markets for this product:
State and Municipal DOT’s
Billboard companies
Outdoor advertisers

Target Date: 3rd Quarter 2018
LSL (LED Sports Lighter)

LSL will be designed as an energy saving LED replacement for HID Sports Lighters.

Features:
• Solid die-cast aluminum housing
• Offer optics required for Sports Lighting (four light distribution options):
  • NEMA 2x2, 3x3, 4x4 and 5x5
• Wattage and lumens
  ▪ 600 watts @ 78,000 lm
  ▪ 750 watts @ 97,500 lm
  ▪ 1000 watts @ 130,000 lm
• UL listed
• DLC listed
• 5 year warranty

Markets for this product:
• Municipal Utilities
• Co-op’s
• Transportation Hubs such as docks at ports

Target release date: 3rd Quarter 2018
Hi-LL (Photo Controls)
Howard Lighting will be expanding our line of photo controls in 2018. We will be offering an economical line of photo controls for LED luminaires, photo controls for HID and shorting caps.

Spec sheets will be available in the coming weeks for the new products. The following provides a table of what will be new.

<table>
<thead>
<tr>
<th>Model #</th>
<th>Application</th>
<th>Warranty</th>
</tr>
</thead>
<tbody>
<tr>
<td>HI-SS-127-15-GN</td>
<td>LED luminaires</td>
<td>6 years</td>
</tr>
<tr>
<td>HI-SS-127-15-GN-F</td>
<td>LED luminaires</td>
<td>6 years</td>
</tr>
<tr>
<td>HI-PC-127-15-BU</td>
<td>HID luminaires</td>
<td>5 years</td>
</tr>
<tr>
<td>HI-SC-BK</td>
<td>Shorting Cap</td>
<td>5 years</td>
</tr>
</tbody>
</table>

Target release date: 2nd Quarter 2018
**LR (LED Roadway)**

LR will be designed as an energy saving LED replacement of High Wattage and High Lumen Roadway fixtures to compete with Holophane.

**Features:**
- Solid die-cast aluminum housing
- Offer optics required to compete with Holophane
- Offer glare shield as option is requested
- UL listed
- DLC listed
- Offer wattages comparable with Holophane and that will meet IESNA’s RP8 for highway lighting.
- Standard with 7 pin photo control receptacle
- 5 year warranty
- Dimming drivers with the option of wireless controls

**Markets for this product:**
- DOT’s
- Municipal Utilities
- IOU’s

**Target release date:** 4th Quarter 2018
Solar LED Street Light
SLS Series

Description
SLS Series LED Solar Street Light is designed with an all-in-one streamlined design. It’s built in high brightness LED combined with the long lifespan of the lithium iron phosphate battery make this a great lighting solution for applications where electric power is not available.

Features
• Solar panel, LED lamp, Battery and Controller all-in-one design
• Die-cast housing with UV resistant powder coat finish
• The angle of the luminaire can be adjustable with the slip fitter
• The LED module can be adjusted to ensure the lighting is aimed at the targeted area
• LEMILEDS 5050 LED chips achieving 200Lm/W, CRI > 70
• Motion sensor and time control intelligent mode available
• Automatically turns on and off according to brightness. The brightness in different time schedule can be set by remote
• Integrated monocrystalline silicon solar panel, with more than 2000 cycles lifespan, LifePO4 battery
• High charging efficiency MPT controller
• Operating Temperature ~-10 C to +50 C
• Optical lens is high light transmittance PC, anti-UV and flame resistant
• 6kA lightning surge protection and IP65 rated
• Standard with slip fitter mounting

<table>
<thead>
<tr>
<th>Ordering Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model #</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>SLS00845FG</td>
</tr>
<tr>
<td>SLS02045FG</td>
</tr>
<tr>
<td>SLS03045FG</td>
</tr>
</tbody>
</table>
LHM (LED High Mast)
LHM will be designed as an energy saving LED replacement for HID High Mast fixtures.

Features:
• Solid die-cast aluminum housing
• UL listed
• 120-277v (Standard), 347-480v optional
• 0-10v dimming available
• Offer wattages to replace 1000w and 1500w HID High Mast fixtures
  • 320w @ 54000 lumens
  • 400w @ 68000 lumens
  • 460w @ 78000 lumens
• 5 year warranty
• Dimming drivers with the option of wireless controls

Markets for this product:
• DOT’s
• Municipal Utilities
• Transportation Hubs such as docks at ports

Target release date: 3rd Quarter 2018
LEDMHR (LED Mogul Base – High Wattage Replacement lamps)
LEDMHR lamps are designed as an energy saving LED replacement for retrofitting high wattage HID post top and tear drop fixtures.

Features:
• 135 Lm/w
• Power Factor >0.9
• CCT: 3000K or 4000K
• 80w @ 10800 lumens
• 100w @ 13500 lumens
• UL/cUL listed
• DLC Listed
• Suitable for totally enclosed fixtures
• Built in 6kV surge protection
• 120-277v, 50/60 Hz
• Working temperature: -40 to +60C
• 50,000 hours reliable lifespan
• 5 year warranty

Target release date: 2nd quarter 2018
LEDMBR LED Mogul Base – High Wattage Replacement lamps

LEDMBR lamps are designed as an energy saving LED replacement for retrofitting HID High Bay are Garage Luminaires.

Features:
- Retrofit to existing HID High Bay fixtures in warehouse or garage applications
- Easy solution that is line voltage (120-277v)
- 115w @ 16100 lumens
- Simple replacement without the need to open the

Markets for this product (warehouse and garage applications):
- Municipal Utilities
- Investor Owned Utilities
- Co-op’s
- DOT’s

Product concept and design currently being evaluated by Howard engineering team.

Target release date: 2nd Quarter 2018
HPS Long Life (XL) Lamps

Our new Long Life (XL) HPS lamps offer an average rated lamp life of 80,000 hours. Available in 100, 150, 250 and 400 watts.

Features:
• 3 times the life of standard HPS lamps
• Similar initial lumens to stand HPS lamps
• Direct replacements for standard HPS or Standby HPS lamps
• Average rated lamp life of 80,000 hours

<table>
<thead>
<tr>
<th>Model #:</th>
<th>Wattage</th>
<th>Lumens</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU100/SBY/XL</td>
<td>100</td>
<td>9800</td>
</tr>
<tr>
<td>LU150/55/SBY/XL</td>
<td>150</td>
<td>15200</td>
</tr>
<tr>
<td>LU250/SBY/XL</td>
<td>250</td>
<td>27500</td>
</tr>
<tr>
<td>LU400/SBY/XL</td>
<td>400</td>
<td>49000</td>
</tr>
</tbody>
</table>

Target Release date: 2nd Quarter 2018
Utility Marketing

Marketing Information for Utility and DOT

2018

The DOE report is the most reliable estimate of the outdoor lighting inventory in the US. The data in this report is from 2015, but the report was not released until November 2017. The following tables provide a great insight into the available market for outdoor lighting, the opportunities that still exist for conversions to LED and the average wattages used by application.

### Inventory of Lamps/Luminaires by Outdoor Application (1,000’s) in 2015

<table>
<thead>
<tr>
<th>Application</th>
<th>Incandescent</th>
<th>Halogen</th>
<th>CFL</th>
<th>Linear Fluorescent</th>
<th>MV</th>
<th>MH</th>
<th>HPS</th>
<th>LPS</th>
<th>LED</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airfield</td>
<td>338</td>
<td>599</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,242</td>
</tr>
<tr>
<td>Billboard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>601</td>
</tr>
<tr>
<td>Building Ext: C&amp;I</td>
<td>3,044</td>
<td>2,524</td>
<td>11,121</td>
<td>49,124</td>
<td>1,361</td>
<td>17,414</td>
<td>8,435</td>
<td></td>
<td></td>
<td></td>
<td>107,914</td>
</tr>
<tr>
<td>Comm. Tower</td>
<td>139</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>350</td>
</tr>
<tr>
<td>Parking</td>
<td>1,250</td>
<td>2,790</td>
<td></td>
<td>5,558</td>
<td>58</td>
<td>27,076</td>
<td>13,785</td>
<td></td>
<td></td>
<td></td>
<td>83,519</td>
</tr>
<tr>
<td>Railway</td>
<td>376</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>921</td>
</tr>
<tr>
<td>Roadway</td>
<td>59</td>
<td>23</td>
<td></td>
<td>272</td>
<td>1,073</td>
<td>35,484</td>
<td>940</td>
<td>9,003</td>
<td>1,396</td>
<td></td>
<td>48,227</td>
</tr>
<tr>
<td>Sports Field</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>300</td>
<td>43</td>
<td></td>
<td></td>
<td></td>
<td>453</td>
</tr>
<tr>
<td>Traffic Signal</td>
<td>2,891</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11,429</td>
<td></td>
<td>14,320</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8,099</strong></td>
<td><strong>5,939</strong></td>
<td><strong>11,121</strong></td>
<td><strong>54,682</strong></td>
<td><strong>1,694</strong></td>
<td><strong>46,350</strong></td>
<td><strong>57,747</strong></td>
<td><strong>940</strong></td>
<td><strong>58,779</strong></td>
<td><strong>12,195</strong></td>
<td><strong>257,546</strong></td>
</tr>
</tbody>
</table>
Updated Market information from the DOE’s “2015 U.S. Lighting Market Characterization – November 2017” report. (cont.)

The following table illustrates the extent which LED lighting has penetrated the outdoor lighting inventory in 2010 and 2015. Applications with the highest average wattages (billboard and sports field) have seen the most significant growth in LED lighting.

### LED Penetration by Outdoor Application in 2010 and 2015

<table>
<thead>
<tr>
<th>Application</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airfield</td>
<td>20%</td>
<td>24%</td>
</tr>
<tr>
<td>Billboard</td>
<td>1%</td>
<td>19%</td>
</tr>
<tr>
<td>Building Exterior: C&amp;I</td>
<td>0%</td>
<td>13%</td>
</tr>
<tr>
<td>Comm. Tower</td>
<td>24%</td>
<td>29%</td>
</tr>
<tr>
<td>Parking</td>
<td>4%</td>
<td>28%</td>
</tr>
<tr>
<td>Railway</td>
<td>53%</td>
<td>59%</td>
</tr>
<tr>
<td>Roadway</td>
<td>5%</td>
<td>19%</td>
</tr>
<tr>
<td>Sports Field</td>
<td>0%</td>
<td>19%</td>
</tr>
<tr>
<td>Traffic Signal</td>
<td>73%</td>
<td>80%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>8%</strong></td>
<td><strong>23%</strong></td>
</tr>
</tbody>
</table>
Updated Market information from the DOE’s “2015 U.S. Lighting Market Characterization – November 2017” report. (cont.)

The table below provides the average system wattage of outdoor lighting.

### Average Lighting Wattage by Outdoor Application in 2015

<table>
<thead>
<tr>
<th>Application</th>
<th>Incandescent</th>
<th>Halogen</th>
<th>CFL</th>
<th>Linear Fluorescent</th>
<th>MV</th>
<th>MH</th>
<th>HPS</th>
<th>LPS</th>
<th>LED</th>
<th>Other</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airfield</td>
<td>105</td>
<td>97</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>15</td>
<td>-</td>
<td>79</td>
</tr>
<tr>
<td>Billboard</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>129</td>
<td>348</td>
</tr>
<tr>
<td>Building Ext.: C&amp;I</td>
<td>69</td>
<td>87</td>
<td>25</td>
<td>38</td>
<td>200</td>
<td>333</td>
<td>183</td>
<td>-</td>
<td>18</td>
<td>19</td>
<td>97</td>
</tr>
<tr>
<td>Comm. Tower</td>
<td>403</td>
<td>114</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>14</td>
<td>-</td>
<td>131</td>
<td>205</td>
</tr>
<tr>
<td>Parking</td>
<td>130</td>
<td>113</td>
<td>-</td>
<td>35</td>
<td>307</td>
<td>407</td>
<td>215</td>
<td>-</td>
<td>105</td>
<td>68</td>
<td>216</td>
</tr>
<tr>
<td>Railway</td>
<td>24</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>211</td>
<td>250</td>
<td>305</td>
<td>108</td>
<td>-</td>
<td>184</td>
<td>120</td>
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<tr>
<td>Roadway</td>
<td>164</td>
<td>-</td>
<td>-</td>
<td>211</td>
<td>250</td>
<td>250</td>
<td>305</td>
<td>108</td>
<td>134</td>
<td>120</td>
<td>282</td>
</tr>
<tr>
<td>Sports Field</td>
<td>-</td>
<td>3,478</td>
<td>-</td>
<td>1,000</td>
<td>1,421</td>
<td>965</td>
<td>-</td>
<td>770</td>
<td>-</td>
<td>34</td>
<td>1,357</td>
</tr>
<tr>
<td>Traffic Signal</td>
<td>134</td>
<td>-</td>
<td>-</td>
<td>9</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>70</td>
<td>93</td>
<td>-</td>
<td>186</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>107</strong></td>
<td><strong>113</strong></td>
<td><strong>25</strong></td>
<td><strong>38</strong></td>
<td><strong>207</strong></td>
<td><strong>382</strong></td>
<td><strong>288</strong></td>
<td><strong>108</strong></td>
<td><strong>70</strong></td>
<td><strong>93</strong></td>
<td><strong>186</strong></td>
</tr>
</tbody>
</table>
Updated Market information from the DOE’s “2015 U.S. Lighting Market Characterization – November 2017” report. (cont.)

The last table noted below presents the average daily operating hours by application and lighting technology.

### Average Daily Operating Hours by Outdoor Application in 2015

<table>
<thead>
<tr>
<th>Application</th>
<th>Incandescent</th>
<th>Halogen</th>
<th>CFL</th>
<th>Linear Fluorescent</th>
<th>MV</th>
<th>MH</th>
<th>HPS</th>
<th>LPS</th>
<th>LED</th>
<th>Other</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airfield</td>
<td>4</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Billboard</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Building Ext.: C&amp;I</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td></td>
<td>22</td>
<td>9</td>
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<tr>
<td>Comm. Tower</td>
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<td></td>
<td>10</td>
</tr>
<tr>
<td>Parking</td>
<td>20</td>
<td>20</td>
<td>-</td>
<td>20</td>
<td>13</td>
<td>14</td>
<td>16</td>
<td>16</td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Railway</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Roadway</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Sports Field</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Traffic Signal</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>10</strong></td>
<td><strong>13</strong></td>
<td><strong>9</strong></td>
<td><strong>10</strong></td>
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<td><strong>12</strong></td>
<td><strong>12</strong></td>
<td><strong>16</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>
Utility Market Information

We’ve broken down the utility segment into three (3) sub segments; IOU, Co-op/REA and Municipal. These three segments represent over 3,000 utility target accounts, with municipal being the largest number, then co-op/REA and then IOU’s. In terms of dollar potentials each of these segments break down as follows:

<table>
<thead>
<tr>
<th>Segment</th>
<th>IOU</th>
<th>Co-op/REA</th>
<th>Municipal</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamp Potential</td>
<td>$43,545,716</td>
<td>$6,625,687</td>
<td>$13,431,465</td>
<td>$63,602,878</td>
</tr>
<tr>
<td>Fixture Potential</td>
<td>$578,753,494</td>
<td>$85,187,534</td>
<td>$172,305,517</td>
<td>$836,246,544</td>
</tr>
<tr>
<td>Photo Control Potential</td>
<td>$37,946,981</td>
<td>$5,773,882</td>
<td>$11,667,716</td>
<td>$55,388,519</td>
</tr>
<tr>
<td>Total Lighting Potential</td>
<td>$660,246,191</td>
<td>$97,587,052</td>
<td>$197,404,698</td>
<td>$955,237,942</td>
</tr>
</tbody>
</table>

Products for this market are sold through Utility Distributors, direct, ESCO’s and contractors. Municipalities are unique since they purchase through distribution, direct, through ESCO’s for major retrofit products and utility lighting contractors where the municipality has requested a complete turn key project from contractors for material and labor.
DOT Market Information

For the DOT market involves primarily Federal, State, County and Municipal lighting projects for lighting roadways, bridges and tunnels. Infrastructure is also associated with the DOT market and shares similar products for lighting airports, correctional facilities, waste water treatment plants, as well as park and recreation. Product for both DOT and infrastructure are typically sold through specialty and electrical distribution. The estimated number of fixtures currently installed for this market is 2,407,622. The estimated annual sales potential is roughly $216,000,000.

Lighting products for the DOT market are limited to a smaller number of applications and products as compared to the commercial/industrial market. The applications are roadway, high mast, signage, tunnel and underpass.

For the roadway lighting applications, traditionally 250w and 400w HID fixtures have been the largest number of products used (cobra head and area lighters). Now the market is converting to LED to replace these traditional HID products. The current estimated inventory of roadway/cobra head fixtures is; 1,392,769.

The second highest volume fixture for DOT are sign lighters. Currently the estimate US inventory for DOT sign lighters are 718,558. Products for this application are also in transition and converting to LED.

The third highest volume product for the DOT/Infrastructure market is High Mast. These products are typically used around interstate/highway intersections and can also be seen lighting airport tarmacs’, railroad switching yards, correctional facilities, shipping terminals and waste water treatment facilities. The traditional HID product for this market (400w and 1000w) is being replaced with LED products. The current US inventory of this product is 296,295 fixtures.

There are two other products required for the DOT/Infrastructure market; tunnel lighters and wall packs for underpass. Both of these applications is only 5% of the total DOT/Infrastructure lighting market.
Utility Marketing

Literature and Trade Show Events for 2018
Utility Lighting Line Card

Check out our literature library under Documents/Forms on our home page at www.howard-lighting.com for a full list of our literature.
Check out our literature library under Documents/Forms on our home page at [www.howard-lighting.com](http://www.howard-lighting.com) for a full list of our literature.
Check out our literature library under Documents/Forms on our home page at [www.howard-lighting.com](http://www.howard-lighting.com) for a full list of our literature.
Utility Products Guide
24 pages

Check out our literature library under Documents/Forms on our home page at www.howard-lighting.com for a full list of our literature.
Check out our individual spec sheets under product selection on our home page at [www.howard-lighting.com](http://www.howard-lighting.com).
Check out our literature library under Documents/Forms on our home page at www.howard-lighting.com for a full list of our literature. For competitive cross reference material ask your Howard representative.
Market Data Base and Information

Market Data Base

- Utilities
  - Investor Owned
  - Co-op/REA
  - Municipal
- Utility Lighting Contractors
- ESCO’s
- DOT estimated market and inventory
- Daily bid alert for municipal, Federal and state DOT projects

Check out our literature library under Documents/Forms on our home page at www.howard-lighting.com for a full list of our literature. For available market information ask your Howard representative.

With DOT lighting being part of our new Utility/DOT lighting profile center, there is a need to understand the market and competition for this segment that we’ve never been involved with. Therefore, I’ve spent time researching the DOT market and lighting products used in this segment. The DOT lighting market involves primarily Federal, State, County and Municipal lighting projects for lighting roadways, bridges and tunnels. Infrastructure is also associated with the DOT market and shares similar products for lighting airports, correctional facilities, waste water treatment plants, as well as parks and recreation. The product for both DOT and infrastructure is typically paid through specialty and electrical distribution. Due to the Federal funding component for most of the projects associated with this market, products need to be assembled in the US. With the results of our recent presidential election, the forecast/prediction is that there will be a dramatic increase in DOT/Infrastructure projects over the next several years. Therefore, we need to ensure that we have the products and sales organization to capture our share of this lighting market.
My Account

Agent and Customer information through Howard Lighting

- Ability for customers to check the following
  - Order Status
  - Inventory
  - Quotes/pricing
  - Shipping information
- Customers have the ability to assign who can see the information
- Presentation available on how to use

Contact your Howard customer service representative or Howard agent for more information.

Go to the Howard Lighting homepage: www.Howard-Lighting.com

Top right corner: Boxes for Username and Password

Lighting for life.
Utility Lighting Trade Shows: 2018

- **TechAdvantage** - Co-op/REA annual conference - (2/25/18 – 2/28/18)
- Alabama Rural Electric Assoc. (AREA) - (4/4/18 – 4/5/18)
- Northwest Public Power (NWPPA) – (4/9/18 – 4/10/18)
- **IEEE** – (4/16/18 – 4/19/18)
- NAAUD – (5/1/18 – 5/3/18)
- Rocky Mountain Electric League – (5/20/18 – 5/22/18)
- **Electric Cities of Georgia** – (6/6/18 – 6/8/18)
- American Public Power Assoc. (APPA) – (6/15/18 – 6/20/18)
- Southeastern Electric Exchange - (6/27/18)
- TN Municipal Electric Power Assoc. (TMEPA) – (7/11/18 – 7/13/18)
- TN Electrical Coop Assoc. (TECA) E&O Meeting – (7/25/18 – 7/27)
- **IMSA** Annual Forum & Expo – (7/24/18 – 7/31/18)
- TVPPA E&O Conference – (8/8/18 – 8/10/18)
- **Utility Purchasing Management Annual Meeting** – (9/9/19 – 9/11/18)
- Texas Electric Cooperatives (TEC) Annual Engineering Conference – (9/19/18 – 9/21/18)
- MN Rural Electric Assoc. (MREA) E&O Meeting – (9/19/18 – 9/21/18)
- **IESNA SALC** – IES Street & Area Lighting Conference – (9/30/18 – 10/3/18)
- FL Municipal Electric Assoc. (FMEA) – (7/17/18 – 7/19/18)
Thank you