LEAGUE OF OREGON CITIES

STREET AND TRAFFIC LIGHTING

SURVEY OF OREGON CITIES

FALL 2010

Published by the League of Oregon Cities

TABLE OF CONTENTS

DISCLAIMER: This is a voluntary survey conducted by the League of Oregon Cities. The responses do not constitute a statistically significant or scientifically valid data set. This survey is for informational purposes only. Based on this data, no legitimate conclusions can be drawn about any city that did not respond to the survey.

Executive Summary

Many new technologies are available for street and traffic lighting, giving cities more options than ever before for finding safe and cost-effective options. In fall of 2010 the League of Oregon Cities conducted a survey about street and traffic lighting. Of Oregon's 242 cities, 90 cities, or 37 percent of all cities, completed the survey. The responding cities are home to 78 percent of Oregon's city residents, and 55 percent of all Oregonians.

Today, many cities are employing new lighting technologies to reduce energy and maintenance costs, and this comprehensive survey details the technology being used to light Oregon's cities.

Street Lights

Streetlight ownership in most cities surveyed is divided amongst multiple entities, including cities, utility companies and private entities. However, the preponderance of streetlights in most responding cities is maintained by an electric utility.

Given the economic downturn, cities across the country are considering and undertaking various methods to reduce costs related to energy and infrastructure maintenance. In Oregon, six cities (7 percent of respondents) chose to reduce street lighting in some way to reduce electricity costs, including Myrtle Creek, Bandon and Portland.

The vast majority of Oregon cities (88 percent) charge developers for costs associated with lighting newly developed areas in the city.

The survey results show that most cities use some form of high intensity discharge lighting (HID), though many cities employ a variety of lighting technologies. A majority of cities have some form of HID lighting: high pressure sodium (83 percent), followed by mercury vapor (46 percent) and metal halide (26 percent). Light-emitting diodes (LEDs) are used by 13 percent of responding cities for street lighting, while 10 percent use some magnetic induction and 14 percent of cities use some other technology. While there are many ways to evaluate the advantages and disadvantages of each, due to the vast differences in technology it is only possible to compare these options in a general sense. The difficulty of comparing apples to oranges requires cities to evaluate options based on their unique situations and lighting needs.

Traffic Lights

Fifty-six percent of responding cities in Oregon do not own any traffic lights. Of the 40 responding cities that own traffic lights, 26 cities (65 percent of respondents) report replacing some portion of their incandescent traffic lights with LED bulbs.

Among cities that replaced incandescent traffic bulbs with LED, 88 percent saw a reduction in electricity cost and 85 percent saw a reduction in maintenance cost.

Introduction

In fall of 2010 the League of Oregon Cities conducted a survey about street and traffic lighting. Street and traffic light technology has changed rapidly since the League of Oregon Cities conducted a survey on this topic in 2004.[1] Today, many cities are employing new lighting technology to reduce energy and maintenance costs. This report shares comprehensive survey results and details the technology being used to light Oregon's cities.

The purpose of this report is to provide an overview of the new technologies available and how these technologies are or are not being used by Oregon cities. This report presents survey results for each of the following areas: budget, ownership, rental information, maintenance, cost-saving measures, technology, and LED. Survey information is supplemented by interview data and recent articles on street and traffic lighting. A complete list of questions and responses are available in the appendices.

Survey Participation

Of Oregon's 242 cities, 90 cities, or 37 percent of all cities, completed the survey. Survey response rates increased with city population, as only 24 percent of cities with populations less than 1,000 completed the survey (20 out of 82), whereas 78 percent of cities with populations over 20,000 completed the survey (21 out of 27). Many of Oregon's smaller cities lack street and/or traffic lights, and many traffic lights in smaller cities are controlled by the Oregon Department of Transportation.
Despite the relatively low rate of participation amongst cities, the responding cities are home to 2,086,480, or 78 percent of Oregon's city residents, and 55 percent of all Oregonians.

City Population[2]	# of Responses	% of Total Responses	% of Cities Responded
1 -1,000	20	22%	24%
1,001 -2,500	17	19%	30%
2,501 -5,000	9	10%	31%
5,001 -10,000	13	14%	50%
10,001 -20,000	10	11%	48%
Over 20,000	21	23%	78%

[1] Note: Due to the significant differences between the 2004 survey and this one, as well as the different cities that

[2] SOURCE: Portland State University; Population Research Center; "2009 Oregon Population Report." This is the most recent certified population available at the time of the survey.

Street Lights

Ownership

Streetlight ownership in most of the cities surveyed is divided amongst several entities. Seventy-one percent of cities report owning some or all of their street lights, with 21 percent owning all. Sixty-eight percent of cities have lights owned by utilities, and 7 percent have streetlights owned by other government entities. Twelve percent reported having streetlights that are owned by private parties.

Owner	City	Utilities	Other Gov. Entities	Private Party
% of Cities with some streetlights owned by:	71%	68%	7%	12%

Note: Percentages do not equal 100 because street lights in many cities are owned by multiple entities.

Maintenance

The majority of streetlights in responding cities are, at least in part, maintained by the electric utility. As a result, many cities may not have much decision-making power over the type of lighting technology used because the city is not directly handling operations and maintenance. However, more than half of cities report maintaining some portion of the street lights with their own city work crews.

% of Cities with Some Street Lights Maintained by:			
City Crews	**Electric Utility**	**Private Party**	**Other Government Entity**
52%	81%	11%	6%

Note: Percentages do not equal 100 because many cities have lights maintained by multiple entities.

Budget and Funding Sources

General fund and state highway fund revenues pay for the majority of street lighting operations in Oregon cities. Cities answered this question, "How are your streetlight costs funded?" in two different ways: by city fund (general fund, street fund), and by revenue source (property tax, gas tax, street lighting fee). Given the two different types of responses, these data do not lend themselves to further statistical analysis, but are nonetheless useful to understand the range of situations in Oregon cities. The full table of responses can be found in Appendix A.

Cost Recovery

Given the economic downturn, cities across the country are considering and undertaking various methods to recover costs related to energy and infrastructure. In Oregon, six cities (7 percent) responded by reducing street lighting to reduce electricity costs. The City of Myrtle Creek, for example, chose to turn out 89 lights in order to save money on electricity cost. The City chose to extinguish non-essential lights, such as ones in the middle of a block or cul-de-sac while preserving all lights that have an impact on safety. It did this in June 2010 for a projected savings of approximately $12,000.[3] Myrtle Creek has given homeowners and businesses the option of "adopting" street lights in order to keep the street lights operating. The property owners, sometimes entire neighborhoods, agree to pay the cost of maintenance. The City estimates this cost to about $15 per light.

The City of Portland has not actively turned out any street lights but rather is not replacing some lights when they stop working and is reducing the wattage used in others. The City still gains approximately 1,000 new lights per year from new property developments, but developers and home owner associations are entirely responsible for handling the costs associated with the new lighting.[4]

The City of Bandon has another way of addressing electricity costs. In mid-block locations of new developments, street lights will only be installed upon unanimous agreement of affected residents, with all costs paid by the individual or neighborhood requesting the installation. This not only reduces expenses for the provider but also for the residents who often opt against the additional street lights in their neighborhood.

The vast majority of Oregon cities (88 percent) charge developers for the costs associated with lighting newly developed areas in the city. While not all cities charge developers with the full cost of equipment, installation, operation, and maintenance, it is clear that most Oregon cities recover some infrastructure costs caused by development in the form of fees or system development charges.

Technology Used for Street Lighting

The survey results show that the most common street lighting type is high intensity discharge (HID). The majority use high pressure sodium (HPS) (83 percent), followed by mercury vapor (46 percent) and metal halide (26 percent), all of which are part of the HID family of light generation.[5] HID lighting is more compact and powerful than incandescent lighting and has therefore replaced the latter as the current technology of choice. Light emitting diode, or LED, is used by 13 percent of responding cities for street lighting. LED is part of the family or umbrella known as solid state lighting. Anecdotal information indicates that incandescent and fluorescent lighting are becoming fairly rare in municipal lighting, a trend which is also reflected in this survey of Oregon cities.

---

[3] News Review Today. "M.C. to try street light adoption program." June 20, 2010. Accessed November 8, 2010 at: http://www.nrtoday.com/article/20100620/NEWS/100619786/1001&parentprofile=1055.

[4] Rich Johnson, Transportation Operations Manager, City of Portland. Phone Interview. November 1, 2010.

[5] U.S. Department of Energy (2010). "High-Pressure Sodium Lamps". Accessed November 8, 2010 at: http://www.energysavers.gov/your_home/lighting_daylighting/index.cfm/mytopic=12110

	Types of Street Light Technology Used					
	High Intensity Discharge			Light Emitting Diode (LED)	Magnetic Induction	Other
	Metal Halide	Mercury Vapor	High Pressure Sodium			
% of cities using this type	26%	46%	83%	13%	10%	14%

Ten percent of responding cities used magnetic induction lighting, which is a newer technology than HPS but older than LED. The City of Portland has been using induction lighting for twelve years with significant gains in energy efficiency. By changing to induction lighting for a test group of street lights, Portland has been able to consume less energy but produce the same amount of visible light in a brighter white hue.[6] The primary benefit of induction lighting is its exceptionally long useful life – rated at 100,000 hours. In the City of Portland's case, only one light bulb has burnt out in the twelve years since the City began testing. Such long-lasting performance would be completely out of the question when using incandescent bulbs. This anecdote is interesting because information about induction lighting technology does not seem to be readily available to the public, and LED lights often receive most of the media attention. Induction lighting may not be receiving its fair share of publicity given its success in energy efficiency and impressively long useful life.

To understand how these technologies differ, it is helpful to know some of the terminology used in the field. For example, it is easy to confuse the ratings of watts versus lumens. Wattage refers to the energy consumed, whereas lumens are a measurement of visible light produced.[7] Similarly, while light output and lamp life are both components of energy efficiency, they are separate measurements yielding different results for each type of technology. Another important indicator of lighting technology is color rendering. Color rendering is a measure of how well light sources render the colors of objects, materials, and skin tones compared to natural sunlight.[8] Lamp life refers to the length of time that the bulb functions before needing to be replaced.

[6] Rich Johnson, Transportation Operations Manager, City of Portland. Phone Interview. November 1, 2010.
[7] National Physical Laboratory (2010). "Lighting Now Labeled in Lumens." Accessed November 22, 2010 at: http://www.npl.co.uk/news/lighting-now-labelled-in-lumens.
[8] U.S. Department of Energy (2010). "How is Color Rendering Index Measured?". Accessed December 17, 2010 at: http://www1.eere.energy.gov/buildings/ssl/measuring_cri.html.

Lighting Technology Comparison*				
	Incandescent	HPS	LED	Mag. Induction
Light Output	Low	High	High	High
Energy Consumption	High	Low	Low	Low
Lamp Life	Short	Average	Long	Long
Color Rendering[9]	Good	Fair	Varies	Good

*Note: This information is included to provide a general introduction to available types and is approximate in nature. These technologies are vastly different and should not be evaluated solely based on this information.

Support for New Technology Testing

The U.S. Department of Energy has sponsored a Municipal Solid-State Street Lighting Consortium. According to the Department of Energy:

Current Participants Representing Oregon
Banks
Corvallis
Portland
Springfield
Eugene Water and Electric Board
Portland General Electric
Tillamook People's Utility District

"Numerous cities and organizations around the nation are announcing plans to conduct large scale retrofits/comparisons of LED street and area lighting products with their conventional street lights…the Consortium represents a coordinated effort among interested cities, power providers, government entities and others to minimize duplication of effort and spread associated risk across multiple locations."[1]

Interested Oregon cities may want to consider joining the consortium to share their own experience or to gain information about projects. The Department of Energy Consortium website also includes informational resources about lighting specifications and technology fact sheets.

Additional information about the Municipal Solid-State Street Lighting Consortium can be found at: http://www1.eere.energy.gov/buildings/ssl/consortium.html

[9] U.S. Department of Energy (2010). "Overview of Color Rendering Index and LEDs." Accessed December 17, 2010 at: http://www1.eere.energy.gov/buildings/ssl/cri_overview.html.

Traffic Lights

Ownership

Fifty cities that responded to the survey (56 percent of respondents) do not own any traffic lights. Therefore, the traffic lighting portion of the survey applied to a smaller sample of cities.

City Population	# of responding cities of this population that own traffic signals	% of responding cities of this size that own traffic signals
1,000 or less	3	15%
1,001-2,500	3	18%
2,501-5,000	2	22%
5,001-10,000	5	38%
10,001-20,000	7	70%
Over 20,000	20	95%

Bulb Replacement and LED Usage

Of the 40 responding cities that own traffic lights, 65 percent of those have replaced some portion of their incandescent traffic lights with LED bulbs. The following table shows the prevalence of LED usage in terms of population.

City Population	% of responding cities that use LED traffic lights
1 -1,000	0%
1,001 -2,500	0%
2,501 -5,000	0%
5,001 -10,000	12%
10,001 -20,000	12%
Over 20,000	77%

Based on the responses to this survey, more than three-quarters of cities with populations over 20,000 have replaced some of their traffic lights with LED lighting technology. According to the responding cities, 87 percent of all city residents in Oregon reside in cities with LED traffic lights. This is a significant step toward energy efficiency in Oregon cities.

Electricity and Maintenance Cost Reductions

Among cities that replaced incandescent traffic bulbs with LED, 88 percent saw a reduction in electricity cost and 85 percent saw a reduction in maintenance cost. The cities experiencing over 50 percent reductions in electricity and maintenance costs are shown in the tables below. The average cost reduction for responding cities was 40 percent for electricity and approximately 34 percent for

maintenance. This average does not include those cities that have not yet determined their cost savings from replacement.

City	% Decrease in Electricity Cost
Beaverton	60%
Corvallis	60%
Eugene	85%
Grants Pass	80%
Gresham	50%
Hillsboro	75%
Portland	50-60%
Wilsonville	60%

City	% Decrease in Maintenance Cost
Grants Pass	80%
Gresham	50%
Klamath falls	80%
Lake Oswego	50%
Wilsonville	50%

Conclusion

Street and traffic lighting technology has changed and improved since the League of Oregon Cities 2004 survey on the subject. Although not a complete survey of all Oregon cities, the survey data presented in this report offer detailed information on street and traffic lighting in specific cities, including quantity, type, maintenance strategy and cost. This report also provides examples of how Oregon cities meet the challenge of providing traffic and street lights in tough economic times by trying new technologies, such as LED, or reducing maintenance costs. For additional information on the survey responses summarized throughout this report please see the appendices.

Appendix A

Street Lighting - Basic Information and Budget

City	2009 PSU Population	# of Street Lights in the City	How are your street lighting operating costs funded?
Albany	49,165	≈2,500	Not Available
Ashland	21,505	Not available	Not Available
Athena	1,270	120	Not Available
Aurora	980	72	User Fees
Bandon	3,295	340	Electric Utility Revenues (Operating costs for street lights at Highway 101 intersections are funded by ODOT.)
Banks	1,435	141	Street Fund (State Highway Fund Revenue)
Bay City	1,285	87	Street Fund (which receives funds from State Highway Fund Revenue)
Beaverton	86,860	≈6,990	Property Tax Levy
Bend	82,280	2,174	Street Maintenance Fund
Brookings	6,470	305	Electric Franchise Agreement
Burns	3,025	195	Property Tax
Butte Falls	445	46	State Highway Fund Revenue
Carlton	1,790	196	State Highway Fund Revenue
Cave Junction	1,750	117	Franchise Fees
Central Point	17,165	1,308	Franchise Fees and State Highway Fund Revenue
Clatskanie	1,735	189	Street Enterprise Fund
Coos Bay	16,670	≈250	General Fund and State Highway Fund Revenue
Cornelius	10,985	700	Streetlight Fees
Corvallis	55,125	3,575	64% General Fund and 36% Street Fund
Cottage Grove	9,485	507	Street Fund
Drain	1,080	59	Electric Utility Fund
Eagle Point	8,790	720	100% Street Fund (State Highway Fund Revenue)

City	2009 PSU Population	# of Street Lights in the City	How are your street lighting operating costs funded?
Echo	715	98	State Highway Fund Revenue
Estacada	2,865	305	General Fund and State Highway Fund Revenue
Eugene	157,100	8,787	State Highway Fund Revenue
Florence	9,580	515	Streetlight Fees
Glendale	955	114	State Highway Fund Revenue
Grants Pass	33,225	1,790	General Fund
Gresham	101,015	7,500	Franchise Fees
Halfway	355	53	Not Available
Hillsboro	90,380	6,781	General Fund and Transportation Fund
Hines	1,870	86	State Highway Fund Revenue
Hood River	6,925	486	City/County Co-op Fund
Hubbard	3,140	224	State Highway Fund Revenue
Huntington	590	75	State Highway Fund Revenue
Idanha	230	0	Not Available
Independence	8,240	538	General Fund
Jordan Valley	240	15	Street Fund
Joseph	1,120	135	State Highway Fund Revenue and City Transient Lodging Tax
Keizer	36,220	≈Hundreds	Street Fund and Local Improvement District Revenue
Klamath Falls	21,305	31,000	Street Light Fees
La Grande	13,085	608	State Highway Fund Revenue (which accounts for 20% of the total gas tax funding)
La Pine	1,625	10	Ford Foundation Grant, then tax revenue after grant expires in 10 years.
Lake Oswego	36,755	3,456	State Highway Fund Revenue
Lakeside	1,560	102 in use	Some are funded by private parties and our power franchise pays for some of it and the City pays the balance
Lebanon	15,580	914	Street Fund

City	2009 PSU Population	# of Street Lights in the City	How are your street lighting operating costs funded?
Lexington	285	8	Street Fund (funded by County and State Highway Fund Revenue)
Madras	6,650	Not available	Transportation Operations Fund (primarily funded through State Highway Fund Revenue and Utility Franchise Fees)
Malin	805	48	General Fund
Medford	77,240	7,200	Street Fund (includes State Highway Fund Revenue)
Metolius	895	≈79	General Fund
Monmouth	9,630	Not available	Street Fund
Myrtle Creek	3,665	175	General Fund
Newberg	23,150	1,709	Street Fund
Newport	10,600	1,027	General Fund
North Bend	9,855	500	General Fund
North Plains	1,910	164	County and State Highway Fund Revenue
North Powder	510	55	General Fund (received from Property Taxes and Franchise Fees)
Oakland	945	110	General Fund
Oregon City	30,710	3,286	General fund
Phoenix	4,855	287	Street Fund
Pilot Rock	1,560	155	Street Fund (State Highway Fund Revenue)
Port Orford	1,285	49	Street Lights are powered and maintained by electric utility in lieu of franchise fees
Portland	582,130	55,044	Property Tax
Prineville	10,370	662	Street Fund
Richland	150	27	Water and Sewer Fees
Rogue River	2,090	163	Street Fund
Roseburg	21,355	1,800	General Fund
Salem	156,955	10,500	State Highway Fund Revenue
Sandy	8,205	1,069	Street Fund and State Highway Fund Revenue

City	2009 PSU Population	# of Street Lights in the City	How are your street lighting operating costs funded?
Scio	790	100	State Highway Fund Revenue
Shady Cove	2,865	67	State Highway Fund Revenue
Silverton	9,585	≈1,842	General Fund (Property Taxes)
Sodaville	295	36	Street Fund
Spray	160	19	Not Available
Springfield	58,085	≈4,313	Street Fund (primarily State Highway Fund Revenue and local fuel taxes)
St. Helens	12,380	Not available	State Highway Fund Revenue
Stayton	7,820	631	General Fund
Sumpter	170	0	State Highway Fund Revenue
Tangent	1,000	≈3	Street Fund
Troutdale	15,535	1,500	User Fees (collected on property tax bill)
Vernonia	2,370	150	Street Fund
Warrenton	4,785	360	State Highway Fund Revenue
West Linn	24,400	2,145	Gas Tax and General Fund
Willamina	1,885	220	Street Fund and State Highway Fund Revenue
Wilsonville	18,020	2,216	User Fees
Winston	5,925	327	General Fund and Franchise Fees
Wood Village	3,130	279	Street Fund (State Highway Fund Revenue)
Woodburn	23,350	1,567	State Highway Fund Revenue
Yamhill	860	104	Street Fund

Appendix B

Street Lighting - Ownership

City	# of Street Lights in the City	# of City-Owned Street Lights	% of City-Owned Street Lights	Other Owners of Street Lights		
				Utilities	Private	Other Government Entities
Albany	≈2,500	0	0%	*		
Ashland	Not available	Not available	Not available			
Athena	120	120	100%			
Aurora	72	12	17%	*	*	
Bandon	340	329	97%			*
Banks	141	84	60%	*		*
Bay City	87	0	0%	*		
Beaverton	≈6,990	4,309	62%	*		
Bend	2,174	0	0%		*	
Brookings	305	305	100%			
Burns	195	16	8%	*		
Butte Falls	46	0	0%	*		
Carlton	196	67	34%	*	*	
Cave Junction	117	10	9%	*		
Central Point	1,308	441	34%	*		
Clatskanie	189	189	100%			
Coos Bay	≈250	≈250	Not available	Not available	Not available	Not available
Cornelius	700	540	77%	*		
Corvallis	3,575	283	8%	*		*

City	# of Street Lights in the City	# of City-Owned Street Lights	% of City-Owned Street Lights	Other Owners of Street Lights		
				Utilities	Private	Other Government Entities
Cottage Grove	507	475	94%		*	
Drain	59	59	100%			
Eagle Point	720	33	5%	*	*	
Echo	98	5	5%	*		
Estacada	305	135	44%	*		
Eugene	8,787	8,757	100%			
Florence	515	35	7%	*		
Glendale	114	0	0%	*		
Grants Pass	1,790	183	10%		*	
Gresham	7,500	7,500	100%			
Halfway	53	0	0%	*		
Hillsboro	6,781	4,901	72%	*	Not available	Not available
Hines	86	1	1%	*		
Hood River	486	23	5%	*		
Hubbard	224	81	36%	*		
Huntington	75	0	0%	*		
Idanha	0	0	N/A			
Independence	538	81	15%	*		*
Jordan Valley	15	15	100%	*		
Joseph	135	50	37%	*		
Keizer	≈Hundreds	Not available	Not available			
Klamath Falls	31,000	31,000	100%			

City	# of Street Lights in the City	# of City-Owned Street Lights	% of City-Owned Street Lights	Other Owners of Street Lights		
				Utilities	Private	Other Government Entities
La Grande	608	20	3%	*		
La Pine	10	10	100%			
Lake Oswego	3,456	3,412	99%	*		
Lakeside	102 in use	16	16%	*		
Lebanon	914	197	22%	*		
Lexington	8	0	0%	*		
Madras	Not available	≈45	Not available	Not available	Not available	Not available
Malin	48	29	60%	*	*	
Medford	7,200	6,000	83%	*	Not available	
Metolius	≈79	21	27%	*		
Monmouth	Not available	Not available	100%			
Myrtle Creek	175	0	0%	*		
Newberg	1,709	1,143	67%	*		
Newport	1,027	30	3%	*		
North Bend	500	36	7%	*	*	
North Plains	164	89	54%	*		
North Powder	55	9	16%	*		
Oakland	110	0	0%	*		
Oregon City	3,286	1,413	43%	*		Not available
Phoenix	287	10	3%	*		
Pilot Rock	155	0	0%	*		
Port Orford	49	0	0%	*		

City	# of Street Lights in the City	# of City-Owned Street Lights	% of City-Owned Street Lights	Other Owners of Street Lights		
				Utilities	Private	Other Government Entities
Portland	55,044	55,044	100%			
Prineville	662	0	0%	*		
Richland	27	27	100%			
Rogue River	163	0	0%	*		
Roseburg	1,800	120	7%	*	*	*
Salem	10,500	7,200	69%	*		
Sandy	1,069	904	85%	*		
Scio	100	0	0%	*		
Shady Cove	67	8	12%	*		
Silverton	≈1,842	≈1,842	100%			
Sodaville	36	35	97%		*	
Spray	19	19	100%			
Springfield	≈4,313	≈4,313	100%			
St. Helens	Not available	0	0%	Not available	Not available	Not available
Stayton	631	0	0%	*		
Sumpter	0	0	N/A			
Tangent	≈3	≈3	100%			
Troutdale	1,500	0	0%			*
Vernonia	150	40	27%	*		
Warrenton	360	360	100%			
West Linn	2,145	905	42%	*		
Willamina	220	49	22%	*	*	

City	# of Street Lights in the City	# of City-Owned Street Lights	% of City-Owned Street Lights	Other Owners of Street Lights		
				Utilities	Private	Other Government Entities
Wilsonville	2,216	2,215	100%	*		
Winston	327	0	0%	*		
Wood Village	279	169	61%	*		
Woodburn	1,567	0	0%	*		
Yamhill	104	104	100%			

Summary

% of Cities with Streetlights Owned by:	City	Utilities	Other Gov. Entities	Private Party
	71%	68%	7%	12%

Cities that own all street lights in their city

Athena	Eugene	La Pine	Silverton	Warrenton
Brookings	Gresham	Monmouth	Spray	Wilsonville
Clatskanie	Jordan Valley	Portland	Springfield	Yamhill
Drain	Klamath Falls	Richland	Tangent	

Appendix C

Street Lighting - Rental Information

(Note: Does not include cities that own all of their street lights)

City	Street lights rented by the city?	If yes, please explain:
Albany	No	
Ashland	No	
Athena	No	
Aurora	No	
Bandon	No	
Banks	Yes	Our electric company is PGE. We "own" under PGE Option B and PGE "owns" under PGE Option A. Also there is a fixture ownership and a pole ownership.
Bay City	Yes	All street lights are owned and maintained by the local utility
Beaverton	No	
Bend	Yes	2,045 from Pacific Power and Light and 129 from Central Electric Cooperation
Brookings	No	
Burns	No	
Butte Falls	Yes	P.P.L. provides lights and maintenance as part of billing statement.
Carlton	No	
Cave Junction	No	
Central Point	No	
Clatskanie	No	
Coos Bay	No	
Cornelius	No	
Corvallis	No	
Cottage Grove	No	
Drain	No	
Eagle Point	No	
Echo	No	
Estacada	No	
Eugene	No	
Florence	No	
Glendale	No	

City	Street lights rented by the city?	If yes, please explain:
Grants Pass	No	
Gresham	No	
Halfway	Yes	We pay power bill to Idaho Power, rent 53.
Hillsboro	Yes	We have 1,880 lights in the public right-of-way owned and maintained by PGE. We pay electric bills and maintain 33 ODOT street lights.
Hines	No	
Hood River	No	
Hubbard	No	
Huntington	No	
Idanha	No	
Independence	Yes	We rent from Pacific Power and the City of Monmouth.
Jordan Valley	No	
Joseph	No	
Keizer	Yes	PGE has several options to choose from. Option A is PGE owned and maintained, Option B is City owned PGE maintained an Option C is City owned and City maintained. Salem Electric offers two options Salem Electric owned and maintained and City owned and Salem Electric maintained.
Klamath Falls	No	
La Grande	Yes	We rent from the local electrical utility company - OTEC
La Pine	No	
Lake Oswego	No	
Lakeside	No	
Lebanon	No	
Lexington	No	
Madras	Yes	Maintenance agreements through Pacific Power and Central Electric Co-op. Contact Mike Wofford with Pacific Power to get the City of Madras light count under operation by Pacific Power.
Malin	No	
Medford	No	
Metolius	No	
Monmouth	No	
Myrtle Creek	No	

City	Street lights rented by the city?	If yes, please explain:
Newberg	Yes	"Rent" from PGE by paying a higher monthly rate.
Newport	Yes	We essentially rent the streetlights owned by Central Lincoln PUD.
North Bend	No	
North Plains	No	
North Powder	No	
Oakland	No	
Oregon City	No	
Phoenix	No	
Pilot Rock	No	
Port Orford	No	
Portland	No	
Prineville	No	
Richland	No	
Rogue River	No	
Roseburg	Yes	We have a contract with Pacific Power that pays for energy consumption and maintenance of lights owned by Pacific Power within the City limits
Salem	Yes	We have option A lights with PGE and some rental lights with Salem Electric
Sandy	No	
Scio	No	
Shady Cove	No	
Silverton	No	
Sodaville	No	
Spray	No	
Springfield	No	
St. Helens	No	
Stayton	No	
Sumpter	Yes	The City rents 22 street lights from Oregon Trail Electric who performs all maintenance.
Tangent	No	
Troutdale	No	
Vernonia	No	
Warrenton	No	

City	Street lights rented by the city?	If yes, please explain:
West Linn	No	
Willamina	No	
Wilsonville	No	
Winston	No	
Wood Village	No	
Woodburn	No	
Yamhill	No	

Summary

Percentage of Cities that Rent Street Lights	17%

Appendix D

Street Lighting - Maintenance

City	% of Street Lights Maintained by:			
	City Crews	Electric Utility	Private Party	Other Government Entity
Albany		100%		
Ashland	Not available	Not available	Not available	Not available
Athena	100%			
Aurora	17%	78%	6%	
Bandon	97%			3%
Banks		100%		
Bay City		100%		
Beaverton	57%	43%		
Bend	2%		98%	
Brookings			100%	
Burns	8%	92%		
Butte Falls		100%		
Carlton		100%		
Cave Junction	9%	91%		
Central Point	34%	66%		
Clatskanie		100%		
Coos Bay	≈100%	Not available	Not available	Not available
Cornelius	4%	96%		
Corvallis	10%	85%		5%
Cottage Grove	5%	95%		
Drain	100%			
Eagle Point	5%	87%	9%	
Echo	5%	95%		
Estacada		100%		
Eugene	99%		<1%	<1%
Florence	7%	93%		
Glendale		100%		
Grants Pass	10%		90%	

City	% of Street Lights Maintained by:			
	City Crews	Electric Utility	Private Party	Other Government Entity
Gresham		100%		
Halfway		100%		
Hillsboro	≈6%	≈94%	Not available	Not available
Hines		100%		
Hood River	5%	95%		
Hubbard		100%		
Huntington		100%		
Idanha	N/A	N/A	N/A	N/A
Independence	15%	83%		2%
Jordan Valley	50%	50%		
Joseph	37%	63%		
Keizer	Not available	Not available	Not available	Not available
Klamath Falls	100%			
La Grande		100%		
La Pine		100%		
Lake Oswego	18%	82%		
Lakeside	16%	84%		
Lebanon	22%	78%		
Lexington		100%		
Madras	Not available	Not available	Not available	Not available
Malin		96%	4%	
Medford	≈83%	≈17%	Not available	
Metolius	100%			
Monmouth	100%			
Myrtle Creek		100%		
Newberg	67%	33%		
Newport	3%	97%		
North Bend	7%	86%	7%	
North Plains		100%		
North Powder	16%	84%		
Oakland		100%		

City	% of Street Lights Maintained by:			
	City Crews	Electric Utility	Private Party	Other Government Entity
Oregon City	3%	97%		
Phoenix	3%	97%		
Pilot Rock		100%		
Port Orford		100%		
Portland	20%	80%		
Prineville		100%		
Richland	100%			
Rogue River		100%		
Roseburg	7%	89%	3%	2%
Salem	22%	78%		
Sandy	2%	98%		
Scio		100%		
Shady Cove	12%	88%		
Silverton	100%			
Sodaville		100%		
Spray		100%		
Springfield	2%	98%		
St. Helens		1%		
Stayton		100%		
Sumpter		100%		
Tangent		100%		
Troutdale		100%		
Vernonia	27%	73%		
Warrenton		100%		
West Linn	5%	95%		
Willamina		99%	<1%	
Wilsonville	<1%	99%		
Winston		100%		
Wood Village		100%		
Woodburn		100%		
Yamhill		100%		

Appendix E

Street Lighting - Cost Saving Measures

City	Has your city reduced street lighting since 2008 to reduce costs?	Does your city impose a fee for street light installation or equipment?	If so, when was the fee last adjusted?
Albany	No	No	
Ashland	No	No	
Athena	No	No	
Aurora	No	Yes - monthly, each city address= $3.80	July 2007
Bandon	Yes	Yes - At intersections in existing neighborhoods, where the Chief of Police determines it a safety requirement, the City installs street lights. For mid-block locations, street lights will only be installed upon 100% agreement of affected residents, with all costs paid by the individual or neighborhood requesting the installation.	Constantly updated to reflect current actual cost.
Banks	No	No	
Bay City	No	No	
Beaverton	No	Yes - separate tax levy	
Bend	No	No	
Brookings	No	No	
Burns	No	No	
Butte Falls	No	No	
Carlton	No	No	
Cave Junction	No	No	
Central Point	No	No	
Clatskanie	No	No	
Coos Bay	No	No	

City	Has your city reduced street lighting since 2008 to reduce costs?	Does your city impose a fee for street light installation or equipment?	If so, when was the fee last adjusted?
Cornelius	No	Yes - monthly streetlight fee of $2.25 per household.	2008
Corvallis	No	No	
Cottage Grove	No	No	
Drain	No	No	
Eagle Point	No	No	
Echo	No	Yes - now that PP&L charges us, we'll pass it along.	
Estacada	No	No	
Eugene	No	No	
Florence	No	Yes - Beginning in July 2009, the City imposed a $2 per month street light fee to all of its customers.	2009
Glendale	No	No	
Grants Pass	No	No	
Gresham	No	Yes - Part of gas and electric franchise fee. Revenue fluctuates with usage.	
Halfway	No	No	
Hillsboro	No	No	
Hines	No	No	
Hood River	No	No	
Hubbard	No	No	
Huntington	No	No	
Idanha	No	No	
Independence	No	No	
Jordan Valley	No	No	
Joseph	Yes	No	

City	Has your city reduced street lighting since 2008 to reduce costs?	Does your city impose a fee for street light installation or equipment?	If so, when was the fee last adjusted?
Keizer	No	No	
Klamath falls	No	Yes - setting a new pole if needed and supplying power.	6 Months ago (2009-10)
La Grande	No	No	
La Pine	No	No	
Lake Oswego	No	No	
Lakeside	Yes	No	
Lebanon	No	No	
Lexington	No	No	
Madras	No	No	
Malin	No	No	
Medford	No	Yes - a street light utility fee is charged properties abutting streets which have decorative pedestrian-scale street lights which can be installed at the developer's option.	
Metolius	No	No	
Monmouth	No	Yes - developer pays for installation	
Myrtle Creek	Yes	No	
Newberg	No	No	
Newport	No	No	
North Bend	No	No	
North Plains	No	No	
North Powder	No	No	
Oakland	No	No	

City	Has your city reduced street lighting since 2008 to reduce costs?	Does your city impose a fee for street light installation or equipment?	If so, when was the fee last adjusted?
Oregon City	No	No	
Phoenix	No	No	
Pilot Rock	No	No	
Port Orford	No	No	
Portland	Yes*	Yes - new systems receive a permit, and where we add Option B lights a fee is collected from the requesting HOA.	2009
Prineville	No	No	
Richland	Yes	No	
Rogue River	No	No	
Roseburg	No	No	
Salem	No	No	
Sandy	No	No	
Scio	No	No	
Shady Cove	No	No	
Silverton	No	No	
Sodaville	No	No	
Spray	No	No	
Springfield	No	No	
St. Helens	No	No	
Stayton	No	No	
Sumpter	No	No	
Tangent	No	No	
Troutdale	No	No	
Vernonia	No	No	

City	Has your city reduced street lighting since 2008 to reduce costs?	Does your city impose a fee for street light installation or equipment?	If so, when was the fee last adjusted?
Warrenton	No	No	
West Linn	No	No	
Willamina	No	No	
Wilsonville	No	Yes - fee is based on type of light.	1998
Winston	No	No	
Wood Village	No	No	
Woodburn	No	No	
Yamhill	No	No	

* Portland has reduced wattage in some lighting and has not replaced other lights when they go out.

Summary

% of Cities with Reduced Lighting	7%
% of Cities with Street Light Installation Fee	13%

Appendix F

Street Lighting - Light Technology Used

City	Population	% of City Electrical Use from Street Lights	Types of Street Light Technology Used					
			Metal Halide	Mercury Vapor	High Pressure Sodium	Light Emitting Diode (LED)	Magnetic Induction	Other
Albany	49,165	Not available			*			
Ashland	21,505	Not available			*			
Athena	1,270	65%		*	*			
Aurora	980	20%	*	*	*			
Bandon	3,295	≈14.4%			*		*	
Banks	1,435	85%			*			
Bay City	1,285	15%			*			
Beaverton	86,860	Not available	*	*	*	*	*	
Bend	82,280	26% (includes both street and traffic lights; individual street light % not available)		*	*			
Brookings	6,470	<1%			*			
Burns	3,025	25%	*	*	*			
Butte Falls	445	40%			*			
Carlton	1,790	Not available	*		*			
Cave Junction	1,750	15%		*	*			
Central Point	17,165	80%				*		
Clatskanie	1,735	Not available			*			
Coos Bay	16,670	60%	*					

City	Population	% of City Electrical Use from Street Lights	Types of Street Light Technology Used					
			Metal Halide	Mercury Vapor	High Pressure Sodium	Light Emitting Diode (LED)	Magnetic Induction	Other
Cornelius	10,985	Not available			*			
Corvallis	55,125	12%		*	*	*	*	
Cottage Grove	9,485	10%			*	*		*
Drain	1,080	5%			*			
Eagle Point	8,790	50%	*	*	*			
Echo	715	Not available		*	*			*
Estacada	2,865	22%			*		*	
Eugene	157,100	19%			*	*		
Florence	9,580	N/A	*		*	*		
Glendale	955	31%		*	*			
Grants Pass	33,225	27%		*	*			
Gresham	101,015	20%			*	*		
Halfway	355	28%						*
Hillsboro	90,380	31%	*	*	*			
Hines	1,870	Not available			*			
Hood River	6,925	52%	*		*			
Hubbard	3,140	30%			*			
Huntington	590	5%			*			
Idanha	230	N/A						
Independence	8,240	40%	*	*	*			
Jordan Valley	240	25%		*				
Joseph	1,120	23%		*	*	*		*
Keizer	36,220	Not available			*			
Klamath Falls	21,305	25%			*			

City	Population	% of City Electrical Use from Street Lights	Types of Street Light Technology Used					
			Metal Halide	Mercury Vapor	High Pressure Sodium	Light Emitting Diode (LED)	Magnetic Induction	Other
La Grande	13,085	15%	*	*				
La Pine	1,625	50%			*			
Lake Oswego	36,755	17%	*	*	*		*	
Lakeside	1,560	Not available		*		*		*
Lebanon	15,580	60%	*		*	*		
Lexington	285	20%	*					
Madras	6,650	21%			*			*
Malin	805	25-30%		*	*			
Medford	77,240	Not available	*		*			*
Metolius	895	Not available			*			
Monmouth	9,630	10%			*			
Myrtle Creek	3,665	85%	*	*	*			
Newberg	23,150	25%		*	*			
Newport	10,600	50%			*			*
North Bend	9,855	51%		*	*			
North Plains	1,910	70%			*			
North Powder	510	27%	*					*
Oakland	945	25%		*	*			
Oregon City	30,710	50%		*	*			
Phoenix	4,855	1-5%	*	*	*			
Pilot Rock	1,560	48%			*			
Port Orford	1,285	0%			*			
Portland	582,130	25%			*		*	*
Prineville	10,370	20%		*	*			

City	Population	% of City Electrical Use from Street Lights	Types of Street Light Technology Used					
			Metal Halide	Mercury Vapor	High Pressure Sodium	Light Emitting Diode (LED)	Magnetic Induction	Other
Richland	150	20%					*	
Rogue River	2,090	21%		*	*			
Roseburg	21,355	<1%			*			
Salem	156,955	Not available			*	*		*
Sandy	8,205	53%	*	*	*			
Scio	790	90%			*			
Shady Cove	2,865	16%		*	*			
Silverton	9,585	90%		*	*			
Sodaville	295	56%		*				
Spray	160	Not available		*				
Springfield	58,085	27%	*	*	*		*	*
St. Helens	12,380	Not available						*
Stayton	7,820	25%	*	*	*			
Sumpter	170	24%		*				
Tangent	1,000	5%		*				
Troutdale	15,535	0%	*	*	*	*		
Vernonia	2,370	25%	*		*			
Warrenton	4,785	30%		*	*			
West Linn	24,400	Not available			*			
Willamina	1,885	Not available		*	*		*	
Wilsonville	18,020	Not available			*			
Winston	5,925	Not available		*	*			
Wood Village	3,130	<1%			*			
Woodburn	23,350	24%			*			

City	Population	% of City Electrical Use from Street Lights	Types of Street Light Technology Used					
			Metal Halide	Mercury Vapor	High Pressure Sodium	Light Emitting Diode (LED)	Magnetic Induction	Other
Yamhill	860	50%		*	*			

Total population: 2,086,480

Summary

	Types of Street Light Technology Used					
	High Intensity Discharge			Light Emitting Diode (LED)	Magnetic Induction	Other
	Metal Halide	Mercury Vapor	High Pressure Sodium			
% of cities using this type	26%	46%	83%	13%	10%	14%
# of people living in cities with this st.light type	477,230	629,975	2,000,920	627,080	827,150	917,785
% of people living in responding cities with this light type	23%	30%	96%	30%	40%	44%

Appendix G

Street Lighting - New Developments

City	Who pays for new street lights associated with development?
Albany	Not available
Ashland	The Developer
Athena	The Developer
Aurora	The Developer
Bandon	The developers/subdividers pay all costs for installing required street lights.
Banks	The developer and their ownership is transferred to the City/PGE.
Bay City	The Developer
Beaverton	The Developer
Bend	The Developer
Brookings	The developer pays for new street light construction.
Burns	The Developer
Butte Falls	City/contract with P.P.L.
Carlton	The developer pays for poles and the City pays for the power.
Cave Junction	The Developer
Central Point	The developer pays for initial cost and then the city pays ongoing maintenance
Clatskanie	The Developer
Coos Bay	The Developer
Cornelius	The Developer
Corvallis	The Developer
Cottage Grove	The developer pays and street lights are dedicated to City as part of subdivision public improvements.
Drain	The developer is required to install street lights per city specifications.
Eagle Point	The developer pays 100% of installation costs.
Echo	The developer pays for installation costs.
Estacada	The developer pays for the streetlights and the line extension fees.
Eugene	The developer pays for installation costs.
Florence	The developer pays for installation costs.
Glendale	The developer pays for installation, City accepts streetlights as part of infrastructure and pays electrical costs for lighting.
Grants Pass	The Developer
Gresham	The Developer

City	Who pays for new street lights associated with development?
Halfway	Power company
Hillsboro	The Developer (usually)
Hines	The Developer
Hood River	The Developer
Hubbard	The Developer
Huntington	The business/developer
Idanha	Not available
Independence	The Developer installs and pays all cost. The city takes over street lights after final inspection of the development.
Jordan Valley	The City
Joseph	The Owner
Keizer	Local road street lights are paid by development. Arterials and Collectors are paid by the City.
Klamath Falls	The Developer
La Grande	The developer pays the initial installation cost and the City pays the monthly charges and long term maintenance costs.
La Pine	The Developer
Lake Oswego	The Developer
Lakeside	The City
Lebanon	The Developer
Lexington	The Developer
Madras	The developer is responsible for all installation costs and then the City pays for monthly power usage.
Malin	The Developer
Medford	The developers, although lights on higher order streets (arterial or collector) may be eligible for impact fee credits.
Metolius	The Developer
Monmouth	The Developer
Myrtle Creek	The Developer
Newberg	The Developer
Newport	The Developer
North Bend	The Developer
North Plains	The Developer
North Powder	Not available
Oakland	The Developer

City	Who pays for new street lights associated with development?
Oregon City	The Developer
Phoenix	The Developer
Pilot Rock	The Developer
Port Orford	The Developer
Portland	The Developer
Prineville	The Developer
Richland	Grants and private donations
Rogue River	The City pays for the usage and the developer pays for installation.
Roseburg	The Developer pays for initial installation, City then pays for monthly service/maintenance fee.
Salem	The developer pays initial equipment and installation costs
Sandy	The developer pays for equipment and installation. City pays for power and maintenance after installation and acceptance.
Scio	The Developer
Shady Cove	The developer is required to purchase and install street lighting using a standard acceptable by the city. The City is responsible for maintenance after final acceptance of all infrastructure .
Silverton	The Developer
Sodaville	The Developer
Spray	The Developer
Springfield	The Developer
St. Helens	The Developer
Stayton	The Developer
Sumpter	Not available
Tangent	The Developer. Usually we try to have them pay for the ongoing costs.
Troutdale	The Developer
Vernonia	Not available
Warrenton	The Developer
West Linn	The Developer
Willamina	The Developer
Wilsonville	The Developer
Winston	The Developer
Wood Village	The developer pays for purchase and installation.
Woodburn	The developer pays for installation - City pays PGE for maintenance.
Yamhill	The developer pays for installation.

Appenix H

Traffic Lighting - Basic Information

City	Population	# of traffic signals owned by city	What percentage of electrical use by your city is from traffic signal lights?
Albany	49,165	19	Not available
Ashland	21,505	11	Not available
Athena	1,270	2	0%
Aurora	980	0	0%
Bandon	3,295	0	0%
Banks	1,435	1 intersection (8 three-color heads)	<1%
Bay City	1,285	0	0%
Beaverton	86,860	37	Not available
Bend	82,280	39	26% (includes both street and traffic signals. Individual % for traffic lights not available)
Brookings	6,470	0	0%
Burns	3,025	0	2%
Butte Falls	445	1	50%
Carlton	1,790	0	0%
Cave Junction	1,750	0	1%
Central Point	17,165	52	Not available
Clatskanie	1,735	0	0%
Coos Bay	16,670	15	4%
Cornelius	10,985	0	0%
Corvallis	55,125	61	2%
Cottage Grove	9,485	6	2%
Drain	1,080	0	0%
Eagle Point	8,790	1	0%
Echo	715	0	0%
Estacada	2,865	7	1%
Eugene	157,100	239	2%
Florence	9,580	1	0%
Glendale	955	0	0%

City	Population	# of traffic signals owned by city	What percentage of electrical use by your city is from traffic signal lights?
Grants Pass	33,225	9	3%
Gresham	101,015	126	12%
Halfway	355	0	0%
Hillsboro	90,380	41	2%
Hines	1,870	1	0%
Hood River	6,925	0	0%
Hubbard	3,140	0	1%
Huntington	590	1	30%
Idanha	230	0	0%
Independence	8,240	3	0%
Jordan Valley	240	0	25%
Joseph	1,120	0	0%
Keizer	36,220	41	15%
Klamath Falls	21,305	31 Intersections	10%
La Grande	13,085	0	0%
La Pine	1,625	0	0%
Lake Oswego	36,755	37	2%
Lakeside	1,560	0	0%
Lebanon	15,580	8	20%
Lexington	285	0	0%
Madras	6,650	0	0%
Malin	805	0	0%
Medford	77,240	138	Not available
Metolius	895	0	0%
Monmouth	9,630	0	0%
Myrtle Creek	3,665	1	<1%
Newberg	23,150	1	2%
Newport	10,600	1	Minimal
North Bend	9,855	2	2%
North Plains	1,910	0	0%
North Powder	510	0	0%
Oakland	945	0	0%

City	Population	# of traffic signals owned by city	What percentage of electrical use by your city is from traffic signal lights?
Oregon City	30,710	50	11%
Phoenix	4,855	0	0%
Pilot Rock	1,560	0	0%
Port Orford	1,285	0	0%
Portland	582,130	1,008	2%
Prineville	10,370	1	0%
Richland	150	0	0%
Rogue River	2,090	0	0%
Roseburg	21,355	29	6%
Salem	156,955	255	Not available
Sandy	8,205	0	0%
Scio	790	0	0%
Shady Cove	2,865	0	0%
Silverton	9,585	0	10%
Sodaville	295	0	0%
Spray	160	0	0%
Springfield	58,085	38	7%
St. Helens	12,380	3	<1%
Stayton	7,820	0	Not available
Sumpter	170	0	0%
Tangent	1,000	0	0%
Troutdale	15,535	0	0%
Vernonia	2,370	0	0%
Warrenton	4,785	0	0%
West Linn	24,400	1	Not available
Willamina	1,885	0	0%
Wilsonville	18,020	19	Not available
Winston	5,925	0	0%
Wood Village	3,130	0	0%
Woodburn	23,350	0	0%
Yamhill	860	1	<1%

Appendix I

Traffic Lighting - LED Usage

(Note: only includes cities that own traffic lights.)

City	# of traffic signals owned by city	% of city-owned traffic light signal bulbs that are LED	Does your city employ LED technology for newly installed traffic lights?
Albany	19	66	Yes
Ashland	11	75	Yes
Athena	2	Not available	Not available
Banks	1 intersection (8 three-color heads)	0	No
Beaverton	37	100	Yes
Bend	39	60	Yes
Butte Falls	1	0	No
Central Point	52	Not available	Yes
Coos Bay	15	0	Not available
Corvallis	61	95	Yes
Cottage Grove	6	100	Yes
Eagle Point	1	0	No
Estacada	7	0	No
Eugene	239	66	Yes
Florence	1	100	Yes
Grants Pass	9	67	Yes
Gresham	126	100	Yes
Hillsboro	41	65	Yes
Hines	1	0	No

City	# of traffic signals owned by city	% of city-owned traffic light signal bulbs that are LED	Does your city employ LED technology for newly installed traffic lights?
Huntington	1	0	No
Independence	3	0	No
Keizer	41	50	Yes
Klamath Falls	31 Intersections	95	Yes
Lake Oswego	37	75	Yes
Lebanon	8	100	Yes
Medford	138	67	Yes
Myrtle Creek	1	0	No
Newberg	1	100	Yes
Newport	1	0	No
North Bend	2	69	Yes
Oregon City	50	70	Yes
Portland	1008	68	Yes
Prineville	1	0	No
Roseburg	29	90	Yes
Salem	255	98	Sometimes. We follow PGE's recommendations on street lighting. They have not approved an LED street light yet. We are currently working with them on a test LED street light location.
Springfield	38	≈36	Almost always. We follow ODOT standard specifications in most cases.
St. Helens	3	0	Not available
West Linn	1	0	Yes
Wilsonville	19	75-80	Yes
Yamhill	1	0	No

Appendix J

Traffic Lighting - Results from Replacement with LED

Note: only includes cities that own traffic lights and have replaced some portion with LED bulbs.

City	Has the replacement resulted in reductions in electricity costs?	If yes, by what (%) percentage?	Has the replacement resulted in reductions in maintenance costs?	If yes, by what percentage?
Albany	Yes	Not available	Yes	Not available
Ashland	Yes	Not available	Yes	Not available
Beaverton	Yes	60	Yes	30
Bend	Yes	Not available	Yes	Not available
Central Point	No	Not available	No	Not available
Corvallis	Yes	60	Yes	approx. 3
Cottage Grove	Yes	5	Yes	5
Eugene	Yes	85	No	Not available
Florence	No	Not available	No	Not available
Grants Pass	Yes	80	Yes	80
Gresham	Yes	50	Yes	50
Hillsboro	Yes	75	Yes	Not available
Keizer	Yes	25	Yes	20
Klamath falls	Yes	25	Yes	80
Lake Oswego	Yes	15	Yes	50
Lebanon	Yes	15	Yes	25
Medford	Yes	Not available	Yes	Not available
Newberg	Yes	1	Yes	Not available

City	Has the replacement resulted in reductions in electricity costs?	If yes, by what (%) percentage?	Has the replacement resulted in reductions in maintenance costs?	If yes, by what percentage?
North Bend	Yes	small	No	Not available
Oregon City	Yes	Not available	Yes	Not available
Portland	Yes	50-60	Yes	20
Roseburg	Yes	40	Yes	25
Salem	Yes	Not available	Yes	Not available
Springfield	Yes	7.4	Yes	3
West Linn	No	Not available	Yes	Not available
Wilsonville	Yes	60	Yes	50

Summary

% of Cities with Electricity Cost Savings	88%
% of City with Maintenance Cost Savings	85%

Appendix K

Traffic Lighting - LED Advantages and Disadvantages

(Note: Only includes cities that have LED traffic lights.)

City	What advantages or disadvantages has your city encountered by replacing incandescent bulbs with LED bulbs?
Albany	No comments
Ashland	Longer change out schedule is a great advantage.
Beaverton	No comments
Bend	Reduced need for replacement over time. Anticipated reduction of energy costs but do not have the data at this time to reflect the reduced costs.
Central Point	ODOT has just recently began experimenting with these on our signals. We don't have enough information at this time to answer.
Corvallis	With the switch to LEDs, the City no longer implements an all-bulb replacement every summer.
Cottage Grove	Advantage is lower cost for electricity and maintenance. Disadvantage is that LED lights do not create enough heat in the winter to melt accumulated ice and snow from lenses.
Eugene	Advantage - Increased reliability Disadvantage - Increased replacement cost
Florence	Our RRFB is new (constructed in 2009). It is also solar powered.
Grants Pass	Less monthly cost, longer life
Gresham	No comments
Hillsboro	Advantage - Savings on electricity costs, overtime costs for maintenance personnel. Disadvantage - up-front cost of LED are much greater than incandescent bulbs.
Keizer	No comments
Klamath Falls	Safety factor to our Techs. and the Citizens.
Lake Oswego	LED lamps use less energy and last longer. Maintenance is reduced by 50%.
Lebanon	Led bulbs have a much longer useful life reducing maintenance costs. Initial cost of the bulbs much higher.
Medford	Advantage: Less maintenance for annual re-lamping. Disadvantage: Indicator appears to be dead when hit at certain angles of the sun.

City	What advantages or disadvantages has your city encountered by replacing incandescent bulbs with LED bulbs?
Newberg	Last longer.
North Bend	No comments
Oregon City	Advantage: They last longer.
Portland	Reduced power usage and maintenance costs due to relamping every 3 years. The visibility of the units seems better. We have fewer failures to respond to.
Roseburg	Advantages: less energy consumption, longer life, fewer maintenance calls, LED's fade and do not go out when end of life is approaching.
Salem	Replace LEDs on a 6 year cycle verses every year with incandescents. We have seen energy use reduce.
Springfield	Advantage: fewer call outs for failed lamps, lower energy cost, longer replacement cycle. Disadvantage: LEDs dim over time with out failure (what is too dim? measurement methods?), partial failure of one string or sector of the lamp face (what is too much loss?)
West Linn	No comments
Wilsonville	Reduced bulb out calls, longer life of bulbs and reduced energy costs. No disadvantages yet.

Appendix L

Traffic Lighting - Comments

Note: only includes cities that made comments.

City	Other comments about traffic lighting:
Athena	According to Pacific Power & Light the utilities do not own any street lights. Each city has a different agreement with PP&L and in ours, which I have yet to find, it says that the city owns the lights, PP&L maintains them, of course at a cost to the city.
Bandon	Since the City's street lights are part of the electric utility, they are not individually metered, so the figures for electricity cost and percent of total City electric consumption are estimates only.
Bend	Please note that this 26% is for both street lights and traffic signals. It would require a very in-depth analysis to break down the costs any further and due to time constraints we were unable to do so. For question 14, we do not yet have date to determine what the percentage of savings we have from using LED bulbs.
Burns	Oregon Dept. of Transportation owns the signal lights, the City pays the power for three lights.
Cave Junction	ODOT controls all of our signal lights.
Cornelius	Traffic signals in Cornelius are all owned and operated by ODOT.
Drain	ODOT pays the city the electrical usage for two flashing corner lights and the city provides the electrical use on one blinker light. ODOT maintains all three lights.
Florence	Our RRFB is solar powered. All new installations (we have three scheduled for 2011) will be solar powered too.
Lake Oswego	The City is exploring ways to eliminate Mercury Vapor streetlights and replace them with LED lights, however, PGE does not support LED streetlights in the current tariff. Adoption of an LED standard in the tariff is needed and should be encouraged by all jurisdictions and the LOC.
Newberg	PGE has done a pilot program for LED street lighting. We hope to have that option in future.
Newport	The City owns one flashing traffic light. All other traffic lights in Newport are owned by ODOT.
Port Orford	The City does not have any traffic lights. Everything on main highway within the City is ODOT controlled as it is on Hwy 101, which is entirely ODOT jurisdiction.
Portland	Pedestrian signals are also being converted to LED units.
Roseburg	Percentage of power consumed by street lights and traffic lights were roughly estimated. Number of street lights reported within the City is under an Audit being conducted by Pacific Power and Light - Actual number may vary slightly from number provided within this document.
Tangent	We don't have traffic lights owned by the city. The state controls 3 sets of lights located in Tangent.
Troutdale	All traffic signals within the City of Troutdale are located on arterial roadways and owned/maintained by Multnomah County.
Wood Village	Owned by Multnomah County.
Woodburn	All traffic signals are located on State Highways and are owned and maintained by state.