



**Preliminary Audit Report  
For  
Cheltenham Township**

**Prepared  
By  
Johnson Controls**

**In Partnership  
With  
The Regional Street Light Procurement Program (RSLPP)**

**Date: April 26th, 2016**

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Preliminary Audit Phase  
RSLPP Guaranteed Savings Agreement

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# Section A

## Executive Summary

# Cheltenham Township

## Executive Summary

Johnson Controls is pleased to present this Preliminary Audit Report to Cheltenham Township. This report details the energy efficiency upgrades that will be considered under the Regional Street Light Procurement Program (RSLPP) through a guaranteed energy savings contract (GESA) with Johnson Controls in connection with each municipality's participation in the Pennsylvania Sustainable Energy Finance (PennSEF) Program. In collaboration with the municipality, Johnson Controls has identified energy conservation measures (ECMs) and quantified the costs and savings that are associated with these upgrades. While converting the existing street lighting to LED is the basis for this program, other ECMs were considered. A list of ECMs investigated for inclusion in the project are shown below;

ECM #	Item	Include?
1	Cobrahead Street Lighting - Upgrade to LED	Yes
2	Decorative Street Lighting - Upgrade to LED	Yes
3	Cobrahead - Wireless Street Lighting Controls	Yes
4	Decorative - Wireless Street Lighting Controls	Yes
5	Traffic Lighting - Upgrade to LED	Yes
6	Exterior Lighting - Upgrade to LED	Yes
7	Electricity Rate Procurement	Yes

The following sections of the report will describe the upgrade(s) listed above and the associated costs and savings for the ECMs to be included in the project.

In collaboration with Cheltenham Township we have developed a preliminary project that meets the goals of the municipality. The cost and benefits of two project options are shown below. The Base Project includes converting cobrahead and decorative fixtures to LED, converting traffic lighting and exterior lighting to LED (if applicable) and procuring a lower energy rate for the municipality (if applicable). The Base Project + Controls includes wireless controls on the street lighting fixtures. The cash flows for these project options are shown in the cash flow section of the report.

	Base Project	Base Project + Controls
<b>Energy Conservation Measure (ECM) Number</b>	<b>1, 2, 5, 6, 7</b>	<b>1, 2, 3, 4, 5, 6, 7</b>
<b>Construction Cost (\$)</b>	<b>\$1,369,881</b>	<b>\$1,395,896</b>
<b>Total Financed Cost (\$)</b>	<b>\$1,722,918</b>	<b>\$1,761,444</b>
<b>Total Project Benefits over 20 Year Term</b>	<b>\$3,210,764</b>	<b>\$3,137,002</b>
1) Energy Savings	\$2,306,963	\$2,311,496
2) O&M Savings	\$828,136	\$828,136
3) Rebates	\$75,665	\$78,749

\*Only applicable costs and savings are shown in the table

The parameters used to develop the project financial models (shown in detail later in the cash flows) are listed below;

Parameter	Base Project Values	Base Project + Controls Values
Interest Rate (%)	2.75%	2.75%
Contract Term (years)	20	20
Energy Escalation Rates (%)*	1.7%-3.0%	1.7%-3.0%
Street Lighting Electric Rate (\$/kWh)	\$0.074	\$0.074
Traffic Lighting Electric Rate (\$/kWh)	\$0.083	\$0.083
Exterior Lighting Rate (\$/kWh)**	Varies	Varies

\*The energy escalation rate varies over the term according to PennSEF's guidelines

\*\*See utility data section of report for rates per location

# Section B

## Existing Light Inventories

## Street Lighting - Existing Utility Bill

Street lighting typically comprises the majority of the electric expense to a municipality, often comprising greater than 70% of all electric costs.

The quantity, type, energy usage, and costs of the street lights present in the municipality according to the PECO bill(s) are shown below. The quantities shown may vary slightly from the actual street lighting fixture quantities present in the municipality. This table shows the baseline for energy costs and cost savings modeled in this analysis.

Type	Size	Fixture (Cobra Head)	Quantity	Billed Wattage	Annual Energy Use (kWh)	Annual Energy Cost (\$)
Mercury Vapor	04000M	100W MV	0	115	0	\$0
Mercury Vapor	08000M	175W MV	0	191	0	\$0
Mercury Vapor	12000M	250W MV	0	275	0	\$0
Mercury Vapor	20000M	400W MV	0	429	0	\$0
Mercury Vapor	42000M	700W MV	0	768	0	\$0
Mercury Vapor	59000M	1000W MV	0	1090	0	\$0
Sodium Vapor	05800S	70W HPS	1727	94	664,287	\$49,310
Sodium Vapor	09500S	100W HPS	655	131	351,114	\$26,063
Sodium Vapor	16000S	150W HPS	344	192	270,268	\$20,062
Sodium Vapor	25000S	250W HPS	232	294	279,107	\$20,718
Sodium Vapor	50000S	400W HPS	0	450	0	\$0
Sodium Vapor	0130KH	1000W HPS	0	1090	0	\$0
Metal Halide	07800H	100W MH	0	131	0	\$0
Metal Halide	13000H	175W MH	0	192	0	\$0
Metal Halide	20500H	250W MH	0	294	0	\$0
Metal Halide	36000H	400W MH	0	450	0	\$0
Metal Halide	0110KH	1000W MH	0	1090	0	\$0
Metal Halide	0155KH	1500W MH	0	1620	0	\$0
Incandescent	00320L	30W INC	0	32	0	\$0
Incandescent	00600L	60W INC	0	58	0	\$0
Incandescent	01000L	100W INC	1	103	421	\$31
Incandescent	02500L	200W INC	0	202	0	\$0
Incandescent	06000L	450W INC	0	448	0	\$0
Incandescent	10000L	700W INC	0	690	0	\$0
LED	-	26W LED	0	26	0	\$0
LED	-	36W LED	0	36	0	\$0
LED	-	49W LED	0	49	0	\$0
LED	-	78W LED	0	78	0	\$0
LED	-	105W LED	0	105	0	\$0
LED	-	160W LED	0	160	0	\$0
LED	-	185W LED	0	185	0	\$0
LED	-	210W LED	0	210	0	\$0
Induction	-	40W IND	0	40	0	\$0
Induction	-	55W IND	0	55	0	\$0
Induction	-	85W IND	0	85	0	\$0
Induction	-	165W IND	0	165	0	\$0
<b>Total</b>			<b>2959</b>		<b>1,565,198</b>	<b>\$116,185</b>
<b>Service Location Distribution Charge*</b>			<b>2937</b>			<b>\$249,528</b>
<b>Modeled Cost for Cobra-heads (annual)</b>						<b>\$365,712</b>

\*Service Location Distribution Charge, also known as the "Tap Fee" is based on \$7.08 per location, per month. This fee is not impacted by the energy reduction from converting street lights to LED, however, it may be impacted by the results of the Investment Grade Audit and the final quantity of street lights determined.



## Street Lighting - Existing Cobra-head Fixtures

Due to the potential inaccuracy in the quantity of street lights found in the PECO bill, information was gathered by JCI in the Needs Assessment Questionnaire and the quantity of cobra-head fixtures in the municipality were adjusted and are shown below. The estimated quantities in the table below represent quantities that are specified for conversion to LED in the project. Energy savings will be determined by comparing the municipality's current street lighting expense from the PECO bill (as shown on the previous page) to the proposed LED fixtures that will be installed as part of this project.

Each of the street lighting fixtures in the table are included in this preliminary analysis of a retrofit to LED. However, it is important to note that the final quantity could be different than that shown after the IGA phase is complete. During the IGA phase, each street light in the municipality will be audited and the exact count determined.

Type	Size	Fixture (Cobra Head)	Quantity (estimated)	Billed Wattage
Mercury Vapor	04000M	100W MV	0	115
Mercury Vapor	08000M	175W MV	0	191
Mercury Vapor	12000M	250W MV	0	275
Mercury Vapor	20000M	400W MV	0	429
Mercury Vapor	42000M	700W MV	0	768
Mercury Vapor	59000M	1000W MV	0	1090
Sodium Vapor	05800S	70W HPS	1386	94
Sodium Vapor	09500S	100W HPS	405	131
Sodium Vapor	16000S	150W HPS	344	192
Sodium Vapor	25000S	250W HPS	232	294
Sodium Vapor	50000S	400W HPS	0	450
Sodium Vapor	0130KH	1000W HPS	0	1090
Metal Halide	07800H	100W MH	0	131
Metal Halide	13000H	175W MH	0	192
Metal Halide	20500H	250W MH	0	294
Metal Halide	36000H	400W MH	0	450
Metal Halide	0110KH	1000W MH	0	1090
Metal Halide	0155KH	1500W MH	0	1620
Incandescent	00320L	30W INC	0	32
Incandescent	00600L	60W INC	0	58
Incandescent	01000L	100W INC	1	103
Incandescent	02500L	200W INC	0	202
Incandescent	06000L	450W INC	0	448
Incandescent	10000L	700W INC	0	690
LED	-	26W LED	0	26
LED	-	36W LED	0	36
LED	-	49W LED	0	49
LED	-	78W LED	0	78
LED	-	105W LED	0	105
LED	-	160W LED	0	160
LED	-	185W LED	0	185
LED	-	210W LED	0	210
Induction	-	40W IND	0	40
Induction	-	55W IND	0	55
Induction	-	85W IND	0	85
Induction	-	165W IND	0	165
<b>Total</b>			<b>2368</b>	

## Street Lighting - Existing Decoratives

Based on the PECO street lighting bill and information provided to JCI in the Needs Assessment Questionnaire, the quantity of decorative fixtures actually present in the municipality were estimated and are shown below. The quantities in the table below represent quantities that are specified for conversion to LED in the project.

Each of the street lighting fixtures in the table are included in this preliminary analysis of a retrofit to LED. However, it is important to note that the final quantity could be different than that shown after the IGA phase is complete. During the IGA phase, each street light in the municipality will be audited and the exact count determined.

Type	Size	Fixture (Decorative)	Style	Quantity (estimated)	Billed Wattage
Mercury Vapor	04000M	100W MV	TBD	0	115
Mercury Vapor	08000M	175W MV	TBD	0	191
Mercury Vapor	12000M	250W MV	TBD	0	275
Mercury Vapor	20000M	400W MV	TBD	0	429
Mercury Vapor	42000M	700W MV	TBD	0	768
Mercury Vapor	59000M	1000W MV	TBD	0	1090
Sodium Vapor	05800S	70W HPS	William & Mary	341	94
Sodium Vapor	09500S	100W HPS	William & Mary	250	131
Sodium Vapor	16000S	150W HPS	TBD	0	192
Sodium Vapor	25000S	250W HPS	TBD	0	294
Sodium Vapor	50000S	400W HPS	TBD	0	450
Sodium Vapor	0130KH	1000W HPS	TBD	0	1090
Metal Halide	07800H	100W MH	TBD	0	131
Metal Halide	13000H	175W MH	TBD	0	192
Metal Halide	20500H	250W MH	TBD	0	294
Metal Halide	36000H	400W MH	TBD	0	450
Metal Halide	0110KH	1000W MH	TBD	0	1090
Metal Halide	0155KH	1500W MH	TBD	0	1620
Incandescent	00320L	30W INC	TBD	0	32
Incandescent	00600L	60W INC	TBD	0	58
Incandescent	01000L	100W INC	TBD	0	103
Incandescent	02500L	200W INC	TBD	0	202
Incandescent	06000L	450W INC	TBD	0	448
Incandescent	10000L	700W INC	TBD	0	690
LED	-	26W LED	TBD	0	26
LED	-	36W LED	TBD	0	36
LED	-	49W LED	TBD	0	49
LED	-	78W LED	TBD	0	78
LED	-	105W LED	TBD	0	105
LED	-	160W LED	TBD	0	160
LED	-	185W LED	TBD	0	185
LED	-	210W LED	TBD	0	210
Induction	-	40W IND	TBD	0	40
Induction	-	55W IND	TBD	0	55
Induction	-	85W IND	TBD	0	85
Induction	-	165W IND	TBD	0	165
<b>Total</b>				<b>591</b>	

## Traffic Lighting - Existing Inventory

Traffic lighting, though typically less than 10% of a municipality's annual electric costs, are often a good source of energy-related savings through conversion to LED. We recommend converting any incandescent traffic lights and signals to LED. Incandescent lighting technology is very inefficient compared to LEDs and should be replaced.

The quantity and type of traffic lights and signals present in the municipality are shown below. The information is based on the actual PECO traffic lighting bill(s) supplied by the municipality for this project.

Type	Label	Description	Wattage	Quantity	Annual Energy Use (kWh)	Annual Energy Cost (\$)
Incandescent	R000TL	8" Red TL	69	28	9,181	\$764
Incandescent	Y000TL	8" Yellow TL	69	33	393	\$33
Incandescent	G000TL	8" Green TL	69	33	8,460	\$704
Incandescent	R000TL	12" Red TL	150	0	0	\$0
Incandescent	Y000TL	12" Yellow TL	150	74	1,918	\$160
Incandescent	G000TL	12" Green TL	150	74	41,239	\$3,434
LED	RLEDTL	8" Red TL	7	125	4,158	\$346
LED	YLEDTL	8" Yellow TL	13	124	279	\$23
LED	GLEDTL	8" Green TL	6	129	2,876	\$239
LED	RLEDTL	12" Red TL	11	483	25,247	\$2,102
LED	YLEDTL	12" Yellow TL	18	452	1,406	\$117
LED	GLEDTL	12" Green TL	12	443	19,750	\$1,645
Incandescent	Y000TA	8" Yellow TA	69	0	0	\$0
Incandescent	G000TA	8" Green TA	69	0	0	\$0
Incandescent	Y000TA	12" Yellow TA	150	4	415	\$35
Incandescent	G000TA	12" Green TA	150	20	2,074	\$173
LED	YLEDTA	8" Yellow TA	10	21	145	\$12
LED	GLEDTA	8" Green TA	9	6	37	\$3
LED	YLEDTA	12" Yellow TA	9	1	6	\$1
LED	GLEDTA	12" Green TA	13	28	252	\$21
Incandescent	WLKSGN	Walk/Don't walk 9"	69	20	11,923	\$993
Incandescent	WLKSGN	Walk/Don't walk 12"	144	12	14,930	\$1,243
Incandescent	HNDSGN	Hand/man	138	34	40,539	\$3,376
LED	HNDSGN	Hand/man	13	134	15,051	\$1,253
-	0MINLT	School Flashers	0	121	0	\$0
-	EMPESD	Preemption Device	2	56	968	\$81
-	00LOOP	Loops	2	131	2,264	\$188
-	USONIC	Ultrasonic Device	5	0	0	\$0
-	TRCONT	Motor Controller	45	63	24,494	\$2,040
<b>Energy Cost</b>				<b>2649</b>	<b>228,003</b>	<b>\$18,986</b>
<b>Service Location Distribution Charge*</b>				<b>62</b>		<b>\$2,507</b>
<b>Total Cost</b>						<b>\$21,493</b>

\* Service Location Distribution Charge is \$3.37 per location

## Exterior Lighting - Existing Inventory

Exterior building, parking lot and park and recreation lighting often utilize inefficient HID lighting (i.e. High Pressure Sodium, Metal Halide etc.) and therefore require 2-3 times the energy of LEDs. We recommend converting all existing HID lighting to LED.

The locations where this will be performed and the type and quantity of the exterior lights to be converted to LED are shown below. The information is based on the questionnaire completed by the municipality.

Number	Location	Type	Wattage	Quantity	Est. Annual Energy Usage (kWh)	Est. Annual Energy Cost (\$)
1	Rowland Community Center	n/a	0	0	0	\$0
2	Conklin Pool	n/a	0	0	0	\$0
3	Shovel Shop	n/a	0	0	0	\$0
4	Tookany Creek Parkway	n/a	0	0	0	\$0
5	Veterans Memorial Fields	n/a	0	0	0	\$0
6	Kleinheinz Pond	n/a	0	0	0	\$0
7	William Gottschalk Field	n/a	0	0	0	\$0
8	Edward F. Drach Memorial Scout Camp	n/a	0	0	0	\$0
9	Administration Building	n/a	0	0	0	\$0
10	Police Department Building	n/a	0	0	0	\$0
11	EMS Building (Azalea Hall)	n/a	0	0	0	\$0
12	District Court	n/a	0	0	0	\$0
13	Richard Wall House	n/a	0	0	0	\$0
14	Richard Wall Carriage House	n/a	0	0	0	\$0
15	Wall Park	n/a	0	0	0	\$0
16	Public Works Facility	n/a	0	0	0	\$0
17	Elkins Park Library	n/a	0	0	0	\$0
18	High School Park	n/a	0	0	0	\$0
19	Glenside Hall	n/a	0	0	0	\$0
20	Glenside Pool	n/a	0	0	0	\$0
21	Renninger Park	n/a	0	0	0	\$0
22	Glenside Library	n/a	0	0	0	\$0
23	Caroll Brooke Brook Park	n/a	0	0	0	\$0
24	La Mott Community Center	n/a	0	0	0	\$0
25	Waverly Road Compost Facility	n/a	0	0	0	\$0
26	Melrose Park	n/a	0	0	0	\$0
27	Curtis Hall and Arboretum	n/a	0	0	0	\$0
28	Ralph Morgan Park	n/a	0	0	0	\$0
29	Brookdale Pump Station	n/a	0	0	0	\$0
30	Flood Control Gate	n/a	0	0	0	\$0
			<b>Total</b>	<b>0</b>	<b>0</b>	<b>\$0</b>

Johnson Controls will complete a lighting survey to verify the fixture type and wattage for each of these locations during the IGA phase.

# Section C

## Project Scope of Work

## Scope of Work - Street Lighting

### Cobra-Head Fixtures - Costs

The following retrofits are specified for the cobra-head fixtures. The costs associated with converting cobra-head fixtures to LED are shown in the table.

Existing		Proposed									
Fixture (Cobra Head)	Billed Wattage	Manufacturer	Model #	New Wattage	Quantity	Unit Material Cost (\$)	Unit Install Cost (\$)	Material Handling (\$)	ESCO Service Cost (\$)	Total Unit Cost (\$)	Total Installed Cost (\$)
70W HPS	94	Philips Lumec	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	38	1386	\$123.97	\$97.50	\$0.62	\$69.07	\$291.16	\$403,547
100W HPS	131	Philips Lumec	RFS-54W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	54	405	\$144.45	\$97.50	\$0.72	\$75.47	\$318.14	\$128,848
150W HPS	192	Philips Lumec	RFM-72W32LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	73	344	\$172.16	\$97.50	\$0.86	\$84.13	\$354.65	\$122,001
250W HPS	294	Philips Lumec	RFM-108W32LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	108	232	\$190.22	\$97.50	\$0.95	\$89.78	\$378.45	\$87,800
100W INC	103	Philips Lumec	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	38	1	\$123.97	\$97.50	\$0.62	\$69.07	\$291.16	\$291
				<b>Total</b>	<b>2368</b>						<b>\$742,487</b>



## Scope of Work - Street Lighting

### Decorative Fixtures - Costs for new Fixture

The following retrofits are specified for the decorative fixtures. The costs associated with retrofitting decorative fixtures to LED are shown in the table.

Existing		Proposed										
Fixture (Decorative)	Billed Wattage	Style	Manufacturer	Model #	New Wattage	Quantity	Unit Material Cost (\$)	Unit Install Cost (\$)	Material Handling (\$)	ESCO Service Cost (\$)	Total Unit Cost (\$)	Total Installed Cost (\$)
70W HPS	94	William & Mark	Philips / Cooper	51W	51	341	\$1,101.85	\$97.50	\$5.51	\$313.02	\$1,517.88	\$517,598
100W HPS	131	William & Mark	Philips / Cooper	51W	51	250	\$1,101.85	\$97.50	\$5.51	\$313.02	\$1,517.88	\$379,470
					<b>Total</b>	<b>591</b>						<b>\$897,068</b>

## Scope of Work - Street Lighting

### *Decorative Fixtures - Costs for Retrofit Kit (for Reference Only, not included in Cash Flows)*

The following retrofits are specified for the decorative fixtures. The costs associated with retrofitting decorative fixtures to LED are shown in the table.

Existing		Proposed										
Fixture (Decorative)	Billed Wattage	Style	Manufacturer	Model #	New Wattage	Quantity	Unit Material Cost (\$)	Unit Install Cost (\$)	Material Handling (\$)	ESCO Service Cost (\$)	Total Unit Cost (\$)	Total Installed Cost (\$)
70W HPS	94	William & Ma	Retrofit Kit	51W	51	341	\$600.00	\$152.00	\$3.00	\$196.15	\$951.15	\$324,342
100W HPS	131	William & Ma	Retrofit Kit	51W	51	250	\$600.00	\$152.00	\$3.00	\$196.15	\$951.15	\$237,787
					<b>Total</b>	<b>591</b>						<b>\$562,129</b>

Decorative Retrofit Kit Cost (estimated)	\$562,129
New Fixture Cost (from table on previous page)	\$897,068
Potential Cost Savings from Retrofit Kit in lieu of New Fixture	<b>\$334,939</b>

## Energy Savings - Street Lighting

### Energy Savings Summary

The table shows the energy savings associated with converting the cobra-head and decorative fixtures to LED.

Existing					Proposed						Project Savings	
PECO Fixture	Billed Wattage	Quantity	Annual Energy Use (kWh)	Annual Energy Cost (\$)	Style	Manufacturer	New Wattage	Quantity	Annual Energy Use (kWh)	Annual Energy Cost (\$)	Annual Energy Savings (kWh)	Annual Energy Savings (\$)
70W HPS	94	1386	533,122	\$39,574	Cobra	Philips Lumec	38	1386	215,517	\$15,998	317,605	\$23,576
100W HPS	131	405	217,101	\$16,115	Cobra	Philips Lumec	54	405	89,492	\$6,643	127,609	\$9,472
150W HPS	192	344	270,268	\$20,062	Cobra	Philips Lumec	73	344	102,758	\$7,628	167,510	\$12,434
250W HPS	294	232	279,107	\$20,718	Cobra	Philips Lumec	108	232	102,529	\$7,611	176,578	\$13,107
100W INC	103	1	421	\$31	Cobra	Philips Lumec	38	1	155	\$12	266	\$20
70W HPS	94	341	131,165	\$9,736	William & Ma	Alt (Philips / Coop	51	341	71,164	\$5,283	60,001	\$4,454
100W HPS	131	250	134,013	\$9,948	William & Ma	Alt (Philips / Coop	51	250	52,173	\$3,873	81,840	\$6,075
<b>Total - Cobraheads</b>		2368	1,300,020	\$96,501			<b>Total - Cobraheads</b>	2368	510,452	\$37,891	789,568	\$58,610
<b>Total - Decoratives</b>		591	265,178	\$19,684			<b>Total - Decoratives</b>	591	123,337	\$9,155	141,841	\$10,529
<b>Project Total</b>		2959	1,565,198	\$116,185			<b>Total</b>	2959	633,789	\$47,046	931,409	\$69,138
<b>Locations*</b>		2937					<b>Locations*</b>	2937				
<b>Service Location Distribution Charge**</b>		\$249,528					<b>Service Location Distribution Charge**</b>	\$249,528				

\*The final number of locations may vary from the amount shown

\*\*Service Location Distribution Charge, or Tap Fee, is based on \$7.08 per fixture, per month



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Preliminary Audit Phase  
RSLPP Guaranteed Savings Agreement

## Wireless Street Lighting Controls

A wireless control system is a unique and differentiating aspect of an LED street lighting project. Once installed, it allows the municipality to efficiently maintain the street lighting system for years to come. From an energy perspective, a control system provides real-time monitoring of energy use. Because a dimming strategy will be implemented, the actual kWh consumed each month will be lower than the typical kWh amount PECO will charge the municipality even after conversion to LED. JCI has verified with PECO that they will honor a kWh reduction from a dimming strategy on the bill. After installation we will compile the data needed from the control system to implement these changes in the bill. From a maintenance perspective, a control system enables the quick diagnosis and resolution of an outage or problem shortly after it develops.

A sample dimming strategy is shown below. We expect a dimming strategy to save an additional 15-30% in energy use off the street light bill after conversion to LED.

- Lights turn on at 50% of full power 30 minutes prior to sunset
- Lights set to 80% of full power beginning at sunset and ending 1 hour before sunrise
- Lights dim to 50% of full power 1 hour before sunrise
- Lights turn off at sunrise

In our model we have estimated, based on the control strategy outlined above, a 25% additional energy (kWh) reduction after conversion to LED for the cobra-head fixtures.

## Scope of Work - Wireless Controls

### Controls Cost: Cobra-Head Fixtures

Controls will be applied to the following cobra-head fixtures.

The controls system is based on the Telensa, PLANet product. The costs for this measure are shown below.

Proposed								
Manufacturer	Model #	New Wattage	Quantity	Controls?	Unit Material Cost (\$)	ESCO Service Cost (\$)	Total Unit Cost (\$)	Total Installed Cost (\$)
Philips Lumec	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	38	1386	NO	\$0.00	\$0.00	\$0.00	\$0
Philips Lumec	RFS-54W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	54	405	NO	\$0.00	\$0.00	\$0.00	\$0
Philips Lumec	RFM-72W32LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	73	344	NO	\$0.00	\$0.00	\$0.00	\$0
Philips Lumec	RFM-108W32LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	108	232	NO	\$0.00	\$0.00	\$0.00	\$0
Philips Lumec	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	38	1	NO	\$0.00	\$0.00	\$0.00	\$0
		<b>Total</b>	<b>2368</b>					<b>\$0</b>

## Scope of Work - Non-Networked Controls (FAWS)

### **Controls Cost: Cobra-Head Fixtures (for Reference Only, not included in Cash Flows)**

Controls will be applied to the following cobra-head fixtures.

The Field Adjustable Wattage Selector (FAWS) option for non-networked controls is shown for consideration; the costs are below.

Proposed								
Manufacturer	Model #	New Wattage	Quantity	Controls?	Unit Material Cost (\$)	ESCO Service Cost (\$)	Total Unit Cost (\$)	Total Installed Cost (\$)
Philips Lumec	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	38	1386	NO	\$0.00	\$0.00	\$0.00	\$0
Philips Lumec	RFS-54W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	54	405	NO	\$0.00	\$0.00	\$0.00	\$0
Philips Lumec	RFM-72W32LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	73	344	NO	\$0.00	\$0.00	\$0.00	\$0
Philips Lumec	RFM-108W32LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	108	232	NO	\$0.00	\$0.00	\$0.00	\$0
Philips Lumec	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	38	1	NO	\$0.00	\$0.00	\$0.00	\$0
		<b>Total</b>	<b>2368</b>					<b>\$0</b>

<b>Non-Networked, Field Adjustable Wattage Selector (FAWS) - Cobra-heads</b>	<b>\$0</b>
<b>Philips CityTouch Wireless Controls (from table on previous page)</b>	<b>\$0</b>
<b>Potential Cost Savings from FAWS in lieu of Wireless Controls</b>	<b>\$0</b>

Note: Savings are assumed to be the same as the networked controls option. This needs to be verified by PECO.

## Scope of Work - Wireless Controls

### *Controls Cost: Decorative Fixtures*

Controls will be applied to the following decorative fixtures.

The controls system is based on the Telensa, PLANet product. The costs for this measure are shown below.

Proposed								
Manufacturer	Model #	New Wattage	Quantity	Controls?	Unit Material Cost (\$)	ESCO Service Cost (\$)	Total Unit Cost (\$)	Total Installed Cost (\$)
Alt (Philips / Cooper)	51W	51	118	YES	\$175.00	\$45.47	\$220.47	\$26,015



## Scope of Work - Wireless Controls

### Controls: Cobra-Head Fixtures - Savings

Controls will be applied to the following cobra-head fixtures.

The controls system is based on the Telensa, PLANet product. The energy savings for this measure are shown below.

Proposed								
Manufacturer	Model #	New Wattage	Quantity	Controls?	% Reduction of Energy	Wattage Reduction (W)	Annual Energy Savings (kWh)	Annual Energy Savings (\$)
Philips Lumec	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	38	1386	NO	0%	0	0	\$0
Philips Lumec	RFS-54W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	54	405	NO	0%	0	0	\$0
Philips Lumec	RFM-72W32LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	73	344	NO	0%	0	0	\$0
Philips Lumec	RFM-108W32LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	108	232	NO	0%	0	0	\$0
Philips Lumec	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	38	1	NO	0%	0	0	\$0
		<b>Total</b>	<b>2368</b>				<b>0</b>	<b>\$0</b>

## Scope of Work - Wireless Controls

### *Controls: Decorative Fixtures - Savings*

Controls will be applied to the following decorative fixtures.

The controls system is based on the Telensa, PLANet product. The energy savings for this measure are shown below.

Proposed								
Manufacturer	Model #	New Wattage	Quantity	Controls?	% Reduction of Energy	Wattage Reduction (W)	Annual Energy Savings (kWh)	Annual Energy Savings (\$)
lt (Philips / Coope	51W	51	118	YES	25%	12.8	6,156	\$457

## Scope of Work - Traffic Lighting

The traffic signals will be updated according to the schedule and costs below.

Existing			Proposed									
PECO Label	PECO Description	Billed Wattage	Make	New Fixture Model #	New Wattage	Quantity	Unit Material Cost (\$)	Unit Install Cost (\$)	Material Handling (\$)	ESCO Service Cost (\$)	Total Unit Cost (\$)	Total Installed Cost (\$)
R000TL	8" Red TL	69	Leotek	IL6-P3	5.5	28	\$47.38	\$40.00	\$0.24	\$27.25	\$114.87	\$3,216
Y000TL	8" Yellow TL	69	Leotek	IL6-P3	6	33	\$54.32	\$40.00	\$0.27	\$29.42	\$124.01	\$4,092
G000TL	8" Green TL	69	Leotek	IL6-P3	6	33	\$54.32	\$40.00	\$0.27	\$29.42	\$124.01	\$4,092
R000TL	12" Red TL	150	Leotek	IL6-P3	5.6	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
Y000TL	12" Yellow TL	150	Leotek	IL6-P3	8.8	74	\$65.87	\$40.00	\$0.33	\$33.03	\$139.23	\$10,303
G000TL	12" Green TL	150	Leotek	IL6-P3	6.7	74	\$57.78	\$40.00	\$0.29	\$30.50	\$128.57	\$9,514
RLEDTL	8" Red TL	7	n/a	No Upgrade	7	125	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
YLEDTL	8" Yellow TL	13	n/a	No Upgrade	13	124	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
GLEDTL	8" Green TL	6	n/a	No Upgrade	6	129	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
RLEDTL	12" Red TL	11	n/a	No Upgrade	11	483	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
YLEDTL	12" Yellow TL	18	n/a	No Upgrade	18	452	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
GLEDTL	12" Green TL	12	n/a	No Upgrade	12	443	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
Y000TA	8" Yellow TA	69	Leotek	IL6-AR	5.5	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
G000TA	8" Green TA	69	Leotek	IL6-AR	6	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
Y000TA	12" Yellow TA	150	Leotek	IL6-AR	8.8	4	\$57.78	\$40.00	\$0.29	\$30.50	\$128.57	\$514
G000TA	12" Green TA	150	Leotek	IL6-AR	6.7	20	\$60.09	\$40.00	\$0.30	\$31.22	\$131.61	\$2,632
YLEDTA	8" Yellow TA	10	n/a	No Upgrade	10	21	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
GLEDTA	8" Green TA	9	n/a	No Upgrade	9	6	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
YLEDTA	12" Yellow TA	9	n/a	No Upgrade	9	1	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
GLEDTA	12" Green TA	13	n/a	No Upgrade	13	28	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
WLKSGN	Walk/Don't walk 9"	69	Leotek	PED Ind.	8	20	\$173.35	\$152.00	\$0.87	\$101.45	\$427.67	\$8,553
WLKSGN	Walk/Don't walk 12"	144	Leotek	PED Ind.	8	12	\$173.35	\$152.00	\$0.87	\$101.45	\$427.67	\$5,132
HNDSGN	Hand/man	138	Leotek	PED Ind.	8	34	\$173.35	\$152.00	\$0.87	\$101.45	\$427.67	\$14,541
HNDSGN	Hand/man	13	n/a	No Upgrade	13	134	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
OMINLT	School Flashers	0	n/a	No Upgrade	0	121	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
EMPESD	Preemption Device	2	n/a	No Upgrade	2	56	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
00LOOP	Loops	2	n/a	No Upgrade	2	131	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
USONIC	Ultrasonic Device	5	n/a	No Upgrade	5	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
TRCONT	Motor Controller	45	n/a	No Upgrade	45	63	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
					<b>Total</b>	<b>2649</b>						<b>\$62,590</b>



## Energy Savings - Traffic Lighting

Converting the traffic signals to LED will generate the following energy and cost savings.

Existing					Proposed					Project Savings	
PECO Description	Billed Wattage	Quantity	Annual Energy Use (kWh)	Annual Energy Cost (\$)	Make	New Wattage	Quantity	Annual Energy Use (kWh)	Annual Energy Cost (\$)	Annual Energy Savings (kWh)	Annual Energy Savings (\$)
8" Red TL	69	28	9,181	\$764	Leotek	5.5	28	732	\$61	8,449	\$704
8" Yellow TL	69	33	393	\$33	Leotek	6	33	34	\$3	359	\$30
8" Green TL	69	33	8,460	\$704	Leotek	6	33	736	\$61	7,724	\$643
12" Yellow TL	150	74	1,918	\$160	Leotek	8.8	74	113	\$9	1,806	\$150
12" Green TL	150	74	41,239	\$3,434	Leotek	6.7	74	1,842	\$153	39,397	\$3,281
8" Red TL	7	125	4,158	\$346	n/a	7	125	4,158	\$346	0	\$0
8" Yellow TL	13	124	279	\$23	n/a	13	124	279	\$23	0	\$0
8" Green TL	6	129	2,876	\$239	n/a	6	129	2,876	\$239	0	\$0
12" Red TL	11	483	25,247	\$2,102	n/a	11	483	25,247	\$2,102	0	\$0
12" Yellow TL	18	452	1,406	\$117	n/a	18	452	1,406	\$117	0	\$0
12" Green TL	12	443	19,750	\$1,645	n/a	12	443	19,750	\$1,645	0	\$0
12" Yellow TA	150	4	415	\$35	Leotek	8.8	4	24	\$2	390	\$33
12" Green TA	150	20	2,074	\$173	Leotek	6.7	20	93	\$8	1,981	\$165
8" Yellow TA	10	21	145	\$12	n/a	10	21	145	\$12	0	\$0
8" Green TA	9	6	37	\$3	n/a	9	6	37	\$3	0	\$0
12" Yellow TA	9	1	6	\$1	n/a	9	1	6	\$1	0	\$0
12" Green TA	13	28	252	\$21	n/a	13	28	252	\$21	0	\$0
Walk/Don't walk 9"	69	20	11,923	\$993	Leotek	8	20	1,382	\$115	10,541	\$878
Walk/Don't walk 12"	144	12	14,930	\$1,243	Leotek	8	12	829	\$69	14,100	\$1,174
Hand/man	138	34	40,539	\$3,376	Leotek	8	34	2,350	\$196	38,189	\$3,180
Hand/man	13	134	15,051	\$1,253	n/a	13	134	15,051	\$1,253	0	\$0
School Flashers	0	121	0	\$0	n/a	0	121	0	\$0	0	\$0
Preemption Device	2	56	968	\$81	n/a	2	56	968	\$81	0	\$0
Loops	2	131	2,264	\$188	n/a	2	131	2,264	\$188	0	\$0
Motor Controller	45	63	24,494	\$2,040	n/a	45	63	24,494	\$2,040	0	\$0
<b>Total</b>	<b>2649</b>	<b>228,003</b>	<b>\$18,986</b>		<b>Total</b>	<b>2649</b>	<b>105,067</b>	<b>\$8,749</b>	<b>122,936</b>	<b>\$10,237</b>	
<b>Locations</b>	<b>62</b>				<b>Locations</b>	<b>62</b>					
<b>Serv. Dist. Charge*</b>	<b>\$2,507</b>				<b>Serv. Dist. Charge*</b>	<b>\$2,507</b>					

\*Service Location Distribution Charge is \$3.37 per location



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Preliminary Audit Phase  
RSLPP Guaranteed Savings Agreement

## Scope of Work - Exterior Lighting

Exterior lighting will be converted to LED at the locations shown below;

Existing				Proposed		
Number	Location	Type	Wattage	New Fixture	Wattage	Quantity
1	Rowland Community Center	n/a	0	LED	0	0
2	Conklin Pool	n/a	0	LED	0	0
3	Shovel Shop	n/a	0	LED	0	0
4	Tookany Creek Parkway	n/a	0	LED	0	0
5	Veterans Memorial Fields	n/a	0	LED	0	0
6	Kleinheinz Pond	n/a	0	LED	0	0
7	William Gottschalk Field	n/a	0	LED	0	0
8	Edward F. Drach Memorial Scout Cabin	n/a	0	LED	0	0
9	Administration Building	n/a	0	LED	0	0
10	Police Department Building	n/a	0	LED	0	0
11	EMS Building (Azalea Hall)	n/a	0	LED	0	0
12	District Court	n/a	0	LED	0	0
13	Richard Wall House	n/a	0	LED	0	0
14	Richard Wall Carriage House	n/a	0	LED	0	0
15	Wall Park	n/a	0	LED	0	0
16	Public Works Facility	n/a	0	LED	0	0
17	Elkins Park Library	n/a	0	LED	0	0
18	High School Park	n/a	0	LED	0	0
19	Glenside Hall	n/a	0	LED	0	0
20	Glenside Pool	n/a	0	LED	0	0
21	Renninger Park	n/a	0	LED	0	0
22	Glenside Library	n/a	0	LED	0	0
23	Caroll Brooke Brook Park	n/a	0	LED	0	0
24	La Mott Community Center	n/a	0	LED	0	0
25	Waverly Road Compost Facility	n/a	0	LED	0	0
26	Melrose Park	n/a	0	LED	0	0
27	Curtis Hall and Arboretum	n/a	0	LED	0	0
28	Ralph Morgan Park	n/a	0	LED	0	0
29	Brookdale Pump Station	n/a	0	LED	0	0
30	Flood Control Gate	n/a	0	LED	0	0
					<b>Total</b>	<b>0</b>

A complete lighting audit will be performed at these locations to determine and verify the fixture types and quantities. Generally, the wattage will be reduced by at least 60% when converting to LED.

## Scope of Work - Exterior Lighting

The costs associated with converting the Exterior lighting to LED are shown below;

Existing				Proposed								
Number	Location	Type	Wattage	New Fixture	Wattage	Quantity	Unit Material Cost (\$)	Unit Install Cost (\$)	Material Handling (\$)	ESCO Service Cost (\$)	Total Unit Cost (\$)	Total Installed Cost (\$)
1	Rowland Community Center	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
2	Conklin Pool	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
3	Shovel Shop	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
4	Tookany Creek Parkway	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
5	Veterans Memorial Fields	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
6	Kleinheinz Pond	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
7	William Gottschalk Field	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
8	Edward F. Drach Memorial Scout Cabin	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
9	Administration Building	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
10	Police Department Building	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
11	EMS Building (Azalea Hall)	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
12	District Court	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
13	Richard Wall House	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
14	Richard Wall Carriage House	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
15	Wall Park	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
16	Public Works Facility	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
17	Elkins Park Library	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
18	High School Park	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
19	Glenside Hall	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
20	Glenside Pool	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
21	Renninger Park	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
22	Glenside Library	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
23	Carroll Brooke Brook Park	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
24	La Mott Community Center	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
25	Waverly Road Compost Facility	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
26	Melrose Park	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
27	Curtis Hall and Arboretum	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
28	Ralph Morgan Park	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
29	Brookdale Pump Station	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
30	Flood Control Gate	n/a	0	LED	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0
					<b>Total</b>	<b>0</b>						<b>\$0</b>

A complete lighting audit will be performed at these locations to determine and verify the fixture types and quantities. Generally, the wattage will be reduced by at least 60% when converting to LED.



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Preliminary Audit Phase  
RSLPP Guaranteed Savings Agreement

## Scope of Work - Exterior Lighting

The savings associated with converting the Exterior lighting to LED are shown below;

Number	Location	Existing					Proposed					Project Savings	
		Type	Wattage	Quantity	Est. Annual Energy Use (kWh)	Est. Annual Energy Cost (\$)	New Fixture	Wattage	Quantity	Est. Annual Energy Use (kWh)	Est. Annual Energy Cost (\$)	Est. Annual Energy Savings (kWh)	Est. Annual Energy Savings (\$)
1	Rowland Community Center	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
2	Conklin Pool	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
3	Shovel Shop	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
4	Tookany Creek Parkway	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
5	Veterans Memorial Fields	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
6	Kleinheinz Pond	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
7	William Gottschalk Field	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
8	dward F. Drach Memorial Scout Cab	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
9	Administration Building	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
10	Police Department Building	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
11	EMS Building (Azalea Hall)	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
12	District Court	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
13	Richard Wall House	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
14	Richard Wall Carriage House	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
15	Wall Park	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
16	Public Works Facility	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
17	Elkins Park Library	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
18	High School Park	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
19	Glenside Hall	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
20	Glenside Pool	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
21	Renninger Park	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
22	Glenside Library	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
23	Caroll Brooke Brook Park	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
24	La Mott Community Center	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
25	Waverly Road Compost Facility	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
26	Melrose Park	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
27	Curtis Hall and Arboretum	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
28	Ralph Morgan Park	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
29	Brookdale Pump Station	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
30	Flood Control Gate	n/a	0	0	0	\$0	LED	0	0	0	\$0	0	\$0
			<b>Total</b>		<b>0</b>	<b>\$0</b>	<b>Total</b>	<b>0</b>		<b>0</b>	<b>\$0</b>	<b>0</b>	<b>\$0</b>

A complete lighting audit will be performed at these locations to determine and verify the fixture types and quantities. Generally, the wattage will be reduced by at least 60% when converting to LED. The annual hours of operation have been estimated to be 4,000 hours.



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Preliminary Audit Phase  
RSLPP Guaranteed Savings Agreement

## Scope of Work - Energy Procurement

The municipality is able to pursue a third party supplier of electricity and potentially procure a cheaper \$/kWh rate than currently being paid for electric generation and transmission.

The current generation and transmission rates (\$/kWh) for street and traffic lighting are shown below, as well as the potential lower new rate (\$/kWh) that could be obtained;

Account	Gen/Tran Rate (\$/kWh)	Potential New Rate (\$/kWh)
Street Lighting	\$0.0647	\$0.0550

In the IGA phase, JCI will work to procure a lower energy rate and investigate inclusion of this measure, at the municipality's request, on other electric accounts, like the municipality's buildings and parks. However, savings for this measure will only be calculated on the street and traffic lighting accounts. JCI will use a broker to get quotes from different electric suppliers. JCI will acquire the necessary documentation for signature by the municipality to obtain the new electric rate.

The preliminary savings for this measure have been calculated using the formula below;

$$\text{Savings (\$)} = \text{New Energy Usage (kWh)} * (\text{Old Rate (\$/kWh)} - \text{New Rate (\$/kWh)})$$

where the New Energy Usage is the kWh consumption from street and traffic lighting after the fixtures have been converted to LED, the Old Rate is the original \$/kWh generation and transmission rate and the New Rate is the new \$/kWh we are expecting to be able to procure. This measure is not saving energy (kWh) but reducing the municipality's cost of energy (\$/kWh).

# Section D

## Project Savings and Cash Flows

## Project Energy Savings

The savings associated with each energy conservation measure are shown in the table below;

Conservation Measure	Annual kWh Savings	Monthly kW Savings	Annual Energy Savings (\$)
Street lighting - Upgrade to LED (Cobra)	789,568	193.0	\$58,610
Street lighting - Upgrade to LED (Decorative)	141,841	34.7	\$10,529
Wireless Street Lighting Controls (Cobra)	0	-	\$0
Wireless Street Lighting Controls (Decorative)	30,834	-	\$2,289
Traffic Lighting - Upgrade to LED	122,936	24.6	\$10,237
Exterior Lighting - Upgrade to LED	0	0.0	\$0
Electric Rate Savings (\$/kWh)	-	-	\$6,227
<b>Total - Base Project</b>	<b>1,054,345</b>	<b>252.2</b>	<b>\$85,602</b>
<b>Total - Base Project + Controls</b>	<b>1,085,179</b>	<b>252.2</b>	<b>\$87,891</b>

Because of the PECO rate tariff structure for street lighting the municipality is unable to change roughly 60% of its street lighting bill. This fixed cost is shown as the Service Location Distribution Charge on your PECO bill, colloquially known as the tap fee. The annual tap fee for the municipality is \$249528.

## Project Costs & Savings

A summary of the costs and savings associated with each ECM are shown below.

Conservation Measure	Construction Cost (\$)	Annual Energy Savings (\$)	Annual O&M Savings (\$)	Rebate(\$)	Simple Payback	Simple Payback w/o O&M
Street lighting - Upgrade to LED (Cobra)	\$742,487	\$58,610	\$23,680	\$57,886	8.3	11.7
Street lighting - Upgrade to LED (Decorative)	\$562,129	\$10,529	\$5,910	\$10,399	33.6	52.4
Wireless Street Lighting Controls (Cobra)	\$0	\$0	\$0	\$0	-	-
Wireless Street Lighting Controls (Decorative)	\$26,015	\$457	\$0	\$3,083	50.2	50.2
Traffic Lighting - Upgrade to LED	\$62,590	\$10,237	\$332	\$7,380	5.2	5.4
Exterior Lighting - Upgrade to LED	\$0	\$0	\$0	\$0	-	-
Electric Rate Procurement	\$2,674	\$6,227	\$0	\$0	0.4	0.4
<b>Total - Base Project</b>	<b>\$1,369,881</b>	<b>\$85,602</b>	<b>\$29,922</b>	<b>\$75,665</b>	11.2	15.1
<b>Total - Base Project + Controls</b>	<b>\$1,395,896</b>	<b>\$86,059</b>	<b>\$29,922</b>	<b>\$78,749</b>	11.4	15.3

The construction cost above is a "turnkey" project cost including installation, material and engineering. The simple payback includes energy, O&M, and rebate savings. The simple payback is calculated using the following formula;

$$\text{Simple Payback} = [(\text{Cost} - \text{Rebates}) / (\text{Energy Savings} + \text{O\&M savings})]$$

The O&M savings are calculated based on a \$/fixture basis. Annual O&M savings for street lighting are estimated at \$10/fixture; annual O&M savings for traffic lighting are estimated at \$2/fixture. Annual O&M savings for exterior lighting are estimated at \$5/fixture. Savings are derived from the 10 year material warranty on all LED street light and traffic light product. These annual maintenance costs will be verified in the IGA phase based off of actual annual maintenance costs provided by the municipality to JCI.

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## Project Cash Flow - Base Project

The financing summary for the project is shown in the table below. The interest rate shown may vary once final financing is secured through PennSEF. This project cash flow does not include wireless controls.

JCI Construction Cost		\$1,369,881		
Paydown of Debt	Capital Contribution	\$0		
	Grants	\$0		
Fees	Customer-Controlled Contingency	\$68,494	<b>Project ECM List</b>	
	PennSEF	\$0	ECM-1: Cobrahead Street Lighting	Yes
	KLS - Program	\$340	ECM-2: Decorative Street Lighting	No
	KLS - Consultant	\$0	ECM-5: Traffic Lighting	Yes
Loan Structure		Lease	ECM-6: Exterior Lighting	Yes
Contract Term - Years		20	ECM-7: Electricity Rate Procurement	Yes
Construction Term - Months		12	<b>*Costs only include applicable ECMs</b>	
Loan Payment Frequency		Annual		
Interest Rate		2.75%		
Total Financed Amount		\$1,438,715		

	Measured Savings	Non-measured Savings			Total Savings	Loan Payment	M&V	Balance
	Utility Savings	Operational Savings	Rebates	Capital Avoidance				
Year 0	\$43,571	\$0	\$0	\$0	\$43,571	\$0	\$0	\$43,571
Year 1	\$89,191	\$30,820	\$75,665	\$0	\$195,676	\$180,329	\$15,347	\$0
Year 2	\$91,064	\$31,744	\$0	\$0	\$122,808	\$107,001	\$15,807	\$0
Year 3	\$93,067	\$32,697	\$0	\$0	\$125,764	\$109,483	\$16,281	\$0
Year 4	\$95,115	\$33,677	\$0	\$0	\$128,792	\$128,792	\$0	\$0
Year 5	\$97,302	\$34,688	\$0	\$0	\$131,990	\$131,990	\$0	\$0
Year 6	\$99,540	\$35,728	\$0	\$0	\$135,269	\$135,269	\$0	\$0
Year 7	\$101,929	\$36,800	\$0	\$0	\$138,730	\$138,730	\$0	\$0
Year 8	\$104,376	\$37,904	\$0	\$0	\$142,280	\$142,280	\$0	\$0
Year 9	\$106,985	\$39,041	\$0	\$0	\$146,026	\$146,026	\$0	\$0
Year 10	\$109,660	\$40,213	\$0	\$0	\$149,872	\$149,872	\$0	\$0
Year 11	\$112,511	\$41,419	\$0	\$0	\$153,930	\$153,930	\$0	\$0
Year 12	\$115,436	\$42,662	\$0	\$0	\$158,098	\$158,098	\$0	\$0
Year 13	\$118,553	\$43,941	\$0	\$0	\$162,494	\$41,119	\$0	\$121,375
Year 14	\$121,754	\$45,260	\$0	\$0	\$167,013	\$0	\$0	\$167,013
Year 15	\$125,163	\$46,618	\$0	\$0	\$171,780	\$0	\$0	\$171,780
Year 16	\$128,667	\$48,016	\$0	\$0	\$176,683	\$0	\$0	\$176,683
Year 17	\$132,399	\$49,457	\$0	\$0	\$181,855	\$0	\$0	\$181,855
Year 18	\$136,238	\$50,940	\$0	\$0	\$187,178	\$0	\$0	\$187,178
Year 19	\$140,189	\$52,468	\$0	\$0	\$192,658	\$0	\$0	\$192,658
Year 20	\$144,255	\$54,042	\$0	\$0	\$198,297	\$0	\$0	\$198,297
<b>Total</b>	<b>\$2,306,963</b>	<b>\$828,136</b>	<b>\$75,665</b>	<b>\$0</b>	<b>\$3,210,764</b>	<b>\$1,722,918</b>	<b>\$47,435</b>	<b>\$1,440,412</b>

## Project Cash Flow - Base Project, No O&M

The financing summary for the project is shown in the table below. The interest rate shown may vary once final financing is secured through PennSEF. This project cash flow does not include wireless controls.

JCI Construction Cost		\$1,369,881		
Paydown of Debt	Capital Contribution	\$0		
	Grants	\$0		
Fees	Customer-Controlled Contingency	\$68,494	<b>Project ECM List</b>	
	PennSEF	\$0	ECM-1: Cobrahead Street Lighting	Yes
	KLS - Program	\$340	ECM-2: Decorative Street Lighting	No
	KLS - Consultant	\$0	ECM-5: Traffic Lighting	Yes
Loan Structure		Lease	ECM-6: Exterior Lighting	Yes
Contract Term - Years		20	ECM-7: Electricity Rate Procurement	Yes
Construction Term - Months		12	<b>*Costs only include applicable ECMs</b>	
Loan Payment Frequency		Annual		
Interest Rate		2.75%		
Total Financed Amount		\$1,438,715		

	Measured Savings	Non-measured Savings			Total Savings	Loan Payment	M&V	Balance
	Utility Savings	Operational Savings	Rebates	Capital Avoidance				
Year 0	\$43,571	\$0	\$0	\$0	\$43,571	\$0	\$0	\$43,571
Year 1	\$89,191	\$0	\$75,665	\$0	\$164,856	\$149,509	\$15,347	\$0
Year 2	\$91,064	\$0	\$0	\$0	\$91,064	\$75,257	\$15,807	\$0
Year 3	\$93,067	\$0	\$0	\$0	\$93,067	\$76,786	\$16,281	\$0
Year 4	\$95,115	\$0	\$0	\$0	\$95,115	\$95,115	\$0	\$0
Year 5	\$97,302	\$0	\$0	\$0	\$97,302	\$97,302	\$0	\$0
Year 6	\$99,540	\$0	\$0	\$0	\$99,540	\$99,540	\$0	\$0
Year 7	\$101,929	\$0	\$0	\$0	\$101,929	\$101,929	\$0	\$0
Year 8	\$104,376	\$0	\$0	\$0	\$104,376	\$104,376	\$0	\$0
Year 9	\$106,985	\$0	\$0	\$0	\$106,985	\$106,985	\$0	(\$0)
Year 10	\$109,660	\$0	\$0	\$0	\$109,660	\$109,660	\$0	\$0
Year 11	\$112,511	\$0	\$0	\$0	\$112,511	\$112,511	\$0	\$0
Year 12	\$115,436	\$0	\$0	\$0	\$115,436	\$115,436	\$0	\$0
Year 13	\$118,553	\$0	\$0	\$0	\$118,553	\$118,553	\$0	(\$0)
Year 14	\$121,754	\$0	\$0	\$0	\$121,754	\$121,754	\$0	\$0
Year 15	\$125,163	\$0	\$0	\$0	\$125,163	\$125,163	\$0	\$0
Year 16	\$128,667	\$0	\$0	\$0	\$128,667	\$128,667	\$0	\$0
Year 17	\$132,399	\$0	\$0	\$0	\$132,399	\$95,813	\$0	\$36,585
Year 18	\$136,238	\$0	\$0	\$0	\$136,238	\$0	\$0	\$136,238
Year 19	\$140,189	\$0	\$0	\$0	\$140,189	\$0	\$0	\$140,189
Year 20	\$144,255	\$0	\$0	\$0	\$144,255	\$0	\$0	\$144,255
<b>Total</b>	<b>\$2,306,963</b>	<b>\$0</b>	<b>\$75,665</b>	<b>\$0</b>	<b>\$2,382,629</b>	<b>\$1,834,355</b>	<b>\$47,435</b>	<b>\$500,839</b>

## Project Cash Flow - Base Project + Controls

The financing summary for the project is shown in the table below. The interest rate shown may vary once final financing is secured through PennSEF. This project INCLUDES controls.

JCI Construction Cost		\$1,395,896		
Paydown of Debt	Capital Contribution	\$0		
	Grants	\$0		
Fees	Customer-Controlled Contingency	\$69,795	<b>Project ECM List</b>	<b>Include?</b>
	PennSEF	\$0	ECM-1: Cobrahead Street Lighting	Yes
	KLS - Program	\$340	ECM-2: Decorative Street Lighting	Yes
	KLS - Consultant	\$0	ECM-3: Cobrahead Wireless Controls	Yes
Loan Structure		Lease	ECM-4: Decorative Wireless Controls	Yes
Contract Term - Years		20	ECM-5: Traffic Lighting	Yes
Construction Term - Months		12	ECM-6: Exterior Lighting	Yes
Loan Payment Frequency		Annual	ECM-7: Electricity Rate Procurement	Yes
Interest Rate		2.75%	<b>*Costs only include applicable ECMs</b>	
Total Financed Amount		\$1,466,031		

	Measured Savings	Non-measured Savings			Total Savings	Loan Payment	M&V	Balance
	Utility Savings	Operational Savings	Rebates	Capital Avoidance				
Year 0	\$43,804	\$0	\$0	\$0	\$43,804	\$0	\$0	\$43,804
Year 1	\$89,360	\$30,820	\$78,749	\$0	\$198,928	\$183,545	\$15,384	(\$0)
Year 2	\$91,237	\$31,744	\$0	\$0	\$122,981	\$107,136	\$15,845	\$0
Year 3	\$93,244	\$32,697	\$0	\$0	\$125,941	\$109,620	\$16,320	\$0
Year 4	\$95,295	\$33,677	\$0	\$0	\$128,973	\$128,973	\$0	\$0
Year 5	\$97,487	\$34,688	\$0	\$0	\$132,175	\$132,175	\$0	\$0
Year 6	\$99,729	\$35,728	\$0	\$0	\$135,458	\$135,458	\$0	\$0
Year 7	\$102,123	\$36,800	\$0	\$0	\$138,923	\$138,923	\$0	\$0
Year 8	\$104,574	\$37,904	\$0	\$0	\$142,478	\$142,478	\$0	\$0
Year 9	\$107,188	\$39,041	\$0	\$0	\$146,230	\$146,230	\$0	\$0
Year 10	\$109,868	\$40,213	\$0	(\$7,398)	\$142,683	\$142,683	\$0	\$0
Year 11	\$112,724	\$41,419	\$0	(\$7,398)	\$146,745	\$146,745	\$0	\$0
Year 12	\$115,655	\$42,662	\$0	(\$7,398)	\$150,919	\$150,919	\$0	\$0
Year 13	\$118,778	\$43,941	\$0	(\$7,398)	\$155,321	\$96,560	\$0	\$58,762
Year 14	\$121,985	\$45,260	\$0	(\$7,398)	\$159,847	\$0	\$0	\$159,847
Year 15	\$125,401	\$46,618	\$0	(\$7,398)	\$164,620	\$0	\$0	\$164,620
Year 16	\$128,912	\$48,016	\$0	(\$7,398)	\$169,530	\$0	\$0	\$169,530
Year 17	\$132,650	\$49,457	\$0	(\$7,398)	\$174,709	\$0	\$0	\$174,709
Year 18	\$136,497	\$50,940	\$0	(\$7,398)	\$180,039	\$0	\$0	\$180,039
Year 19	\$140,455	\$52,468	\$0	(\$7,398)	\$185,526	\$0	\$0	\$185,526
Year 20	\$144,529	\$54,042	\$0	(\$7,398)	\$191,173	\$0	\$0	\$191,173
<b>Total</b>	<b>\$2,311,496</b>	<b>\$828,136</b>	<b>\$78,749</b>	<b>(\$81,378)</b>	<b>\$3,137,002</b>	<b>\$1,761,444</b>	<b>\$47,549</b>	<b>\$1,328,009</b>

\*\*\*Capital Cost Avoidance in year 11-20 represents amount to be budgeted for Telensa controls refresh

## Project Cash Flow - Base Project + Controls (No O&M)

The financing summary for the project is shown in the table below. The interest rate shown may vary once final financing is secured through PennSEF. This project INCLUDES controls but excludes operations and maintenance savings.

JCI Construction Cost		\$1,395,896		
Paydown of Debt	Capital Contribution	\$0		
	Grants	\$0		
Fees	Customer-Controlled Contingency	\$69,795	<b>Project ECM List</b>	
	PennSEF	\$0	ECM-1: Cobrahead Street Lighting	Yes
	KLS - Program	\$340	ECM-2: Decorative Street Lighting	Yes
	KLS - Consultant	\$0	ECM-3: Cobrahead Wireless Controls	Yes
Loan Structure		Lease	ECM-4: Decorative Wireless Controls	Yes
Contract Term - Years		20	ECM-5: Traffic Lighting	Yes
Construction Term - Months		12	ECM-6: Exterior Lighting	Yes
Loan Payment Frequency		Annual	ECM-7: Electricity Rate Procurement	Yes
Interest Rate		2.75%	<b>*Costs only include applicable ECMs</b>	
Total Financed Amount		\$1,466,031		

	Measured Savings	Non-measured Savings			Total Savings	Loan Payment	M&V	Balance
	Utility Savings	Operational Savings	Rebates	Capital Avoidance				
Year 0	\$43,804	\$0	\$0	\$0	\$43,804	\$0	\$0	\$43,804
Year 1	\$89,360	\$0	\$78,749	\$0	\$168,109	\$152,725	\$15,384	(\$0)
Year 2	\$91,237	\$0	\$0	\$0	\$91,237	\$75,392	\$15,845	\$0
Year 3	\$93,244	\$0	\$0	\$0	\$93,244	\$76,924	\$16,320	\$0
Year 4	\$95,295	\$0	\$0	\$0	\$95,295	\$95,295	\$0	\$0
Year 5	\$97,487	\$0	\$0	\$0	\$97,487	\$97,487	\$0	\$0
Year 6	\$99,729	\$0	\$0	\$0	\$99,729	\$99,729	\$0	\$0
Year 7	\$102,123	\$0	\$0	\$0	\$102,123	\$102,123	\$0	\$0
Year 8	\$104,574	\$0	\$0	\$0	\$104,574	\$104,574	\$0	\$0
Year 9	\$107,188	\$0	\$0	\$0	\$107,188	\$107,188	\$0	\$0
Year 10	\$109,868	\$0	\$0	(\$7,398)	\$102,470	\$102,470	\$0	\$0
Year 11	\$112,724	\$0	\$0	(\$7,398)	\$105,326	\$105,326	\$0	\$0
Year 12	\$115,655	\$0	\$0	(\$7,398)	\$108,257	\$108,257	\$0	\$0
Year 13	\$118,778	\$0	\$0	(\$7,398)	\$111,380	\$111,380	\$0	\$0
Year 14	\$121,985	\$0	\$0	(\$7,398)	\$114,587	\$114,587	\$0	\$0
Year 15	\$125,401	\$0	\$0	(\$7,398)	\$118,003	\$118,003	\$0	\$0
Year 16	\$128,912	\$0	\$0	(\$7,398)	\$121,514	\$121,514	\$0	\$0
Year 17	\$132,650	\$0	\$0	(\$7,398)	\$125,252	\$125,252	\$0	\$0
Year 18	\$136,497	\$0	\$0	(\$7,398)	\$129,099	\$64,769	\$0	\$64,330
Year 19	\$140,455	\$0	\$0	(\$7,398)	\$133,057	\$0	\$0	\$133,057
Year 20	\$144,529	\$0	\$0	(\$7,398)	\$137,131	\$0	\$0	\$137,131
<b>Total</b>	<b>\$2,311,496</b>	<b>\$0</b>	<b>\$78,749</b>	<b>(\$81,378)</b>	<b>\$2,308,867</b>	<b>\$1,882,995</b>	<b>\$47,549</b>	<b>\$378,322</b>

\*\*\*Capital Cost Avoidance in year 11-20 represents amount to be budgeted for Telensa controls refresh

## Investment Grade Audit Cost

The costs to develop and finalize this project in the next step, the Investment Grade Audit (IGA) phase, are shown below. Should the municipality decide not to move forward with a project, it will be responsible to pay this amount as a break fee with JCI.

Energy Conservation Measure	JCI Hard Cost (\$)	IGA (%)	IGA Cost (\$)
Street lighting - Upgrade to LED (Cobra)	\$566,352	7.4%	\$41,910
Street lighting - Upgrade to LED (Decorative)	\$452,144	7.4%	\$33,459
Wireless Street Lighting Controls (Cobra)	\$0	7.4%	\$0
Wireless Street Lighting Controls (Decorative)	\$19,859	7.4%	\$1,470
Traffic Lighting - Upgrade to LED	\$47,743	7.4%	\$3,533
Exterior Lighting - Upgrade to LED	n/a	n/a	\$12,500
Electric Rate Procurement	\$2,040	7.4%	\$151
Other Municipality Requests			\$0
<b>Total</b>			<b>\$93,022</b>

The IGA cost is based on a percentage of the total hard costs of that conservation measure to JCI. This percentage is 7.4% for street lighting, wireless controls and traffic lighting. This percentage includes the audit, design and analysis services for street lighting. The exterior lighting IGA cost and the electric rate procurement IGA costs are also calculated based on 7.4% of their total hard costs to JCI.

## Project Savings Summary per Unit

Savings per fixture upgrade are shown in this section for the cobra-head street light upgrades. As specified in the RFP, the final savings for the cobra-head street lights will be within 90% of the savings shown below.

Existing				Proposed					Savings per Unit			
Fixture (Cobra Head)	Billed Wattage	Energy Usage (kWh/Fixture)	Energy Cost (\$/Fixture)	Manufacturer	New Wattage	Quantity	Energy Usage (kWh/Fixture)	Energy Cost (\$/Fixture)	kWh Savings / Fixture	Controls kWh Saved / Fixture	Total kWh Saved/ Fixture	Total Savings / Fixture (\$)
70W HPS	94	385	\$28.55	Philips Lumec	38	1,386	155	\$11.54	229	0	229	\$17.01
100W HPS	131	536	\$39.79	Philips Lumec	54	405	221	\$16.40	315	0	315	\$23.39
150W HPS	192	786	\$58.32	Philips Lumec	73	344	299	\$22.17	487	0	487	\$36.15
250W HPS	294	1,203	\$89.30	Philips Lumec	108	232	442	\$32.80	761	0	761	\$56.50
100W INC	103	421	\$31.29	Philips Lumec	38	1	155	\$11.54	266	0	266	\$19.74
					<b>Total</b>	<b>2,368</b>						



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Preliminary Audit Phase  
RSLPP Guaranteed Savings Agreement

## Next Steps / Notes for Investment Grade Audit Phase

Key Project Milestones:	Planned Date
• Preliminary Midpoint Meeting	2/3/2016
• Final Preliminary Report Delivery	3/2/2015
• Council/Commissioners GSA Contract Vote and Approval	3/9/2015
• Investment Grade Audit Mid-point Meeting	April
• Final GSA Contract / IGA Report Delivery	May
• Council/Commissioners Final GSA Contract Vote and Approval	May
• Construction Start	July
• Construction Complete	September
• Add'l	TBD
• Add'l	TBD

In the next phase of this project, the IGA phase, we will discuss the following items further with the municipality:

- 1 - Assumed 20% Decorative Acorn Fixtures
- 2 - Public Works Committee -- 2nd Wednesday Board of Commissioners - 3rd Wednesday
- 3 - Cheltenham Township participates in the Montgomery County Traffic Signal Consortium, which provides maintenance services for participating
- 4 - Not sure about controls
- 5 - **Updated Report:**
- 6 - Telensa Controls used for an alternative controls solution
- 7 - Updated O&M savings to \$10/fixtures instead of the \$145,000 provided by Cheltenham for a more conservative estimate. This will be discussed in IGA.
- 8 - 2.75% Interest Rate used for a more conservative model
- 9 - 5% customer contingency added to project
- 10 - Project assumes using retrofit kits for decorative fixtures. Conservative estimate retrofit kits. Alternative options may be available once assessed during IGA.
- 11 - Decorative count still assumes 20% of street lights on bill.
- 12 -
- 13 -
- 14 -
- 15 -
- 16 -
- 17 -
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# Section E

## Appendix

## Appendix 1 - Utility Rates used in Analysis

For each conservation measure the following rates were used to calculate the energy savings. In the cash flow, the energy rates are escalated 3% beginning in year 1 of the guarantee term.

Conservation Measure	\$/kWh Rate
Street Lighting	\$0.0742
Traffic Lighting	\$0.0833
n/a	\$0.0000

For exterior lighting accounts in which the utility rate (\$/kWh) information was not received from the municipality in the Needs Assessment questionnaire, JCI assumed a rate of \$0.08/kWh

## Appendix 2 - PennSEF Escalation Rates

The following energy escalation rates were used in the cash flow as directed by PennSEF.

Year	Electricity
2016	1.70%
2017	1.80%
2018	2.00%
2019	2.10%
2020	2.20%
2021	2.20%
2022	2.30%
2023	2.30%
2024	2.40%
2025	2.40%
2026	2.50%
2027	2.50%
2028	2.60%
2029	2.60%
2030	2.70%
2031	2.70%
2032	2.80%
2033	2.80%
2034	2.90%
2035	2.90%
2036	3.00%
2037	3.00%
2038	3.10%