

LED Street Lights

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October 2012 LUC

- Colorado Revised Statute (CRS) 24-82-902 requires full-cutoff streetlights
- Larimer County Urban Area Street Standards requires the City to meet this statute on Arterials and Collectors

Since we're require to make changes....

Staff decided to evaluate the benefit of converting to LED streetlights.

Some Cities Adopting LED Streetlights

- Town of Dillon
- City of Las Animas
- Town of Ouray
- City of Pueblo
- Intermountain REA
- City of Seattle
- City of Los Angeles

Current HPS Streetlights

HPS Light Fixtures in City of Loveland			
Fixture	# Installed	O&M Cost per Year**	Projected Total Cost over 23 yrs*
100W Cobra Head	293	\$29,560	\$964,280
250W Cobra Head	1784	\$220,425	\$6,494,590
400W Cobra Head	403	\$61,102	\$1,800,921
70W Post Top	1701	\$151,952	\$4,452,012
100W Post Top	293	\$28,082	\$824,058
Total:	4474	\$491,126	\$14,535,862

*HPS total cost includes maintenance and parts over 23 years (which equates to the expected LED fixture life).

**Based on 2014 rates

System Wide Change Out

LED Replacement Light Fixtures in City of Loveland				
LED Equivalent Fixture	# to install	Fixture Cost	Total Cost*	Total Savings*
100W Cobra Head	293	\$65,700	\$197,963	\$766,320
250W Cobra Head	1784	\$892,000	\$2,425,460	\$4,069,130
400W Cobra Head	403	\$254,520	\$759,008	\$1,041,910
70W Post Top	1701	\$884,0000	\$1,620,180	\$2,831,830
100W Post Top	293	\$151,840	\$281,387	\$542,670
Total:	4474	\$2,248,060	\$6,147,265	\$9,251,860

*Total Cost/Total Savings is based off the LED fixtures expected life of 23 years

Potential System Efficiency

HPS Fixture	Yearly KWH	LED Fixture	Yearly KWH
100 W HPS Cobra Head	161,704	100 W LED	69,300
250 W HPS Cobra Head	2,305,106	250 W LED	1,015,810
400 W HPS Cobra Head	806,669	400 W LED	363,619
70 W HPS Post Top	640,733	70 W LED	365,069
100 W HPS Post Top	161,701	100 W LED	74,434
Total System KWH	4,075,910	Potential System KWH	1,888,231
Potential Energy Savings per year KWH			2,187,679
Potential Saving per year			\$78,320

Current Post Top



Potential Post Tops Styles





Affect on Developers

- LED fixtures cost between 2 – 4 times more than the current HPS fixtures
- The Water and Power Department is proposing to offset the cost of the LED fixtures for the next 5 years when the cost difference will be less
- Projected cost of \$479,500

Why Offset LED Streetlights Costs

- Reduces warehousing cost to stock multiple streetlights
- Reduces cost of LED streetlights
- Ensures uniformity of streetlights throughout the City
- Saves the City O&M costs from having to change out streetlights at a later date

Recommendation:

Update the City of Loveland's Street Light Design Guideline to require the installation of LED street lights in new construction and replacement of existing street lights upon failure

- Potentially save \$500,000 per year in O&M costs after the first 4 years of installing LED fixtures
- Minimize the impact of increased energy cost
- Minimize the quantity of inventory needed
- Take advantage of the continual decrease in LED lighting cost
- Provide better light distribution and better color quality

Steps to Accomplish

- Complete revision to the Street Light Design Guideline
- Present changes before CAB
- Present changes before LUC
- Present changes to City Council
- Revise the City's portion of Larimer County Urban Area Street Standards (LCUASS)

Staff is proposing to rewrite the City of Loveland's Street Light Design Guideline specifying LED light fixtures

System Wide Change Out Assumptions

- The cost benefit analysis assumed a 4 year change out plan
 - Plan length is based on previous work tickets, and quantity of parts bought per year
- Lights are on 4380 hours a year
- 4 year life of a HPS bulb
- 11 year photo eye life
- 14 year ballast life
- PRPA rate increases
- Labor rate increase
- 100,000 hours (23 years) LED fixture life

Different Implementation Options

1. Install LED fixtures for new construction only
2. Implement a complete system wide change out

New Construction – Cobra Heads

100 W HPS Cobra Head			
Mfg.	Usage	Fixture Cost	Total Cost*
HPS	126 W	\$91	\$2,758
LED #1	54 W	\$400	\$764
LED #2	62 W	\$721	\$1,114
LED #3	55 W	\$375	\$743

250 W HPS Cobra Head			
Mfg.	Usage	Fixture Cost	Total Cost*
HPS	295 W	\$94	\$3,378
LED #1	130 W	\$600	\$1,239
LED #2	148 W	\$1,024	\$1,728
LED #3	208 W	\$799	\$1,706

400 W HPS Cobra Head			
Mfg.	Usage	Fixture Cost	Total Cost*
HPS	475 W	\$131	\$4,027
LED #1	260 W	\$1,000	\$2,110
LED #2	240 W	\$1,118	\$2,155
LED #3	300 W	\$737	\$1,991

*Total Cost is based off the LED fixtures expected life of 23 years. HPS total cost includes maintenance and parts over 23 years.

New Construction – Post Tops

70 W HPS Post Top			
Mfg.	Usage	Fixture Cost	Total Cost*
HPS	86 W	\$376	\$2,928
LED #1	49 W	\$1000	\$1,346
LED #2	49 W	\$600	\$946
LED #3	70 W	\$1,549	\$1,971

100 W HPS Post Top			
Mfg.	Usage	Fixture Cost	Total Cost*
HPS	126 W	\$376	\$3,075
LED #1	49 W	\$1,000	\$1,346
LED #2	49 W	\$600	\$946
LED #3	70 W	\$1,609	\$2,031

*Total Cost is based off the LED fixtures expected life of 23 years. HPS total cost includes maintenance and parts over 23 years.