



# Comparative Energy Analysis Report

*Prepared for*

**City Of Thousand Oaks**

*Prepared by*

**The Energy Network**

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## 1. Overview

This report is intended to provide a framework for City of Thousand Oaks to identify inefficient facilities and prioritize further investigation and energy efficiency retrofit work. This analysis uses only total floor area and energy billing data provided by the City of Thousand Oaks to provide an overview of energy use in City facilities and to help identify individual locations with the potential for energy efficiency improvements. Many factors affect the energy use in different facilities, including age, type of heating, ventilation, air conditioning, and lighting equipment, facility occupancy and hours, plug loads, and climate. Once individual facilities with the greatest potential for energy savings are identified, a more detailed screening of those facilities can be performed to identify the specific sources of the inefficiencies. Further analysis can identify inefficient equipment, malfunctioning equipment, equipment not operating as designed, or suboptimal operational procedures.

## 2. City of Thousand Oaks City Facilities Summary

As identified in **Table 1**, this report presents an analysis of energy consumption data for 22 facilities or other asset types (such as streetlights) over the period August 31, 2012 to August 31, 2013. Within this portfolio of the City's properties, electricity data is available for 22 facilities and gas data is available for 10 facilities. Together these facilities account for 98% of the electricity usage data and 100% of the gas usage data available for the analysis period. The approximate annual energy cost for all accounts included in this analysis is \$2,704,285 per year. Based on the available utility data, the average electricity cost is \$0.15/kWh and the average gas cost is \$0.57/therm.

The facilities in City of Thousand Oaks' portfolio contain about 3,500,000 square feet of floor space (excluding facilities with no available information). The facility sizes range from 3,397 to 2,613,600 square feet. In the figures presented in the section "Annual Energy Costs and Usage", annual energy consumption and costs are normalized for square footage in buildings where floor area data are available. Annual energy usage or cost values that have been normalized for floor area are called "intensity" values. Since the facilities included in the City of Thousand Oaks' portfolio represent a variety of building types and space uses, it may not be feasible or desirable to equalize the energy usage or cost intensity across all facilities. **Figure 1** shows the highest, lowest, and median energy cost intensities for the office facilities in the City's portfolio.

Additional details on methodology are presented in the section "Notes on Methodology."

**Table 1 – Energy Comparative Energy Analysis Report Total Energy Cost Summary – City of Thousand Oaks – August 31, 2012- August 31, 2013 (Sorted by Annual Energy Cost)**

Facility Name	Annual Electricity Use (kWh/yr)	Annual Electricity Cost (\$/yr)	Average Electricity Rate (\$/kWh)	Annual Gas Use (therm/yr)	Annual Gas Cost (\$/yr)	Average Gas Rate (\$/therm)	Total Annual Energy Cost (\$/yr)	Total Annual Energy Cost Intensity (\$/sq.ft./yr)
Streetlight LS-1	2,434,760	\$962,280	\$0.40				\$962,280	
Hill Canyon Treatment Plant	1,881,261	\$360,885	\$0.19	27,502	\$19,713	\$0.72	\$380,598	\$0.15
Pump & Irrigation	2,044,322	\$259,522	\$0.13				\$259,522	
Municipal Service Center	571,828	\$71,072	\$0.12	275,139	\$135,551	\$0.49	\$206,623	\$8.26
Civic Arts Plaza	1,781,916	\$127,182	\$0.07	32,379	\$21,514	\$0.66	\$148,697	\$1.22
Los Robles Golf Course	891,324	\$92,272	\$0.10	17,383	\$12,942	\$0.74	\$105,214	\$4.76
City Hall	1,632,128	\$104,706	\$0.06				\$104,706	\$1.20
Thousand Oaks Library	1,200,695	\$90,653	\$0.08	5,864	\$5,173	\$0.88	\$95,825	\$1.28
Traffic Control	511,269	\$90,576	\$0.18				\$90,576	
Erbes Rd Pump Station	959,859	\$84,139	\$0.09				\$84,139	
Streetlight LS-2	577,729	\$51,620	\$0.09				\$51,620	
CRPD Parks and Rec Office	415,176	\$33,149	\$0.08	15,887	\$11,756	\$0.74	\$44,904	\$2.12
National Park Service HQ	393,427	\$36,521	\$0.09	9,319	\$7,195	\$0.77	\$43,716	\$1.34
Newbury Park Library	339,531	\$33,592	\$0.10	2,416	\$2,291	\$0.95	\$35,882	\$1.13
Goebel Adult Center	394,344	\$26,805	\$0.07	10,503	\$8,102	\$0.77	\$34,907	\$1.87
Teen Center	223,842	\$18,738	\$0.08	6,299	\$5,199	\$0.83	\$23,937	\$0.10
Transportation Center	124,412	\$9,884	\$0.08				\$9,884	\$2.91
Civic Arts Plaza Parking	99,978	\$9,797	\$0.10				\$9,797	\$0.04
<b>Total</b>	16,614,506	\$2,474,849		402,690	\$229,436		\$2,704,285	
<b>% of Total</b>		<b>92% of Total Energy Costs</b>			<b>8% of Total Energy Costs</b>		<b>100% of Total Energy Costs</b>	

**Figure 1 - Annual Energy Costs and Cost Intensities for City of Thousand Oaks City Office Facilities**

	\$2.12	<b>City of Thousand Oaks Highest Cost Intensity</b> (CRPD Parks and Rec Office)	\$44,904	
\$/sq.ft.	\$1.55	<b>City of Thousand Oaks Median Cost Intensity</b>	\$43,3416*	\$/facility
	\$1.20	<b>City of Thousand Oaks Lowest Cost Intensity</b> (City Hall)	\$104,706	

\*Calculated as the product of the median energy cost intensity and median floor area

### 3. Annual Energy Costs and Usage in City of Thousand Oaks Facilities

Figures 2 – 4 provide graphical comparisons of the energy cost, cost intensity, energy use, and energy use intensity of the facilities in this analysis. Figures 2.1 and 2.2 show the facilities with the highest energy costs and cost intensities including both gas and electricity data. Figures 3.1 – 3.8 show the facilities with the highest electricity costs; highest gas costs; highest electricity cost intensities; highest gas cost intensities; highest electricity usage; highest gas usage; highest electricity usage intensities; and highest gas usage intensities, respectively. Table of Figures on p. ii above provides a list of all figures in this report. Figures 4.1 and 4.2 show the electricity costs and usage for distributed assets, such as streetlights and traffic signals. Figure 2.3 shows the total energy costs of distributed assets.

Figure 2.1 – Facilities with Highest Total Annual Energy Cost (\$)

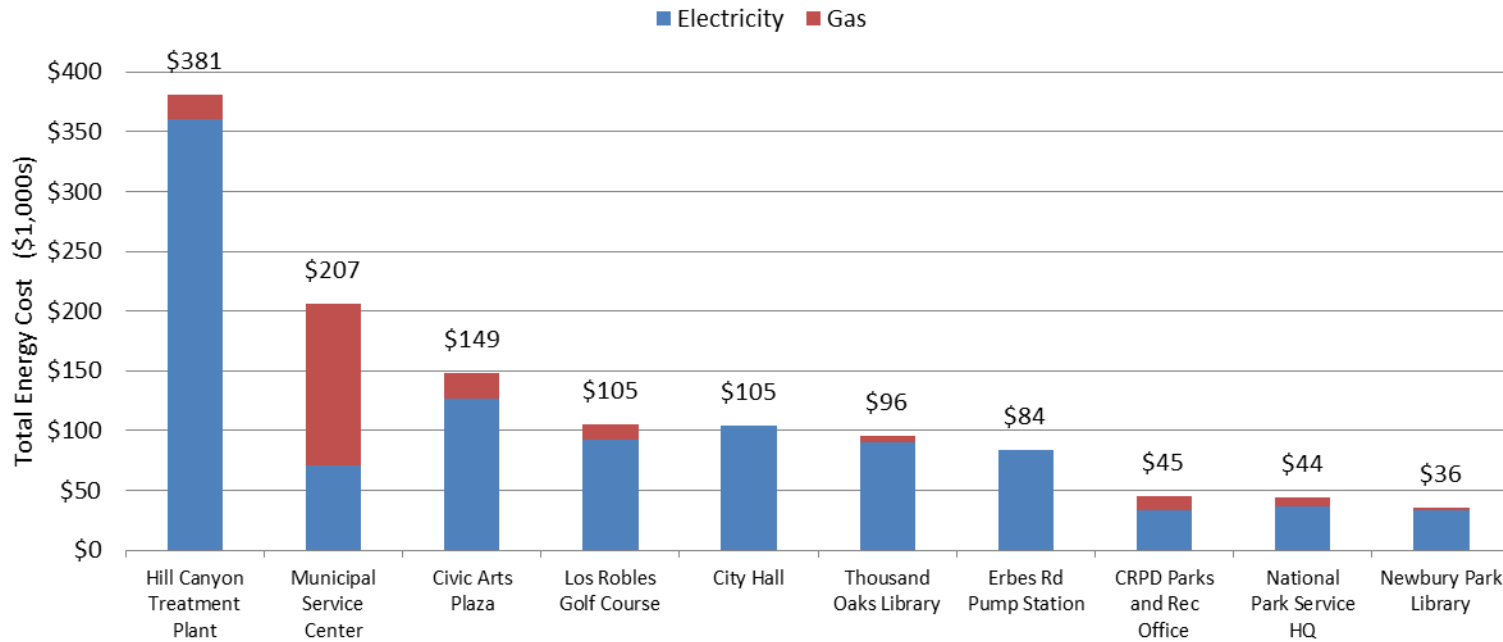




Figure 2.2 – Facilities with Highest Annual Energy Cost Intensity (\$/sq.ft.)

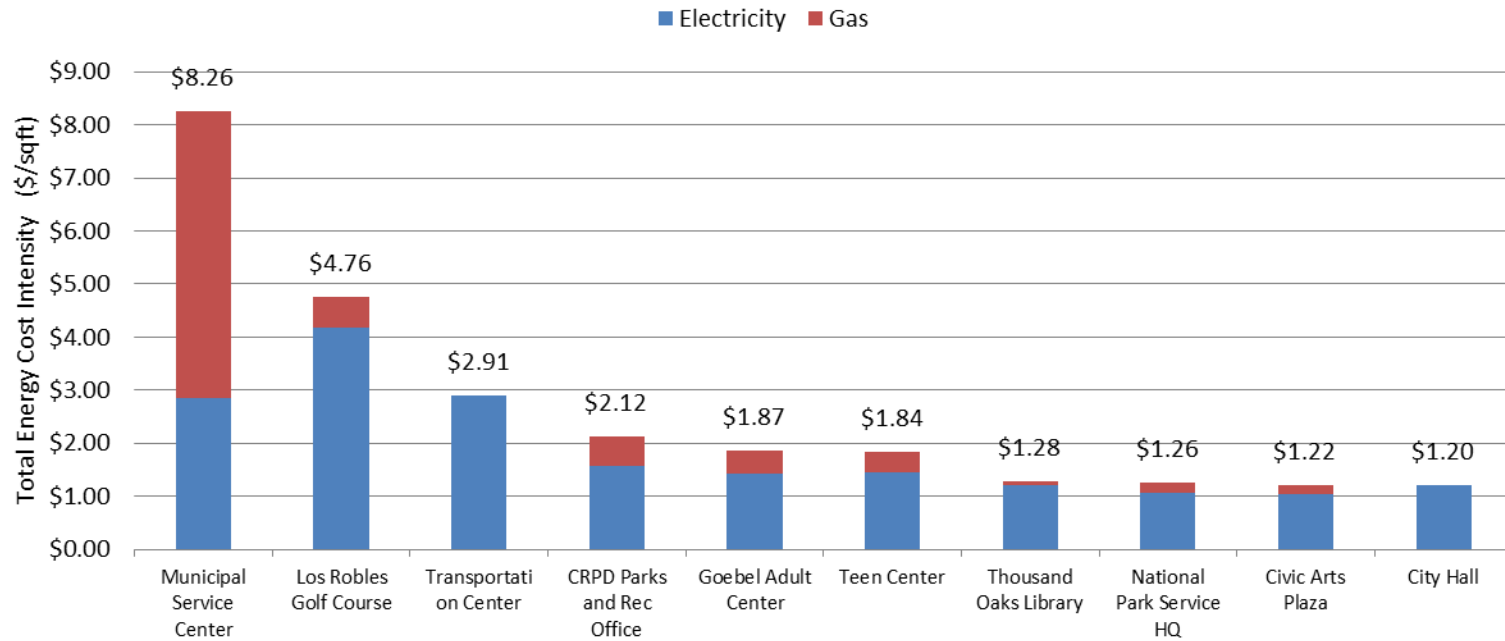


Figure 3.1 – Facilities with Highest Total Annual Electricity Cost (\$)

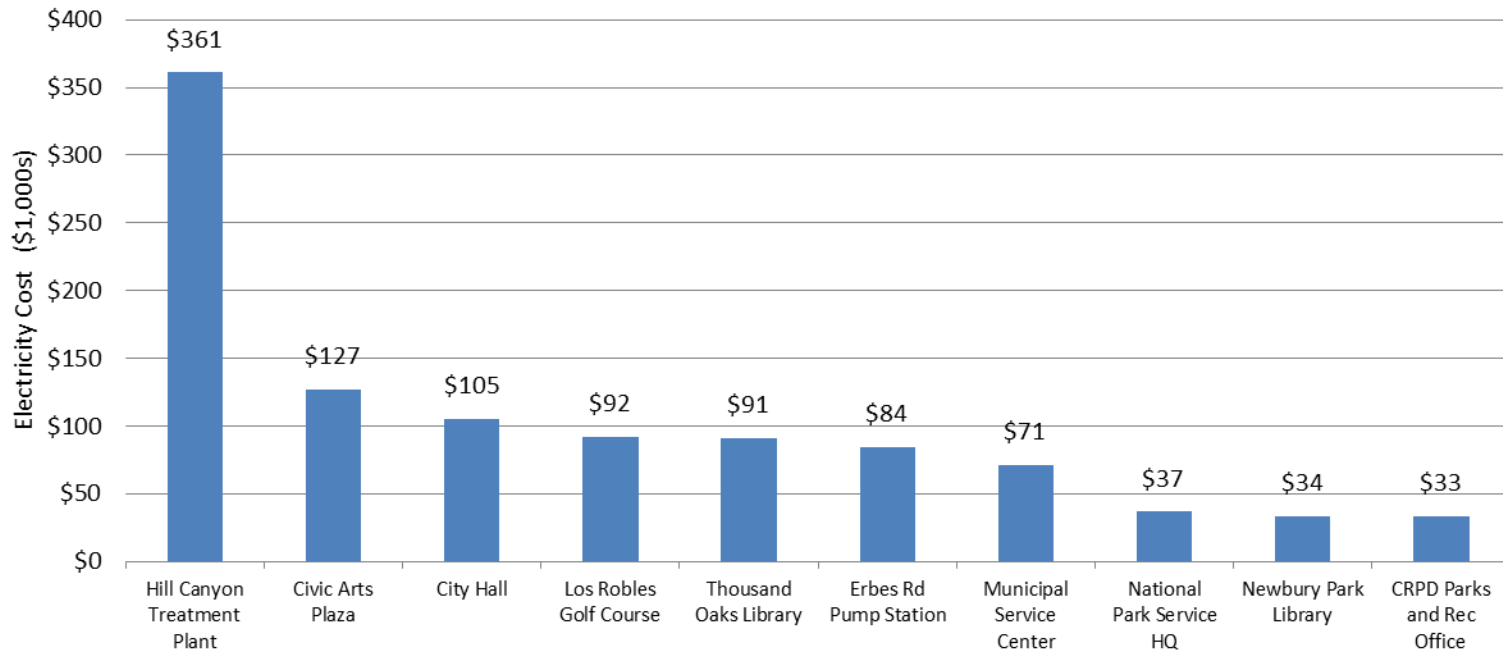


Figure 3.2 – Facilities with Highest Total Annual Gas Cost (\$)

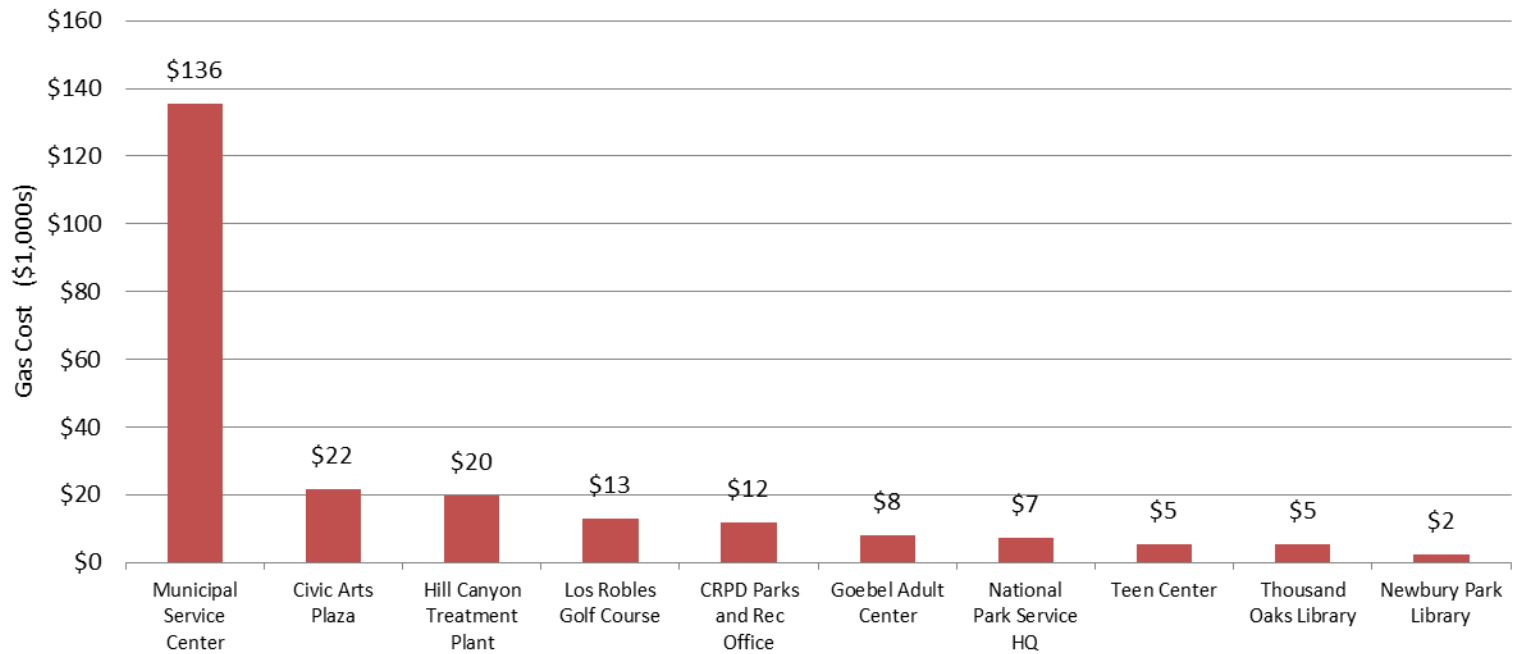


Figure 3.3 – Facilities with Highest Annual Electricity Cost Intensity (\$/sq.ft.)

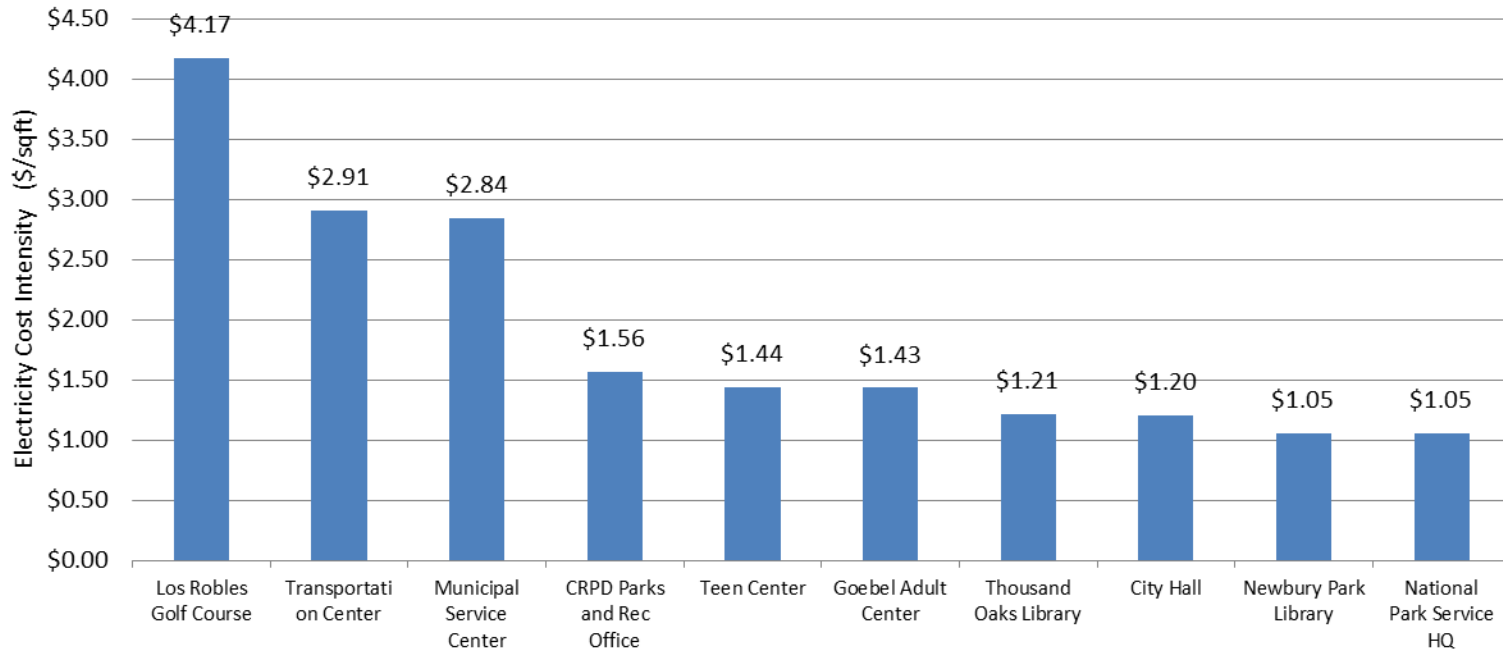


Figure 3.4 – Facilities with Highest Annual Gas Cost Intensity (\$/sq.ft.)

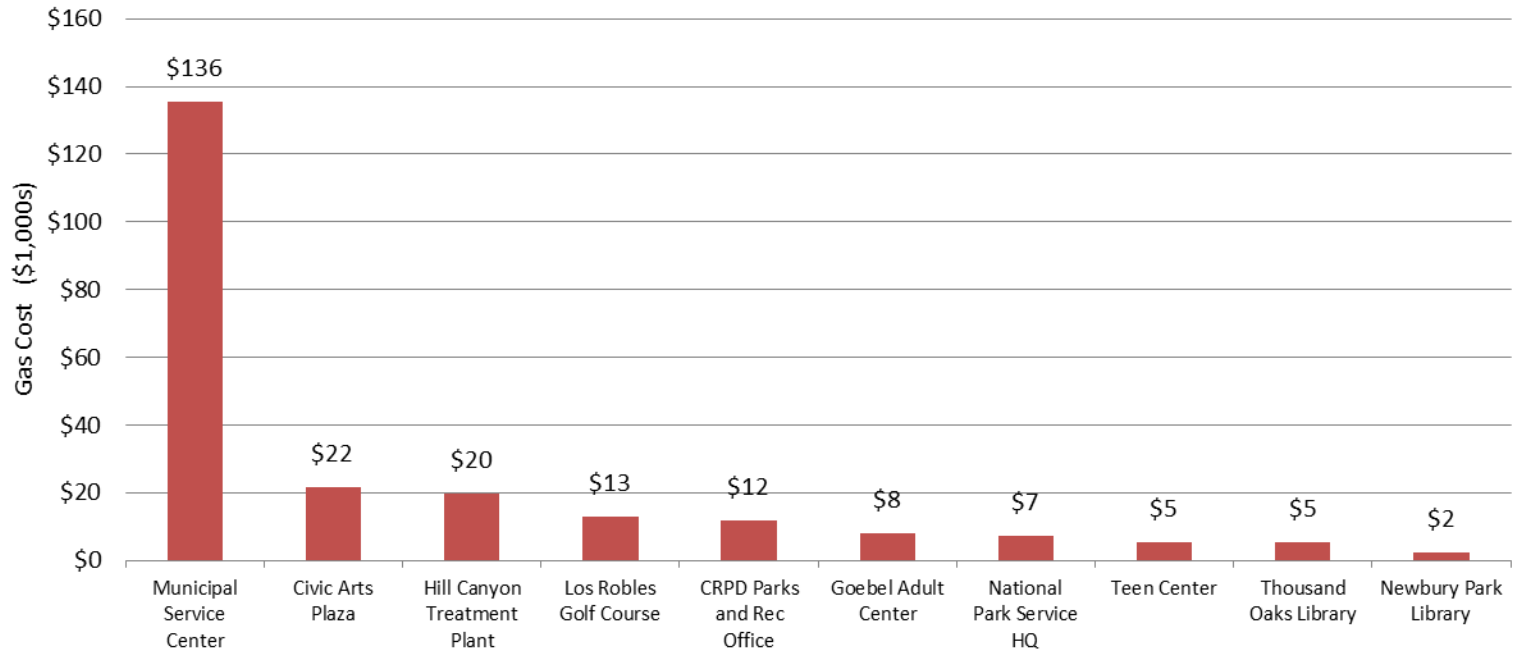


Figure 3.5 – Facilities with Highest Annual Electricity Use (kWh)

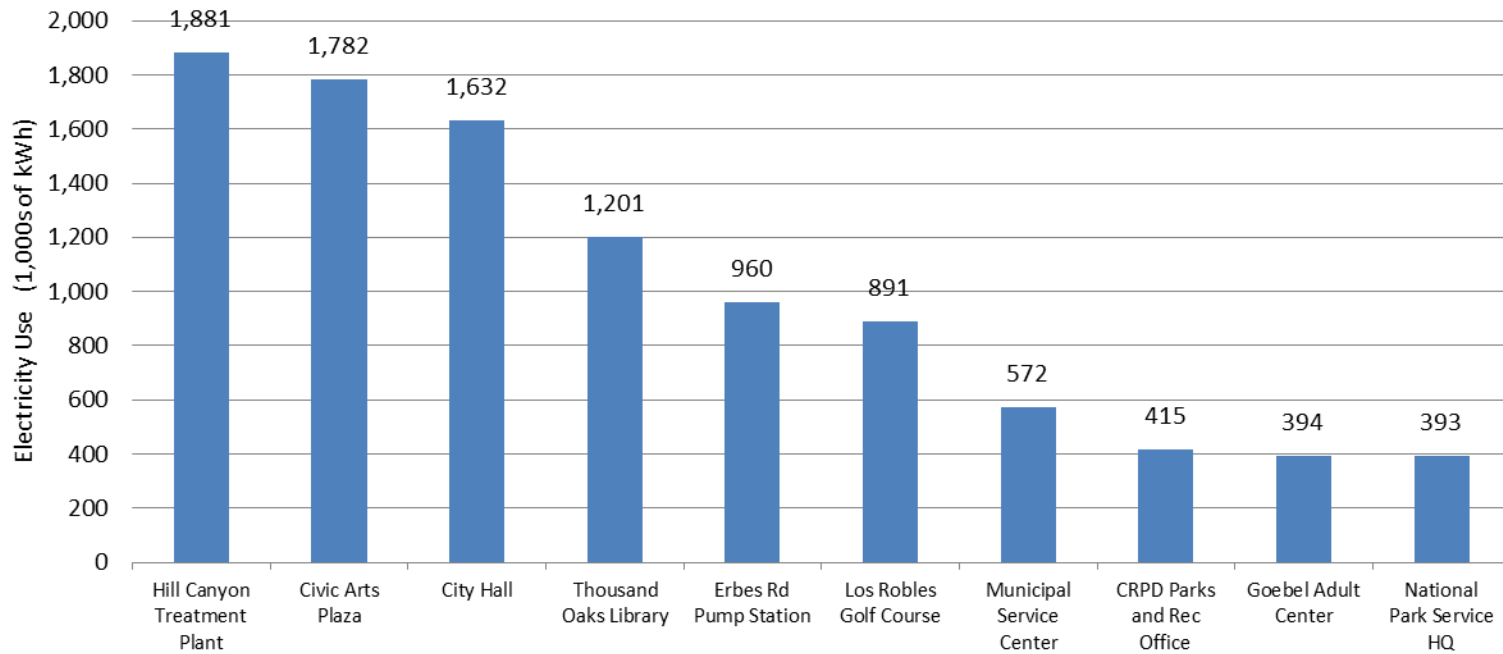


Figure 3.6 – Facilities with Highest Total Annual Gas Use (therms)

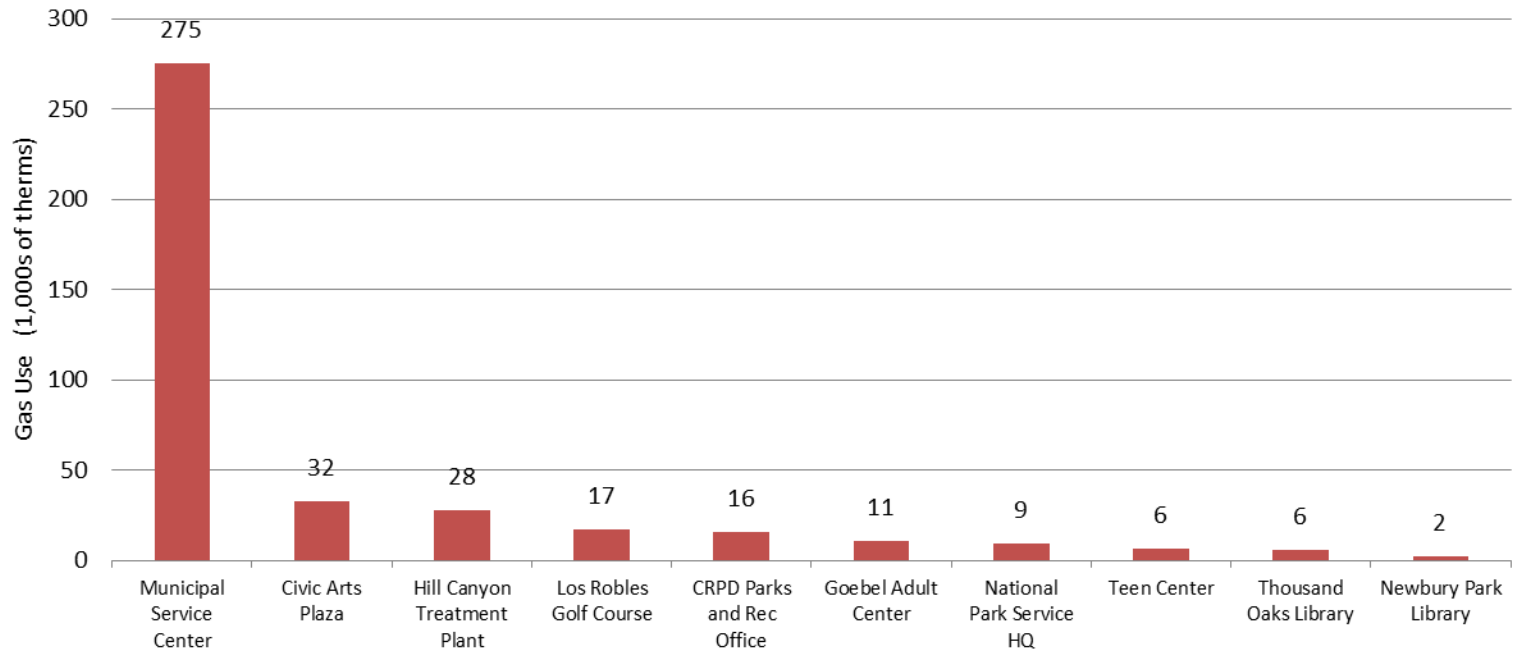


Figure 3.7 – Facilities with Highest Annual Electricity Use Intensity (kWh/sq.ft.)

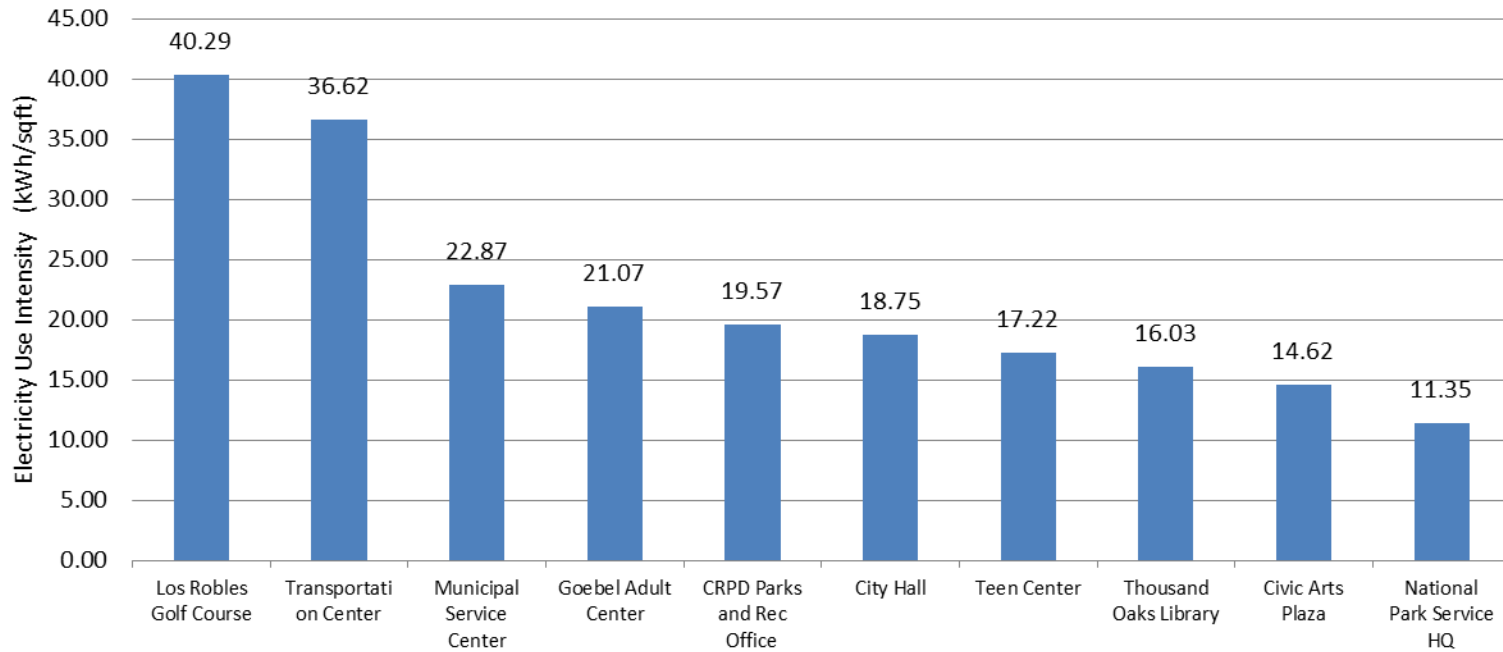




Figure 3.8 – Facilities with Highest Annual Gas Use Intensity (therms/sq.ft.)

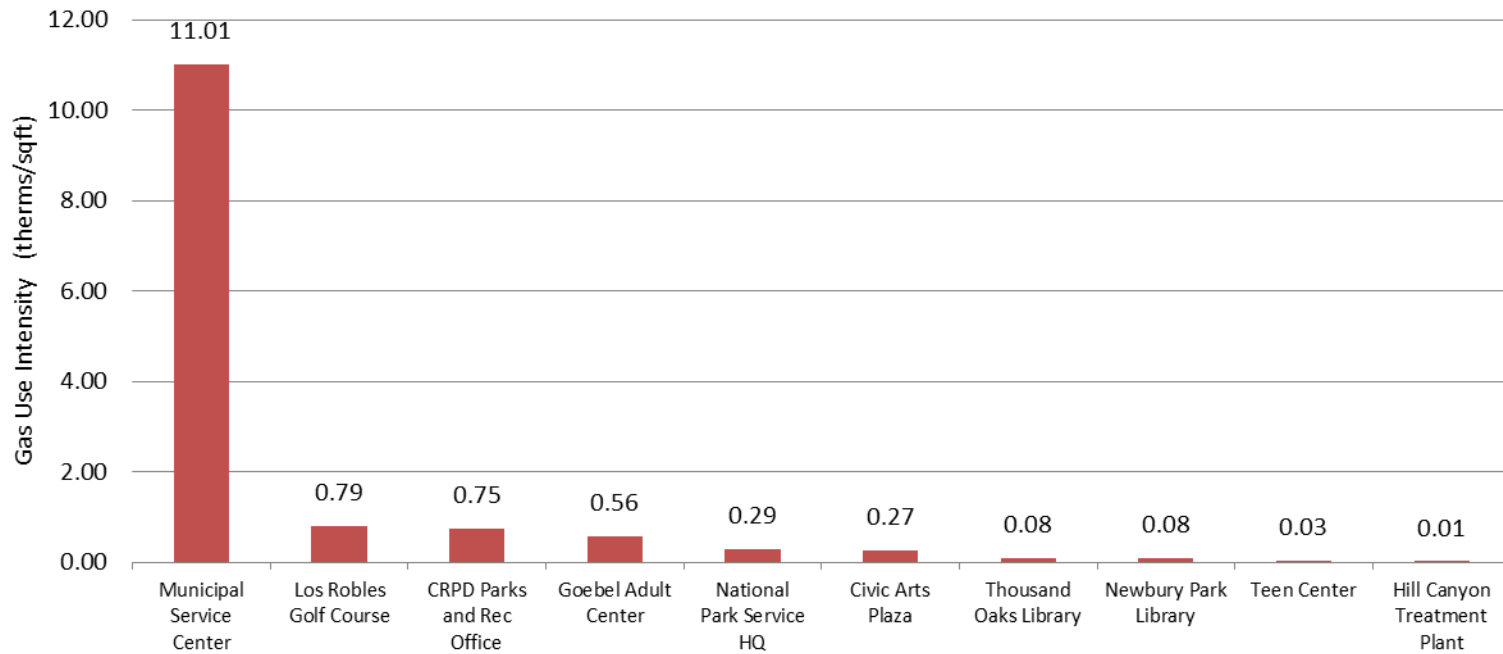


Figure 4.1 – Distributed Assets – Total Annual Electricity Cost (\$)

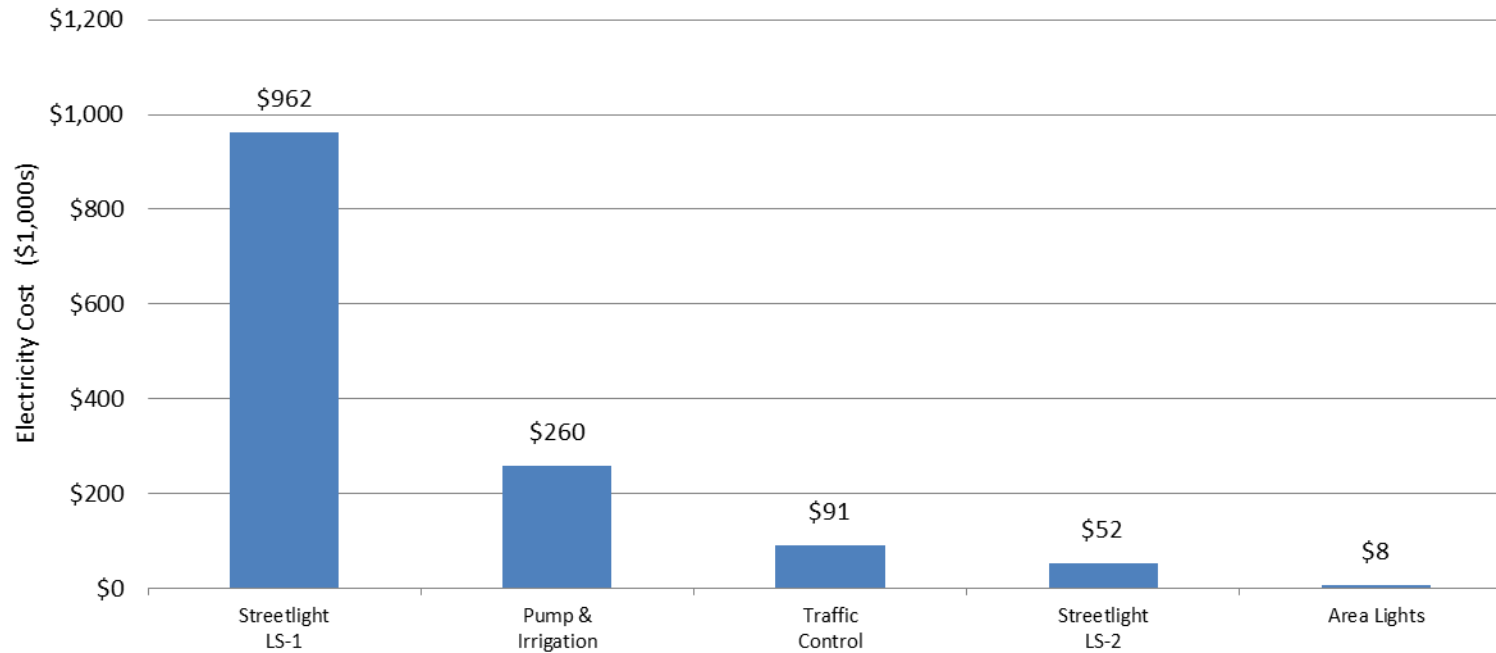
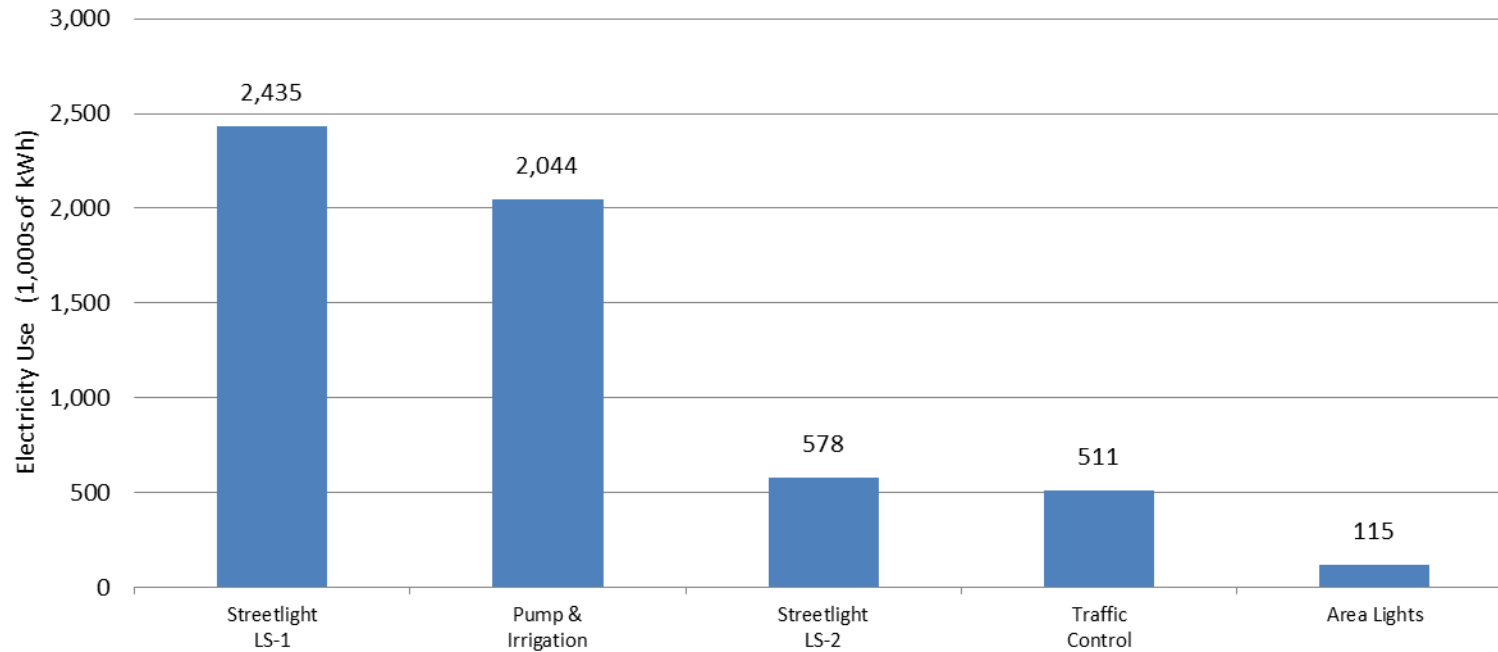


Figure 4.2 – Distributed Assets – Total Annual Energy Use (kWh)



#### 4. Notes on Methodology

- All electricity and gas results were based on usage during period August 31, 2012 – August 31, 2013.
- Energy usage and cost data used in this analysis were derived from utility billing data provided by City staff.
- Monthly usage data from individual meters were assigned to the City facilities using a combination of matching information provided by City staff and supplemental research.
- Highest, median and lowest energy cost intensities in Figure 1 were calculated excluding facilities with low floor areas (typically less than 1,000 square feet) or abnormally high or low energy intensities.
- Facility names, types, and floor area information for most facilities were provided by City staff. Errors in floor area information can have a significant effect on energy intensity calculations. It is recommended that all floor area information be verified as part of any closer investigation of facilities analyzed in this report.
- In some cases, multiple meters were associated with a single facility or asset type. For such facilities, to generate estimates of facility-wide energy use and energy intensity, energy usage and cost values were aggregating by summing the average daily energy usage and cost values for each day in the analysis period.
- Gas usage at Civic Center Plaza is not metered separately for City Hall, so gas usage was assumed to be proportional to the share of the total floor area.
- The electric meters matched to specific facilities included in this analysis accounted for 98.1% of electricity usage and 95.3% of electricity costs during the analysis period.
- The gas meters matched to specific facilities included in this analysis accounted for approximately 100% of gas usage and 100% of gas costs during the analysis period.
- **Table 2** indicates the data types available for each facility. One known facility could not be matched to electricity or gas usage data.
  - Child Care Center at 110 Conejo School Rd.

**Table 2 – Facilities Included in Analysis**

Facility Name	Street	Electricity Data Interval	Gas Data Interval	Facility Type	Area (sq.ft.)
Area Lights		monthly	unavailable	Distributed	
Cameron Center	288 W. Greenmeadow	monthly	unavailable	Misc	4,530
Child Care Center	110 Conejo School Rd.	unavailable	unavailable	Misc	8,228
City Hall	2100 E Thousand Oaks Blvd	monthly	unavailable	Office	87,036
Civic Arts Plaza	2100 E Thousand Oaks Blvd	monthly	monthly	Office	121,884
Civic Arts Plaza Parking	2100 E Thousand Oaks Blvd	monthly	unavailable	Parking	231,049
CRPD Parks and Rec Office	403 W Hillcrest Drive	monthly	monthly	Office	21,220
Domestic Areas		monthly	unavailable	Domestic	
Erbes Rd Pump Station	2237 Peak Place	monthly	unavailable	Pump Station	
Goebel Adult Center	1385 E Janss Road	monthly	monthly	Office	18,717
Hill Canyon Treatment Plant	9600 Santa Rosa Road	monthly	monthly	Misc	2,613,600
Janss House	482 W. Greenmeadow	monthly	unavailable	Misc	6,081
Los Robles Golf Course	299 S Moorpark Road	monthly	monthly	Golf	22,122
Municipal Service Center	1993 Rancho Conejo Blvd	monthly	monthly	Misc	25,000
National Park Service HQ	401 W Hillcrest Drive	monthly	monthly	Office	32,649
Newbury Park Library	2331 Borchard Rd	monthly	monthly	Library	31,852
Pump & Irrigation		monthly	unavailable	Distributed	
Streetlight LS-1		monthly	unavailable	Distributed	
Streetlight LS-2		monthly	unavailable	Distributed	
Teen Center	1375 E Janss Road	monthly	monthly	Office	13,000
Thousand Oaks Library	1401 E Janss Road	monthly	monthly	Library	74,919
Traffic Control		monthly	unavailable	Distributed	
Transportation Center	265 S Rancho Road	monthly	unavailable	Misc	3,397