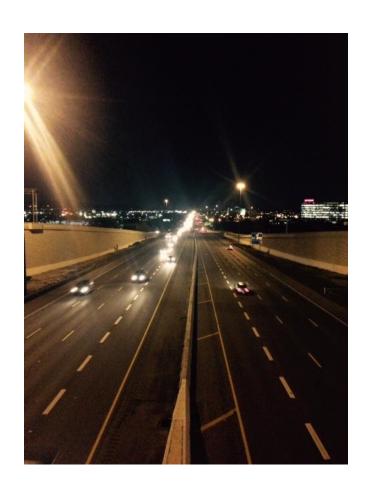
HIGH MAST INTERSTATE LEDS







February 2016

High Mast Interstate Lights

Existing Conditions

- 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







Case Study: Moores Lane and I-65

What are the benefits of LEDs?

Cost Savings

- Reduced Energy Usage
- Reduced Maintenance
- Better Light Quality
 - Improved Aesthetics
 - Improved Visibility





Moores Lane High Mast

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

<u>Year 2012</u>	Energy Cost	<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		
Total:	\$1,165	19,606		

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

Moore's Lane High Mast Gen 1

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

The price was reduced \$600/unit

Energy efficiency increased by 20%

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

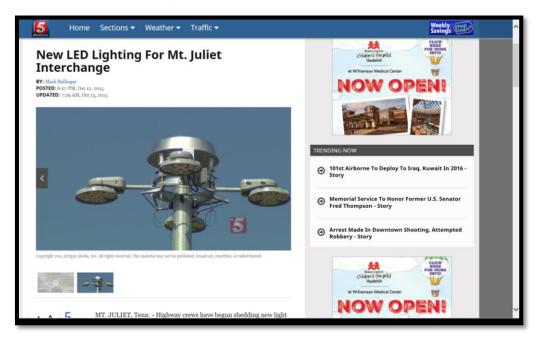
Includes 5 year warranty; life expectancy up to 20 years

Mount Juliet, TN

Providence Interchange in Mount Juliet

Exit 226 on I-40; previously unlit

First interchange in Tennessee to be all LED;



Current HPS vs LED GEN 2

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
- Total annual savings: \$26,920

Economic Payback

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Existing Costs:												
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
Total:	\$38,700	\$39,012	\$39,327	\$39,645	\$39,967	\$40,292	\$40,619	\$40,951	\$41,285	\$41,623	\$41,964	\$42,309
If LEDs				6 year cost=		\$236,943						
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	\$,1000
Total:	\$192,780	\$12,898	\$13,017	\$13,137	\$13,258	\$13,381	\$13,505	\$13,630	\$13,756	\$13,884	\$14,012	\$14,143
				6 year cost=		\$258,471						
1% electricity cost Increase/yr				TVA	Rebate =	- \$10,000						
						\$248,471						

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

Conclusion

- 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