



## RETROFIT PROJECT COST-BENEFIT ANALYSIS

PROJECT	COST (\$ MILLIONS)	ANNUAL SAVINGS		SIMPLE PAYBACK (YEARS)
		ENERGY (KWH)	COSTS (\$)	
<b>Traffic Lights</b> 6,600 lights retrofitted from incandescent to LED	2.98	9,888,132	642,192	4.6
<b>Streetlights, Phase 1</b> 7,300 lights converted	7.8	5,553,177	830,225	9.4
<b>Downtown Lights Retrofit</b> 920 decorative antique-style lights replaced	1.5	410,710	107,118	14
<b>Streetlights, Phase 2</b> 10,600 streetlights converted	7.5	5,428,670	838,795	8.9

### Benefits of Retrofitting

The City of El Paso anticipates significant savings in both energy consumption and expenditures when all planned phases of the project are complete. The city expects to save 21 million kWh and \$2.4 million per year. The average lifespan of the lights is approximately 15 years which will significantly reduce the city's maintenance costs as well. The table above displays costs and savings for each project including the city's 6,600-traffic-light retrofit.

### Challenges Faced and Addressed

The primary challenge confronting the city was an incomplete inventory of the number or type of streetlights in its portfolio. Without this data, the city did not know who owned what lamps, making it difficult to conduct a lighting assessment.<sup>1</sup> Further, absent a valid accounting, the utility was billing the city based on an estimated number of streetlights. To fill this information vacuum, the city hired a contractor to map and classify its streetlight inventory, including each light's height, wattage and owner. Through this process, staff learned that the city had 28,000 streetlights – 3,000 more than what the utility had estimated.

The second challenge was negotiating a new streetlight tariff to reflect the savings from the LEDs. Streetlights in El Paso, as in many cities, are not metered; the city is charged a flat rate based on the wattage of the lamp. A retrofit from a 200-watt, high-pressure sodium or metal halide lamp to a 100-watt LED is a significant reduction in watts per lamp.<sup>2</sup> It has taken considerable time to establish and publish a new rate reflecting this shift in lamp size. Due to the length of the process, the new rate was not in place when the lights were installed.<sup>3</sup> The city had to continue paying the prior rate until El Paso Electric determined a new rate and the Public Utility Commission approved a new rate schedule through a rate case filing.

Upon approval of the new rate, El Paso Electric began applying the LED rate to streetlights for which it had been charging the city at the prior rate. The utility is still in the process of applying the new rate structure to 2,300 of the original 7,300 streetlights. The changeover was delayed, however, in order to confirm ownership of the poles. That issue has now been resolved, and the lower rate continues to be applied to new lights.

<sup>1</sup> In El Paso, either the city or the utility own the streetlights; neither entity owns all of them.

<sup>2</sup> Less electricity consumption by the new LEDs means less power to be generated and used per streetlight. This change should be reflected in a lower rate charged per light.

<sup>3</sup> The prior rate was flat based on lamp size/wattage. New rates average 15-20 percent less than the prior rate.

## A NEW TARIFF IN TOWN

Streetlights typically are not metered. Therefore, charges for electricity consumed by a streetlight largely are calculated based on the wattage of the lamp. This translates into a flat monthly fee assessed per streetlight.

When installing new LED streetlights or replacing high-pressure sodium or metal halide streetlights, it is important to negotiate a new streetlighting service rate reflecting the reduced electricity consumption of the more energy-efficient LEDs.

Learn more about EL Paso's new LED [service rates](#).

### Description of the Retrofit Process

Motivated by the desire to reduce operating costs, as well as to comply with state law, the City of El Paso began the process of implementing a comprehensive, energy-efficient lighting strategy. To manage the program more effectively, the city determined that the best approach would be to contract with an energy service company (ESCO). The ESCO is responsible for providing turn-key retrofitting of the streetlighting as well as energy efficiency upgrades for traffic lights and municipal buildings.

### How El Paso's Retrofit Process Worked

Upon selection of the ESCO, and with the approval of the City Council, city staff and the ESCO proceeded to identify and evaluate prospective projects. Their approach was to assess those projects affording the greatest benefit early on, so that the savings would foster additional efforts going forward. This strategy was termed "*the firstest with the mostest*." The outcome of this assessment was a phased approach that included both streetlight and building retrofits.

Upon finalizing the project plan for Phase 1, the city applied for and obtained funding from [SECO's LoanSTAR](#) program. El Paso is repaying a low-interest loan with the energy cost savings derived from the retrofitting projects.

## STEPS TO RETROFIT PROCESS



Simultaneous with securing the project funding, the city negotiated a lower streetlighting tariff with El Paso Electric. The new rate resulted in a 15-30 percent reduction in the rate charged per light for LEDs versus the mercury vapor and high-pressure sodium lamps previously in use. The city was able to lower its costs further by assuming responsibility for the operation and maintenance of the streetlights. Doing so is saving the city approximately \$30,000 a month.

The city also has been able to develop an additional revenue stream from the old light fixtures. With council approval, the General Services Department held a pre-construction conference and began the resale project. The fixtures are sold at auction through [GovDeals](#) – four fixtures per pallet at \$100 to \$180 per pallet.

Phase 1 of the energy efficiency project spanned about 270 days from start-up through close-out. Subsequent phases followed a similar procedure excluding the ESCO selection and tariff negotiation. The same ESCO will be used for all phases of the project. The newly negotiated rate with El Paso Electric applies to all the streetlight retrofits in each additional phase. The rate will be adjusted as old lamps are replaced with LEDs.

### Ongoing Efforts

In early June 2014, the City Council authorized spending \$7.5 million to replace another 10,600 streetlights. This project will begin in August of 2014 and is expected to last 12-14 months. Upon completion, a total of 18,000 of the city's 28,000 streetlights will have been retrofitted.