



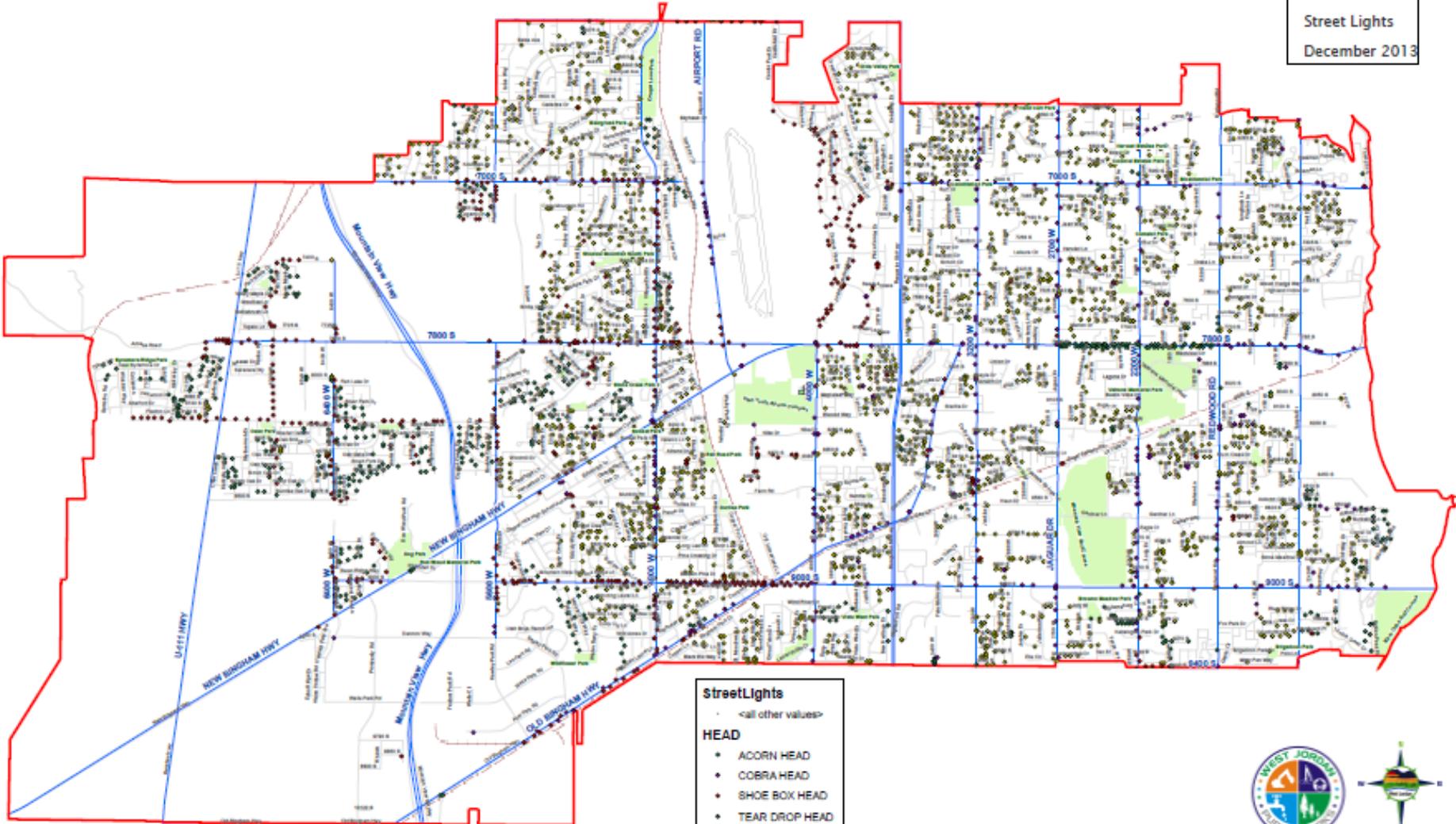
LED STREET LIGHTS

CITY OF WEST JORDAN
2014

WEST JORDAN STREET LIGHTS

- × Owned by WJ City = 4,655
- × Owned by R.Mtn. Power = 383
- × Total (approx.) = 5,038

City of
West Jordan
Street Lights
December 2013



- StreetLights**
- <all other values>
- HEAD**
- ACORN HEAD
 - COBRA HEAD
 - SHOE BOX HEAD
 - TEAR DROP HEAD
 - TOWN & COUNTRY
 - WALL PACK

All Locations Approximate
Not For Use As Legal Property Description
or Engineering Design Purposes
Some Items Subject to Change Without Notice



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This map (I:\GIS_DATA\Working\Delete\Publicworks\PublicWorksBaseSept2013.mxd)
was produced on September, 2013



LED = 173



Shoe Box = 525



Cobra = 536



Acorn = 1,079



Town & Country = 2,719

Current

Proposed LED

Old Cobra



New Cobra

Shoe Box



New Cobra

Acorn



Acorn

or



Bellshade

Town & Country



or



ENERGY (EXAMPLE)

Current



250 watts
\$6.54/mo

Proposed LED



150 watts
\$3.37/mo

MAINTENANCE



Lamp: 4-5 yrs
Ballasts: 4-5 yrs
Photocells: 4-5 yrs
Poles
Mast arms
Glassware
Wiring



Lamp: 10-20 yrs
Driver: 10-20 yrs
Photocells: 10-20 yrs
Poles
Mast arms
Glassware
Wiring

City	LED Payback
Portland, OR	<10 yrs
Anchorage, AK	<5 yrs
Seattle, WA	7.7 yrs
Los Angeles, CA	6 yrs
Ann Arbor, MI	4-5 yrs
Utah DOT	4-5 yrs
Herriman, UT	New conversion
South Jordan, UT	New conversion
Layton, UT	New conversion
Holladay, UT	New conversion
Sandy, UT	New conversion
West Valley, UT	New conversion

SUMMARY OF PUBLIC WORKS IMPLEMENTATION CONCERNS

- ✘ Safety consideration in design with the product selection and application
- ✘ Quality vs. Price – not all LED's are created equal
- ✘ Look at most current technology
- ✘ Two main areas of street lighting:
 - + Roadway (arterial and collector roads)
 - + Residential (subdivision streets)
- ✘ Life cycle costs



LYRB COST ANALYSIS

(Lewis Young Robertson & Burningham, Inc.)

	<u>Staff Retrofit</u>	<u>Contracted Installation</u>	<u>3rd Party Lease</u>
Product Costs	\$2,547,797.00	\$2,547,797.00	\$0.00
Installation Costs	\$550,620.03	\$704,184.00	\$0.00
Sub-Total	\$3,098,417.03	\$3,251,981.00	\$0.00
Rebate	-\$577,200.00	-\$577,200.00	\$0.00
Cost to Purchase Poles	\$142,100.00	\$142,100.00	\$203,000.00
Net Costs	\$2,663,317.03	\$2,816,881.00	\$203,000.00
Annual Energy Savings	\$301,304.12	\$301,304.12	\$21,380.00
Annual Maintenance Savings	\$83,000.00	\$83,000.00	\$83,000.00
Total Annual Savings	\$384,304.12	\$384,304.12	\$104,380.00
Total Annual Savings over life of LEDs*	\$8,773,663.06	\$8,773,663.06	\$2,382,995.40

* LED estimated useful Life is 22.83 years

CITY STAFF COST ANALYSIS

	Option 1 Contract Labor (One Phase)	Option 2 ESCO contract (One Phase)	Option 3 Contract Labor (Phases 3 yrs)	Option 4 In-House Labor (Phases 3 yrs)
Product Costs	\$ 2,775,358	Similar to Option 1	\$ 2,194,694	\$ 2,194,694
Installation Costs	\$ 423,168	Similar to Option 1	\$ 423,168	\$ 550,620
Sub-Total	\$ 3,198,526	Similar to Option 1	\$ 2,617,862	\$ 2,745,314
Rebate	\$ (486,400)	Similar to Option 1	\$ (486,400)	\$ (486,400)
Cost to Purchase Poles	\$ 191,500	Similar to Option 1	\$ 191,500	\$ 191,500
Net Costs	\$ 2,903,626	Similar to Option 1	\$ 2,322,962	\$ 2,450,414
Annual Energy Savings	\$ 200,000	Similar to Option 1	\$ 200,000	\$ 200,000
Annual Maint Savings	\$ 50,000	Similar to Option 1	\$ 50,000	\$ 50,000
Total Annual Savings	\$ 250,000	Similar to Option 1	\$ 250,000	\$ 250,000
Net Savings life of LED*	\$ 2,596,374	Similar to Option 1	\$ 2,927,038	\$ 2,799,586
Simple Payback (yrs)	11.6	Similar to Option 1	9.3	9.8
Net Present Value of Savings (*22.83 yrs)	\$ 681,877	Similar to Option 1	\$ 1,125,406	\$ 1,009,077
Notes:	<ul style="list-style-type: none"> Multiple bidders Project mgt 	<ul style="list-style-type: none"> State contract Pre-qualified bidders Guaranteed savings Project mgt 	<ul style="list-style-type: none"> Multiple bidders Assume 15%/yr LED cost decrease R.Mtn.Power rebates could end anytime 	<ul style="list-style-type: none"> Assume 15%/yr LED cost decrease R.Mtn.Power rebates could end anytime

DECISIONS

1. Phases:

- × One Phase (12mo.)
- × Three Phases (3 yrs)

2. Labor: Contract vs. In-House ?

3. Bidding: Which method ?

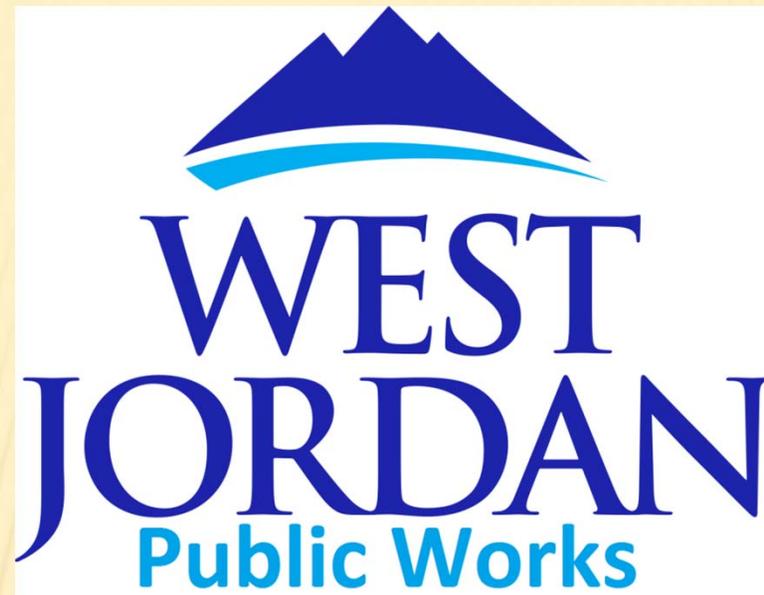
- RFP (Request For Proposal)
- ESCO-RFP “Energy Service Company” state contract (Siemens, Chevron, etc)
- IFB (Invitation For Bid)

4. Styles: Cobra, Acorn, Bellshade, others ?

- × To be determined after Project Mgt. Contractor is chosen

5. Funding: Cash, Bond, or both ?

Part 2



A PUBLIC WORKS PERSPECTIVE

LED STREET LIGHTING

STREET LIGHTING SAFETY

- ✘ Lighting Research Center – *“This study shows a statistically reliable reduction in crash risk due to the presence of fixed lighting” ...*
- ✘ Pacific institute – *“Streetlights do more than prevent crime. They allow safer operation of vehicles at night, reduce accidents, and assist*



NOT ALL LED'S ARE CREATED EQUAL...

“Many manufacturers like to over inflate the savings and the cost variances, as is the case with LEDs. It is a hot topic today and yes, LEDs will save you money, but as in many cases, you get what you pay for. LED lighting experts are there to help navigate you through the maze of overrated and lesser quality products because not all LED lighting is created equal.” – Get LEDucated



MISCONCEPTIONS

- ✘ One size fits all – One needs to develop a lighting Master Plan
- ✘ Don't let green turn dark – Photometric analysis for lighting level guarantee
- ✘ LED upgrade = maintenance free streetlight system – Should likely reduce fixture replacement, however; system maintenance is still needed...



NON-UNIFORM LIGHT DISTRIBUTION (PHOTOMETRICS)



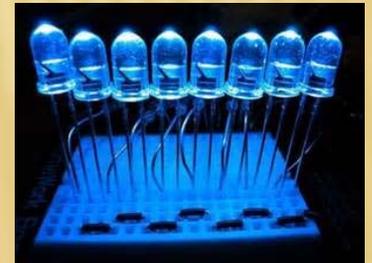
TECHNOLOGY CONTINUES TO MARCH FORWARD...

LED Journal

“The LED lamp retrofit market continues to be a much sought after arena with more and more players entering the market. With an abundance of choices available, it is important to do your research to understand some key parameters of these novel light sources.”

LED's Magazine

“LED component technology continues to march forward in efficacy and in terms of lumen and color maintenance and uniformity while the market is demanding LEDs that specifically meet target applications.”



ROADWAY AND RESIDENTIAL LIGHTS

Roadway

- ✘ We have approximately 959 roadway lights – higher wattage lights
- ✘ Total wattage = approximately 226,088+/- W (average 200+~ watts)
- ✘ Cost: 2010 the units were \$820 each, today approximately \$425 each a reduction in price of 48%

Residential

- ✘ We have approximately 4,079 residential units – lower wattage
- ✘ The residential units average 80+~ watts.
- ✘ Cost: In 2010 the acorn units were approximately \$1060 each, in 2013 they were approximately \$1030 – only a reduction of about 3%



REDUCED PRICES AND INCREASED TECHNOLOGY

- ✘ Capitalize on the reduction in price and increase in technology on the roadway lighting, which utilizes higher wattage
- ✘ This also illustrates that while the rebate is certainly something to take full advantage of, there are other considerations to be taken into account, when prices are being reduced in the 40%+ range.



THE SELECTION PROCESS

The FHWA lighting handbook includes detailed information on a variety of issues associated with roadway lighting, including: light trespass, glare, etc. The report mentions that “Where possible, maintenance personnel should be consulted by those undertaking the roadway lighting design.

In some cases, products with a higher initial purchase cost can significantly reduce operating or maintenance costs over the life of the project.” “The use of high quality products is critical to prolonging the overall operating life of roadway lighting systems.”



SELECTION GUIDELINES FROM THE U.S. DEPARTMENT OF ENERGY

Define the required product functionality and durability requirements and/or limits,

- × Electrical
 - + Input voltage range
 - + Maximum power consumption
 - × Rebate requirements
- × Mechanical
 - + Vibration resistance
 - + Corrosion resistance
- × Warranty
- × And then include product characteristics or “must haves”
- × Designed to mount on ____” pole or horizontal tenon
- × Finish color
- × Luminaire shall not exceed weight
- × Driver: UL listed, 100,000 hours expected life
- × Integral surge protection
- × Serviceable and upgradeable light engine
- × XX year luminaire warranty
- × Minimum XX year finish warranty, etc.



LIGHTING HANDBOOK

“While quality could be overlooked if low price is the primary criterion for product selection, it should always be a key consideration in product selection. In general, focusing on price alone will not deliver best value installations.

In addition to quality, other key considerations when specifying a product include:

Certification

Photometric Performance (for luminaires) – A photometric comparison of luminaires is critical to selecting the best product for a given application.

Durability – Durability is the capability of a product to resist deterioration, damage, and corrosion over time.

Availability – Custom and/or decorative products or products manufactured in small quantities often have long lead times for replacement.

Maintenance Requirements – Maintenance considerations include ease of access for servicing, as well as maintenance frequency and level of service required over the product's anticipated useful life.

Operations Cost”



U.S. Department
of Transportation

**Federal Highway
Administration**

SEATTLE CITY LIGHT

- ✘ A street lighting system of nearly 84,000 street and area lights that used predominately HPS light sources.
- ✘ Seattle developed a list of key goals:
 - + Evaluate the lighting, economic and energy consumption performance
 - + Evaluate the ability for LED products to produce a 40 percent energy savings compared to existing HPS luminaires.
 - + Develop a functional specification (standards) and recommendations for the installation and maintenance of these products.
 - + Identify next steps to increasing energy efficiency of LED lighting.



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