

# HIGH MAST INTERSTATE LEDS



February 2016

# High Mast Interstate Lights

## Existing Conditions

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- City owned and maintained
- Total of 26 poles
- Located at each I-65 Interchange except Goose Creek
- Each pole has 4, 6, or 8 lights
- Total of 168 individual light fixtures
- 3 poles have been retrofitted to LED
- 16 LED lights installed
- 8 different utility bills



# Three Existing Poles have been retrofitted

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# Case Study: Moores Lane and I-65



# What are the benefits of LEDs?

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- **Cost Savings**
  - Reduced Energy Usage
  - Reduced Maintenance
- **Better Light Quality**
  - Improved Aesthetics
  - Improved Visibility



# Moores Lane High Mast

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Located between Macaroni Grille and I-65

6 fixtures mounted on the pole (only lights on the meter)

Conventional 1000 watt High Pressure Sodium lights

2012 Total Energy Cost= \$1,164 (\$194/light)

Retrofitted to LEDs in 2013

# Moores Lane High Mast

## Before and After LED Conversion

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<u>Year 2012</u>	<u>Energy Cost</u>	<u>kWh</u>
January	\$127	2124
February	\$104	1750
March	\$114	1908
April	\$94	1603
May	\$88	1499
June	\$72	1204
July	\$77	1289
August	\$76	1277
September	\$99	1652
October	\$89	1508
November	\$103	1746
December	\$122	2046
<b>Total:</b>	<b>\$1,165</b>	<b>19,606</b>

<u>Year 2014</u>	<u>Energy Cost</u>	<u>kWh</u>
January	\$75	1248
February	\$59	991
March	\$68	1139
April	\$52	881
May	\$46	784
June	\$51	851
July	\$40	674
August	\$45	746
September	\$51	845
October	\$62	1036
November	\$58	963
December	\$63	1046
<b>Total:</b>	<b>\$670</b>	<b>11,204</b>

# Moore's Lane High Mast Gen 1

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2012 Total Energy Cost= \$1,164

2014 Total Energy Cost=\$670 (43% savings)

Cost of Gen 1 Holophane High Mast LEDs: \$1800/fixture (440 watt)

Cost of conventional light (1,000 watt):

- \$750/fixture (6 year lifecycle)
- \$40/bulb (6 years)
- \$350/ballast (10 year lifecycle)

\*\*Result: We love the lights, but payback did not pencil out (10-12 years)



# Holophane High Mast Gen 2

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The price was reduced \$600/unit

Energy efficiency increased by 20%

Cost of Gen 2 Holophane High Mast LEDs: \$1200/fixture

Includes 5 year warranty; life expectancy up to 20 years

# Mount Juliet, TN

Providence Interchange in Mount Juliet

Exit 226 on I-40; previously unlit


First interchange in Tennessee to be all LED;

The screenshot shows a news article on the News Channel 5 website. The main headline is "New LED Lighting For Mt. Juliet Interchange" by Mark Ballinger, posted on October 12, 2015. The article features a large image of a modern, multi-lamp LED streetlight. To the right of the article is a sidebar with a "TRENDING NOW" section listing three stories: "101st Airborne To Deploy To Iraq, Kuwait In 2016 - Story", "Memorial Service To Honor Former U.S. Senator Fred Thompson - Story", and "Arrest Made In Downtown Shooting, Attempted Robbery - Story". Above and below the trending section are promotional banners for the new Children's Hospital at Williamson Medical Center, which is "NOW OPEN!". The website's navigation bar includes "Home", "Sections", "Weather", and "Traffic".

5 Home Sections Weather Traffic Weekly Savings

## New LED Lighting For Mt. Juliet Interchange

BY: Mark Ballinger  
POSTED: 6:07 PM, Oct 12, 2015  
UPDATED: 7:29 AM, Oct 13, 2015



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MT. JULIET, Tenn. - Highway crews have begun shedding new light

Children's Hospital at Williamson Medical Center  
**NOW OPEN!**

CLICK HERE FOR MORE INFO!

**TRENDING NOW**

- 101st Airborne To Deploy To Iraq, Kuwait In 2016 - Story
- Memorial Service To Honor Former U.S. Senator Fred Thompson - Story
- Arrest Made In Downtown Shooting, Attempted Robbery - Story

Children's Hospital at Williamson Medical Center  
**NOW OPEN!**

CLICK HERE FOR MORE INFO!

# Current HPS vs LED GEN 2

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Cost of Gen 2 Holophane High Mast LEDs: \$1200/fixture

- Decrease of \$600 and increased energy efficiency
- Includes 5 year warranty; life expectancy of up to 20 years

## **Existing HPS**

- Current Maintenance: Approximately \$7,500/year on high mast lighting
- Current Utility Bill: \$31,000/year on all high mast lighting (about \$185/light)
- Total=\$38,500

## **Gen 2 LED**

- Proposed Maintenance = \$0
  - Proposed Utility Bill = \$11,700
  - Total=\$11,700
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- Total annual savings: \$26,920

# Economic Payback

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
<b>Existing Costs:</b>												
Electricity Cost	\$31,200	\$31,512	\$31,827	\$32,145	\$32,467	\$32,792	\$33,119	\$33,451	\$33,785	\$34,123	\$34,464	\$34,809
Maintenance	\$7,500	\$7,500	\$7,500	\$7,500	\$7,500	\$7,500	\$7,500	\$7,500	\$7,500	\$7,500	\$7,500	\$7,500
<b>Total:</b>	\$38,700	\$39,012	\$39,327	\$39,645	\$39,967	\$40,292	\$40,619	\$40,951	\$41,285	\$41,623	\$41,964	\$42,309
<b>If LEDs</b>				<b>6 year cost=</b>		<b>\$236,943</b>						
Cost of LEDs	\$180,000											
Electricity Costs	\$11,780	\$11,898	\$12,017	\$12,137	\$12,258	\$12,381	\$12,505	\$12,630	\$12,756	\$12,884	\$13,012	\$13,143
Maintenance Cost	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<b>Total:</b>	\$192,780	\$12,898	\$13,017	\$13,137	\$13,258	\$13,381	\$13,505	\$13,630	\$13,756	\$13,884	\$14,012	\$14,143
				<b>6 year cost=</b>		<b>\$258,471</b>						
1% electricity cost Increase/yr				<b>TVA Rebate =</b>		<b>-\$10,000</b>						
						<b>\$248,471</b>						

With a one for one conversion, the payback period is approximately 6 years.

# Conclusion

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- THERE ARE SEVERAL BENEFITS FOR CONVERTING HIGH MAST LIGHTS TO LED
  - BETTER OVERALL LIGHT QUALITY AND AESTHETICS
  - APPROXIMATELY \$27,000 SAVINGS/YEAR
  - ELIGIBLE FOR TVA ENERGY RIGHT SOLUTIONS INCENTIVE WORTH ABOUT \$10,000
  - 6 YEAR PAYBACK
  - LONG LIFE EXPECTANCY