IGA Volume 2
For
Cheltenham Township

Prepared
By
Johnson Controls

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

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Section A

Executive Summary

Cheltenham Township

Executive Summary

Johnson Controls is pleased to present this Investment Grade Audit Volume 2 Report to Cheltenham Township. This report details the energy efficiency upgrades that were 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	No
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
8	Field Adjustable Wattage Selector (FAWS)	No

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 project that meets the goals of the municipality. The cost and benefits of the project are shown below. The project includes converting cobrahead and decorative fixtures to LED, converting traffic lighting to LED, converting exterior lighting to LED, electric rate procurement, and wireless controls on a portion of decorative fixtures.

	Base Project + Controls
Energy Conservation Measure (ECM) Number	**1, 2, 4, 5, 6, 7**
Construction Cost ($)*	**$1,544,091**
Total Financed Cost ($)**	**$1,927,826**
Total Project Benefits over 20 Year Term	**$5,060,207**
1) Energy Savings	$2,563,587
2) O&M Savings	$2,425,303
3) Rebates	$73,121

*Only applicable costs and savings are shown in the table

**Includes customer controlled contingency, program consulting fee, owner agent fees if applicable, measurement and verification, closing costs and interest.

***Rebate estimate based on Phase 3 of PECO rebates

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

Parameter	Base Project + Controls
Interest Rate (%)	2.40%
Contract Term (years)	10
Energy Escalation Rates (%)*	1.7%-3.0%
Street Lighting Electric Rate ($/kWh)	$0.076
Traffic Lighting Electric Rate ($/kWh)	$0.085
Exterior Lighting Rate ($/kWh)**	Varies

*The energy escalation rate varies over the term according to PennSEF's guidelines, details in Appendix 2

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

Section B

Measures Not Evaluated

Measures Not Evaluated

Field Adjustable Wattage Selector (FAWS) Controls
The manual controls option, known as (FAWS), was not deemed as an important feature to add to the street lights and thus excluded from the project

Section C

Utility Baselines

Street Lighting - Baseline

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, types and wattages of fixtures shown may vary from the actual street lighting fixture quantities, types and wattages present in the municipality. **Because the energy cost savings that are realized from this project will be reflected through changes to your utility bill, the baseline for energy cost is also based on the street lights listed in your bill - and not what was identified as actually installed in your municipality as a result of the field audit.** This table shows the baseline for energy costs modeled in this analysis.

Type	Size	Fixture (Cobra Head)	Quantity	Billed Wattage	Annual Energy Use (kWh)	Annual Energy Cost ($)
Sodium Vapor	05800S	70W HPS	1727	94	664,287	$50,706
Sodium Vapor	09500S	100W HPS	655	131	351,114	$26,801
Sodium Vapor	16000S	150W HPS	344	192	270,268	$20,630
Sodium Vapor	25000S	250W HPS	232	294	279,107	$21,305
Incandescent	01000L	100W INC	1	103	421	$32
		Total	**2959**		**1,565,198**	**$119,474**
		Service Location Distribution Charge*	**2937**			**$249,528**
		Modeled Cost for Cobra-heads (annual)				**$369,001**

*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 if the final quantity of street lights identified in the Investment Grade Audit differ from that listed on your bill.

Street Lighting - Audited Cobra-head Fixtures

JCI performed a detailed, field based street lighting audit of the municipality. This audit provided the data needed to do a photometric design analysis (pole spacing, pole height, lamp type, etc.) and helped to reconcile inaccuracies in the quantity and location of street lights found in the PECO bill and database. The quantities in the table below represent quantities of fixtures that are present in the municipality based on the investment grade audit (IGA). The street lighting audit performed in the IGA serves as the basis for determining the scope of work for the project since it details out the type and quantity of fixtures present that are eligible for conversion to LED and replacement. Energy savings were 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.

Type	Size	Fixture (Cobra Head)	Quantity	Wattage
Mercury Vapor	04000M	100W MV	6	115
Sodium Vapor	05800S	70W HPS	1399	94
Sodium Vapor	09500S	100W HPS	665	131
Sodium Vapor	16000S	150W HPS	396	192
Sodium Vapor	25000S	250W HPS	205	294
Sodium Vapor	50000S	400W HPS	1	450
Metal Halide	07800H	100W MH	25	131
Metal Halide	20500H	250W MH	1	294
		Total	**2698**	

Street Lighting - Audited Decoratives

JCI performed a detailed, field based street lighting audit of the municipality. This audit provided the data needed to do a photometric design analysis (pole spacing, pole height, lamp type, etc.) and helped to reconcile inaccuracies in the quantity and location of street lights found in the PECO bill and database. The quantities in the table below represent quantities of decorative fixtures that are present in the municipality based on the investment grade audit (IGA). The street lighting audit performed in the IGA serves as the basis for determining the scope of work for the project since it details out the type and quantity of fixtures present that are eligible for conversion to LED and replacement. Energy savings were 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.

Type	Size	Fixture (Decorative)	Style	Quantity	Wattage
Sodium Vapor	05800S	70W HPS	4 Sided Colonial	70	94
Sodium Vapor	09500S	100W HPS	4 Sided Colonial	19	131
Sodium Vapor	16000S	150W HPS	4 Sided Colonial	2	192
Sodium Vapor	05800S	70W HPS	Acorn	8	94
Sodium Vapor	09500S	100W HPS	Acorn	3	131
Sodium Vapor	09500S	100W HPS	Barn Light	1	131
Sodium Vapor	16000S	150W HPS	Lantern	43	192
Sodium Vapor	09500S	100W HPS	Paragon	287	131
		Total		**433**	

Traffic Lighting - Baseline

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. JCI has performed a traffic lighting survey to verify the quantity of traffic lights in the municipality and determine the quantity eligible for conversion to LED and replacement.

Type	Label	Description	Wattage	Quantity	Annual Energy Use (kWh)	Annual Energy Cost ($)
Incandescent	R000TL	8" Red TL	69	28	7,349	$627
Incandescent	Y000TL	8" Yellow TL	69	33	315	$27
Incandescent	G000TL	8" Green TL	69	33	6,771	$578
Incandescent	Y000TL	12" Yellow TL	150	74	1,535	$131
Incandescent	G000TL	12" Green TL	150	74	33,010	$2,818
LED	RLEDTL	8" Red TL	7	125	3,328	$284
LED	YLEDTL	8" Yellow TL	13	124	223	$19
LED	GLEDTL	8" Green TL	6	129	2,302	$197
LED	RLEDTL	12" Red TL	11	483	20,209	$1,725
LED	YLEDTL	12" Yellow TL	18	452	1,125	$96
LED	GLEDTL	12" Green TL	12	443	15,809	$1,350
Incandescent	Y000TA	12" Yellow TA	150	4	332	$28
Incandescent	G000TA	12" Green TA	150	20	1,660	$142
LED	YLEDTA	8" Yellow TA	10	21	116	$10
LED	GLEDTA	8" Green TA	9	6	30	$3
LED	YLEDTA	12" Yellow TA	9	1	5	$0
LED	GLEDTA	12" Green TA	13	28	201	$17
Incandescent	WLKSGN	Walk/Don't walk 9"	69	20	9,544	$815
Incandescent	WLKSGN	Walk/Don't walk 12"	144	12	11,951	$1,020
Incandescent	HNDSGN	Hand/man	138	34	32,449	$2,770
LED	HNDSGN	Hand/man	13	134	12,048	$1,029
-	0MINLT	School Flashers	0	121	0	$0
-	EMPESD	Preemption Device	2	56	775	$66
-	00LOOP	Loops	2	131	1,812	$155
-	TRCONT	Motor Controller	5	63	2,179	$186
-	NTMNTR	Motor Controller	5	4	138	$12
		Energy Cost		**2653**	**165,216**	**$14,105**
		Service Location Distribution Charge*		**62**		**$2,507**
		Total Cost				**$16,612**

* Service Location Distribution Charge is $3.37 per location

Traffic Lighting - Audited Inventory

The quantity and type of traffic lights and signals present in the municipality are shown below. The information is based on the traffic lighting survey performed by JCI to verify the quantity of traffic lights in the municipality and determine the quantity eligible for conversion to LED and replacement.

Type	Label	Description	Wattage	Quantity
Incandescent	R000TL	8" Red TL	69	0
Incandescent	Y000TL	8" Yellow TL	69	0
Incandescent	G000TL	8" Green TL	69	0
Incandescent	R000TL	12" Red TL	150	23
Incandescent	Y000TL	12" Yellow TL	150	29
Incandescent	G000TL	12" Green TL	150	25
LED	RLEDTL	8" Red TL	7	108
LED	YLEDTL	8" Yellow TL	13	109
LED	GLEDTL	8" Green TL	6	109
LED	RLEDTL	12" Red TL	11	514
LED	YLEDTL	12" Yellow TL	18	492
LED	GLEDTL	12" Green TL	12	490
Incandescent	Y000TA	8" Yellow TA	69	0
Incandescent	G000TA	8" Green TA	69	0
Incandescent	Y000TA	12" Yellow TA	150	4
Incandescent	G000TA	12" Green TA	150	12
LED	YLEDTA	8" Yellow TA	10	0
LED	GLEDTA	8" Green TA	9	2
LED	YLEDTA	12" Yellow TA	9	40
LED	GLEDTA	12" Green TA	13	51
Incandescent	WLKSGN	Walk/Don't walk 9"	69	8
Incandescent	WLKSGN	Walk/Don't walk 12"	144	0
Incandescent	HNDSGN	Hand/man	138	59
LED	HNDSGN	Hand/man	13	195
-	0MINLT	School Flashers	0	116
-	EMPESD	Preemption Device	2	56
-	00LOOP	Loops	2	131
-	USONIC	Ultrasonic Device	5	0
-	TRCONT	Motor Controller	5	63
-	NTMNTR	Motor Controller	5	4
		Total		**2640**

Exterior Lighting - Audited Inventory

Exterior building, parking lot, 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 an exterior lighting survey performed by JCI at these locations.

Number	Location	Type	Wattage	Quantity	Est. Annual Energy Usage (kWh)	Est. Annual Energy Cost ($)
1	Township administrative building	Deco Wall Sconce	13	9	512	$37
2	Township administrative building	Deco on ceiling	94	3	1,235	$89
3	Township administrative building	Ingrade	127	4	2,225	$160
4	Township administrative building	Deco wall sconce	14	4	245	$18
5	Township administrative building	Flood	1077	1	4,717	$340
6	Township administrative building	Shoebox	456	2	3,995	$288
7	Township administrative building	Wallpack	75	1	329	$24
8	Township administrative building	Wallpack	23	1	101	$7
9	Township administrative building	Flood	1077	1	4,717	$340
10	EMS Station	Flood	23	1	101	$7
11	EMS Station	Cobrahead	23	4	403	$29
12	EMS Station	Flood	455	1	1,993	$144
13	Police Station	Deco	127	3	1,669	$120
14	Police Station	Flood	291	2	2,549	$183
15	Police Station	Shoebox	456	2	3,995	$287
16	Police Station	Deco	42	2	368	$26
17	Police Station	Recessed	13	1	57	$4
18	District Court	Recessed	23	7	705	$51
19	District Court	Surface Mount	95	1	416	$30
20	District Court	Cobrahead	138	1	604	$44
21	District Court	Flood	1077	1	4,717	$340
22	District Court	Wall Sconce	100	1	438	$32
23	Community Center	Flood	184	3	2,418	$174
24	Community Center	Dusk to Dawn	209	2	1,831	$131
25	Community Center	Wallpack	60	5	1,314	$94
26	Community Center	Dusk to Dawn	291	1	1,275	$91
27	Community Center	Cobrahead	291	1	1,275	$91
28	Community Center	Recessed	156	6	4,100	$294
29	Community Center	Wallpack on ceiling	184	5	4,030	$289
30	Community Center	Wallpack	291	7	8,922	$640
31	Community Center	Flood	156	1	683	$49
32	Veterans memorial field	Wallpack	95	1	416	$30
33	Veterans memorial field	Sports Light	1077	44	207,559	$14,960
34	Veterans memorial field	Flood	456	3	5,992	$432
35	Veterans memorial field	Flood	456	4	7,989	$576
36	Veterans memorial field	Flood	127	1	556	$40
37	Tookany Parkway Pond	Dusk to Dawn	127	1	556	$40
38	Tookany Parkway Pond	Flood	291	1	1,275	$92
39	Elkins park public library	Wallpack	60	4	1,051	$76
40	Elkins park public library	Recessed	100	4	1,752	$126
41	Elkins park public library	Flag Light	100	1	438	$32
42	Elkins park public library	Shoebox	456	6	11,984	$864
43	Elkins park public library	Wallpack	60	2	526	$38
44	Elkins park public library	Shoebox	184	6	4,836	$349
45	Elkins park public library	Shoebox	456	2	3,995	$288
46	gottschalk fire training	No lightbulb	0	1	0	$0

Number	Location	Type	Wattage	Quantity	Est. Annual Energy Usage (kWh)	Est. Annual Energy Cost ($)
47	Conklin pool	Flood	456	9	17,976	$1,314
48	Conklin pool	Recessed	23	9	907	$66
49	Conklin pool	Shoebox	290	14	17,783	$1,300
50	Conklin pool	Flood	23	2	201	$15
51	Conklin pool	Deco	0	1	0	$0
52	Flood Gate	LED on flood gate	23	36	3,627	$261
53	Richard wall house museum	Deco	100	3	1,314	$93
54	Richard wall house museum	Wallpack	23	4	403	$29
55	Richard wall house museum	Flood	23	2	201	$14
56	Richard wall house museum	Recessed	60	4	1,051	$75
57	Richard wall house museum	Deco	100	2	876	$62
58	Richard wall house museum	Flood	95	2	832	$59
59	Public Service Building	Flood	127	3	1,669	$120
60	Public Service Building	Wall Sconce	23	1	101	$7
61	Public Service Building	Wallpack	127	5	2,781	$200
62	Public Service Building	Flood	23	2	201	$15
63	Public Service Building	4 dusk-dawn style lights with a cover	456	4	7,989	$576
64	Public Service Building	Shoebox	456	6	11,984	$864
65	Public Service Building	Cobrahead	456	2	3,995	$288
66	Public Service Building	Wall sconces on pole	23	6	604	$44
67	Public Service Building	Recessed	60	4	1,051	$76
68	Glenside hall and pool and Harry s renninger park	Deco	55	1	241	$17
69	Glenside hall and pool and Harry s renninger park	Flood	184	4	3,224	$234
70	Glenside hall and pool and Harry s renninger park	Flood	23	6	604	$44
71	Glenside hall and pool and Harry s renninger park	Flood	184	3	2,418	$176
72	Glenside hall and pool and Harry s renninger park	Deco	23	2	201	$15
73	Glenside hall and pool and Harry s renninger park	Wallpack	23	2	201	$15
74	Glenside hall and pool and Harry s renninger park	Flood	456	1	1,997	$145
75	Glenside hall and pool and Harry s renninger park	Recessed	23	20	2,015	$146
76	Glenside hall and pool and Harry s renninger park	Flood	456	12	23,967	$1,740
77	Glenside hall and pool and Harry s renninger park	Cobrahead	456	1	1,997	$145
78	flood gate	LED on flood gate	23	3	302	$22
79	shovel house	Flag Light	23	1	101	$7
80	shovel house	Deco	40	4	701	$51
81	shovel house	Flood	23	2	201	$15
82	four flood gates	LED on Flood gates	23	36	3,627	$261
83	flood gate	LED on gate	23	3	302	$22
84	Chelton hills drive and church road	LED on gate	23	33	3,324	$240
85	Chelten hills drive and heacock lane	LED on gate	23	36	3,627	$261
86	Township administrative building	New Flag Light	0	0	0	$0
			Total	**456**	**435,460**	**$31,428**

Section D

Design Process

Project Design Process

1. Receive final validated audit data from municipality
2. Assign Road Type to each record
    a.) Residential
    b.) Collector (connects residential to major)
    c.) Major
    d.) Major State or Highway
3. Prescribe LED solution based on following attributes:
    a.) Road Type
    b.) Number of lanes on road
    c.) Pole location (street or intersection)
    d.) Fixture style
    e.) Existing lamp wattage and type
4. Map prescribed LED solution and look for outliers
    a.) Outliers will identify "non-conforming" existing fixtures
5. Analyze outliers
    a.) Conform to prescriptive (e.g. treat 175W in a row of 100W poles as a 100 W)
    b.) Retrofit non-conforming to appropriate LED (e.g. assume 175W was for a reason and replace with 175W prescriptive LED)
    c.) Present to municipality for discussion (e.g. major state road has 100W poles, prescriptive design for road type is 108W)
6. Generate photometrics for sample population
7. Present recommended design
    a.) Include rationale for outliers as supporting document
    b.) Photometrics
    c.) Roadway use
    d.) Municipality preference

Proposed Design Standards

Residential Road

Type II distribution for street, Type III distribution of intersection

Existing Lamp Type	Existing Lamp Watts	Prescriptive LED Upgrade Watts	Final LED Upgrade Watts
Mercury Vapor	175W or less	35W	35W/ 54 for Type 2 residential collector
Metal Halide	175W or less	35W	35W/ 54 for Type 2 residential collector
High Pressure Sodium	100W or less	35W	35W/ 54 for Type 2 residential collector

Light Commercial Road

Type II distribution for street, Type III distribution of intersection

Existing Lamp Type	Existing Lamp Watts	Prescriptive LED Upgrade Watts	Final LED Upgrade Watts
Mercury Vapor	400W or greater than 175W	72W	72W
Metal Halide	250W or greater than 175W	72W	72W
High Pressure Sodium	150W	72W	72W

State Road/Busy Road

Type II distribution for street, Type III distribution of intersection

Existing Lamp Type	Existing Lamp Watts	Prescriptive LED Upgrade Watts	Final LED Upgrade Watts
Metal Halide	400W	108W	108W/160W
High Pressure	250W	160W	108W/160W
High Pressure Sodium	400W	215W	108W/160W

4 Sided Colonial

Existing Lamp Type	Existing Lamp Watts	Prescriptive LED Upgrade Watts	Final LED Upgrade Watts
Mercury Vapor	100W	52W	52W
Metal Halide	100W	52W	52W
High Pressure Sodium	100W	52W	52W
High Pressure Sodium	150W	75W	52W

Decorative fixtures

Prescribed to be upgraded with retrofit kit

Existing Lamp Type	Existing Lamp Watts	Prescriptive LED Upgrade Watts	Final LED Upgrade Watts
Metal Halide	175W or less	63W	63W
High Pressure Sodium	150W or less	63W	63W

Section E

Energy Conservation Measures, Price and Savings

Scope of Work - Street Lighting

Cobra-Head Fixtures - Costs

Proposed											
Manufacturer	**Model #**	**IES Distribution Type**	**New Wattage (IGA)**	**Quantity**	**Warranty (Years)**	**Unit Material Cost ($)**	**Unit Install Cost ($)**	**Material Handling ($)**	**ESCO Service Cost ($)**	**Total Unit Cost ($)**	**Total Installed Cost ($)**
Philips Lumec	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	Type 2	38	1056	10	$123.97	$97.50	$0.62	$63.07	$285.16	$301,133
Philips Lumec	RFS-35W16LED4K-T-R3M-UNIV-DMG-RCD-SP2-GY3	Type 3	38	389	10	$123.97	$97.50	$0.62	$63.07	$285.16	$110,929
Philips Lumec	RFS-54W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	Type 2	54	418	10	$144.45	$97.50	$0.72	$68.92	$311.59	$130,245
Philips Lumec	RFS-54W16LED4K-T-R3M-UNIV-DMG-RCD-SP2-GY3	Type 3	54	260	10	$144.45	$97.50	$0.72	$68.92	$311.59	$81,014
Philips Lumec	RFM-72W32LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	Type 2	73	213	10	$172.16	$97.50	$0.86	$76.83	$347.35	$73,985
Philips Lumec	RFM-72W32LED4K-T-R3M-UNIV-DMG-RCD-SP2-GY3	Type 3	73	51	10	$172.16	$97.50	$0.86	$76.83	$347.35	$17,715
Philips Lumec	RFM-108W32LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	Type 2	108	72	10	$194.54	$97.50	$0.97	$83.22	$376.23	$27,088
Philips Lumec	RFM-108W32LED4K-T-R3M-UNIV-DMG-RCD-SP2-GY3	Type 3	108	58	10	$194.54	$97.50	$0.97	$83.22	$376.23	$21,821
Philips Lumec	RFM-160W48LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	Type 2	161	77	10	$208.54	$97.50	$1.04	$87.21	$394.29	$30,361
Philips Lumec	RFM-160W48LED4K-T-R3M-UNIV-DMG-RCD-SP2-GY3	Type 3	161	104	10	$208.54	$97.50	$1.04	$87.21	$394.29	$41,007
			Conversion to LED	2698							$835,297
			No Conversion	0							$0
										Total	**$835,297**

* Please see line-by-line in the appendix of IGA Volume 1 for detailed information of existing and proposed fixtures

Energy Savings - Street Lighting

Decorative Fixtures-Costs (New Fixtures for 4 Sided Colonials)

Proposed											
Style	**Manufacturer**	**Model #**	**IES Distribution Type**	**New Wattage**	**Quantity**	**Unit Material Cost ($)**	**Unit Install Cost ($)**	**Material Handling ($)**	**ESCO Service Cost ($)**	**Total Unit Cost ($)**	**Total Installed Cost ($)**
Paragon	Pennsylvania Globe Co.	SM-Acorn	ASYMMETRIC	50	70	$841.14	$97.50	$4.21	$216.16	$1,159.00	$81,130
Paragon	Pennsylvania Globe Co.	SM-Acorn	ASYMMETRIC	50	19	$841.14	$97.50	$4.21	$216.16	$1,159.00	$22,021
Paragon	Pennsylvania Globe Co.	SM-Acorn	ASYMMETRIC	50	2	$841.14	$97.50	$4.21	$216.16	$1,159.00	$2,318
Acorn	Amerlux	AVISY4H4000K80CRI	ASYMMETRIC	63	8	$528.67	$152.00	$2.64	$186.54	$869.85	$6,959
Acorn	Amerlux	AVISY4H4000K80CRI	ASYMMETRIC	63	3	$528.67	$152.00	$2.64	$186.54	$869.85	$2,610
Barn Light	Phillips	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	Type 2	38	1	$123.97	$97.50	$0.62	$63.07	$285.16	$285
Lantern	Spring City	S103091	ASYMMETRIC	60	43	$956.14	$152.00	$4.78	$237.21	$1,350.13	$58,056
Paragon	Amerlux	SBP-LED-Retrofit Kit	ASYMMETRIC	63	287	$528.67	$152.00	$2.64	$186.54	$869.85	$249,647
Paragon	Pennsylvania Globe Co.	SM-Acorn	ASYMMETRIC	50	2	$886.14	$207.50	$4.43	$251.74	$1,349.81	$2,700
New Pole	Pennsylvania Globe Co.	New Decorative Poles	N/A		91						$82,421
				Total	**435**						**$508,146**

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 Bill					Proposed Bill						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 ($)
100W MV	115	0	0	$0	Cobrahead	Philips Lumec	38	1,056	164,204	$12,534		
175W MV	191	0	0	$0	Cobrahead	Philips Lumec	38	389	60,488	$4,617		
250W MV	275	0	0	$0	Cobrahead	Philips Lumec	54	418	92,365	$7,050		
400W MV	429	0	0	$0	Cobrahead	Philips Lumec	54	260	57,452	$4,385		
700W MV	768	0	0	$0	Cobrahead	Philips Lumec	73	213	63,627	$4,857		
1000W MV	1090	0	0	$0	Cobrahead	Philips Lumec	73	51	15,235	$1,163		
70W HPS	94	1657	637,362	$48,651	Cobrahead	Philips Lumec	108	72	31,819	$2,429		
100W HPS	131	359	192,443	$14,689	Cobrahead	Philips Lumec	108	58	25,632	$1,957		
150W HPS	192	301	236,485	$18,051	Cobrahead	Philips Lumec	161	77	50,729	$3,872		
250W HPS	294	232	279,107	$21,305	Cobrahead	Philips Lumec	161	104	68,516	$5,230		
100W INC	103	1	421	$32	0	0	0	0	0	$0		
100W MV	115	0	0	$0	Paragon	Pennsylvania Globe Co.	50	70	14,322	$1,093		
175W MV	191	0	0	$0	Paragon	Pennsylvania Globe Co.	50	19	3,887	$297		
250W MV	275	0	0	$0	Paragon	Pennsylvania Globe Co.	50	2	409	$31		
400W MV	429	0	0	$0	Acorn	Amerlux	63	8	2,062	$157		
700W MV	768	0	0	$0	Acorn	Amerlux	63	3	773	$59		
1000W MV	1090	0	0	$0	Barn Light	Phillips	38	1	155	$12		
70W HPS	94	70	26,925	$2,055	Lantern	Spring City	60	43	10,557	$806		
100W HPS	131	296	158,671	$12,112	Paragon	Amerlux	63	287	73,987	$5,648		
150W HPS	192	43	33,784	$2,579	Paragon	Pennsylvania Globe Co.	50	2	409	$31		
Total - Cobraheads		2550	1,345,818	$102,728	**Total - Cobraheads**			2,698	630,066	$48,094	715,752	$54,634
Total - Decoratives		409	219,380	$16,746	**Total - Decoratives**			435	106,564	$8,134	112,816	$8,611
Project Total		2959	1,565,198	$119,474	**Total**			3133	736,630	$56,228	828,569	$63,246
Locations*		2937			**Locations***			2937				
Service Location Distribution Charge**		$249,528			**Service Location Distribution Charge****			$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

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 ($)**	**Unit Install Cost ($)**	**Material Handling ($)**	**ESCO Service Cost ($)**	**Total Unit Cost ($)**	**Total Installed Cost ($)**
Cooper	LXFE02LEDDUASYM4N7BK	52	70	NO	$0.00	$0.00	$0.00	$0.00	$0.00	$0
Cooper	LXFE02LEDDUASYM4N7BK	52	19	NO	$0.00	$0.00	$0.00	$0.00	$0.00	$0
Cooper	LXFE02LEDDUASYM4N7BK	52	2	NO	$0.00	$0.00	$0.00	$0.00	$0.00	$0
Amerlux	AVISY4H4000K80CRI	63	8	NO	$0.00	$0.00	$0.00	$0.00	$0.00	$0
Amerlux	AVISY4H4000K80CRI	63	3	NO	$0.00	$0.00	$0.00	$0.00	$0.00	$0
Phillips	W16LED4K-T-R2M-UNIV-DMG-RCD-S	38	1	NO	$0.00	$0.00	$0.00	$0.00	$0.00	$0
Amerlux	AVISY4H4000K80CRI	63	41	YES	$596.00	$30.00	$2.98	$178.63	$774.63	$31,760
Amerlux	AVISY4H4000K80CRI	63	287	NO	$0.00	$0.00	$0.00	$0.00	$0.00	$0
		Total	**433**							**$31,760**

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 ($)**
Cooper	LXFE02LEDDUASYM4N7BK	52	70	NO	0%	0.0	0	$0
Cooper	LXFE02LEDDUASYM4N7BK	52	19	NO	0%	0.0	0	$0
Cooper	LXFE02LEDDUASYM4N7BK	52	2	NO	0%	0.0	0	$0
Amerlux	AVISY4H4000K80CRI	63	8	NO	0%	0.0	0	$0
Amerlux	AVISY4H4000K80CRI	63	3	NO	0%	0.0	0	$0
Phillips	RFS-35W16LED4K-T-R2M-UNIV-DMG-RCD-SP2-GY3	38	1	NO	0%	0.0	0	$0
Amerlux	AVISY4H4000K80CRI	63	43	Yes	25%	15.8	2,771	$212
Amerlux	AVISY4H4000K80CRI	63	287	NO	0%	0.0	0	$0
		Total	**435**				**2,771**	**$212**

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	Warranty	Unit Material Cost ($)	Unit Install Cost ($)	Material Handling ($)	ESCO Service Cost ($)	Total Unit Cost ($)	Total Installed Cost ($)
R000TL	12" Red TL	150	GE	DR6 RTFB VLA	6.3	15	10	$40.00	$40.00	$0.20	$24.94	$105.14	$1,577
Y000TL	12" Yellow TL	150	GE	DR6 YTFB VLA	10	21	10	$40.00	$40.00	$0.20	$24.94	$105.14	$2,208
G000TL	12" Green TL	150	GE	DR6 GTFB VLA	8.8	17	10	$40.00	$40.00	$0.20	$24.94	$105.14	$1,787
RLEDTL	8" Red TL	7	n/a	No Upgrade	7	108	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
YLEDTL	8" Yellow TL	13	n/a	No Upgrade	13	109	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
GLEDTL	8" Green TL	6	n/a	No Upgrade	6	109	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
RLEDTL	12" Red TL	11	n/a	No Upgrade	11	514	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
YLEDTL	12" Yellow TL	18	n/a	No Upgrade	18	492	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
GLEDTL	12" Green TL	12	n/a	No Upgrade	12	490	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
G000TA	12" Green TA	150	GE	DR6 GTAAN 17A	5	10	10	$40.00	$40.00	$0.20	$24.94	$105.14	$1,051
GLEDTA	8" Green TA	9	n/a	No Upgrade	9	2	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
YLEDTA	12" Yellow TA	9	n/a	No Upgrade	9	40	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
GLEDTA	12" Green TA	13	n/a	No Upgrade	13	51	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
HNDSGN	Hand/man	138	GE	PS6 CFL1 26A	5	29	10	$106.50	$152.00	$0.53	$80.56	$339.59	$9,848
HNDSGN	Hand/man	13	n/a	No Upgrade	13	195	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
0MINLT	School Flashers	0	n/a	No Upgrade	0	116	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
EMPESD	Preemption Device	2	n/a	No Upgrade	2	56	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
00LOOP	Loops	2	n/a	No Upgrade	2	131	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
TRCONT	Motor Controller	5	n/a	No Upgrade	5	63	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
NTMNTR	Motor Controller	5	n/a	No Upgrade	5	4	n/a	$0.00	$0.00	$0.00	$0.00	$0.00	$0
					Total								**$16,472**

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 ($)
12" Red TL	150	0	0	$0	GE	6.3	23	689	$59		
12" Yellow TL	150	74	1,918	$164	GE	10	29	50	$4		
12" Green TL	150	74	41,239	$3,521	GE	8.8	25	817	$70		
8" Red TL	7	125	4,158	$355	n/a	7	108	3,593	$307		
8" Yellow TL	13	124	279	$24	n/a	13	109	245	$21		
8" Green TL	6	129	2,876	$245	n/a	6	109	2,430	$207		
12" Red TL	11	483	25,247	$2,155	n/a	11	514	26,868	$2,294		
12" Yellow TL	18	452	1,406	$120	n/a	18	492	1,530	$131		
12" Green TL	12	443	19,750	$1,686	n/a	12	490	21,845	$1,865		
12" Yellow TA	150	4	415	$35	GE	9	4	25	$2		
12" Green TA	150	20	2,074	$177	GE	5	12	41	$4		
8" Green TA	9	6	37	$3	n/a	9	2	12	$1		
12" Yellow TA	9	1	6	$1	n/a	9	40	249	$21		
12" Green TA	13	28	252	$21	n/a	13	51	458	$39		
Walk/Don't walk 9"	69	20	11,923	$1,018	GE	5	8	346	$30		
Hand/man	138	34	40,539	$3,461	GE	5	59	2,549	$218		
Hand/man	13	134	15,051	$1,285	GE	9	195	15,163	$1,294		
School Flashers	0	121	0	$0	n/a	0	116	0	$0		
Preemption Device	2	56	968	$83	n/a	2	56	968	$83		
Loops	2	131	2,264	$193	n/a	2	131	2,264	$193		
Motor Controller	5	63	2,722	$232	n/a	5	63	2,722	$232		
Motor Controller	5	4	173	$15	n/a	5	4	173	$15		
Total		**2653**	**206,230**	**$17,606**	**Total**		**2640**	**83,036**	**$7,089**	**123,367**	**$10,532**
Locations		**62**			**Locations**		**62**				
Serv. Dist. Charge*		**$2,507**			**Serv. Dist. Charge***		**$2,507**				

*Service Location Distribution Charge is $3.37 per location

Scope of Work - Exterior Lighting

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

Existing				Proposed									
Number	Location	Type	Wattage	Manuf.	Model #	Warranty	Wattage	Quantity	Unit Material Cost ($)	Install Cost ($)	Material Handling ($)	ESCO Service Cost ($)	Total Installed Cost ($)
1	Township administrative building	Deco Wall Sconce	13	Philips	10.5PL-C/T LED/26V-2700 IF 4P 10/1	5	11	9	$18.90	Cheltenham Install			
2	Township administrative building	Deco on ceiling	94	Green Creative	17A21G4DIM/840	5	17	3	$17.59	Cheltenham Install			
3	Township administrative building	Ingrade	127	Green Creative	17A21G4DIM/840	5	17	4	$17.59	Cheltenham Install			
4	Township administrative building	Deco wall sconce	14	Philips	6.5A19/LED/8xx-22 DIM	5	7	4	$8.40	Cheltenham Install			
5	Township administrative building	Flood	1077	Cooper	UFLD-L-B100 D U 66 C BZ 4N7	10	257	1	$943.00				
6	Township administrative building	Shoebox	456	Lithonia	KAX1 LED P3 xxK R3 MVOLT SPA DDBXD	5	130	2	$466.67				
7	Township administrative building	Wallpack	75	Lithonia	OLWP 11 PE BZ	5	11	1	$89.00	Cheltenham Install			
8	Township administrative building	Wallpack	23	Lithonia	OLWP 11 PE BZ	5	11	1	$89.00	Cheltenham Install			
9	Township administrative building	Flood	1077	Cooper	UFLD-L-B100 D U 66 C BZ 4N7	10	257	1	$943.00				
10	EMS Station	Flood	23	Green Creative	9PAR38G3DIM/840FL40	5	19	1	$24.29	Cheltenham Install			
11	EMS Station	Cobrahead	23	Green Creative	8.5A19DIM/840	5	9	4	$8.66	Cheltenham Install			
12	EMS Station	Flood	455	Lithonia	OFL2 LED P3 xxK MVOLT YK DDBXD	5	183	1	$367.50				
13	Police Station	Deco	127	Cooper	LXFE01LEDD U SYM 4N7 BK	10	25	3	$312.47				
14	Police Station	Flood	291	Lithonia	OFL2 LED P2 xxK MVOLT IS DDBXD	5	121	2	$320.25				
15	Police Station	Shoebox	456	Lithonia	KAX1 LED P3 xxK R3 MVOLT SPA DDBXD	5	130	2	$466.67				
16	Police Station	Deco	42	Philips	10.5PL-C/T LED/26V-2700 IF 4P 10/1	5	11	2	$18.90	Cheltenham Install			
17	Police Station	Recessed	13	Philips	6.5A19/LED/8xx-22 DIM	5	7	1	$8.40	Cheltenham Install			
18	District Court	Recessed	23	Philips	6.5A19/LED/8xx-22 DIM	5	7	7	$8.40	Cheltenham Install			
19	District Court	Surface Mount	95	Green Creative	17A21G4DIM/840	5	17	1	$17.59	Cheltenham Install			
20	District Court	Cobrahead	138	Philips	RFS-35W16LED4K-T-R3M-UNIV-DMG-RCD-	10	35	1	$114.43				
21	District Court	Flood	1077	Cooper	UFLD-L-B100 D U 66 C BZ 4N7	10	257	1	$943.00				
22	District Court	Wall Sconce	100	Philips	6.5A19/LED/8xx-22 DIM	5	7	1	$8.40	Cheltenham Install			
23	Community Center	Flood	184	Lithonia	OFL1 LED P2 xxK MVOLT THK DDBXD	5	49	3	$162.75				
24	Community Center	Dusk to Dawn	209	Lithonia	TDD LED 1 xxK 120 PE M4	5	21	2	$92.19				
25	Community Center	Wallpack	60	Cooper	XTOR2A	10	18	5	$124.16	Cheltenham Install			
26	Community Center	Dusk to Dawn	291	Lithonia	TDD LED 2 xxK 120 PER M4	5	37	1	$110.25				
27	Community Center	Cobrahead	291	Philips	RFM-108W48LED4K-T-R2M-UNIV-DMG-RCD-	10	108	1	$180.68				
28	Community Center	Recessed	156	Green Creative	9PAR38G3DIM/840FL40	5	19	6	$24.29	Cheltenham Install			
29	Community Center	Wallpack on ceiling	184	Green Creative	17A21G4DIM/840	5	17	5	$17.59	Cheltenham Install			
30	Community Center	Wallpack	291	Lithonia	THW LED 20C 1000 xxK T3M DDBXD	5	72	7	$297.15	Cheltenham Install			
31	Community Center	Flood	156	Lithonia	OFL1 LED P2 xxK MVOLT THK DDBXD	5	49	1	$162.75	Cheltenham Install			
32	Veterans memorial field	Wallpack	95	Lithonia	OLWP 11 PE BZ	5	11	1	$89.00	Cheltenham Install			
33	Veterans memorial field	Sports Light	1077	Cooper	UFLD-L-B100 D U 66 C BZ 4N7	10	257	44	$943.00				
34	Veterans memorial field	Flood	456	Lithonia	OFL2 LED P3 xxK MVOLT YK DDBXD	5	183	3	$367.50				
35	Veterans memorial field	Flood	456	Lithonia	OFL2 LED P3 xxK MVOLT YK DDBXD	5	183	4	$367.50				
36	Veterans memorial field	Flood	127	Lithonia	OFL1 LED P2 xxK MVOLT THK DDBXD	5	49	1	$162.75				
37	Tookany Parkway Pond	Dusk to Dawn	127	Lithonia	TDD LED 1 xxK 120 PE M4	5	21	1	$92.19				
38	Tookany Parkway Pond	Flood	291	Lithonia	OFL2 LED P2 xxK MVOLT IS DDBXD	5	121	1	$320.25				
39	Elkins park public library	Wallpack	60	Lithonia	OLWP 11 PE BZ	5	11	4	$89.00	Cheltenham Install			
40	Elkins park public library	Recessed	100	Green Creative	17A21G4DIM/840	5	17	4	$17.59	Cheltenham Install			

Existing				Proposed									
Number	Location	Type	Wattage	Manuf.	Model #	Warranty	Wattage	Quantity	Unit Material Cost ($)	Install Cost ($)	Material Handling ($)	ESCO Service Cost ($)	Total Installed Cost ($)
41	Elkins park public library	Flag Light	100	ILP	FML-40WLED-UNIV-4000K	5	35	1	$140.00				
42	Elkins park public library	Shoebox	456	Lithonia	KAX1 LED P3 xxK R3 MVOLT SPA DDBXD	5	130	6	$466.67				
43	Elkins park public library	Wallpack	60	Lithonia	OLWP 11 PE BZ	5	11	2	$89.00	Cheltenham Install			
44	Elkins park public library	Shoebox	184	Lithonia	ASL-A-8LxK-210-4-U-DB	5	62	6	$327.33				
45	Elkins park public library	Shoebox	456	Lithonia	KAX1 LED P3 xxK R3 MVOLT SPA DDBXD	5	130	2	$466.67				
46	gottschalk fire training	No lightbulb	0	0	0	N/A	0	1	No Retrofit				
47	Conklin pool	Flood	456	Lithonia	OFL2 LED P3 xxK MVOLT YK DDBXD	5	183	9	$367.50				
48	Conklin pool	Recessed	23	Philips	6.5A19/LED/8xx-22 DIM	5	7	9	$8.40	Cheltenham Install			
49	Conklin pool	Shoebox	290	Lithonia	KAX1 LED P2 xxK R3 MVOLT SPA DDBXD	5	96	14	$437.59				
50	Conklin pool	Flood	23	Green Creative	9PAR38G3DIM/840FL40	5	19	2	$24.29	Cheltenham Install			
51	Conklin pool	Deco	0	Cooper	LXFE01LEDD U SYM 4N7 BK	10	25	1	$312.47				
52	Flood Gate	LED on flood gate	23	N/A	0	N/A	23	36	No Retrofit	Cheltenham Install			
53	Richard wall house museum	Deco	100	Cooper	LXFE01LEDD U SYM 4N7 BK	10	25	3	$312.47				
54	Richard wall house museum	Wallpack	23	Lithonia	OLWP 11 PE BZ	5	11	4	$89.00	Cheltenham Install			
55	Richard wall house museum	Flood	23	Green Creative	9PAR38G3DIM/840FL40	5	19	2	$24.29	Cheltenham Install			
56	Richard wall house museum	Recessed	60	Philips	6.5A19/LED/8xx-22 DIM	5	7	4	$8.40	Cheltenham Install			
57	Richard wall house museum	Deco	100	Cooper	LXFE01LEDD U SYM 4N7 BK	5	25	2	$312.47	Cheltenham Install			
58	Richard wall house museum	Flood	95	Lithonia	OFL1 LED P2 xxK MVOLT THK DDBXD	5	49	2	$162.75				
59	Public Service Building	Flood	127	Lithonia	OFL1 LED P1 xxK MVOLT THK DDBXD	5	23	3	$117.60				
60	Public Service Building	Wall Sconce	23	Philips	6.5A19/LED/8xx-22 DIM	5	7	1	$8.40	Cheltenham Install			
61	Public Service Building	Wallpack	127	Lithonia	TWH LED 10C 1000 xxK T3M MVOLT	5	39	5	$309.75				
62	Public Service Building	Flood	23	N/A	0	N/A	23	2	No Retrofit				
63	Public Service Building	-dawn style lights with a	456	Lithonia	KAX1 LED P3 xxK R3 MVOLT SPA DDBXD	5	130	4	$466.67				
64	Public Service Building	Shoebox	456	Lithonia	KAX1 LED P3 xxK R3 MVOLT SPA DDBXD	5	130	6	$466.67				
65	Public Service Building	Cobrahead	456	Philips	RFL-145W64LED4K-T-R2M-R2M-UNIV-DMG-RCD-SP2-GY3	5	137	2	$266.50				
66	Public Service Building	Wall sconces on pole	23	N/A	0	N/A	23	6	No Retrofit				
67	Public Service Building	Recessed	60	Green Creative	8.5A19DIM/840	5	9	4	$8.66	Cheltenham Install			
68	Glenside hall and pool and Harry s renninger park	Deco	55	Philips	6.5A19/LED/8xx-22 DIM	5	7	1	$8.40	Cheltenham Install			
69	Glenside hall and pool and Harry s renninger park	Flood	184	Lithonia	OFL1 LED P2 xxK MVOLT THK DDBXD	5	49	4	$162.75	Cheltenham Install			
70	Glenside hall and pool and Harry s renninger park	Flood	23	Green Creative	9PAR38G3DIM/840FL40	5	19	6	$24.29	Cheltenham Install			
71	Glenside hall and pool and Harry s renninger park	Flood	184	Lithonia	OFL1 LED P2 xxK MVOLT THK DDBXD	5	49	3	$162.75				
72	Glenside hall and pool and Harry s renninger park	Deco	23	Philips	6.5A19/LED/8xx-22 DIM	5	7	2	$8.40	Cheltenham Install			
73	Glenside hall and pool and Harry s renninger park	Wallpack	23	Lithonia	OLWP 11 PE BZ	5	11	2	$89.00	Cheltenham Install			
74	Glenside hall and pool and Harry s renninger park	Flood	456	Lithonia	OFL2 LED P3 xxK MVOLT YK DDBXD	5	183	1	$367.50				
75	Glenside hall and pool and Harry s renninger park	Recessed	23	Philips	6.5A19/LED/8xx-22 DIM	5	7	20	$8.40	Cheltenham Install			
76	Glenside hall and pool and Harry s renninger park	Flood	456	Lithonia	OFL2 LED P3 xxK MVOLT YK DDBXD	5	183	12	$367.50				
77	Glenside hall and pool and Harry s renninger park	Cobrahead	456	Philips	RFL-145W64LED4K-T-R2M-R2M-UNIV-DMG-RCD-SP2-GY3	10	137	1	$266.50				
78	flood gate	LED on flood gate	23	N/A	0	N/A	23	3	No Retrofit				
79	shovel house	Flag Light	23	Green Creative	9PAR38G3DIM/840FL40	5	19	1	$24.29	Cheltenham Install			
80	shovel house	Deco	40	Green Creative	5.5B11DIM/827/E26	5	5.5	4	$9.01	Cheltenham Install			
81	shovel house	Flood	23	Green Creative	9PAR38G3DIM/840FL40	5	19	2	$24.29	Cheltenham Install			
82	four flood gates	LED on Flood gates	23	N/A	0	0	23	36	No Retrofit	No Retrofit			
83	flood gate	LED on gate	23	N/A	0	0	23	3	No Retrofit	No Retrofit			
84	Chelton hills drive and church road	LED on gate	23	N/A	0	0	23	33	No Retrofit	No Retrofit			
85	Chelten hills drive and heacock lane	LED on gate	23	N/A	0	0	23	36	No Retrofit	No Retrofit			
86	Township administrative building	New Flag Light	0	0	DSXF3 LED 6 P1 40K NSP MVOLT IS	5	129	1	$682.50				
							Total	**456**	**$89,514**	**$26,660**	**$448**	**$33,121**	**$149,743**

Energy Savings - Exterior Lighting

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

Existing							Proposed					Project Savings	
Number	Location	Type	Wattage	Quantity	Annual Energy Use (kWh)	Annual Energy Cost ($)	Manuf.	Wattage	Quantity	Annual Energy Use (kWh)	Annual Energy Cost ($)	Annual Energy Savings (kWh)	Annual Energy Savings ($)
1	Township administrative building	Deco Wall Sconce	13	9	512	$37	Philips	11	9	434	$31	79	$6
2	Township administrative building	Deco on ceiling	94	3	1,235	$89	Green Creative	17	3	223	$16	1,012	$73
3	Township administrative building	Ingrade	127	4	2,225	$160	Green Creative	17	4	298	$21	1,927	$139
4	Township administrative building	Deco wall sconce	14	4	245	$18	Philips	7	4	11	$1	234	$17
5	Township administrative building	Flood	1077	1	4,717	$340	Cooper	257	1	1,126	$81	3,592	$259
6	Township administrative building	Shoebox	456	2	3,995	$288	Lithonia	130	2	1,139	$82	2,856	$206
7	Township administrative building	Wallpack	75	1	329	$24	Lithonia	11	1	48	$3	280	$20
8	Township administrative building	Wallpack	23	1	101	$7	Lithonia	11	1	48	$3	53	$4
9	Township administrative building	Flood	1077	1	4,717	$340	Cooper	257	1	1,126	$81	3,592	$259
10	EMS Station	Flood	23	1	101	$7	Green Creative	19	1	83	$6	18	$1
11	EMS Station	Cobrahead	23	4	403	$29	Green Creative	9	4	158	$11	245	$18
12	EMS Station	Flood	455	1	1,993	$144	Lithonia	183	1	802	$58	1,191	$86
13	Police Station	Deco	127	3	1,669	$120	Cooper	25	3	329	$24	1,340	$96
14	Police Station	Flood	291	2	2,549	$183	Lithonia	121	2	1,060	$76	1,489	$107
15	Police Station	Shoebox	456	2	3,995	$287	Lithonia	130	2	1,139	$82	2,856	$205
16	Police Station	Deco	42	2	368	$26	Philips	11	2	96	$7	272	$20
17	Police Station	Recessed	13	1	57	$4	Philips	7	1	31	$2	26	$2
18	District Court	Recessed	23	7	705	$51	Philips	7	7	215	$15	491	$35
19	District Court	Surface Mount	95	1	416	$30	Green Creative	17	1	74	$5	342	$25
20	District Court	Cobrahead	138	1	604	$44	Philips	35	1	153	$11	451	$33
21	District Court	Flood	1077	1	4,717	$340	Cooper	257	1	1,126	$81	3,592	$259
22	District Court	Wall Sconce	100	1	438	$32	Philips	7	1	31	$2	407	$29
23	Community Center	Flood	184	3	2,418	$174	Lithonia	49	3	644	$46	1,774	$127
24	Community Center	Dusk to Dawn	209	2	1,831	$131	Lithonia	21	2	184	$13	1,647	$118
25	Community Center	Wallpack	60	5	1,314	$94	Cooper	18	5	394	$28	920	$66
26	Community Center	Dusk to Dawn	291	1	1,275	$91	Lithonia	37	1	162	$12	1,113	$80
27	Community Center	Cobrahead	291	1	1,275	$91	Philips	108	1	473	$34	802	$58
28	Community Center	Recessed	156	6	4,100	$294	Green Creative	19	6	499	$36	3,600	$258
29	Community Center	Wallpack on ceiling	184	5	4,030	$289	Green Creative	17	5	372	$27	3,657	$262
30	Community Center	Wallpack	291	7	8,922	$640	Lithonia	72	7	2,208	$158	6,715	$482
31	Community Center	Flood	156	1	683	$49	Lithonia	49	1	215	$15	469	$34
32	Veterans memorial field	Wallpack	95	1	416	$30	Lithonia	11	1	48	$3	368	$27
33	Veterans memorial field	Sports Light	1077	44	207,559	$14,960	Cooper	257	44	49,529	$3,570	158,030	$11,390
34	Veterans memorial field	Flood	456	3	5,992	$432	Lithonia	183	3	2,405	$173	3,587	$259
35	Veterans memorial field	Flood	456	4	7,989	$576	Lithonia	183	4	3,206	$231	4,783	$345
36	Veterans memorial field	Flood	127	1	556	$40	Lithonia	49	1	215	$15	342	$25
37	Tookany Parkway Pond	Dusk to Dawn	127	1	556	$40	Lithonia	21	1	92	$7	464	$34
38	Tookany Parkway Pond	Flood	291	1	1,275	$92	Lithonia	121	1	530	$38	745	$54
39	Elkins park public library	Wallpack	60	4	1,051	$76	Lithonia	11	4	193	$14	858	$62
40	Elkins park public library	Recessed	100	4	1,752	$126	Green Creative	17	4	298	$21	1,454	$105
41	Elkins park public library	Flag Light	100	1	438	$32	ILP	35	1	153	$11	285	$21
42	Elkins park public library	Shoebox	456	6	11,984	$864	Lithonia	130	6	3,416	$246	8,567	$617
43	Elkins park public library	Wallpack	60	2	526	$38	Lithonia	11	2	96	$7	429	$31
44	Elkins park public library	Shoebox	184	6	4,836	$349	Lithonia	62	6	1,629	$117	3,206	$231
45	Elkins park public library	Shoebox	456	2	3,995	$288	Lithonia	130	2	1,139	$82	2,856	$206
46	gottschalk fire training	No lightbulb	0	1	0	$0	0	0	1	0	$0	0	$0
47	Conklin pool	Flood	456	9	17,976	$1,314	Lithonia	183	9	7,214	$527	10,762	$787
48	Conklin pool	Recessed	23	9	907	$66	Philips	7	9	276	$20	631	$46
49	Conklin pool	Shoebox	290	14	17,783	$1,300	Lithonia	96	14	5,887	$430	11,896	$869
50	Conklin pool	Flood	23	2	201	$15	Green Creative	19	2	166	$12	35	$3
51	Conklin pool	Deco	0	1	0	$0	Cooper	25	1	110	$8	-110	-$8
52	Flood Gate	LED on flood gate	23	36	3,627	$261	N/A	23	36	3,627	$261	0	$0
53	Richard wall house museum	Deco	100	3	1,314	$93	Cooper	25	3	329	$23	986	$70
54	Richard wall house museum	Wallpack	23	4	403	$29	Lithonia	11	4	193	$14	210	$15
55	Richard wall house museum	Flood	23	2	201	$14	Green Creative	19	2	166	$12	35	$2
56	Richard wall house museum	Recessed	60	4	1,051	$75	Philips	7	4	123	$9	929	$66
57	Richard wall house museum	Deco	100	2	876	$62	Cooper	25	2	219	$16	657	$47
58	Richard wall house museum	Flood	95	2	832	$59	Lithonia	49	2	429	$30	403	$29
59	Public Service Building	Flood	127	3	1,669	$120	Lithonia	23	3	302	$22	1,367	$98
60	Public Service Building	Wall Sconce	23	1	101	$7	Philips	7	1	31	$2	70	$5
61	Public Service Building	Wallpack	127	5	2,781	$200	Lithonia	39	5	854	$62	1,927	$139
62	Public Service Building	Flood	23	2	201	$15	N/A	23	2	201	$15	0	$0
63	Public Service Building	4 dusk-dawn style lights with a cover	456	4	7,989	$576	Lithonia	130	4	2,278	$164	5,712	$412
64	Public Service Building	Shoebox	456	6	11,984	$864	Lithonia	130	6	3,416	$246	8,567	$617
65	Public Service Building	Cobrahead	456	2	3,995	$288	Philips	137	2	1,200	$87	2,794	$201
66	Public Service Building	Wall sconces on pole	23	6	604	$44	N/A	23	6	604	$44	0	$0
67	Public Service Building	Recessed	60	4	1,051	$76	Green Creative	9	4	158	$11	894	$64

Existing							Proposed					Project Savings	
Number	Location	Type	Wattage	Quantity	Annual Energy Use (kWh)	Annual Energy Cost ($)	Manuf.	Wattage	Quantity	Annual Energy Use (kWh)	Annual Energy Cost ($)	Annual Energy Savings (kWh)	Annual Energy Savings ($)
68	side hall and pool and Harry s renninger	Deco	55	1	241	$17	Philips	7	1	31	$2	210	$15
69	side hall and pool and Harry s renninger	Flood	184	4	3,224	$234	Lithonia	49	4	858	$62	2,365	$172
70	side hall and pool and Harry s renninger	Flood	23	6	604	$44	Green Creative	19	6	499	$36	105	$8
71	side hall and pool and Harry s renninger	Flood	184	3	2,418	$176	Lithonia	49	3	644	$47	1,774	$129
72	side hall and pool and Harry s renninger	Deco	23	2	201	$15	Philips	7	2	61	$4	140	$10
73	side hall and pool and Harry s renninger	Wallpack	23	2	201	$15	Lithonia	11	2	96	$7	105	$8
74	side hall and pool and Harry s renninger	Flood	456	1	1,997	$145	Lithonia	183	1	802	$58	1,196	$87
75	side hall and pool and Harry s renninger	Recessed	23	20	2,015	$146	Philips	7	20	613	$45	1,402	$102
76	side hall and pool and Harry s renninger	Flood	456	12	23,967	$1,740	Lithonia	183	12	9,618	$698	14,349	$1,042
77	side hall and pool and Harry s renninger	Cobrahead	456	1	1,997	$145	Philips	137	1	600	$44	1,397	$101
78	flood gate	LED on flood gate	23	3	302	$22	N/A	23	3	302	$22	0	$0
79	shovel house	Flag Light	23	1	101	$7	Green Creative	19	1	83	$6	18	$1
80	shovel house	Deco	40	4	701	$51	Green Creative	5.5	4	96	$7	604	$44
81	shovel house	Flood	23	2	201	$15	Green Creative	19	2	166	$12	35	$3
82	four flood gates	LED on Flood gates	23	36	3,627	$261	N/A	23	36	3,627	$261	0	$0
83	flood gate	LED on gate	23	3	302	$22	N/A	23	3	302	$22	0	$0
84	Chelton hills drive and church road	LED on gate	23	33	3,324	$240	N/A	23	33	3,324	$240	0	$0
85	Chelten hills drive and heacock lane	LED on gate	23	36	3,627	$261	N/A	23	36	3,627	$261	0	$0
86	Township administrative building	New Flag Light	0	0	0	$0	P1 40K NSP MV	129	1	565	$41	-565	-$41
			Total	**456**	**435,460**	**$31,428**	**Total**		**457**	**131,547**	**$9,499**	**303,913**	**$21,930**

The annual hours of operation have been estimated to be 4,380 hours.

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	$0.0668	$0.0617
Traffic Lighting	$0.0668	$0.0617
Exterior Accounts	$0.0720	$0.0617

In the IGA phase, JCI worked to procure a lower energy rate and investigated 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 savings for this measure have been calculated using the formula below;

Savings ($) = New Energy Usage (kWh) * (Old Rate ($/kWh) - 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).

Project Energy Savings

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

Conservation Measure	Calculated Annual kWh Savings	Guaranteed Annual kWh Savings	Calculated Monthly kW Savings	Guaranteed Monthly kW Savings	Calculated Annual Energy Savings ($)	Guaranteed Energy Savings ($)
Street lighting - Upgrade to LED (Cobra)	715,752	679,965	174.9	166.2	$54,634	$51,903
FAWS (Cobra)	0	0	0.0	0.0	$0	$0
Street lighting - Upgrade to LED (Decorative)	112,816	107,176	27.6	26.2	$8,611	$8,181
Wireless Street Lighting Controls (Cobra)	0	0	0.0	0.0	$0	$0
Wireless Street Lighting Controls (Partial Decorative)	2,771	2,633	0.6	0.6	$212	$201
Traffic Lighting - Upgrade to LED	123,367	117,199	37.4	35.5	$10,532	$10,005
Exterior Lighting - Upgrade to LED	303,913	288,717	10.6	10.1	$21,930	$20,833
Electric Rate Savings ($/kWh)	0	0	0.0	0.0	$4,688	$4,453
Total - Base Project + Controls	**1,258,620**	**1,195,689**	**251**	**239**	**$100,606**	**$95,576**

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, also known as the tap fee. The annual tap fee for the municipality is $249528.

Johnson Controls guarantees 95% of the expected savings. The guaranteed savings are carried in the project cash flow. In the M&V performance period, savings will be compared to the guarantee for reconciliation purposes.

O&M Savings Methodology

Operations and Maintenance (O&M) Savings for LED street lights are based on costs incurred by Cheltenham Township to repair and replace existing fixtures (including cobra heads and decorative fixtures). Maintenance records were collected and reviewed by JCI for a 24 month period. The cost for repairing and replacing existing fixtures during this time was shows to be an average of $120215 annually . This cost excludes street lighting expenses that will not be impacted by the project (i.e. painting poles, installing new fixtures and knockdowns). Cheltenham Township has agreed that the cost for repairing and replacing existing fixtures will be reduced by 70% in project years 1-10 and 60% in project years 11-20 (at a lower rate to account for possible replacements needed for photocells and drivers that might occur during years 10-20). O&M Savings are escalated at 3% each year. The O&M savings derived from the bills and using the percentages shown below were agreed to by Cheltenham Township and such savings will be included in the annual reconciliation reports throughout the guarantee term. In order to realize these savings, the municipality is responsible for following the requirements outlined in the manufacturer's warranty when filing a warranty claim. The responsibility to achieve the savings estimated by JCI and agreed to by Cheltenham Township will lie solely with Cheltenham Township.

Year	Fixed Maintenance Contract	Repairs & Maintenance	Knockdowns and other excluded Maint. Costs	In-House Maintenance Related Materials	Totals
Year 2014	$2,304	$112,108	$0	$0	$114,412
Year 2015	$1,752	$124,265	$0	$0	$126,017
Average	$2,028	$118,187	$0	$0	$120,215
Agreed Savings % (Years 1-10)	50%	70%	0%	0%	70%
Agreed Savings % (Years 11-20)	50%	60%	0%	0%	60%
Savings $ (Years 1-10)	$1,014.00	$82,730.55	$0.00	$0.00	$83,744.55
Savings $ (Years 11-20)	$1,014.00	$70,911.90	$0.00	$0.00	$71,925.90

O&M Savings for LED traffic lights is based on actual costs incurred by Cheltenham Township to repair and replace existing fixtures. Maintenance records were collected and reviewed for a 24 month period. The cost during this time was shown to be $42642 annually, excluding traffic light expenses that will not be impacted by the project. 30% of the total applicable maintenance traffic was taken, as only 30% of the traffic light bill is still incandescent. Cheltenham Township has agreed that the cost for repairing and replacing existing fixtures will be reduced by 80% in project years 1-10 and 70% in project years 11-20. The O&M savings are escalated 3%. The O&M savings derived from the bills and using the percentages shown below were agreed to by Cheltenham Township and such savings will be included in the annual reconciliation reports throughout the guarantee term. In order to realize these savings, the municipality is responsible for following the requirements outlined in the manufacturer's warranty when filing a warranty claim. The responsibility to achieve the savings estimated by JCI and agreed to by Cheltenham Township will lie solely with Cheltenham Township.

Year	Fixed Maintenance Contract	Repairs & Maintenance	Knockdowns and other excluded Maint. Costs	In-House Maintenance Related Materials	Totals
Year 2014	$640	$71,750	$0	$0	$72,389
Year 2015	$2,620	$10,275	$0	$0	$12,896
Average	$1,630	$41,012	$0	$0	$42,642
30% of Average	$488.99	$12,303.75			
Agreed Savings % (Years 1-10)	80%	80%	0%	0%	80%
Agreed Savings % (Years 11-20)	70%	70%	0%	0%	70%
Savings $ (Years 1-10)	$391.20	$9,843.00	$0.00	$0.00	$10,234.19
Savings $ (Years 11-20)	$342.30	$8,612.62	$0.00	$0.00	$8,954.92

O&M savings for Building Exterior lighting will be realized as well. The replacement of the exterior lighting fixtures with new LED fixtures will reduce the need for lamp replacements as a result of the longer life of the new lamps. Maintenance savings are based on the cost to replace exterior lighting material as the existing lighting system fails. For example, a light that costs $50 to replace with a rated life of 50,000 hours serving a space that operates 5,000 hours a year would cost $5 per year over its useful life of 10 years. This calculation is performed for each type of exterior light in the municipality to arrive at an annual O&M savings projection. O&M savings are escalated at 3%. The O&M savings calculated for exterior lighting shown below were agreed to by Cheltenham Township and such savings will be included in the annual reconciliation reports throughout the guarantee term. The responsibility to achieve the savings estimated by JCI and agreed to by Cheltenham Township will lie solely withCheltenham Township . A detailed calculation is attached.

Item	Year 1 O&M Savings
Township Administration Building	$110
EMS Station	$23
Police Station	$45
District Court	$44
Community Center	$197
Tookany Creek Parkway	$45
Tookany Creek Pond	$10
Public Library	$117
Conklin Pool	$161
Richard Wall House Museum	$69
Public Service Building	$107
Glenside Hall and Pool Harry S Renninger Park	$209
Shovel House	$23
Total	**$1,162**

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	KLS Fees*	Closing Costs (Including PennSEF fee)	Contingency	M&V Fee (3 Years)	IGA Recoverable Costs	Total Cost	Total Payback
Street lighting - Upgrade to LED (Cobra)	$835,297	$51,903	$72,117	$57,790	6.3							
FAWS (Cobraheads)	$0	$0	$0	$0	-							
Street lighting - Upgrade to LED (Decorative)	$508,146	$8,611	$11,627	$6,180	24.8							
Wireless Street Lighting Controls (Cobra)	$0	$0	$0	$0	-							
Wireless Street Lighting Controls (Partial Decorative)	$31,760	$212	$0	$132	149.5							
Traffic Lighting - Upgrade to LED	$16,472	$10,005	$10,234	$2,234	0.7							
Exterior Lighting - Upgrade to LED	$149,743	$20,833	$1,162	$6,785	6.5							
Electric Rate Procurement	$2,674	$4,688	$0	$0	0.6							
Base Project + Controls: Construction Cost	**$1,544,091**	**$96,252**	**$95,140**	**$73,121**	**7.7**	**$375**	**$51,727**	**$77,200**	**$50,841**	**$0**	**$1,724,234**	**8.6**

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 and total payback are calculated using the following formulas;

Simple Payback = [(Construction Cost - Rebates) / (Energy Savings + O&M savings)]

Total Payback = [(Total Cost - Rebates) / (Energy Savings + O&M savings)]

Total cost includes the KLS consulting fee(s), closing costs, customer-controlled contingency costs, the M&V fee and any IGA Recoverable costs.

Maintenance costs were provided to JCI by the municipality during the IGA phase. The O&M savings were calculated based on information provided and agreed upon by the municipality and JCI.

Measurement and Verification Payments

The total cost for 3 years of M&V services are detailed below; the costs for these services are included in the total project construction price as a one time payment. The M&V fee is 1.38% of project hard costs in Year 1. The M&V fee is escalated 3% in years 2 and 3.

Year	Annual M&V Fee
1	$16,093
2	$16,575
3	$17,073
Total	**$49,741**

No further measurement or verification of energy savings will take place after completion of Year 3. In the event the Municipality wishes to extend the duration of the guarantee term and associated M&V Services beyond Year 3, JCI shall furnish the Municipality pricing for such extension. In the absence of the Municipality's decision to extend the guarantee term and M&V Services, the guarantee shall be deemed complete and satisfied at the end of Year 3.

Section F

Project Cash Flows

Project Cash Flow - Base Project + Controls (41 Decos)

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.

JCI Construction Cost		$1,544,091
Measurement and Verification		$50,841
Recoverable IGA Costs		$0
Total JCI Construction Cost		$1,594,932
Capital Contribution		$0
Fees	Customer-Controlled Contingency	$77,200.00
	Closing Costs (Including PennSEF fee)	$51,727
	KLS-Program Fee	$375
	KLS-Consultant	$0
Loan Structure		Lease
Contract Term - Years		10
Construction Term - Months		12
Loan Payment Frequency		Annual
Interest Rate		2.40%
Total Financed Amount		$1,724,234

Project ECM List	Include?
ECM-1: Cobrahead Street Lighting	Yes
ECM-2: Decorative Street Lighting	Yes
ECM-3: Cobrahead Wireless Controls	No
ECM-4: Decorative Wireless Controls	Yes
ECM-5: Traffic Lighting	Yes
ECM-6: Exterior Lighting	Yes
ECM-7: Electricity Rate Procurement	Yes
ECM-8: FAWS	No

***Costs only include applicable ECMs**

	Measured Savings	Non-measured Savings			Total Savings	Loan Payment	M&V	Wireless Controls and Cellular Fees	Balance
	Utility Savings	Operational Savings	Rebates	Wireless Controls Software Subscription					
Year 0	$48,944	$0	$0	$0	$48,944	$0	$0	$0	$48,944
Year 1	$99,650	$97,995	$73,121	$0	$270,765	$270,465	$0	$300	$0
Year 2	$101,643	$100,934	$0	$0	$202,577	$202,277	$0	$300	$0
Year 3	$103,777	$103,962	$0	$0	$207,740	$207,440	$0	$300	$0
Year 4	$106,060	$107,081	$0	$0	$213,142	$212,842	$0	$300	$0
Year 5	$108,394	$110,294	$0	$0	$218,687	$218,387	$0	$300	$0
Year 6	$110,887	$113,603	$0	$0	$224,489	$224,189	$0	$300	$0
Year 7	$113,437	$117,011	$0	$0	$230,448	$230,148	$0	$300	$0
Year 8	$116,160	$120,521	$0	$0	$236,681	$236,381	$0	$300	$0
Year 9	$118,948	$124,137	$0	$0	$243,084	$125,697	$0	$300	$117,087
Year 10	$121,921	$127,861	$0	($164)	$249,618	$0	$0	$300	$249,318
Year 11	$124,969	$113,566	$0	($164)	$238,371	$0	$0	$300	$238,071
Year 12	$128,218	$116,973	$0	($164)	$245,027	$0	$0	$300	$244,727
Year 13	$131,552	$120,482	$0	($164)	$251,870	$0	$0	$300	$251,570
Year 14	$135,104	$124,096	$0	($164)	$259,037	$0	$0	$300	$258,737
Year 15	$138,752	$127,819	$0	($164)	$266,407	$0	$0	$300	$266,107
Year 16	$142,637	$131,654	$0	($164)	$274,127	$0	$0	$300	$273,827
Year 17	$146,631	$135,604	$0	($164)	$282,070	$0	$0	$300	$281,770
Year 18	$150,883	$139,672	$0	($164)	$290,391	$0	$0	$300	$290,091
Year 19	$155,259	$143,862	$0	($164)	$298,957	$0	$0	$300	$298,657
Year 20	$159,761	$148,178	$0	($164)	$307,775	$0	$0	$300	$307,475
Total	**$2,563,587**	**$2,425,303**	**$73,121**	**($1,804)**	**$5,060,207**	**$1,927,826**	**$0**	**$6,000**	**$3,126,381**

Investment Grade Audit Recoverable Cost

Johnson Controls has performed the investment grade audit for the ECMs agreed upon in the preliminary phase of the project. The total cost for Investment Grade Audit is included in the previous cash flow and included in the total construction costs. However, for any measures that the municipality decides not to go forward with in the actual project the full construction cost of the ECM will be removed from the project and instead JCI will be paid the break fee listed below for these ECMs that were developed but not included. JCI can only recover costs for services that actually occurred during the investment grade audit. These recoverable costs are limited to 7.4% of hard cost, and also limited to services defined by the RSLPP. The municipality will retain the design and engineering materials developed for these ECMs, however, no work pertaining to these measures will be performed in the project.

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
Total			**$93,022**

The amounts shown above are based on the break fee amounts that were developed in the preliminary phase of the project and included in the GSA agreement.

No IGA recoverable costs currently apply to Cheltenham Township because the above scopes of work are included in the final project's construction cost.

Pre-Approved Change Orders and Customer-Controlled Contingency Guidelines of Use

This schedule details the individual responsibilities of the Customer and the Contractor (JCI), not specified in the investment grade audit in parallel with the installation process. Maintaining a smooth, orderly installation without delays is the goal of these guidelines. Note this work will be provided for a safe operational fixture, not as an upgrade or revision to the contract. JCI and the customer shall follow the procedure below.

1. Upon arrive at fixture location, visually inspect for improper or unsafe conditions, examples include but are not limited to; burnt wiring connections, frayed or missing wiring insulation, damaged support arm or fixture.

2. Notify customer designated contact (text message, email or phone call). JCI will notify the municipality within 24 hours when an issue requiring a repair arises.

3. Upon notification or discussion, proceed with fixture replacement and service or repairs, unless directed not to service or repair. Lack of customer response after notification will not stop installation, repairs shall be made to make fixture safe or operational. However, for repairs that will cost more than $500 (excluding ESCO fees) we will halt installation until a notice to proceed has been given by the municipality.

4. Repairs / services to be detailed on Line by Line report and on separate documentation for invoice consolidation. Invoice will be presented as a project change order of the additional costs at a regular scheduled project meeting.

5. Customer shall use contingency funds available or provide payment using an agreed upon process

The following table details the costs to be used for repairs etc.:

Item	Labor ($)/Unit	Material ($)/Unit
Arm Removal Only	$35.00	-
Arm Add Only	$75.50	$95 (6ft), $138 (10ft), $274 (15ft)
Fixture Re-wiring	$110.00	$45*
Overhead Power Connection	$35.00	$2/ft
Underground Power Connection (Dirt Only)	$45.00	$2/ft
Overhead Power Disconnect/Removal	$35.00	-
Underground Power Disconnect/Removal (Dirt Only)	$90.00	-
Tree Branch Trimming	$75.50	-

Note: standard ESCO fees apply to hard costs

*Includes a bucket truck and 25ft of wire

Section G

O&M Payments,
O&M Savings Methodology &
Milestones

O&M Payments

Aside from Measurement and Verification service fees, there are no additional operations and maintenance payments due to the contractor. A schedule of Measurement and Verification service fees can be found in Schedule R – Measurement and Verification Fee in Volume 1 of the IGA. The Measurement and Verification fee for years 1-3 are paid for upfront and are included in the Total Construction price.

Milestones

Milestone Schedule Objectives

The major objective for the schedule are to:

1. Provide a forecast of construction payments
2. Allow for financial planning during the project

Requirements for Milestone Schedule

The milestone schedule is based on the final contract approval and execution:

1. Notice to proceed with PDA / IGA payment
2. Delivery of cobra fixtures (normally, 4 to 6 weeks from # 1)
3. Delivery of retrofit decorative fixtures (normally 6 to 8 weeks from # 1)
4. Monthly progress billing during installation; below shows a billing period based on a project with three months of installation completions
    a. First month of installation, meeting typically 15th to 22nd of month
    b. Second monthly meeting, (as agreed to)
    c. Third monthly meeting, (as agreed to)

    Note, dependent on municipality's approval schedule, monthly progress invoice schedule could change
5. Retention reduction from 5% to 2-1/2% upon punch list completion and approval
6. Final invoice, with Unit Completion Certificate provided

Schedule Timeline (Tentative)

1. The Notice to proceed and IGA payment, first week of the month
2. Cobra delivery, six weeks from IGA payment
3. First monthly progress invoice is planned for 3rd week of month following cobra delivery
4. Second monthly progress invoice planned for following month, 3rd week
5. Third monthly progress invoice planned for following month, 3rd week
6. Final invoice to follow punch list completion, planned for the following month, 3rd week

Note, if installation is fast tracked, (agreement by both parties) the milestone schedule may be modified.

Section H

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 according to the PennSEF rates on the following page.

Conservation Measure	$/kWh Rate	$/kW Rate	
Street Lighting	$0.0763	-	
Traffic Lighting	$0.0854	-	
Township administrative building	$0.0720	$6.24	
EMS Station	$0.0722	$6.49	
Police Station	$0.0719	$6.40	
District Court	$0.0721	$6.25	*Average Rate
Community Center	$0.0718	$6.28	
Tookany Parkway Pond	$0.0722	$6.19	
Tookany Parkway Pond	$0.0722	$6.19	
Elkins park public library	$0.0721	$6.25	*Average Rate
gottschalk fire training	$0.0721	$6.25	*Average Rate
Flood Gate	$0.0721	$6.25	*Average Rate
Richard wall house museum	$0.0709	$6.90	
Public Service Building	$0.0721	$6.25	*Average Rate
Glenside hall and pool and Harry s renninger park	$0.0726	$5.98	
shovel house	$0.0721	$6.25	*Average Rate
four flood gates	$0.0721	$6.25	*Average Rate
flood gate	$0.0721	$6.25	*Average Rate
Chelten hills drive and heacock lane	$0.0721	$6.25	*Average Rate

Appendix 2 - PennSEF Escalation Rates

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

Year	Street Lighting (Electric)	Traffic Lighting (Electric)	Exterior Lighting (Electric)
2016	0.00%	0.00%	0.00%
2017	1.70%	1.70%	1.70%
2018	1.80%	1.80%	1.80%
2019	2.00%	2.00%	2.00%
2020	2.10%	2.10%	2.10%
2021	2.20%	2.20%	2.20%
2022	2.20%	2.20%	2.20%
2023	2.30%	2.30%	2.30%
2024	2.30%	2.30%	2.30%
2025	2.40%	2.40%	2.40%
2026	2.40%	2.40%	2.40%
2027	2.50%	2.50%	2.50%
2028	2.50%	2.50%	2.50%
2029	2.60%	2.60%	2.60%
2030	2.60%	2.60%	2.60%
2031	2.70%	2.70%	2.70%
2032	2.70%	2.70%	2.70%
2033	2.80%	2.80%	2.80%
2034	2.80%	2.80%	2.80%
2035	2.90%	2.90%	2.90%
2036	2.90%	2.90%	2.90%
2037	3.00%	3.00%	3.00%
2038	3.00%	3.00%	3.00%

Appendix 3 - Maintenance Savings Analysis

The attachment on the next page shows the maintenance cost data received from the municipality and the analysis performed to develop the maintenance savings carried in the project.

PECO Rebate Calculations (Cobrahead and Deco)

Rebates have been calculated based on phase 3 of the PECO rebate program under PA Act 129

Min watts reduced	50	70	150
Incentive	$15.00	$30.00	$50.00

Total Rebate Amount

$ 62,095.00

Decorative Fixtures								
Existing Fixture	Existing Lamp	Existing Wattage	Existing Billed Wattage	New Wattage	Wattage Reduction	Rebate per fixture	Quantity	Total Rebate
4 Sided Colonial	HPS	150	192	50	142	$ 30.00	2	$ 60.00
4 Sided Colonial	HPS	100	131	50	81	$ 30.00	19	$ 570.00
4 Sided Colonial	HPS	70	94	50	44	$ -	70	$ -
Acorn	HPS	70	94	63	31	$ -	7	$ -
Barn Light	HPS	100	131	63	68	$ 15.00	1	$ 15.00
Lantern	HPS	70	94	38	56	$ 15.00	10	$ 150.00
Lantern	HPS	150	192	60	132	$ 30.00	33	$ 990.00
Other	HPS	70	94	63	31	$ -	1	$ -
Other	HPS	100	131	50	81	$ 30.00	3	$ 90.00
Paragon	HPS	100	131	63	68	$ 15.00	287	$ 4,305.00
							433	**$ 6,180.00**

Cobrahead Fixtures								
Existing Fixture	Existing Lamp	Existing Wattage	Existing Billed Wattage	New Wattage	Wattage Reduction	Rebate per fixture	Quantity	Total Rebate
Cobrahead	HPS	100	131	108	23	$ -	8	$ -
Cobrahead	HPS	100	131	38	93	$ 30.00	161	$ 4,830.00
Cobrahead	HPS	100	131	54	77	$ 30.00	463	$ 13,890.00
Cobrahead	HPS	100	131	73	58	$ 15.00	33	$ 495.00
Cobrahead	HPS	150	192	108	84	$ 30.00	97	$ 2,910.00
Cobrahead	HPS	150	192	161	31	$ -	3	$ -
Cobrahead	HPS	150	192	38	154	$ 50.00	20	$ 1,000.00
Cobrahead	HPS	150	192	54	138	$ 30.00	24	$ 720.00
Cobrahead	HPS	150	192	73	119	$ 30.00	252	$ 7,560.00
Cobrahead	HPS	250	294	108	186	$ 50.00	25	$ 1,250.00
Cobrahead	HPS	250	294	161	133	$ 30.00	176	$ 5,280.00
Cobrahead	HPS	250	294	73	221	$ 50.00	4	$ 200.00
Cobrahead	HPS	400	450	161	289	$ 50.00	1	$ 50.00
Cobrahead	HPS	70	94	38	56	$ 15.00	1251	$ 18,765.00
Cobrahead	HPS	70	94	54	40	$ -	147	$ -
Cobrahead	HPS	70	94	73	21	$ -	1	$ -
Cobrahead	MH	100	131	38	93	$ 30.00	9	$ 270.00
Cobrahead	MH	100	131	54	77	$ 30.00	13	$ 390.00
Cobrahead	MH	100	131	73	58	$ 15.00	3	$ 45.00
Cobrahead	MH	250	294	161	133	$ 30.00	1	30
Cobrahead	MV	100	115	38	77	$ 30.00	1	30
Cobrahead	MV	100	115	54	61	$ 15.00	5	75
							2698	**$ 57,790.00**

PECO Rebate Calculations (Exterior and Traffic)

Rebates have been calculated based on phase 3 of the PECO rebate program under PA Act 129

	Pole/Arm		Outdoor/Flood		Wall Mount/Retrofit Kit	
	Min watts reduced	Incentive	Min watts reduced	Incentive	Min watts reduced	Incentive
Exterior	50	$15.00	50	$10.00	50	$15.00
	70	$30.00	70	$15.00	70	$40.00
	150	$50.00				

Exterior

Existing Fixture	Existing Lamp	Existing Wattage	Existing Billed Wattage	New Wattage	Wattage Reduction	Rebate per fixture	Quantity	Total Rebate
4 dusk-dawn style lig	MH	400	456	130	326	$ 50.00	4	$ 200.00
Cobrahead	CFL	23	23	9	14	$ -	4	$ -
Cobrahead	HPS	100	138	35	103	$ 30.00	1	$ 30.00
Cobrahead	MH	250	291	108	183	$ 50.00	1	$ 50.00
Cobrahead	MH	400	456	137	319	$ 50.00	2	$ 100.00
Cobrahead	MH	400	456	137	319	$ 50.00	1	$ 50.00
Deco	MH	100	127	25	102	$ 30.00	3	$ 90.00
Deco	CFL	42	42	11	31	$ -	2	$ -
Deco	HPS	100	131	25	106	$ 30.00	1	$ 30.00
Deco	INC	100	100	25	75	$ 30.00	3	$ 90.00
Deco	INC	100	103	25	78	$ 30.00	2	$ 60.00
Deco	CFL	55	55	7	48	$ -	1	$ -
Deco	CFL	23	23	7	16	$ -	2	$ -
Deco	INC	40	40	5.5	35	$ -	4	$ -
Deco on ceiling	MH	70	94	17	77	$ 40.00	3	$ 120.00
Deco Wall Sconce	CFL	13	13	11	2	$ -	9	$ -
Deco wall sconce	CFL	14	14	7	7	$ -	4	$ -
Dusk to Dawn	MH	175	209	21	188	$ 50.00	2	$ 100.00
Dusk to Dawn	MH	250	291	37	254	$ 50.00	1	$ 50.00
Dusk to Dawn	MH	100	127	21	106	$ 30.00	1	$ 30.00
Flag Light	INC	100	100	35	65	$ 10.00	1	$ 10.00
Flag Light	CFL	26	26	19	7	$ -	1	$ -
Flood	MH	1000	1077	257	820	$ 15.00	1	$ 15.00
Flood	MH	1000	1077	257	820	$ 15.00	1	$ 15.00
Flood	CFL	23	23	19	4	$ -	1	$ -
Flood	MV	400	455	183	272	$ 15.00	1	$ 15.00
Flood	MH	250	291	121	170	$ 15.00	2	$ 30.00
Flood	MH	1000	1077	257	820	$ 15.00	1	$ 15.00
Flood	MH	150	184	49	135	$ 15.00	3	$ 45.00
Flood	CFL	150	156	49	107	$ 15.00	1	$ 15.00
Flood	MH	400	456	183	273	$ 15.00	3	$ 45.00
Flood	MH	400	456	183	273	$ 15.00	4	$ 60.00
Flood	MH	100	127	49	78	$ 15.00	1	$ 15.00
Flood	MH	250	291	121	170	$ 15.00	1	$ 15.00
Flood	MH	400	456	183	273	$ 15.00	9	$ 135.00
Flood	CFL	23	23	19	4	$ -	2	$ -
Flood	CFL	23	23	19	4	$ 15.00	2	$ 30.00
Flood	HPS	70	95	49	46	$ -	2	$ -
Flood	HPS	250	294	23	271	$ 15.00	3	$ 45.00
Flood	LED	No Retrofit	No Retrofit	No Retrofit	No Retrofit	$ -	2	$ -
Flood	MH	150	184	49	135	$ 15.00	4	$ 60.00
Flood	CFL	23	23	19	4	$ -	6	$ -
Flood	MH	150	184	49	135	$ 15.00	3	$ 45.00
Flood	MH	400	456	183	273	$ 15.00	1	$ 15.00
Flood	MH	400	456	183	273	$ 15.00	12	$ 180.00
Flood	CFL	23	23	19	4	$ -	2	$ -
Ingrade	MH	100	127	17	110	$ 40.00	4	$ 160.00
LED on flood gate	LED	No Retrofit	No Retrofit	No Retrofit	No Retrofit	$ 30.00	36	$ 1,080.00
LED on flood gate	LED	No Retrofit	No Retrofit	No Retrofit	No Retrofit	$ -	3	$ -
LED on Flood gates	LED	No Retrofit	No Retrofit	No Retrofit	No Retrofit	$ -	36	$ -
LED on gate	LED	No Retrofit	No Retrofit	No Retrofit	No Retrofit	$ -	3	$ -
LED on gate	LED	No Retrofit	No Retrofit	No Retrofit	No Retrofit	$ -	33	$ -
LED on gate	LED	No Retrofit	No Retrofit	No Retrofit	No Retrofit	$ -	36	$ -
Recessed	CFL	13	13	7	6	$ -	1	$ -
Recessed	CFL	23	23	7	16	$ -	7	$ -
Recessed	CFL	150	156	19	137	$ 40.00	6	$ 240.00
Recessed	HPS	100	100	17	83	$ 40.00	4	$ 160.00
Recessed	CFL	23	23	7	16	$ -	9	$ -
Recessed	INC	60	60	7	53	$ 15.00	4	$ 60.00
Recessed	INC	60	60	9	51	$ 15.00	4	$ 60.00
Recessed	CFL	23	23	7	16	$ -	20	$ -
Shoebox	MH	400	456	130	326	$ 50.00	2	$ 100.00
Shoebox	MH	400	456	130	326	$ 50.00	2	$ 100.00
Shoebox	MH	400	456	130	326	$ 50.00	6	$ 300.00
Shoebox	MH	150	184	62	122	$ 30.00	6	$ 180.00
Shoebox	MH	400	456	130	326	$ 50.00	2	$ 100.00
Shoebox	MV	250	290	96	194	$ 50.00	14	$ 700.00
Shoebox	MH	400	456	130	326	$ 15.00	6	$ 90.00
Sports Light	HPS	1000	1090	257	833	$ 15.00	44	$ 660.00
Surface Mount	HPS	70	95	17	78	$ 15.00	1	$ 15.00
Wall Sconce	INC	100	100	7	93	$ 40.00	1	$ 40.00
Wall Sconce	CFL	23	23	7	16	$ -	1	$ -
Wall sconces on pole	LED	No Retrofit	No Retrofit	No Retrofit	No Retrofit	$ -	6	$ -
Wallpack	INC	75	75	11	64	$ 15.00	1	$ 15.00
Wallpack	CFL	23	23	11	12	$ -	1	$ -
Wallpack	HPS	100	131	18	113	$ 40.00	5	$ 200.00
Wallpack	MH	250	291	72	219	$ 40.00	7	$ 280.00
Wallpack	HPS	70	95	11	84	$ 40.00	1	$ 40.00
Wallpack	INC	60	60	11	49	$ -	4	$ -
Wallpack	INC	60	60	11	49	$ -	2	$ -
Wallpack	CFL	23	23	11	12	$ -	4	$ -
Wallpack	MH	100	127	39	88	$ 40.00	5	$ 200.00
Wallpack	CFL	23	23	11	12	$ -	2	$ -
Wallpack on ceiling	MH	150	184	17	167	$ 40.00	5	$ 200.00
							455	**$ 6,785.00**

Traffic

Existing Fixture	Existing Lamp	Rebate per fixture	Quantity	Total Rebate
Round Traffic Signals	INC	**$ 15.00**	242	$ 3,630.00
Turn Arrow Signals	INC	**$ 13.00**	24	$ 312.00
Pedestrian Signals	INC	**$ 13.00**	66	$ 858.00
				$ 4,800.00