(The following is not a verbatim transcript of comments or discussion that occurred during the meeting, but rather a summarization intended for general informational purposes. All motions and votes are the official records).

PUBLIC WORKS COMMITTEE

Regular meeting of the Public Works Committee was held on Monday, October 5, 2015, in the Council Chambers, City Hall, Cranston, Rhode Island.

CALL MEETING TO ORDER:

The meeting was called to order at 6:55 P.M. by the Chairman.

Present: Councilman Mario Aceto, Chair
Councilman Steven A. Stycos, Vice-Chair
Councilman Michael J Farina
Council Vice-President Richard D. Santamaria, Jr.
Councilman Christopher G. Paplauskas
Council President John E. Lanni, Jr.

Also Present: Council Majority Leader Paul H. Archetto
Council Minority Leader Michael W. Favicchio
Carlos Lopez, Chief of Staff
Evan Kirshenbaum, Assistant City Solicitor
Kenneth Mason, Director of Public Works
Maria Medeiros Wall, City Clerk
Rosalba Zanni, Assistant City Clerk/Clerk of Committees
Heather Finger, Stenographer

MINUTES OF THE LAST MEETING:

On motion by Councilman Farina, seconded by Council President Lanni, it was voted to dispense with the reading of the minutes of the last meeting and they stand approved as recorded.

CORRESPONDENCE:

PUBLIC HEARING:

Robert Murray, Esq. appeared to speak regarding Ordinance 9-15-03 and asked that it be approved.

OLD BUSINESS:

Street Light Investment Program – Prism's full report.

On motion by Council President Lanni, seconded by Councilman Farina, it was voted ot continue this item. Motion passed unanimously.

Rhode Island Resource Recovery Corporation Appeal dated November 21, 2012 from ruling dated November 5, 2012 on Aug. 15, 2012 Fine Notice. (Cont. 6/3/2013, 1/6/2014, 2/3/2014 & 7/7/2014, 8//2015 & 9/14/2015). [click here to view]

Rhode Island Resource Recovery Corporation Dec. 7, 2012 Appeal of Fine Notice dated Aug. 15, 2012. (Cont. 6/3/2013, 1/6/2014, 2/3/2014 & 7/7/2014, 8/3/2015 & 9/14/2015). [click here to view]

RIRRC Appeal of DPW Director's Decision on RIRRC's Petition for Review of Modification to Industrial Wastewater Discharge Permit #1808. (Cont. 11/4//2013, 1/6/2014, 2/3/2014, 7/7/2014, 8/3/2015 & 9/14/2015). [click to view]

Solicitor stated that this item is still in litigation.

On motion by Councilman Farina, seconded by Councilman Paplauskas, it was voted to continue the above three items. Motion passed unanimously.

- ***Administration to submit street paving list (Council Majority Leader Archetto)***
  - ***list of roads that have been paved in the last five years. (Councilman Stycos)***
  - ***top 100 worst streets in Cranston (Council President Lanni)***

Mr. Mason appeared to speak.

Councilman Stycos asked it there is a way to get a list of which streets were re-paved with CDBG money and which were done with Providence Water. Mr. Mason stated, not from the list he has provided, but he can provide this information.

On motion by Council Vice-President Santamaria, seconded by Council President Lanni, it was voted to continue this item. Motion passed unanimously.

Councilman Aceto stated that Vallone Rd. was just paved. The way it is crowned and it seems there is a space already opening up in the middle. He asked that this be looked at. Mr. Mason stated that he will check into this.

- ***Macklin St. and Palmer Avenue Industrial area – Administrative report on violations and remedial action taken – Council President Lanni***

Mr. Lopez stated that he does not have a report this evening and requested that this item be continued to next month's meeting.

NEW BUSINESS:

9-15-03 ***Ordinance authorizing the Director of Public Works to execute a grant of an easement relating to underground utilities for the Woods at Orchard Valley Subdivision.*** [click to view]

On motion by Councilman Farina, seconded by Council President Lanni, it was voted to recommend approval of this Ordinance.

Under Discussion:

Councilman Aceto asked if the trench will be paved shortly. Mr. Mason stated that it will be done by the end of the month.

Roll call was taken on motion to recommend approval of this Ordinance and motion passed unanimously.

Norwood Avenue – status DOT restriping. Report from Administration. Councilman Stycos

Mr. Mason stated that this has been discussed with DOT and they are trying to come up with a solution for that roadway.

- ***Update from Grant Writer, Mr. Filarski regarding spending source for Cross Alert System (Referred from Traffic Safety Commission 9/21/2015).***

Council Vice-President Santamaria stated that, as Chair of the Traffic Safety Commission, this item was referred by the Traffic Commission to the Public Works Committee with recommendation that traffic signals be installed at four intersections near the bike path and Mr. Filarski is looking to get funds for this.

Council Vice-President Santamaria asked that this item be continued.

- ***Administration report on tree cutting budget. Councilman Stycos***

Mr. Mason stated that the City has two tree budgets, one is line item #1305 "Care of Trees" and has approximately $15,000 allocated to it. The other is in the Parks and Recreation budget for $60,000. The budgets for the "Tree Care and Removal" has pretty much been wiped out for the year due to the storms we have had.

Chair asked if there are plans to get funds from someplace else. Mr. Mason stated that currently, no. if there is a tree that has to be addressed and it is an emergency, it will be taken care of.

Council Majority Leader Archetto asked that this item be continued for further clarification from the Administration as to the funding.

Councilman Farina asked that it be continue to the Finance Committee in order for the Finance Director to address this.

Chair asked that this item be placed on the Finance Committee agenda.

MISCELLANEOUS BUSINESS:

Council Vice-President Santamaria stated that he is receiving complaints of Weingeroff Blvd., near Park View, where it is becoming a dumping site for mattresses.

Mr. Lopez stated that he spoke to the Police Colonel of possibly setting up cameras, but there are none available. They will look into increasing patrol in that area.

Council Minority Leader Favicchio asked if we have the ability to get grant funding for cameras for that. Council Vice-President Santamaria stated that he will have Mr. Filarski research that.

Council Majority Leader Archetto asked that the following be added to next month's agenda:

- Discussion of why there is no street sign at Princess Ave. from Cranston St. to Union Ave. He made this request in August and has not been addressed.

The meeting adjourned at 7:15 p.m.

Respectfully submitted,

Rosalba Zanni

Rosalba Zanni
Assistant City Clerk/Clerk of Committees

PW 10/5/15
dist by Ken Mann, PW Dir.

STREETS PAVED FROM 2010-PESENT – Updated 10/2/15

Street Name	Ward(s)	Street Segment
2010		
Blossom Drive	6	Entire
Cindy Lane	4	Entire
Cottonwood Drive	4	Entire
Gansett Avenue	3	Park Avenue to Pengrove Street
Natick Avenue	4	Comfort Drive to West Warwick Town Line
2011		
Fourth Avenue	2	Elmwood Avenue to Goeckel Avenue
Third Avenue	2	Entire
2012		
Amy Drive	4	Entire
Broad Street	1	Park Avenue to Ocean Avenue
Dean Street	5	Cranston Street to Meshanticut Valley Parkway
Hope Road	4	Burlingame Road to Seven Mile Road
Laten Knight Road	4	Pippin Orchard Road to 1000' West of Beechwood Drive
Lawnacre Drive	6	Entire
North Street	5	Entire
Overhill Road	5	Entire
2013		
Berwick Lane	1	Entire
Chestnut Avenue	2	Pontiac Avenue to Glengrove Avenue
Cranston Street	4	Overbrook Drive to Sherman Avenue
Davis Avenue	2	Entire
Dwight Street	4	Entire
Dyer Avenue	3	Argyle Street to Oxford Street
Eden Park Drive	2	Chestnut to Oakland
Eldridge Street	3	Reservoir Avenue to Hornbine Street
Fernbrook Court	4	Entire
Gaglione Court	4	Entire
Gleason Street	3	Entire
Herod Street	4	Entire
Hornbine Street	3	Gleason Street to Eldridge Street
Ionia Street	4	Entire
Legion Way	2	Midland Street to Reservoir Avenue
Massasoit Avenue	1	Entire
Miles Avenue	6	Entire
Oakland Avenue	2	Intersection of Glengrove Avenue

Salem Avenue	5	Entire
Sefton Drive	1	Broad Street to Narraganset Boulevard
Sheffield Road	6	Entire
Wentworth Avenue	1	Entire
Woodridge Road	6	Entire

2014

Angela Avenue	4	Entire
Anstis Street	1	Entire
Applewood Road	6	Entire
Autumn Street	2	Davis Avenue to Myrtle Avenue
Birchfield Road	1	Entire
Carlton Street	2	Entire
Cliffdale Avenue	1	Park Avenue to Avon Road
Colony Street	5	Entire
Cottage Circle	2	Entire
Cottage Street	2	Entire
Dover Street	3	Entire
Dyer Avenue	3	Casino Avenue to Cranston Street
Evans Way	6	Entire
Garden City Drive	6	Rotary only
Glen View Drive	6	Entire
Heather Street	3	Dyer Avenue to Laurel Hill Avenue
Howard Street	3	Entire
King Avenue	1	Entire
Main Street	4	Entire
Marion Avenue	1	Entire
Mica Avenue	3	Entire
Norman Avenue	2	Entire
Phenix Avenue	5	Cranston Street to Highland Street
Phenix Avenue	4	Hillcrest Drive to Phenix Ridge Drive
Pontiac Avenue	6	Mayfield Avenue to Warwick City Line
Priscilla Drive	4	Entire
Ridge Street	3	Entire
Seneca Street	3	Entire
Summit Drive	6	Meshanticut Valley Parkway to West Blue Ridge Drive
Valente	5	Entire
Valerie Court	4	Beechwood Drive to Crest Drive

2015

Asia Street	3	Entire
Batcheller Avenue	5	Entire
Cambio Court	4	Entire
Caporal Street	2	Entire
Chappy Street	5	Entire

Chester Avenue	5	Vallone Road to Cavalry Street
Chicory Lane	4	Hope Hill Terrace to Baneberry Drive
Clemence Street	5	Entire
Collingwood Drive	4	Entire
Conley Avenue	4	Entire
Dockside Way	6	Entire
East Belair Road	6	Entire
Farm Street	5	Entire
Flint Avenue	3	Entire
Forest Avenue	2	Pontiac Avenue to Mapleton Street
Hall Lane	4	Entire
Hervey Street	5	Entire
High School Avenue	2	Entire
Hillcrest Drive North	4	Entire
Homestead Avenue	3	Entire
Jordan Avenue	3	Park Avenue to Flint Avenue
Longview Drive	6	Entire
Mapleton Street	2	Pontiac Avenue to Briarcliff Road
Narragansett Blvd.	1	Traffic calming at Ocean Avenue
Pasture View Lane	4	Chicory Lane to Hope Hill Terrace
Phenix Avenue	4	Maple Farms Drive to West Warwick Town line
Saint Mary's Drive	5	Entire
Shean Street	5	Entire
Standish Avenue	3	Entire
Topeka Street	5	Entire
Urbana Street	5	Entire
Vallone Road	5	Entire
West Belair Road	6	Entire
Wilbur Avenue	4	Locus Glen Drive to Phenix Avenue

City of Cranston, Rhode Island

Pavement Management Program

Roadways Sorted - Road Surface Rating (RSR)

Name	Length (Miles)	Length (Feet)	Avg. Width	Square Yards	RSR	Overall Repair	Estimated Cost	Functional Class
Roadway Status:	Accepted							
COUNTRY VIEW DRIVE	0.17	892.89	30	2,976.29	**0.00**	Reconstruction	$133,932.93	LO/CS/DE
WOODDALE AVENUE	0.02	125.80	18	251.60	**2.75**	Reconstruction	$11,322.20	LO/CS/DE
JOHN STREET	0.11	597.79	20	1,328.42	**3.85**	Reconstruction	$59,778.78	LO/CS/DE
AUMOND STREET	0.03	166.53	24	444.07	**4.69**	Reconstruction	$19,983.14	LO
TOPEKA STREET	0.10	519.91	18	1,039.82	**5.69**	Reconstruction	$46,791.79	LO
BLUEBERRY LANE	0.16	831.96	30	2,773.20	**6.76**	Reconstruction	$124,793.92	LO
TAYLOR STREET	0.11	564.60	22	1,380.13	**7.74**	Reconstruction	$62,105.63	LO/CS/DE
LIPPITT AVENUE	0.70	3,671.46	24	9,790.56	**9.73**	Reconstruction	$440,575.40	LO
OLD PARK AVENUE	0.09	492.19	18	984.38	**9.80**	Reconstruction	$44,296.91	LO/CS/DE
THOMAS STREET	0.06	305.58	20	679.07	**10.02**	Reconstruction	$30,558.15	LO
STRATHCONA ROAD	0.20	1,066.04	24	2,842.77	**12.58**	Reconstruction	$127,924.47	LO
HONEYSUCKLE DRIVE	0.10	538.34	30	1,794.45	**12.63**	Reconstruction	$80,750.28	LO
LANTERN LANE	0.11	586.01	30	1,953.35	**12.73**	Reconstruction	$87,900.94	LO
WELL AVENUE	0.14	750.26	32	2,667.58	**12.81**	Reconstruction	$120,041.23	LO
PERENNIAL DRIVE	0.21	1,115.51	30	3,718.36	**12.85**	Reconstruction	$167,326.12	LO
REDWOOD DRIVE	0.24	1,264.58	30	4,215.28	**13.85**	Reconstruction	$189,687.38	LO
JERSEY STREET	0.02	129.48	26	374.06	**14.65**	Reconstruction	$16,832.78	LO/CS/DE
GALVESTON STREET	0.04	197.54	20	438.98	**14.68**	Reconstruction	$19,753.99	LO/CS/DE
AZALEA COURT	0.12	653.18	30	2,177.28	**16.47**	Reconstruction	$97,977.41	LO
CAROLE COURT	0.12	655.26	30	2,184.20	**16.69**	Reconstruction	$98,289.14	LO/CS/DE
AZALEA DRIVE	0.18	933.43	30	3,111.45	**16.73**	Reconstruction	$140,015.21	LO
MARINE DRIVE	0.05	249.54	24	665.44	**16.81**	Reconstruction	$29,944.92	LO
HANS STREET	0.09	474.93	21	1,108.18	**17.69**	Reconstruction	$49,868.07	LO
SWEET FERN DRIVE	0.24	1,260.32	30	4,201.06	**18.68**	Reconstruction	$189,047.58	LO
MARCY STREET	0.13	662.98	24	1,767.95	**19.64**	Reconstruction	$79,557.67	LO
MARSHALL ROAD	0.08	440.22	24	1,173.92	**19.84**	Reconstruction	$52,826.51	LO
CROSS STREET	0.05	246.82	30	822.74	**20.65**	Reconstruction	$37,023.25	LO
GOECKEL AVENUE	0.12	643.59	27	1,930.78	**22.51**	Reconstruction	$86,884.88	LO
CHARLOTTE STREET	0.02	95.08	24	253.54	**22.68**	Reconstruction	$11,409.24	LO/CS/DE
ENTERPRISE STREET	0.05	270.05	22	660.12	**22.70**	Reconstruction	$29,705.38	LO/CS/DE
APPLE HILL DRIVE	0.07	370.52	30	1,235.06	**22.73**	Reconstruction	$55,577.67	LO
TRICIA CIRCLE	0.06	299.25	30	997.51	**22.73**	Reconstruction	$44,888.04	LO/CS/DE
DROWNE STREET	0.20	1,050.14	24	2,800.37	**23.65**	Reconstruction	$126,016.74	LO

Name	Length (Miles)	Length (Feet)	Avg. Width	Square Yards	RSR	Overall Repair	Estimated Cost	Functional Class
DONNA DRIVE	0.13	708.59	30	2,361.96	**23.69**	Reconstruction	$106,288.09	LO/CS/DE
WHITEWOOD DRIVE	0.41	2,173.86	30	7,246.20	**23.82**	Reconstruction	$326,078.96	LO
ALTHEA DRIVE	0.16	842.18	30	2,807.27	**23.85**	Reconstruction	$126,327.19	LO
USHER AVENUE	0.07	376.06	23	961.04	**23.85**	Reconstruction	$43,246.84	LO
BARNSDALE ROAD	0.12	649.51	24	1,732.04	**23.87**	Reconstruction	$77,941.64	LO
BRIARBROOKE LANE	0.25	1,328.45	30	4,428.18	**24.73**	Reconstruction	$199,268.02	LO
EZEKIEL STREET	0.03	171.12	26	494.35	**24.83**	Reconstruction	$22,245.70	LO/CS/DE
ZINNIA DRIVE	0.41	2,166.30	30	7,221.00	**25.42**	Reconstruction	$324,944.96	LO
SANDSTONE CIRCLE	0.11	555.06	30	1,850.20	**25.73**	Reconstruction	$83,258.84	LO/CS/DE
VAUGHN LANE	0.19	987.07	15	1,645.12	**25.73**	Reconstruction	$74,030.40	CO
CARLO COURT	0.15	780.77	30	2,602.56	**26.69**	Reconstruction	$117,115.23	LO/CS/DE
SCOTT STREET	0.08	399.84	22	977.39	**26.74**	Reconstruction	$43,982.74	LO/CS/DE
HOLLINS DRIVE	0.11	595.54	23	1,521.94	**26.85**	Reconstruction	$68,487.27	LO
IRVING STREET	0.18	964.52	24	2,572.05	**26.89**	Reconstruction	$115,742.38	LO
GARRISON STREET	0.10	536.02	18	1,072.04	**27.69**	Reconstruction	$48,241.66	LO
SAVERIO STREET	0.05	268.12	40	1,191.63	**27.75**	Reconstruction	$53,623.25	LO
BLAINE STREET	0.13	694.75	24	1,852.65	**27.75**	Reconstruction	$83,369.41	LO
RUGGIERI CIRCLE	0.07	366.20	30	1,220.65	**27.81**	Reconstruction	$54,929.25	LO/CS/DE
~~ST. MARYS DRIVE~~	~~0.21~~	~~1,102.83~~	~~30~~	~~3,676.10~~	~~**28.30**~~	~~Reconstruction~~	~~$165,424.61~~	~~LO~~
REINDEER DRIVE	0.04	215.68	40	958.60	**28.83**	Reconstruction	$43,136.98	LO/CS/DE
CAVALRY STREET	0.17	903.25	30	3,010.84	**29.52**	Reconstruction	$135,488.02	LO
UNITY STREET	0.05	248.37	23	634.73	**29.85**	Reconstruction	$28,563.04	LO
LARKSPUR DRIVE	0.18	929.82	30	3,099.41	**30.64**	Reconstruction	$139,473.24	LO
LEBARON COURT	0.03	161.78	30	539.27	**30.73**	Reconstruction	$24,267.29	LO/CS/DE
BROOKS STREET	0.15	777.02	24	2,072.04	**30.75**	Reconstruction	$93,241.92	LO
BUTLER STREET	0.12	629.42	24	1,678.45	**30.75**	Reconstruction	$75,530.17	LO
CLIFFSIDE DRIVE	0.24	1,241.09	30	4,136.98	**31.69**	Reconstruction	$186,163.90	LO
RED BUD TERRACE	0.05	257.43	30	858.09	**31.80**	Reconstruction	$38,613.92	LO/CS/DE
HINES FARM ROAD	0.43	2,282.25	30	7,607.51	**31.94**	Reconstruction	$342,338.10	LO
MONUMENT STREET	0.15	782.83	24	2,087.54	**31.95**	Reconstruction	$93,939.47	LO
FOX RUN	0.30	1,584.35	30	5,281.17	**32.30**	Reconstruction	$237,652.72	LO/CS/DE
NORMANDY DRIVE	0.19	1,001.58	27	3,175.72	**32.57**	Reconstruction	$135,213.06	LO
PEPPER MILL LANE	0.09	464.20	30	1,547.34	**32.73**	Reconstruction	$69,630.33	LO/CS/DE
MOORLAND AVENUE	0.20	1,039.56	24	2,772.17	**33.65**	Reconstruction	$124,747.65	LO/CS/DE
STERLING DRIVE	0.03	163.68	30	545.59	**33.83**	Reconstruction	$24,551.68	LO/CS/DE
IVANHOE STREET	0.15	787.66	24	2,100.42	**34.69**	Reconstruction	$94,519.08	LO
COLLINGWOOD DRIVE	0.17	919.42	30	3,064.74	**34.69**	Reconstruction	$137,913.17	LO
BOLTON STREET	0.16	848.50	18	1,697.00	**34.75**	Reconstruction	$76,365.14	LO/CS/DE
D STREET	0.05	283.21	22	692.29	**34.75**	Reconstruction	$31,153.12	LO
ANNUAL DRIVE	0.11	571.76	30	1,905.88	**34.85**	Reconstruction	$85,764.40	LO

Name	Length (Miles)	Length (Feet)	Avg. Width	Square Yards	RSR	Overall Repair	Estimated Cost	Functional Class
WINTHROP STREET	0.10	513.45	24	1,369.19	**34.87**	Reconstruction	$61,613.53	LO/CS/DE
TURIN STREET	0.04	198.84	24	530.23	**34.88**	Reconstruction	$23,860.41	LO/CS/DE
STATION STREET	0.43	2,255.38	29	7,086.52	**35.17**	Reconstruction	$321,390.94	LO
PARKSIDE CIRCLE	0.04	201.51	24	537.36	**35.64**	Reconstruction	$24,181.42	LO/CS/DE
DEER RUN	0.11	575.54	30	1,918.46	**35.69**	Reconstruction	$86,330.73	LO/CS/DE
LANG COURT	0.11	560.67	30	1,868.90	**35.73**	Reconstruction	$84,100.56	LO/CS/DE
CRANBERRY TERRACE	0.40	2,101.53	30	7,005.10	**35.79**	Reconstruction	$315,229.46	LO/CS/DE
RANDOLPH STREET	0.08	413.15	23	1,055.84	**35.85**	Reconstruction	$47,512.66	LO
RUGBY STREET	0.29	1,553.56	25	4,325.91	**36.15**	Reconstruction	$192,253.23	LO
ROME DRIVE	0.26	1,371.95	30	4,573.16	**36.26**	Reconstruction	$205,792.33	LO
FOREST AVENUE	0.45	2,378.80	28	7,122.05	**36.32**	Reconstruction	$328,274.25	LO
HILLCREST DRIVE	0.30	1,561.47	30	5,204.91	**36.46**	Reconstruction	$234,220.93	LO
BETSEY WILLIAMS DRIVE	0.45	2,398.62	23	6,129.81	**36.49**	Reconstruction	$275,841.28	LO
CAMBIO COURT	0.13	712.47	30	2,374.89	**36.69**	Reconstruction	$106,869.93	LO/CS/DE
ELDORADO STREET	0.16	866.54	24	2,310.76	**36.70**	Reconstruction	$103,984.28	LO
LAUREN COURT	0.40	2,100.50	30	7,001.66	**36.72**	Reconstruction	$315,074.61	LO/CS/DE
DELTA STREET	0.13	660.60	24	1,761.59	**36.80**	Reconstruction	$79,271.71	LO
WEST RUSSE STREET	0.04	228.44	20	507.65	**36.85**	Reconstruction	$22,844.10	LO/CS/DE
BLACK OAK COURT	0.11	582.85	30	1,942.83	**37.69**	Reconstruction	$87,427.46	LO/CS/DE
FOXGLOVE DRIVE	0.21	1,116.22	30	3,720.74	**37.72**	Reconstruction	$167,433.11	LO
THYME DRIVE	0.07	395.53	30	1,318.43	**37.73**	Reconstruction	$59,329.13	LO/CS/DE
SEVEN MILE ROAD	2.33	12,326.51	24	32,870.70	**38.08**	Reconstruction	$1,479,181.71	CO
ELLWOOD AVENUE	0.03	146.19	30	487.30	**38.68**	Reconstruction	$21,928.44	LO/CS/DE
TACOMA STREET	0.14	714.02	20	1,586.71	**38.69**	Reconstruction	$71,401.79	LO
OCEANVIEW DRIVE	0.07	349.16	30	1,163.86	**38.69**	Reconstruction	$52,373.50	LO
SPECTACLE STREET	0.07	375.47	24	1,001.26	**38.75**	Reconstruction	$45,056.61	LO
ARNOLD AVENUE	0.47	2,491.27	36	9,965.08	**38.79**	Reconstruction	$448,428.76	LO
GREENVIEW ROAD	0.07	362.26	30	1,207.53	**38.80**	Reconstruction	$54,338.78	LO/CS/DE
GOLINI STREET	0.03	134.05	32	476.62	**38.87**	Reconstruction	$21,447.94	LO/CS/DE
APPLE BLOSSOM LANE	0.22	1,141.35	30	3,804.49	**39.19**	Reconstruction	$171,201.86	LO
FIFTH AVENUE	0.16	850.49	23	2,173.47	**39.35**	Reconstruction	$97,806.20	LO
TALBOT MANOR	0.11	593.09	24	1,581.57	**39.64**	Reconstruction	$71,170.51	LO/CS/DE
GINA COURT	0.11	555.10	30	1,850.32	**39.69**	Reconstruction	$83,264.49	LO/CS/DE
REGAL WAY	0.22	1,184.80	30	3,949.35	**39.73**	Reconstruction	$177,720.56	LO
DORIC AVENUE	0.99	5,208.28	34	19,960.29	**39.80**	Reconstruction	$896,980.71	LO
SAGE DRIVE	0.33	1,733.92	30	5,779.74	**39.83**	Reconstruction	$260,088.29	LO
WINTON STREET	0.14	739.12	27	2,217.35	**39.85**	Reconstruction	$99,780.60	LO
VALLONE ROAD	0.20	1,061.65	23	2,646.67	**40.19**	Reconstruction	$119,436.01	LO
WAYSIDE DRIVE	0.27	1,433.42	29	4,483.18	**40.37**	Reconstruction	$205,456.84	LO
SWIFT STREET	0.06	296.04	24	789.44	**40.65**	Reconstruction	$35,525.00	LO/CS/DE

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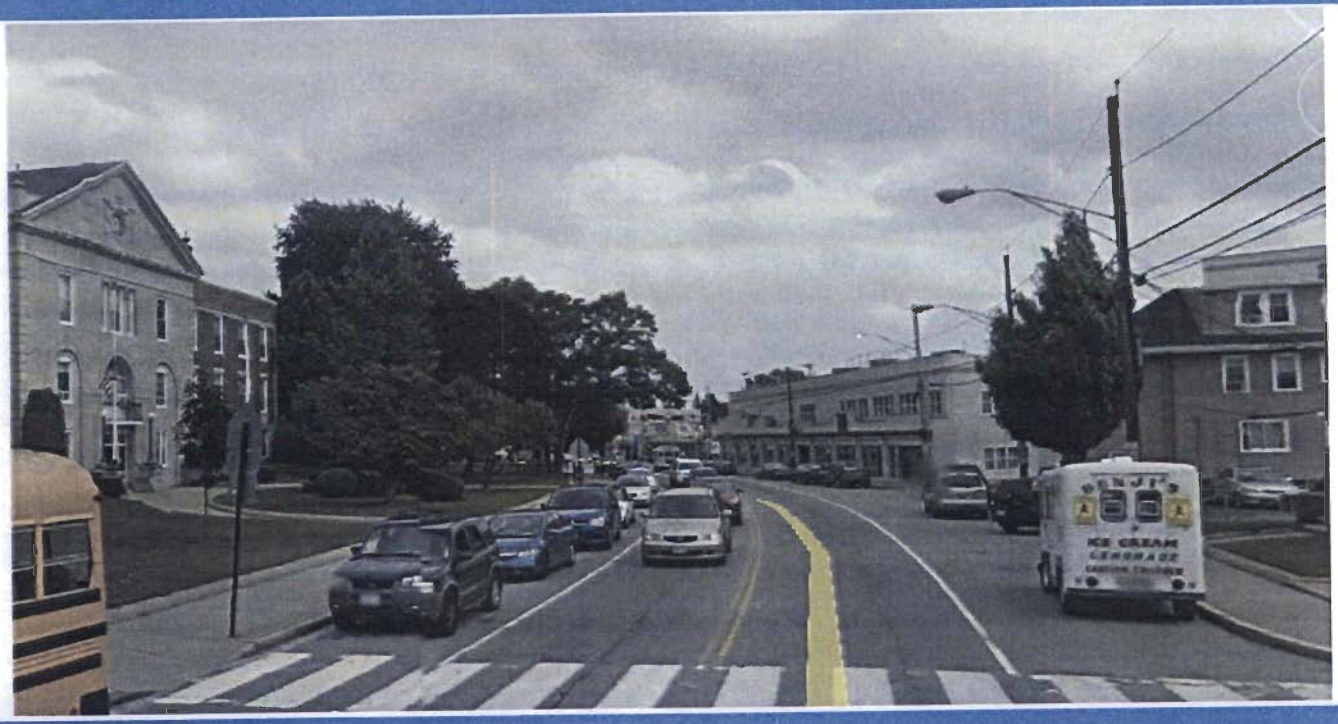
dist by Ken Mason

City of Cranston



Street Light Acquisition and Energy Efficiency Improvement Options

PRISM PARTNERSHIP FOR RHODE ISLAND STREETLIGHT MANAGEMENT

By: LightSmart Energy Consulting, LLC, August 2015

Executive Summary

EXECUTIVE SUMMARY:

The City Of Cranston has joined the Partnership for Rhode Island Streetlight Management (PRISM) in order to reduce its annual $1,566,244 street lighting bill. PRISM is a nonprofit municipal-run collaborative program that manages streetlighting systems for RI municipalities and gains economies of scale to reduce the cost for large and small municipalities.

This summary introduces the topic, and then addresses the three key questions that Cranston will answer in determining the future of its streetlighting system. This summary has the following sections:

1. Background and Rationale
2. Should Cranston purchase its streetlights?
3. Should Cranston convert its lights to LED lights?
4. Should Cranston install an intelligent streetlighting control system?
5. Recommendations

1. BACKGROUND AND RATIONALE

For decades, aggressive utility pricing has made streetlighting an expensive public service for Rhode Island (RI) towns and cities. In response, a reform movement is being spearheaded by the Washington County Regional Planning Council (WCRPC) and its statewide streetlighting program, the Partnership for Rhode Island Streetlight Management (PRISM). PRISM manages streetlighting systems for RI municipalities, including supporting activities such as analysis, asset acquisition, and equipment upgrades. PRISM also advocates for towns and cities at the RI Public Utilities Commission (PUC). This report is the first phase of PRISM's service to the City of Cranston.

2. SHOULD CRANSTON PURCHASE ITS STREETLIGHTS?

Rhode Island's communities are better positioned than ever before to participate in efficient and effective management of their streetlighting systems. State law (RIGL 39-30) now allows municipalities to acquire streetlighting assets in their communities for the net book value of those assets. Communities may now acquire streetlights from their utility for their depreciated value. **With PRISM maintenance, Cranston can enjoy a 40% annual savings. That is $423,723 each year in reduced ownership and maintenance costs.**

Initial Savings: The table below outlines the savings through acquisition of the system and maintaining it "as-is." It does not include conversion to more efficient LED lights—these are discussed below.

	CURRENT S-14/10	S-05 ALL FIXTURES
NGRID FIXTURE CHARGES	$792,455	$0
NGRID DISTRIBUTION CHARGES	$269,548	$406,805
SUPPLY ENERGY COSTS (DE)	$504,240	$504,240
PROJECTED MAINTENANCE	Incl. above	$231,474
TOTAL COSTS	$1,566,244	$1,142,520
ANNUAL SAVINGS W/MAINTENANCE	$0	**$423,723**

*Note NGRID customer owned distribution energy rates are higher because a portion of these rates are built into the fixture charges and under the customer owned S-05 rate the PUC included them in distribution energy rate.

3. SHOULD CRANSTON CONVERT ITS LIGHTS TO LED LIGHTS?

LED Conversion: Communities can also benefit from conversion to Light Emitting Diode (LED) technology. LED lighting can further reduce municipal costs, potentially increasing their annual savings to as much as 60% or more. **Cranston can save $1,069,465 annually, and receive a one-time energy efficiency incentive of $484,161 if it purchases LED lights.** LED lights come with a ten-year warranty, and, as a result, also reduce maintenance costs. They offer improved color rendering, which can aid in public safety work because colors are correct and details are easier to see. LED conversions improve overall appearance of a community, have been very well received by the public, and are a highly visible demonstration of the City's commitment to cost savings, energy efficiency, and improved safety. In fact, no other investment in energy conservation provides a higher return than conversion to LED lighting. (See below for LED cost savings)

Intelligent Controls: Deploying LED lights also opens the possibility of using intelligent remote controls in place of the standard photocell. The standard photocell turns the light on at dusk and off at dawn, and the light burns at full power all night. Intelligent controls allow the light to be dimmed or brightened individually or in groups for all or part of the night, and thus allow the community to control lights to balance public safety, neighborhood preferences, and energy efficiency. These controls have an internal chip that, like a house meter, measures the energy consumed. **An Intelligent streetlighting system of LED lights and controls that dims the lighting by 50% from 11pm to 5am can increase the savings to $1,198,114 each year and can receive a potential one-time incentive of $788,851.**

The Table below compares the City-owned, "as-is" system to a control-ready LED system. Note that the current costs are $1,566,244 and the savings are based on this cost. This table does not include financing costs—these are discussed in the following section.

	CITY OWNED COSTS CURRENT HPS SYSTEM	CONTROL READY LED	LED W/CONTROLS 50% DIMMED 11 PM TO 5 AM
NGRID DISTRIBUTION COSTS	$406,805	$159,522	$71,296
DIRECT ENERGY COSTS	$504,240	$192,985	$86,251
MAINTENANCE & ADMINISTRATION	$231,474	$144,271	$210,581
TOTAL ANNUAL COST	$1,142,520	$496,779	$368,130
SAVINGS FROM CURRENT	**$423,723**	**$1,069,465**	**$1,198,114**
POTENTIAL INCENTIVE	N/A	**$484,161**	**$788,851**

Other public uses of the network: The controls communicate with nearby streetlights and, via the Internet, with the City through a mesh network. The communication network can also support other uses, such as synchronizing traffic signal controllers, and linking with motion sensors, weather monitors, pedestrian level monitoring, parking systems and, with

some increased bandwidth, cameras. In high crime areas the right system could support license plate and facial recognition as well as gun shot pinpoint. The system priced in this report does not have all the features mentioned above; if Cranston so chooses, we will add these in the Phase 2 analysis.

These systems also provide the potential for income for the city. Already, telecomm companies are inquiring about leasing space on the streetlight to attach micro cells to improve their phone coverage areas. The full potential of such systems is just beginning to emerge. The City could choose to install a control-ready system (but not the controls, at this time) or go with the full up system with controls. Both NGRID and the Rhode Island Office of Energy Resources (OER) are providing grants for the LED conversion and special funds for control systems, making it economically justifiable to purchase such a system now.

Managing the network and the associated network fees add to the maintenance costs but these are offset by the added savings generated by part-night and dimming. Studies show that the human eye does not detect dimming up to 30%, so some after-hours dimming, even at 50%, can be exercised and it will not be noticed. This has been the practice where dimming is allowed under a utility tariffs in other parts of the country.

Financing: The acquisition cost of $451,372 and the $2,943,142 cost to complete the LED conversion project, or the $4,066,821 for LED/Controls conversion can be financed through the savings using a tax-exempt municipal lease that is treated as an operating expense. Current interest rates are below 3% for a ten-year lease. **The table below illustrates how financing the entire cost through a tax-exempt lease can save Cranston over $700,000 per year.**

	CITY OWNED COSTS CURRENT HPS SYSTEM	CONTROL READY LED	LED W/CONTROLS 50% DIMMED 11PM TO 5 AM
AMOUNT FINANCED	$451,372	$2,943,142	$4,066,821
LEASE COSTS	($51,373)	($334,976)	($462,869)
NET ANNUAL BUDGET SAVINGS	**$372,350**	**$734,488**	**$735,245**

The City could also if it chose pay some of the savings forward by increasing the amount financed. Interest rates would be slightly higher but even operating within the 10-year model the City could receive a check for $700,000 and still save over $45,000 per year on the street lighting budget.

These savings are only possible because of the work done by PRISM over the past several years. The City may now avail itself of the opportunity to convert community lighting to LED technology, improve public safety, generate potential revenue, and demonstrate its commitment to providing better services at lower costs to its citizens. It is clear from our analysis and the structure of the incentives being offered now that the LED system with controls is the best overall choice for the City.

Converting to LED lights can reduce energy and CO2 pollution and increase savings significantly. The table below shows the environmental savings impact of the LED conversion.

	CITY OWNED COSTS CURRENT HPS SYSTEM	CONTROL READY LED	LED W/CONTROLS 50% DIMMED 11PM TO 5 AM
SYSTEM KWH	5,171,699	1,906,384	1,406,387
BILLED KWH	N/A	2,028,006	1,406,387
KWH SAVINGS	N/A	3,225,680	3,725,678
BUDGET KWH ENERGY SAVINGS	N/A	3,104,058	4,068,272
% KWH SAVINGS	N/A	62.9%	72.6%
METRIC TONS OF CO2 SAVED	N/A	2,140	2,805
EQUIVALENT AVERAGE ANNUAL CAR MILES SAVED	N/A	5,096,205	6,679,241

With control ready LED lights Cranston can save over 62% kWh usage, and if Cranston chooses a streetlighting system of LED lights and controls that dims the lighting by 50% from 11pm to 5am they can increase their energy savings to over 72% kWh usage. If the City selects the control ready LED lights they can save up to 2,140 metric tons of CO2 per year, which is equivalent to an average of 5,096,205 annual car miles. If they choose the intelligent lighting system with the dimming feature they can save up to 2,805 metric tons of CO2 per year, which is equivalent to 6,679,241 annual car miles saved.

5 RECOMMENDATIONS

1. **Audit and Map the System** – The data set is clearly inaccurate. The billing errors must be identified before the purchase is complete in order to get a refund. Once the City owns the lights this opportunity is lost. An audit would not only create a valuable asset database for the City and would be useful if the City opted for the controls sometime in the future. This would be undertaken almost immediately so that it would be complete before we can get the final acquisition documents from NGRID.

2. **Acquire the system from NGRID**- Once the City gives notice to NGRID of its intention to move forward with the acquisition there will typically be at least a 60 day delay to finalize the paperwork. During this time delay we would endeavor to complete the system GIS audit.

3. **Complete a conversion to LED technology with a control ready system**. Work with the water enterprise to determine the viability of going to the wireless read of the water meters using the street lighting network. If it looks like this is an option the City would like to consider review the financing options to see if the there is a means to work the financing given any restrictions on mixing City funds with enterprise funds and make adjustments to the financing model as needed.

Report

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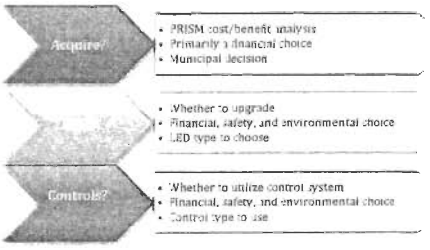
ECONOMICS OF ACQUISITION:

For decades, aggressive utility pricing has made street lighting an expensive public service for Rhode Island's Cities and Towns. In response, a reform movement is being spearheaded by the Washington County Regional Planning Council (WCRPC) and its statewide street lighting program, the Partnership for Rhode Island Streetlight Management (PRISM). PRISM manages street lighting systems for RI municipalities, including supporting activities such as analysis, asset acquisition, and equipment upgrades. PRISM also advocates for cities at the RI Public Utilities Commission (PUC). This report is the first phase of PRISM's service to the City of Cranston.

Communities are better positioned than ever before to participate in efficient and effective management of their street lighting systems. State law (RIGL 39-30) now allows municipalities to acquire the street lighting assets in their community for the net book value of that asset. Communities may now acquire streetlights from their utility or Local Distribution Company (LDC), for their depreciated value – and potentially enjoy a 40% savings in ownership and maintenance costs. Furthermore, conversion to Light Emitting Diode (LED) technology can further reduce those costs, potentially increasing the savings to as much as 60% or more. LED lights improve overall appearance of a community and are a highly visible demonstration of municipal commitment to cost savings and improved safety. In fact, no other investment in energy conservation has a higher return on investment than conversion to LED lighting.

The objective of this report is to provide the City of Cranston with the information necessary to determine the best overall course of action with regards to the benefits provided under RIGL 39-30. This report reviews the financial considerations associated with the acquisition, ownership, and maintenance of the streetlights as provided by the legislation. These include the applicable utility tariff costs, maintenance costs, property taxes, insurance, purchase price, and other factors pertinent to the decision making process. In addition, it reviews the costs of converting lights to LED sources and the impact on costs and savings. Information was gathered from City Departments, the Narragansett Electric Company

Figure 1. City of Cranston Choices



(NGRID) approved tariffs (as published by NGRID), financial organizations that provide tax-exempt municipal financing, streetlight equipment manufacturers, and suppliers. The initial sections of the report deals with acquiring the system "as-is." The report also looks at the cost and impact of converting to LED lighting and offers two options: converting to LED lights that are capable of supporting control technology (control ready), and conversion to LED lights with a complete control system.

The steps to acquiring streetlight assets from National Grid are:

1. Request purchase price information from the utility.
2. Conduct economic analysis to determine benefit and payback of acquisition (As fulfilled by this report).
3. Define scope of services.
4. Notify utility of intent to purchase, triggering the sixty-day (60) clock.
5. Final review and approval by the City.
6. Execution of all documents.
7. Project initiation.

The Legislation specifies the utilities must sell their lights for the original cost less depreciation at the time they receive notification from the community of the intent to purchase. The terms of the asset transfer will be covered in a Purchase and Sale Agreement developed during PUC proceedings and an Attachment Agreement approved by the PUC. The community will acquire all assets associated with the streetlights including: underground feeds and conduits to the point of connection to the utility distribution system, any poles that are dedicated to streetlights and have no telephone or electric distribution lines on them, and all streetlight brackets and fixtures. All joint use poles (those with either telephone or electric distribution wires) will be subject to the Attachment Agreement governing the responsibilities of each of the joint users of the pole. These Agreements were generally based on the standard agreements the utilities have with other joint users, and were then negotiated thoroughly at the PUC by the joint interveners PRISM and the Rhode Island League of Cities and Towns (League).

Once the lights are acquired, the community becomes responsible for their maintenance as well as any dedicated poles and underground feeds. The Local Distribution Company, LDC, (NGRID) reserves the right to make and break the electrical connection to its distribution system and for any work in its manholes. As such, the utility will perform any work necessary between its manholes and the streetlights for underground fed lights, make or break any secondary overhead connection, and bill the City for this work. The details for

this division of responsibility will be spelled out in the Attachment Agreement. The City (or PRISM for the City) will be required to install a fuse between the mast arm and the secondary connection when the light is serviced for the first time after acquisition. All lights must be fused within ten years. In the event the City chooses to upgrade the lights to LED sources, fusing would then be accomplished at the time of conversion.

The maintenance can be performed by contract, in-house or a combination of both. NGRID now requires that any time a fuse is installed, the worker must be a qualified electrical worker as specified in Occupational Safety and Health Administration (OSHA) 1910.269. If the City or PRISM employs personnel not so qualified then they must have NGRID de-energize the circuit first and then reenergize the circuit when the work is done. This would apply to changing a fixture or installing the fuse. Once the fuse is installed, then the worker can de-energize the circuit by pulling the fuse and NGRID is not required. These options will be discussed in greater detail later in this report.

Streetlight rates are defined by Rate Tariffs that are proposed by NGRID and approved by the PUC. Municipalities are billed according to which rate tariff is applicable. NGRID currently has four tariffs that apply to street lighting in Rhode Island: S-14, S-10, S-06, and S-05.

Virtually all Cranston streetlights are billed pursuant to the S-14 or S-10 tariff regarding utility ownership and maintenance. It consists of a fixed charge based on the size, type, and class of the luminaire (Fixture Charge), a kWh charge (seventeen separate small charges, including Transmission, LIHEAP, Net Metering, Pension Adjustment, and Renewable Energy) based on the energy consumption (in kilowatt hours) of the fixture, and pole charges for non-standard poles. Included in the Fixture Charges are depreciation and maintenance costs. The Fixture Charges are divided into three lamp types: Mercury Vapor (MV), High Pressure Sodium (HPS), and Incandescent, as well as charges for Decorative fixtures and various Pole types.

The S-05 Tariff was developed in response to RIGL 39-30, the Municipal Streetlights Investment Act, and applies to municipally owned and maintained streetlights and would apply to the City if it acquired its streetlights. This Tariff is based on an energy charge for each type of lamp and the operating hours during each month. There are no pole charges under this tariff and it does not provide for maintenance. Therefore, communities under this tariff must provide their own maintenance either through contract services, in-house work force, or a combination of both. PRISM is the nonprofit maintenance collaborative enabled by the Act.

Copies of both the S-14 and S-05 Tariffs and Tariff 2905 that defines the kWh charges are included in Appendix D of this report. Appendix C contains spreadsheets based on these tariffs used to calculate the annual costs of Cranston's particular inventory of streetlights.

The other tariffs, S-06, & S-10, are special tariffs for unique circumstances. S-10 applies to private lights and S-06 to decorative and area lighting. Most decorative municipal lights are not billed under S-14, but instead are metered and billed in the "Small C&I", (Commercial/Industrial) rate. This report covers only roadway lights and not decorative lights that are separately metered and billed under the Small C & I rate. Savings can be achieved with these lights but the bills do not present any information as to wattages or counts so it is not possible to determine the potential savings without first completing a field inventory.

NGRID originally supplied inventory data for 9558 fixtures that are on, 86 fixtures permanently turned off, one inactive light and 223 dedicated poles. The City provided bills for 9491 fixtures and 209 poles on three accounts. There is a possibility that there are additional bills from the schools not provided or some small miscellaneous accounts not provided.

We do not have the purchase price spread sheets, which typically will show a different count. We also do not have a form of the inventory that shows the different billing account numbers. If the final inventory shows less lights than listed on the NGRID inventory it should result in some adjustments to the final purchase price.

The analysis in this report is based on the information we were able to gain from the inventory supplied by NGRID and the bills provided with emphasis on the current bills as that will be the basis of the budget savings. The counts used are 9491 lights and 209 poles. Ultimately, we would like to verify the inventory data supplied and compare to the actual bills. Our experience thus far is that a field inventory should be conducted to verify the counts and the inventory. This inventory would supply a asset database for the City and if the City is being improperly billed we can recover some of the overcharges.

Table 1. below summarizes the projected costs/savings associated with the change of ownership from NGRID to City owned and includes the cost of a typical full service maintenance contract derived from current bid prices in other communities for the 2893 streetlights identified from the NGRID supplied inventory that are currently owned and maintained by NGRID.

	CURRENT S-14/10	S-05 ALL FIXTURES
NGRID FIXTURE CHARGES	$792,455	$0
NGRID DISTRIBUTION CHARGES	$269,548	$406,805
SUPPLY ENERGY COSTS (DE)	$504,240	$504,240
PROJECTED MAINTENANCE	Incl. above	$231,474
TOTAL COSTS	$1,566,244	$1,142,520
ANNUAL SAVINGS W/MAINTENANCE	$0	**$423,723**

*Note NGRID customer owned distribution energy rates are higher because a portion of these charges are built into the fixture charges and under the customer owned S-05 rate they are moved into the distribution energy rate. ** Includes $15,000.00 in contingency funds.

The energy costs were calculated using the NGRID fixed distribution S-05 rate effected July 2015 of $.07866 and the $.0975 Direct Energy supply costs not including the winter reliability charge of $.00236, which only applies for the three winter months. The $.0975 supply rate is the current Direct Energy rate for the City through Dec 2016. The distribution energy rate is $.05212, which was in effect beginning in July. The total savings is unaffected by the rate except for any option which reduces the energy usage. Table 1 illustrates the gross potential savings, which must be adjusted by amortization of the purchase price, loss of tax revenue, and other factors outlined later in this analysis. It provides the gross savings from which these other expenses are deducted and provides the basis for later calculations. It also assumes a commercial contract for maintenance.

The projected CY 2015 bill under both scenarios was calculated using the December 1, 2015 approved S-05 tariffs for NGRID and applying Cranston's specific inventory. Maintenance cost is estimated per fixture/per year based on bids in Massachusetts. This does not include certain types of enhancements or repairs that are unpredictable such as the addition of new lights, knockdowns or pole relocations. Recent bids in other communities have been somewhat lower, however, it is important the estimates are conservative. **Based on the current tariff rates, the estimated contract maintenance costs, and assuming acquisition of all streetlights, the gross annual savings would be $423,723.** Other miscellaneous expenses outlined below will further adjust these savings.

NGRID's stated purchase price as of October 2014 for all fixtures (9558 lights and 223 poles) is $451,372.00. Most lights are on utility owned poles, which NGRID will continue to own and be responsible for. The majority of the decorative poles are Colonial style post top fixtures in neighborhoods such as those on Fox Ridge or Independence.

Cranston's system is a mix of some older mercury vapor (10%) and mostly HPS (high-pressure sodium) fixtures. NGRID reports one incandescent but it is not likely this is the case. NGRID has said once the City commits to the purchase it will update the purchase price to account for any additional depreciation and changes in the system. This price should not be substantially different then the one already provided and would be the subject of limited final negotiations with NGRID.
Included in Appendix B is the purchase price information supplied by NGRID.

The street lighting equipment subject to purchase is part of the basis for the tangible property taxes paid by the utility to the City. Subsequent to the purchase, the street lighting equipment's assessed value will be deducted from that basis resulting in the loss of a portion of the total tangible property tax revenues paid by the utility. The City receives a property valuation statement each year in regards to the tax basis of the utility assets in the City and this should be closely monitored if the City chooses to acquire the streetlights. Street lighting is included on that statement, and, if it is broken out by the U.S. Federal Regulatory Commission (FERC) account codes, the streetlights are included in the Distribution Plant 373 account. NGRID pays taxes on the depreciated value of the assets with a floor of 30% of its investment. It is not known if the streetlight account has reached the floor yet. Based on the purchase price, and assuming it was all taxed at the tangible property rate of $33.68 per thousand, then the lost tax revenue would be $15,202, although the actual amount could be somewhat larger.

Qualified personnel must perform the work, prevailing wage laws do apply, and RIGL 37-2 governs portions of the maintenance work. Once the City owns the lights it is responsible for the fixture and bracket on all joint use poles, and the fixture, bracket and pole for any dedicated poles - that is, poles that serve no other purpose except streetlights. Cranston has 209 dedicated poles according to the bills. The acquisition of the system in Cranston would include the 209 poles dedicated to streetlights. If a joint use pole (utility owned) needed replacement, the City would be responsible for reattaching the streetlight to the new pole. Pole replacement of the joint use poles remains

the responsibility of the utility. In the case of the dedicated poles, the City would be responsible for the pole replacement as well as the fixture and bracket. The post top Colonial Fixtures are typically less than $1800 and are readily available.

PRISM will issue a Request for Proposal (RFP) for maintenance services that include all routine maintenance requirements. This RFP would call for a full service contract that minimizes the City's responsibilities. It should include a call center, seven-day maximum repair time (five working days), a fixed price for services, only qualified workers, and contractor coordination with the utility whenever required. The City would receive monthly detailed reports of all services rendered. PRISM would be responsible to contact the reporting party if the repair cannot be completed within the prescribed number of days. The City should also expect an occasional expense associated with pole relocations, underground faults, storm damage, or knockdowns. The City should include a reserve contingency in the street lighting account and retain that reserve, replenishing as necessary. Under the terms of the contract, the contractor(s) would be managed by PRISM staff, giving the City a single point of contact at PRISM.

In the event the City chooses to convert the system to LED lighting, these fixtures come with a ten-year warranty, and maintenance requirements will drop dramatically. NGRID reports its average repair rate for HPS lighting is 18% of the lights per year. An LED system would drop to less than 1% per year. As a result, the best maintenance approach is a time and materials contract. PRISM will develop a maintenance service approach that would apply in all circumstances to the advantage of their members. This can include a contingency that if not needed would revert back to the City at the end of each year or carried forward if the City so desires.

A typical service contract will include: routine maintenance for component failure due to normal age and/or deterioration, a call center, outage inspections, general cleaning, and tree trimming within three feet of the lamp in conjunction with any repair. The community would be charged separately for new installations, replacements, removals, and repairs associated with knockdowns. In general, the knockdown rate is less than 0.4% and only one tenth of those involve a hit-and-run. In a case of hit-and-run, the City (or the City's insurance provider) would bear the full cost of any dedicated poles and the cost of the fixture or in the event of a joint use pole, the cost of attaching a new fixture to the utility pole and the reconnect fee. Most knockdowns involve a known operator, in which case, the individual's insurance carrier or the individual would be responsible to pay for the repair. In the event of an unknown cause, the City will bear the full cost. The maintenance

estimates in this report include a contingency for such costs.

The City has direct control over the addition of new lights. Some allowance for new lights may be appropriate if the City believes it will be adding lights. The contingency should cover the addition of a limited number of new lights. Depending on the actual status of the six inactive lights the City may choose to restore them to service.

The main risk the City accepts with ownership of its lights is the risk of a major storm damaging a large number of streetlights or significant underground wiring problems. To cover this possibility, the City may wish to consider adding streetlights to its current insurance plan. The cost for such insurance is minimal since the risk is relatively small. Typically, after such an occurrence both State and Federal aid (U.S. Federal Emergency Management Agency and RI Emergency Management Agency) is available. Again, the likelihood of one of the dedicated poles being struck by an uninsured motorist or of a hit-and-run is small. In the case of an insured motorist, the motorist's insurance would reimburse the City. There are a number of firms specializing in seeking reimbursement for Cities and Towns. Additionally, the service contractor will typically request that he/she be allowed to deal directly with the insurance carrier as the contractor can collect a larger sum. The City should plan for some reinstallations of brackets and fixtures associated with the utility replacing poles as part of routine operations. The City would need to discuss this with its insurance carrier, but the experience in other communities has been these costs are quite low. Included in a contract maintenance service is the requirement that the contractor provide liability insurance for its equipment and personnel as part of its costs, and both the City and utility are named as additional insured.

As a rule, communities do not supply or require police details for streetlight repairs. The work is usually accomplished quickly with minimal interruption of traffic. The contractor is required to provide appropriate traffic warning devices as well as completing work on any main thoroughfares outside of normal peak traffic periods. Police details would be required for new installations and during knockdown repairs. The cost of police details for knockdowns would be paid by the utility company in the case of a joint use pole and by the City in the case of a dedicated pole. New installations can be scheduled at night to minimize these costs. The City is responsible for the cost of police details as pass through costs.

The Attachment Agreement with the utility for joint use poles provides certain services in conjunction with streetlights that must be performed by the utility (NGRID) personnel on a reimbursable basis. Only the utility can make or break the connection to NGRID's secondary lines. The typical fee for this service is the $130.00 Lighting Service Fee specified in paragraph 18 of NGRID Terms and Conditions in its Rate Tariff. NGRID requires a fuse be installed and once installed these costs can be avoided. If the electrical worker is properly certified then he/she can install the fuse without NGRID involvement. The installation of a new fixture or the removal of an unwanted fixture will require this fee be paid. The Agreement requires the City have the utility's approval before installing a new light on any existing joint use utility pole. The utility would conduct a survey to determine if a streetlight can be safely attached to the pole and bill the City for the inspection service. Fees will be quoted at the time of the request and must be paid in advance. The contingency maintenance costs will cover general expenses in this category.

The routine maintenance contract price for the streetlights is independent of whether they are overhead or underground fed and under the customer owned S-05 tariff, the energy cost for each is the same as it is based solely on energy use. Repairs to the City owned poles would be an extra cost paid on an as required basis if the City acquired all of its lights and the pole were damaged or failed due to age. The City would also be responsible to move its light from an old pole to a new pole if the old pole is replaced by NGRID (or other pole owner, such as Verizon) as part of ongoing maintenance. NGRID (or other pole owner, such as Verizon) is responsible for all pole repairs to joint use poles. The City should review its history to determine the expected frequency of problems with knockdowns or pole replacements.

The City may also want to review the lighting on all streets for uniformity. Very often there will be a mixture of wattages on a single street, which could be made uniform, and save energy in the process. The City has 1257 named streets and 603 of these have multiple wattage lamps on them. The most common mix is a single 100 watt lamp on a residential street that is all 50 watt fixtures. The lights for possible change would be identified as part of an audit process and reviewed with the City for a decision.

The Illuminating Engineering Society of North America (IESNA) publishes the RP-8 Report with recommended lighting levels that are based on class of roadway and pedestrian activity levels. A review of the multiple wattage streets

should be conducted to determine what the appropriate lamp is for the location based on the adjacent land use and level of pedestrian activity and/or roadway safety issues. The existing illumination levels in some locations may be justified and should be maintained. However, in some cases lighting levels may need to be decreased or even increased. A careful review of each area and its associated factors should be done prior to any recommendation for lumen level reductions or changes. This report does not take into account any adjustments but rather assumes lighting levels would remain as they are currently.

The City should **not** adopt any foot-candle standards for lighting levels. There is no requirement to light roadways, but once a light is installed, the City is responsible to maintain it. Setting lighting standards could create a liability for the City, which is unnecessary and should be avoided. It is best to have general guidelines.

The most energy efficient roadway lighting technology available today is the LED. The City's current inventory of HPS, high pressure sodium lamps, is very energy efficient but once placed in fixtures with the required reflectors and housing, these lamps lose approximately 35% of their output internal to the fixture and, with age, this drops to nearly 50% fairly quickly. The mean time to failure of the HPS lamp is 24,000 hours or about six operating years (streetlights operate approximately 4,175 hours per year/per NGRID). The current better quality LED fixtures are over 95% efficient at distributing the light onto the roadway and are more energy efficient than HPS lamps. In addition, their life expectancy is over 100,000 hours or approximately 24 years and during that time they maintain their lighting output much better than HPS lamps. The leading manufacturers are all offering ten years as their standard warranty. The City of Los Angeles has installed 140,000 LED lights with less than a .8% annual failure rate. As a result, once a City converts to LED lights there is only the occasional labor charge to replace a unit that fails prematurely, but there are no hardware costs during the ten-year warranty period.

As a result of PRISM's legislative effort, NGRID now offers an LED tariff for customer-owned lights. This tariff identifies ranges of wattages for LED lights and then bills based on the midpoint of the range. These ranges are shown below.

LIGHT EMITTING DIODE (LED) WATTAGE	BILLED WATTAGE
0.1 to 20.0w	10w
20.1 to 40.0w	30w
40.1 to 60.0w	50w
60.1 to 100.0w	80w
100.1 to 140.0w	120w
140.1 to 220.0w	180w
220.1 to 300.0w	260w

All street lighting in service today uses high intensity discharge (HID) lamps including HPS, mercury vapor (MV), and metal halide (MH) as the light source. Some very limited numbers of incandescent lamps are still in service in New England but not in Cranston. Mercury vapor was banned in 2008[1] and may no longer be installed as a lamp source and the ballasts that support MV lamps may not be produced or imported. LED roadway lighting first appeared in 2000, but at the time was very expensive and its energy efficiency was only marginally better than the HID fixtures it was intended to replace. However, in the past few years the cost of a replacement LED fixture for the most common HID wattage fixtures has dropped dramatically and the energy efficiency of LED fixtures exceeds the HID fixture by more than 50%[2]. As a result, these conversion projects are much more financially attractive. The other issue has been the resistance of the utilities to adopt tariffs that would support LED lights. Prior to 2011, New England utilities (with the exception of NSTAR) were not allowing either induction or LED technology. At that time, these types of lights had not been widely used in street lighting applications and there was little history on their performance over time or their frequency of failure. As such, the utilities were not able to develop a tariff rate that would reliably protect their investors and insure profitability. However, NSTAR started, and some other utilities have followed,

[1] The 2006 Energy Policy Act banned the importation or manufacture of MV ballast effective 1 January 2008, which will eventually cause all MV lamps to be replaced with an alternative lamp source.

[2] Note there is a difference in lamp efficiency and fixture efficiency. HID fixtures have upwards to 35% internal losses while most LED fixtures deliver more than 96% of the LED output to the roadway. In addition, HID fixtures suffer additional losses from the affects of time-dirt lumen depreciation.

allowing their use for communities that own their lights. RIGL 39-30 mandated that NGRID develop a tariff for customer-owned LED lights in RI. Since LEDs contribute to energy conservation and the ability of the utilities to meet their efficiency mandates, NGRID has begun offering incentives to communities to make the change. In addition, the RI Office of Energy Resources (OER) is offering additional incentives for these conversions. Both NGRID and OER incentives are calculated in this report.

Color Rendering-The ability of a light to correctly render a standard color palate as compared to a standard source light. While it is theoretically possible to have a color rendering above 100, generally all lights sources fall within the 0 to 100 range with 100 being true colors. HPS, the most common light in Cranston, is rated at 25, low pressure sodium (LPS) at zero, MH can range from 65 to 92, induction at 82-84, and LED is typically 74 to 80. Studies have shown a shift to higher color rendering sources improves night-time visibility, assists with crime prevention and is more appealing to the public.

Efficacy-This is a measure of the amount of lumens (light) produced per watt of applied power. Note that there is a difference between fixture efficacy and lamp efficacy. As an example, the 100-watt HPS lamp with its ballast uses 121 watts and produces approximately 9600 lumens. However, once placed inside a fixture, the internal losses of the fixture reduce the effective lumens of the fixture to about 6500 lumens. [3] Each fixture has a certain amount of loss associated with design.

Lumens-Is a measure of the total output of a light source as measured inside a special sphere.

Foot-candle-The amount of light falling on a surface compared to the light from a single candle one foot from the measuring device or a lumen per square foot.

Correlated Color Temperature-The apparent color of a light source is measured in degrees Kelvin, °K. As the color temperature of a light increases it shifts from red through yellow to blue. BMW's bluish headlights are in the 7000°K, while natural sunlight is between 4800°K (direct sunlight) and 6000°K (cloudy sunlight). The chart below illustrates CCT. With LED lights the color temperature can be selected at purchase—warmer yellowish light is more pleasant to the eye but is less efficient.

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[3] Based on DOE Caliper 7 test results. Typical HPS cobra heads lose approximately 35% of their light output due to design while a well designed LED lamp will emit over 96% of its rated lumens. The DOE, Department of Energy, LM79 report provides us with the actual emitted lumens and distribution pattern for a fixture from an independent lab test

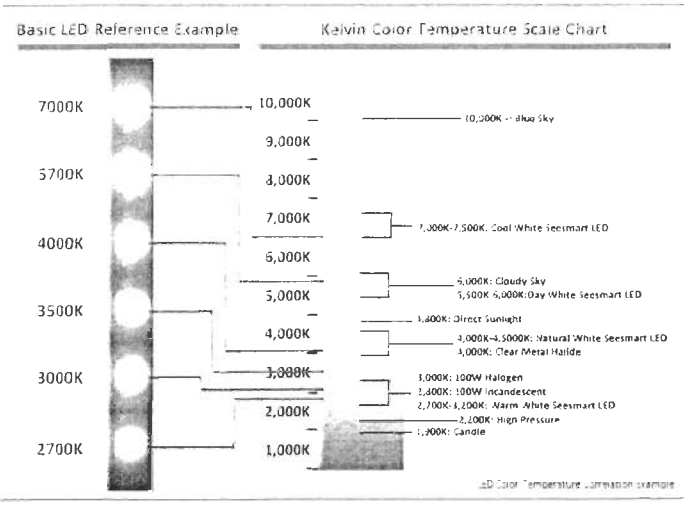

*Chart from the web site of a California company, Seesmart Inc.

HPS is the lamp of choice for the utilities. It is very energy efficient and a low cost option. Typical HPS lamps produce 96 lumens per watt, and when in a fixture, the efficacy drops to 54 lumens per watt of power. HPS's primary drawback is that it is a very poor color rendering source (rated at 25) and so requires higher lumen levels to provide the same level of perceived brightness and visual clarity as an LED. Additionally, as noted above, the typical fixture loses approximately 35% of the lamp output due to fixture inefficiency and this is compounded over time with fixture age. Average lamp life for HPS is 24,000 hours or six years.

As energy prices rose and the cost of maintenance increased, widespread interest developed in both induction and LED technologies because of their long lives and low maintenance. Induction technology is a variant of fluorescent technology and as such has extraordinary lamp life - 80,000 to 100,000 hours. It produces a high color-rendering source, roughly 82 versus HPS at 25. People perceive induction lights as brighter because of improved light output in the spectrum of light that aids night vision.

Induction lighting is not a new technology but rather one that had not received a lot of interest previously because of its relatively high cost and the low cost of energy. Early on, it found application in locations that were difficult or expensive to access where long-life lamps saved considerable maintenance expense. However, given the much higher energy rates today, together with higher labor rates and the fact that the cost of these fixtures has

come down some, they are a useful alternative in certain applications. Induction fixtures are nearly identical to HPS in overall efficiency but because of the improved nighttime visibility offered by a full color rendering source and the perception of the human eye, we find we can reduce lumen levels by roughly 35% and the light level is perceived as the same.

Three to four years ago, higher energy costs, increased maintenance costs and a lower fixture cost relative to LED lighting created a short-term market for induction streetlight applications. PSE&G in New Jersey installed approximately 140,000 induction lights in its service territory in 2010. The potential savings over HPS lights from induction lighting is between 35 and 40%. Although failure rates are generally low, we have found induction lamps to have higher initial failures than LEDs. One application where Induction may have a slight edge over LED is for decorative post top lighting, which is why it is presented here. It is apparent that Cranston took advantage of this and installed 80w and 100w induction light sources into many of its post top fixtures in 2011. The lower glare levels and higher color rendering can be considered enough to outweigh LED's better efficiency rates in certain applications. LED retrofit kits for decorative lights are improving and their costs are coming down.

LED technology is the choice for roadway and many other lighting applications today as it can provide a 50 to 65 percent energy savings and, like induction lighting, offers extraordinary long life (100,000 hours) greatly reducing maintenance costs.

LED technology is not new but in fact has been used since the early 1960s. The early LED's were limited to red and typically were used as indicator lights. They began appearing in traffic signals in the late 1980s. As the science progressed, we began to see colors other than red and some early efforts to mimic white light using fixtures with combinations of red, green, blue, and yellow LED chips. In the late 1990s, using nanotechnology and either ultraviolet or long wavelength blue LEDs in combination with phosphors, we were able to produce white light. These early LEDs were very expensive and not very energy efficient.

The overall efficiency of the LED lamp continues to improve rapidly. Today the typical efficacy is 94 to 115 lumens per watt as compared to HPS's 54 fixture lumens per watt. Beta, the leading U.S. LED chip manufacturer, has just announced its newest LED chip at over 124 lumens per watt. Additionally, we have seen the cost of LED technology drop fairly dramatically making it far more attractive. Just three years ago, the average cost of a 250w HPS replacement LED fixture could cost over $650. Today, that same replacement

costs less than half that price.

The color rendering of LED lights is slightly lower compared to induction, 74 verses 82. We have found that a color temperature with an acceptable performance level for LED is around 4300K. There are versions available in the 3000K range but to get the warmer color temperature they sacrifice energy efficiency and lamp life. The 3000K color temperature is generally more appealing for decorative downtown areas which would suggest the induction lamp. However, the new Cree DPT solution (an LED lamp) is also a 3000K lamp and is about the same price or slightly cheaper than the induction kit. The question will be our ability to adapt it to the existing decorative fixtures and whether it makes sense to go back and redo what was done just four years ago.

Public Safety is also enhanced by the use of LED lighting in several ways. The higher color rendering allows for proper identification of car and clothing colors, has been shown to make license plates easier to read, and improves the ability to see facial features. These characteristics will aid the police as well as make any camera recordings better. In addition, the whiter light improves contrast, which makes objects in the road (pot holes, pedestrians, etc.) easier to see. Improved lighting has also been shown to improve night-time commercial activity. The choice to take over the street lighting assets is an opportunity to "rebrand" the City in a very positive and visible way while showing the City's commitment to cost savings and improved service to its residents.

LEDs within an LED array of a streetlight fixture are directional and designed to provide a wider, more uniform dispersion of light. LED fixtures are superior in areas where streetlights are further apart. The life expectancy of LED lights is sensitive to high temperature so New England is an exceptional location for their use. Hotter areas such as Phoenix with night-time temperatures routinely above 80 degrees can shorten the life of the LED and its components. LEDs are unaffected by low temperatures, so cooler climates will extend their life.

Currently, HPS and other HID streetlights are "controlled" with simple photocells that turn the light on at dusk and off a dawn, and once the light warms up, it runs at full power all night. Unlike HID lamps, LEDs are instant on and instant off and can be dimmed. As a result, the standard photocell can be replaced with an intelligent control that permits remote operation of the lights and measures their precise energy usage. These intelligent controls communicate using a variety of approaches. The American National Standards Institute (ANSI) and an international group called the TALQ Consortium are working on standards to introduce non-proprietary protocols. The lack of such standards has resulted

in many proprietary systems. The goal is a system similar to cell phones where every phone regardless of the carrier can talk to other carriers' phones. We recommend using control devices that comply with the evolving standards, where the controls are addressable using a standard computer IPv6 address. In addition the control should employ a metering chip that meets the ANSI 12.20 Class 1 meter requirement of +/- .5% in order to satisfy the utility concerns for accuracy. The analysis in this report uses such a system and its associated costs.

The deployment of the control system provides a network that can also be used to support other municipal functions. These same devices are already used in smart electric meters. They are being integrated into water meters, traffic signal controller systems, and other types of monitoring equipment. With increased bandwidth, they can support cameras capable of license plate reading, facial recognition, and gunshot location for high crime areas when needed. They could also power wireless microcells used by cellular companies to increase their coverage, thus providing the opportunity for the City to lease space on their lights for use by these carriers. Some systems provide sufficient bandwidth for the City to offer City-wide WIFI. Much like the cell phone, the number and types of applications will grow exponentially in the coming years as these systems become more widespread and the industry grows to take advantage of them for a variety of purposes. Two potential added benefits to the City would be to communicate with the water meters eliminating the need for meter reading as the streetlights could relay water usage data back to the Water Department, and localized Wi-Fi with some localized equipment upgrades, such as at the industrial parks.

Currently the NGRID tariffs do not support these ancillary uses and only allow fixed dimming operating schedules. A pilot directed by the PUC will address concerns of the parties and is expected to result in tariff changes when finished in about a year. In addition there is an amendment at the legislature to address this and other issues and make clear it was the original intent of the drafters of RIGL 39-30 to allow for these applications. We believe, and NGRID has admitted, it is not a question of if but rather of when. The legislation would ensure municipal control of these devices and systems.

The major manufacturers of the LED fixtures have come to the same conclusion and beginning this summer they are going to only offer fixtures for sale that are control ready. As a result, this report will look at two options for the conversion to LED technology:

1. **Control-Ready LEDs:** Conversion of the existing system to LED technology with internal adjustability and a control ready seven-pin receptacle. This would allow the

City the option of not investing in the controls today but they could be added in the future without changing the fixture. As a part of this section we will look at the added cost and savings of part night diming photo controls.

2. **LEDs with Part Night Controls:** Conversion of the system to LED with part night controls. Part night controls allow for partial dimming for set periods and are currently supported by the NGRID tariffs. This approach will be the most expensive but, as will be seen, can result in nearly the same savings because of the combination of energy savings, reduced maintenance costs, and incentives. This would provide the City with the ability to use the system for a multitude of purposes even if it did not provide financial savings on the streetlight bill for essentially the same costs.

NGRID is offering two incentives. A basic incentive of $0.15 per annual kWh saved and $0.25 per incremental kWh saved by dimming or part-night operations. These incentives are based on actual kWh not the assumed kWh for billing. The RI Office of Energy Resources is offering additional grants that have an upper cap of $105,000 per community. These consist of $0.40 per watt saved and $20.00 per control installed. Should Cranston choose the control option, this grant would be below the maximum incentive allowed, so Cranston would thus be able to take full advantage of the incentives. **If the City determines to proceed with LED installation, PRISM will design the conversion to meet City objectives while maximizing incentives and reducing billed wattage.**

The City can combine the asset acquisition costs and LED conversion into a single finance project. This has been a common approach by many communities in Massachusetts, and our consultant, Mr. George Woodbury has helped in many such transactions. Available funding sources can come from:

1. Appropriation
2. Bonding
3. Tax-exempt Municipal Lease
4. Cash Reserves

Appropriation: Appropriation offers the lowest cost of money. If the City opted to appropriate the purchase price, it would see the full savings immediately following the acquisition. This would require the appropriation be included in the budget but that can present timing problems depending on when the budget is built and approved relative to the desired acquisition dates.

Bonding: Bonding does not make sense for the small dollar amounts. Issuing a bond typically costs approximately $50-$70,000 in administrative costs and these must be considered when comparing to a lease purchase. Typically bonding less than $1.2 million costs more than current leasing costs for the same amount.

Tax-exempt Municipal Leasing: Lease arrangements using tax-exempt municipal financing can provide an excellent alternative to borrowing. These contracts are year-to-year leases subject to annual appropriation. As such, they are not a borrowing. They can be structured to allow the full cost of the streetlight program to be within existing streetlight account budgets and provide some annual savings depending on the term of the lease. Current representative lease rates for a ten-year lease might range from 2.8% to 3%. Actual rates will vary from these depending on treasury rates at the time the contract is signed, the amount financed, the term of the lease, the City's credit rating, and whether or not the lease payments are made monthly in arrears or annually in advance. There are no lease initiation fees or costs except for the City's legal review of the lease document.

These leases can be set up to have little or no prepayment penalty. Should the City at some time during the term of the lease, wish to pay it off with money from another source it could do so. Consequently, the lease option can provide a "bridge" to other financing. The shorter the term of the lease, the greater the long-term payback. More leasing companies and banks will be willing to finance the shorter term and interest rates are lower particularly for smaller sums. However, the longer-term leases provide a greater immediate savings and if the City would plan to retire the lease early, the effective interest rate is reduced and both the short-term and long-term savings can be maximized.

Cash Reserves: Those communities that have sufficient reserves and believe this would be an appropriate use of these funds can use cash reserves. The cash reserves could be replenished over time from the savings in the streetlight account. This approach provides a viable alternative to the appropriation approach and avoids the cost of borrowing. However, the interest earnings of the cash reserves must be considered, as those revenues would be lost.

The Table below illustrates two LED options and compares it to City ownership with no system changes. It is important to note these figures are based on assumptions using recent contracts in other states; bids and final costs in Rhode Island could be more or less. **An Intelligent streetlighting system of LED lights and controls that dims the lighting by 50% from 11pm to 5am can increase the savings to $1,198,114 each year and can receive**

a potential one-time incentive of $788,851.

	CITY OWNED COSTS CURRENT HPS SYSTEM	CONTROL READY LED	LED W/CONTROLS 50% DIMMED 11 PM TO 5 AM
NGRID DISTRIBUTION COSTS	$406,805	$159,522	$71,296
DIRECT ENERGY COSTS	$504,240	$192,985	$86,251
MAINTENANCE & ADMINISTRATION	$231,474	$144,271	$210,581
TOTAL ANNUAL COST	$1,142,520	$496,779	$368,130
SAVINGS FROM CURRENT	**$423,723**	**$1,069,465**	**$1,198,114**
POTENTIAL INCENTIVE	N/A	**$484,161**	**$788,851**

The table below looks at the financing options and uses the ten-year lease as the financing vehicle for all three options. Please note that the first column considers lease purchase to pay for the acquisition of the streetlights to maximize the first two years' savings. The lease costs do account for the potential incentives noted in Table 2. **The table below illustrates how financing the entire cost through a tax-exempt lease can save Cranston over $700,000 per year.**

	CITY OWNED COSTS CURRENT HPS SYSTEM	CONTROL READY LED	LED W/CONTROLS 50% DIMMED 11PM TO 5 AM
AMOUNT FINANCED	$451,372	$2,943,142	$4,066,821
LEASE COSTS	($51,373)	($334,976)	($462,869)
NET ANNUAL BUDGET SAVINGS	**$372,350**	**$734,488**	**$735,245**

The table below shows the environmental savings impact of the LED conversion.

	CITY OWNED COSTS CURRENT HPS SYSTEM	CONTROL READY LED	LED W/CONTROLS 50% DIMMED 11PM TO 5 AM
SYSTEM KWH	5,171,699	1,906,384	1,406,387
BILLED KWH	N/A	2,028,006	1,406,387
KWH SAVINGS	N/A	3,225,680	3,725,678
BUDGET KWH ENERGY SAVINGS	**N/A**	**3,104,058**	**4,068,272**
% KWH SAVINGS	**N/A**	**62.9%**	**72.6%**
METRIC TONS OF CO2 SAVED	**N/A**	**2,140**	**2,805**
EQUIVALENT AVERAGE ANNUAL CAR MILES SAVED	**N/A**	**5,096,205**	**6,679,241**

Current energy rates are increasing. We have seen an increase in the distribution rate charged by NGRID for customer owned lights increase from $.06471 in 2014 to $.07866 in July this year. In addition the most recent offerings by Direct Energy and the rates we are

seeing in Massachusetts are at or over ten cents per kWh. Cranston's current contract expires in December 2016. Future energy rates are likely to increase and the conversion to LED lights will significantly reduce the impact of any rate increases. This cannot be considered savings but it represents a cost avoidance that otherwise would impact the City budget in the future.

The City could also consider paying some of the savings forward and use this money to help fund other initiatives. We can certainly look at this option if the City desires. Based on the numbers and using the option with full controls the City could extract an additional $4,000,000 and still see a $45,000 reduction in their current street lighting budget.

Once the City owns the streetlights, requests for additional lighting, light removals, dark sky issues, and so forth will become the City's issues. The City should develop a policy as to how it plans to deal with requests for changes in the lighting levels and other related issues. PRISM will help with this policy development if the City chooses. Existing lighting levels should be reviewed and a policy established that would, over time, align the existing lighting to be consistent with the developed policy. Thus, whenever a light fails and the lamp head must be replaced it would be replaced with the appropriate type fixture for that location. If the City chose to convert to LED lighting then the selection of LED lights would follow the desired policy. Such a policy should be based on a lighting philosophy that addresses the purposes of street lighting and provides a basic guideline for decision-making rather than setting lighting standards. Included should be:

1. Requests for new lights or increased wattages
2. Requests for removals
3. Types of fixtures permitted
4. Light trespass and light pollution
5. Permissible lighting levels for various applications
6. Process for application and decision

Typically an application is made to the City Council, which in turn would give the request to a committee for review and recommendation. Represented on the committee are the Police, Fire, DPW and relevant boards or commissions. The committee would review the request against the established criteria and make a recommendation to the Council. The recommendation may need to be reviewed by the budget committee, as changes will impact the current and future budgets.

There is a national effort to implement a policy directing any newly installed fixtures be full

cut-off fixtures to reduce light pollution and spill light (see darksky.org.) Any policy should take this into account. Finally, the City may wish to address outdoor lighting in general such as up lighting or use of flood lighting as a part of its policy if this has not already been done. There are a number of example policies available, which the City could use as a basis, and PRISM will help develop Cranston's policy if requested to do so.

The City has provided bills and NGRID has supplied two different inventories. The most recent inventory does not agree with the billing. A simple field verification audit would cost approximately $50,000 and a full GIS audit would be $90-105,000. If the error rate is similar to that observed in West Warwick the City may be overpaying for their lights and PRISM would assist the City with recovery of the over charges. An option is to do the simple field verification audit and GIS the system as part of the install process if the City wanted to not consider the control option until some time in the future. The cost of such an audit could be incorporated into the project costs and financed through the savings. Relative to the total project cost this represents less than a 3% adder but the value would benefit the City greatly in asset management going forward. Further, the GPS mapping of the system is needed in order to design the control network layout. NGRID provided some locational data in Universal Transverse Mercator format, which we can convert to usable GIS data, but it is incomplete and we are uncertain as to its accuracy. If we find this data to be reasonably accurate it would help reduce the cost. However given the inaccuracies we have seen all of the data is suspect and the field verification is a minimum requirement. These costs can be reimbursed by including them in the financed amount.

This analysis demonstrates the potential value of acquiring the streetlights and converting to an LED system. Once the purchase price is amortized, the savings are 27.1%. With some energy efficiency adjustments these savings can increase to over 45%. The actual cost of maintenance and the final purchase price may be different than presented in these estimates depending on the approach taken, bid prices at the time of the maintenance bids, and any additional accumulated depreciation. However, the numbers in this report are an excellent representative example of the typical savings communities are experiencing and are intentionally conservative. The City can save money immediately. Ownership of the lights will provide the City the ability to take advantage of technological advances and to choose the type of lighting it desires with less reliance on the utility for cooperation. It was this very issue that led to our writing the Municipal Streetlights Investment Act that gives Cities and Towns the right to take over their lights. Issues such as light pollution, color quality, life cycle costs, lighting

levels, and lamp styles become a matter of choice for the City. The final design and selection of lights will be a collaborative effort with the City to best meet the City's goals. It may include a mix of solutions depending on location.

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1. **Audit and Map the System** – The data set is clearly inaccurate. The billing errors must be identified before the purchase is complete in order to get a refund. Once the City owns the lights this opportunity is lost. An audit would not only create a valuable asset database for the City and would be useful if the City opted for the controls sometime in the future. This would be undertaken almost immediately so that it would be complete before we can get the final acquisition documents from NGRID.

2. **Acquire the system from NGRID**- Once the City gives notice to NGRID of its intention to move forward with the acquisition there will typically be at least a 60 day delay to finalize the paperwork. During this time delay we would endeavor to complete the system GIS audit.

3. **Complete a conversion to LED technology with a control system.** Look to expand the system capability to assist with other City operations such as water meter reading, traffic signal management, etc.

Appendices

APPENDIX B

STREET LIGHTING TARIFFS

Included is a table showing the calculation of the current and customer owned costs using the applicable tariff

THE NARRAGANSETT ELECTRIC COMPANY
Summary of Retail Delivery Rates

Rate	Charge Description	Distribution Charge	Operating & Maintenance Exp Charge	O&M Reconciliation Factor	CapEx Factor Charge	CapEx Reconciliation Factor	RDM Adj Factor	Pension Adjustment Factor	Billing Distribution Charge	Net Metering Charge	Long-Term Contracting	Renewable Energy Distribution Charge	LIHEAP Enhancement Charge	Base Transmission Charge	Transmission Adjustment	Transmission Uncollectible Factor	Total Transmission Charge	Base Transition Charge	Transition Charge Adj	Total Transition Charge	Energy Efficiency Program Charge	Total Delivery Charges
A	B	C	D	E	F	G	H	I	J=C+D+E+F+G+H+I	K	L	M=K+L	N	O	P	Q	R=O+P+Q	S	T	U=S+T	V	W=J+M+N+R+U+V
A-16																						
Basic Residential Rate	Customer Charge	$5.00							$5.00				$0.73									$5.73
R.I.P.U.C. No. 2100	kWh Charge	$0.03664	$0.00183	($0.00005)	$0.00153	($0.00021)	($0.00001)	$0.00000	$0.03973	$0.00002	$0.00057	$0.00059		$0.02253	$0.00365	$0.00030	$0.02648	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.07102
	Effective Date	*2/1/13*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	
A-60																						
Low Income Rate	Customer Charge	$0.00							$0.00				$0.73									$0.73
R.I.P.U.C. No. 2101	kWh Charge	$0.02317	$0.00183	($0.00005)	$0.00153	($0.00021)	($0.00001)	$0.00000	$0.02626	$0.00002	$0.00057	$0.00059		$0.02253	$0.00365	$0.00030	$0.02648	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.05815
	Effective Date	*2/1/13*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	
B-32																						
Large Demand Back up Service Rate																						
R.I.P.U.C. No. 2137	Customer Charge	$825.00							$825.00				$0.73									$825.73
	Backup Service kW Charge - kW > 200 only	$0.70	$0.03		$0.04				$0.79													$0.79
	Supplemental Service kW Charge - kW > 200 only	$3.70			$0.40				$4.10													$4.10
	kW Charge (all kW)								$0.00					$3.40			$3.40					$3.40
	kWh Charge	$0.00551	$0.00090	($0.00005)	$0.00000	($0.00009)	($0.00001)	$0.00000	$0.00626	$0.00002	$0.00057	$0.00059		$0.00825	$0.00480	$0.00025	$0.00930	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.02397
	High Voltage Delivery Discount	($0.42)							($0.42)													($0.42)
	High Voltage Delivery Addt'l Discount (115kV)	($2.75)							($2.75)													($2.75)
	Second Feeder Service	$2.75							$2.75													$2.75
	Second Feeder Service - Addt'l Transformer	$0.42							$0.42													$0.42
	High Voltage Metering Discount	-1.0%							-1.0%													-1.0%
	Effective Date	*4/1/15*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	
B-62																						
Optional Large Demand Back up Service Rate																						
R.I.P.U.C. No. 2138	Customer Charge	$17,000.00							$17,000.00				$0.73									$17,000.73
	Backup Service kW Charge (all kW)	$0.30	$0.03		$0.02				$0.35													$0.35
	Supplemental Service kW Charge (all kW)	$2.99	$0.32		$0.23				$3.54													$3.54
	kW Charge (all kW)													$3.22			$3.22					$3.22
	kWh Charge	$0.00000	$0.00000	($0.00005)	$0.00000	($0.00009)	($0.00001)	$0.00000	-$0.00013	$0.00002	$0.00057	$0.00059		$0.00913	$0.00309	$0.00025	$0.01247	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.02073
	High Voltage Delivery Discount	($0.42)							($0.42)													($0.42)
	High Voltage Delivery Addt'l Discount (115kV)	($2.75)							($2.75)													($2.75)
	Second Feeder Service	$2.75							$2.75													$2.75
	Second Feeder Service - Addt'l Transformer	$0.42							$0.42													$0.42
	High Voltage Metering Discount	-1.0%							-1.0%													-1.0%
	Effective Date	*4/1/15*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	
C-06																						
Small C&I Rate	Customer Charge	$10.00							$10.00				$0.73									$10.73
R.I.P.U.C. No. 2104	Unmetered Charge	$6.00							$6.00				$0.73									$6.73
	kWh Charge	$0.03253	$0.00200	($0.00005)	$0.00150	($0.00021)	($0.00001)	$0.00000	$0.03576	$0.00002	$0.00057	$0.00059		$0.02263	($0.00218)	$0.00027	$0.02072	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.06389
	Additional Minimum Charge (per kVA in excess of 25 kVA)	$1.85							$1.85													$1.85
	Effective Date	*2/1/13*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	
G-02																						
General C&I Rate	Customer Charge	$135.00							$135.00				$0.73									$135.73
R.I.P.U.C. No. 2139	kW > 10 Charge	$4.85			$0.38				$5.23													$5.23
	CTIP Maximum Demand Charge (effective 1/1/13)	$4.85			$0.38				$5.23													$5.23
	kW Charge								$0.00					$3.02			$3.02					$3.02
	kWh Charge	$0.00468	$0.00148	($0.00005)	$0.00000	($0.00015)	($0.00001)	$0.00000	$0.00595	$0.00002	$0.00057	$0.00059		$0.00919	($0.00051)	$0.00026	$0.00894	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.02310
	High Voltage Delivery Discount	($0.42)							($0.42)													($0.42)
	High Voltage Metering Discount	-1.0%							-1.0%													-1.0%
	Effective Date	*2/1/13*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	

Taxes and other rate charges apply as stated and will appear on customer bills as applicable

Effective 4/1/2015
(Replacing R.I.P.U.C. No. 2095 effective 1/1/15)
Issued 3/20/2015

Column Description

A - C per retail delivery tariffs
D - G per Infrastructure, Safety and Reliability Provision, R.I.P.U.C. No. 2118
H per Revenue Decoupling Mechanism Provision, R.I.P.U.C. No. 2073
I per Pension Adjustment Mechanism Provision, R.I.P.U.C. No. 2119
J Col C + Col D + Col E + Col F + Col G + Col H + Col I
K per Net Metering Provision, R.I.P.U.C. No. 2099
L per Long-Term Contracting for Renewable Energy Recovery Provision, R.I.P.U.C. No. 2125 & 2127
M Col K+ Col L
N per LIHEAP Enhancement Plan Provision, R.I.P.U.C. No. 2079
O - Q per Transmission Cost Adjustment Provision, R.I.P.U.C. No. 2115
R Col O+ Col P + Col Q
S - T per Non-Bypassable Transition Adjustment Provision, R.I.P.U.C. No. 1188
U Col S+ Col T
V per Energy Efficiency Program Provision, R.I.P.U.C. No. 2114; also includes $0.00030 per kWh Renewable Energy Charge per R.I.G.L. §39-2-1.2
W Col J+ Col M+ Col N+ Col R + Col U + Col V

TIII: NARRAGANSETT ELECTRIC COMPANY
Summary of Retail Delivery Rates

Rate	Charge Description	Distribution Charge	Operating & Maintenance Exp Charge	O&M Reconciliation Factor	CapEx Factor Charge	CapEx Reconciliation Factor	RDM Adj Factor	Pension Adjustment Factor	Billing Distribution Charge	Net Metering Charge	Long-Term Contracting	Renewable Energy Distribution Charge	LIHEAP Enhancement Charge	Base Transmission Charge	Transmission Adjustment	Transmission Uncollectible Factor	Total Transmission Charge	Base Transition Charge	Transition Charge Adj	Total Transition Charge	Energy Efficiency Program Charge	Total Delivery Charges
A	B	C	D	E	F	G	H	I	J=C+D+E+F+G+H+I	K	L	M=K+L	N	O	P	Q	R=O+P*Q	S	T	U=S+T	V	W=J+M+N+R+U+V
G-32																						
Large Demand Rate	Customer Charge	$825.00							$825.00				$0.73									$825.73
R.I.P.U.C. No. 2147	kW Charge - in excess of 200 kW	$3.70			$0.40				$4.10													$4.10
	CHP Minimum Demand Charge (effective 1/1/13)	$3.70			$0.40				$4.10													$4.10
	kW Charge								$0.00					$3.40			$3.40					$3.40
	kWh Charge	$0.00551	$0.00090	($0.00005)	$0.00000	($0.00009)	($0.00001)	$0.00000	$0.00626	$0.00002	$0.00057	$0.00059		$0.00825	$0.00180	$0.00025	$0.00930	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.02397
	High Voltage Delivery Discount	($0.42)							($0.42)													($0.42)
	High Voltage Delivery Addl'l Discount (115kV)	($2.75)							($2.75)													($2.75)
	Second Feeder Service	$2.75							$2.75													$2.75
	Second Feeder Service - Addl'l Transformer	$0.42							$0.42													$0.42
	High Voltage Metering Discount	-1.0%							-1.0%													-1.0%
	Effective Date	*2/1/13*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	
G-62																						
Optional Large Demand Rate	Customer Charge	$17,000.00							$17,000.00				$0.73									$17,000.73
R.I.P.U.C. No. 2141	kW Charge	$2.99	$0.32		$0.23				$3.54													$3.54
	CHP Minimum Demand Charge (effective 1/1/13)	$2.99	$0.32		$0.23				$3.54													$3.54
	kW Charge								$0.00					$3.22			$3.22					$3.22
	kWh Charge	$0.00000	$0.00000	($0.00005)	$0.00000	($0.00009)	($0.00001)	$0.00000	($0.00015)	$0.00002	$0.00057	$0.00059		$0.00913	$0.00409	$0.00025	$0.01247	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.02074
	High Voltage Delivery Discount	($0.42)							($0.42)													($0.42)
	High Voltage Delivery Addl'l Discount (115kV)	($2.75)							($2.75)													($2.75)
	Second Feeder Service	$2.75							$2.75													$2.75
	Second Feeder Service - Addl'l Transformer	$0.42							$0.42													$0.42
	High Voltage Metering Discount	-1.0%							-1.0%													-1.0%
	Effective Date	*2/1/13*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	
X-01																						
Electric Propulsion Rate	Customer Charge	$16,500.00							$16,500.00				$0.73									$16,500.73
R.I.P.U.C. No. 2108	kW Charge	$0.00							$0.00					$3.22			$3.22					$3.22
	kWh Charge	$0.01600	$0.00147	($0.00005)	$0.00123	($0.00017)	($0.00001)	$0.00000	$0.01847	$0.00002	$0.00057	$0.00059		$0.00913	$0.00409	$0.00025	$0.01247	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.03935
	Effective Date	*2/1/13*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	
M-1																						
Station Power Delivery & Reliability Service Rate	Option A																					
R.I.P.U.C. No. 2109	fixed charges	$3,959.09	$0.00		$0.00				$3,959.09				$0.73	$0.00	$0.00	$0.00	$0.00	$3,500.00	$0.00	$3,500.00	$868.00	$8,259.82
	variable charges	$0.00	$0.00		$0.00				$0.00					$0.00	$0.00	$0.00	$0.00	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.00782
	(transition and conservation charges billed on higher of fixed charges or kWhs times variable charges)																					
	Option B																					
	fixed charge	$3,959.09	$0.00		$0.00				$3,959.09				$0.73									$3,959.82
	kWh charge													$0.00000	$0.00000	$0.00000	$0.00000	($0.00187)	($0.00014)	($0.00201)	$0.00983	$0.00782
	Effective Date	*2/1/13*	*4/1/15*		*4/1/15*						*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	
S-05	Customer Charge												$0.73									$0.73
Customer Owned Street and Area Lighting	kWh Charge	$0.02054	$0.01372	($0.00005)	$0.00725	($0.00103)	($0.00001)	$0.00000	$0.04042	$0.00002	$0.00057	$0.00059	$0.00000	$0.01029	$0.01062	$0.00027	$0.02118	($0.00187)	($0.00014)	-$0.00201	$0.00983	$0.07601
R.I.P.U.C. No. 2142	*Effective Date*	*8/2/14*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	
S-06																						
Decorative Street and Area Lighting Service																						
R.I.P.U.C. No. 2110																						
S-10																						
Limited Service Private Lighting																						
R.I.P.U.C. No. 2111																						
S-14	Customer Charge												$0.73									$0.73
General Street and Area Lighting Service	kWh Charge	$0.00000	$0.01372	($0.00005)	$0.00725	($0.00103)	($0.00001)	$0.00000	$0.01988	$0.00002	$0.00057	$0.00059		$0.01029	$0.01062	$0.00027	$0.02118	($0.00187)	($0.00014)	-$0.00201	$0.00983	$0.04947
R.I.P.U.C. No. 2112	*Effective Date*	*2/1/13*	*4/1/15*	*10/1/14*	*4/1/15*	*10/1/14*	*7/1/14*	*2/1/13*		*4/1/15*	*4/1/15*		*1/1/14*	*4/1/15*	*4/1/15*	*4/1/15*		*4/1/15*	*4/1/15*		*1/1/15*	

Taxes and other rate clauses apply as usual and will appear on customer bills as applicable.

Effective 4/1/2015
(Replacing R.I.P.U.C. No. 2095 effective 1/1/15)
Issued 3/20/2015

Column Descriptions:

A - C per retail delivery tariffs
D - G per Infrastructure, Safety and Reliability Provision, R.I.P.U.C. No. 2118
H per Revenue Decoupling Mechanism Provision, R.I.P.U.C. No. 2073
I per Pension Adjustment Mechanism Provision, R.I.P.U.C. No. 2159
J Col C+ Col D+ Col E+ Col F + Col G + Col H + Col I
K per Net Metering Provision, R.I.P.U.C. No. 2099
L per Long-Term Contracting for Renewable Energy Recovery Provision, R.I.P.U.C. No. 2125 & 2127
M Col K+ Col L
N per LIHEAP Enhancement Plan Provision, R.I.P.U.C. No. 2079
O - Q per Transmission Cost Adjustment Provision, R.I.P.U.C. No. 2115
R Col O+ Col P + Col Q
S - T per Non-Bypassable Transition Adjustment Provision, R.I.P.U.C. No. 1188
U Col S+ Col T
V per Energy Efficiency Program Provision, R.I.P.U.C. No. 2114, also includes $0.00030 per kWh Renewable Energy Charge per R.I.G.L. §39-2-1.2
W Col J+ Col M+ Col N+ Col R + Col U + Col V

THE NARRAGANSETT ELECTRIC COMPANY
Summary of Retail Delivery Rates

Rate	Charge Description	Distribution Charge			
A	B	C			
Rate S-06	Fixture Charges				
Decorative Street and Area Lighting Service					
R.I.P.U.C. No. 2110		Full Service S-06	Full Service S-10	Full Service S-14	Luminaire Only S-14
	Luminaires				
Rate S-10	Incandescent				
Limited Service - Private Lighting	Roadway LUM INC RWY 105W	n/a	$77.43	$77.43	$46.46
R.I.P.U.C. No. 2111	LUM INC RWY 205W (S-14 Only)	n/a	n/a	$77.43	$46.46
	Mercury Vapor				
Rate S-14	Roadway LUM MV RWY 100W	n/a	$78.06	$78.06	$46.84
General Street and Area Lighting Service	LUM MV RWY 175W	n/a	$78.06	$78.06	$46.84
R.I.P.U.C. No. 2112	LUM MV RWY 250W (S-14 Only)	n/a	n/a	$120.39	$72.23
	LUM MV RWY 400W	n/a	$163.46	$163.46	$98.08
	LUM MV RWY 1000W	n/a	$163.46	$163.46	$98.08
	Post-top LUM MV POST 175W (S-14 Only)	n/a	n/a	$156.80	$94.08
	Flood LUM MV FLD 400W	n/a	$181.37	$181.37	$108.82
	LUM MV FLD 1000W	n/a	$181.37	$181.37	$108.82
	Sodium Vapor				
	Roadway LUM HPS RWY 50W	n/a	$77.43	$77.43	$46.46
	LUM HPS RWY 70W	n/a	$76.91	$76.91	$46.15
	LUM HPS RWY 100W	n/a	$78.06	$78.06	$46.84
	LUM HPS RWY 150W	n/a	$78.58	$78.58	$47.15
	LUM HPS RWY 250W	n/a	$120.39	$120.39	$72.23
	LUM HPS RWY 400W	n/a	$163.46	$163.46	$98.08
	Flood LUM HPS FLD 250W	n/a	$146.11	$146.11	$87.67
	LUM HPS FLD 400W	n/a	$181.37	$181.37	$108.82
	Post-top LUM HPS POST 50W	n/a	$155.49	$155.49	$93.29
	LUM HPS POST 100W	n/a	$156.80	$156.80	$94.08
	WALL HPS 250W 24HR	n/a	$172.21	$172.21	$103.33
	SHOEBOX - LUM HPS REC 100W-CT	n/a	$98.99	n/a	n/a
	Metal Halide				
	Flood LUM MH FLD 400W	n/a	$181.37	$181.37	$108.82
	LUM MH FLD 1000W	n/a	$181.37	$181.37	$108.82
	Decorative DEC HPS TR 50W	$155.49	n/a	n/a	n/a
	DEC HPS TR 100W	$156.80	n/a	n/a	n/a
	DEC HPS AG 50W	$292.34	n/a	n/a	n/a
	DEC HPS AG 100W	$280.77	n/a	n/a	n/a
	DEC HPS WL 50W	$325.35	n/a	n/a	n/a
	DEC HPS WL 100W	$325.30	n/a	n/a	n/a
	DEC HPS TR-TW 50W	$506.29	n/a	n/a	n/a
	DEC HPS TR-TW 100W	$509.46	n/a	n/a	n/a
	DEC HPS AG-TW 50W	$693.84	n/a	n/a	n/a
	DEC HPS AG-TW 100W	$670.71	n/a	n/a	n/a
	DEC HPS WL-TW 50W	$759.87	n/a	n/a	n/a
	DEC HPS WL-TW 100W	$759.77	n/a	n/a	n/a
	Standards				
	POLE-WOOD	n/a	$133.71	$133.71	$133.71
	POLE FIBER RPT EMB <25' w/out foundation	n/a	$260.22	$260.22	$260.22
	POLE FIBER RWY <25 w/ foundation	n/a	$424.14	$424.14	$424.14
	POLE FIBER RWY => 25 w/ foundation	n/a	$473.53	$473.53	$473.53
	POLE METAL EMBEDDED (S-14 Only)	n/a	n/a	$405.16	$405.16
	POLE METAL=>25FT (with foundation)	n/a	$484.72	$484.72	$484.72
	DEC WELL PT/FDN	$566.70	n/a	n/a	n/a
	DEC WASH PT/FDN	$575.78	n/a	n/a	n/a
	Effective Date	*2/1/13*	*2/1/13*	*2/1/13*	*2/1/13*

Taxes and other rate charges apply as usual and will appear on customer bills as applicable.

Effective: 4/1/2015
(Replacing R.I.P.U.C. No. 2095 effective 1/1/15)
Issued: 3/20/2015

Column Descriptions

A - C: per retail delivery tariffs R.I.P.U.C. Nos. 2110 through 2112

THE NARRAGANSETT ELECTRIC COMPANY

STREET AND AREA LIGHTING – CUSTOMER OWNED EQUIPMENT S-05
RETAIL DELIVERY SERVICE

AVAILABILITY

Street and Area Lighting Service is available under this rate to any municipal city or town, hereinafter referred to as Customer, in accordance with the qualifications and specifications set forth below and all provisions and terms as further defined in applicable attachment agreements.

Customers who have received service under the Company's General Street and Area Lighting Rate S-14 or Decorative Street and Area Lighting Service Rate S-06 and have purchased street and area lighting facilities, including dedicated poles, standards, or accessories pursuant to R.I.G.L § 39-30-1 *et seq.*, shall be served under this rate, provided that the Customer has complied with all provisions and terms of the rates and any related attachment agreements. Service under this rate is contingent upon the execution of a written purchase and sale agreement for the Company's designated street and area lighting facilities, and dedicated poles, standards or accessories, the completed transfer of title to the facilities from the Company to the Customer, and the execution of and compliance with associated attachment agreements between the Customer and the Company. Any street and area lighting additions, removals, or replacements performed by the Customer shall be served on this tariff provided the Customer is compliant with all terms and provisions of this tariff and attachment agreements, and written notice is provided to the Company.

Service provided under this tariff shall be unmetered. The type of service supplied and delivery service voltage shall be determined by the Company in accordance with the Company's Specifications for Electrical Installations.

Street and Area Lighting Service under this rate does not include maintenance of street and area lighting equipment owned by the Customer. The Customer shall be responsible for providing maintenance, and absent a separate written contract between the Company and the Customer, the Company shall have no obligation to maintain facilities and equipment owned by the Customer.

STREET AND AREA LIGHTING – CUSTOMER-OWNED EQUIPMENT

RATE

The following are unmetered annual billable kWh delivered values for specific individual light source types functioning on a designated operating schedule for applicable customer-owned street and area lights. These annual billable kWh deliveries for the specified light source type/wattage and operating schedule shall be applied to customer-owned street and area lights that require annual kWh deliveries that are less than or equal to the values indicated below as determined by the Company.

1. Annual Billable kWh Deliveries

Incandescent & High Intensity Discharge (HID) Light Sources:

Light Source Type	Nominal Wattage	Billable Wattage	Annual Billable kWh Delivered Operating Schedule			
			Continuous	Dusk-To-Dawn	Dimming-70%	Part-Night-4hr
Incandescent (INC)	105	105	920	438	392	285
	205	205	1,796	856	766	557

THE NARRAGANSETT ELECTRIC COMPANY

STREET AND AREA LIGHTING – CUSTOMER-OWNED EQUIPMENT S-05
RETAIL DELIVERY SERVICE

RATE (CONTINUED:

Incandescent & High Intensity Discharge (HID) Light Sources (continued):

Light Source Type	Nominal Wattage	Billable Wattage	Annual Billable kWh Delivered Operating Schedule			
			Continuous	Dusk-To-Dawn	Dimming-70%	Part-Night-4hr
Mercury Vapor (MV)	100	130	1,139	543	486	353
	175	211	1,848	881	789	573
	250	307	2,689	1,282	1,147	834
	400	477	4,179	1,991	1,783	1,295
	1,000	1,095	9,592	4,572	4,092	2,973
Metal Halide (MH)	400	451	3,951	1,883	1,685	1,224
	1,000	1,078	9,443	4,501	4,028	2,927
High Pressure Sodium (HPS)	50	61	534	255	228	166
	70	86	753	359	321	233
	100	118	1,034	493	441	320
	150	173	1,515	722	647	470
	250	304	2,663	1,269	1,136	825
	400	470	4,117	1,962	1,756	1,276

[1] Billable Wattage represents the total luminaire energy consumption including the ballast, control, and other applicable adjustments.

Solid State Lighting (SSL) Sources

Light Source Type	Nominal Wattage[2] (Range)	Billable Wattage	Annual Billable kWh Delivered Operating Schedule			
			Continuous	Dusk-To-Dawn	Dimming-70%	Part-Night-4hr
Light Emitting Diode (LED)	0.1 to 20.0	10	88	42	37	27
	20.1 to 40.0	30	263	125	112	81
	40.1 to 60.0	50	438	209	187	136
	60.1 to 100.0	80	701	334	299	217
	100.1 to 140.0	120	1,051	501	448	326
	140.1 to 220.0	180	1,577	752	673	489
	220.1 to 300.0	260	2,278	1,086	972	706

[2] LED Nominal Wattage includes the total device system wattage (LED array, driver, and control) and applicable adjustments.

2. Other Fees and Charges:

Fee or Charge Type	Charge Amount
Lighting Service Charge	See Terms and Conditions for Distribution Service
Field/Office Survey Charge	See Attachment Agreement for Customer-Owned Street and Area Lighting Attachments

THE NARRAGANSETT ELECTRIC COMPANY

STREET AND AREA LIGHTING – CUSTOMER OWNED EQUIPMENT S-05
RETAIL DELIVERY SERVICE

3. Rates for Retail Delivery Service

Customers receiving delivery service under this rate shall be charged the applicable charges contained in the Summary of Retail Delivery Rates, R.I.P.U.C. No. 2095, as in effect from time to time.

RATE ADJUSTMENT PROVISIONS

Transmission Service Charge Adjustment

The prices under this rate as set forth under "Monthly Charge" may be adjusted from time to time in the manner described in the Company's Transmission Service Cost Adjustment Provision.

Transition Charge Adjustment

The prices under this rate as set forth under "Monthly Charge" may be adjusted from time to time in the manner described in the Company's Non-Bypassable Transition Charge Adjustment Provision.

Standard Offer Adjustment

All Customers served on this rate must pay any charges required pursuant to the terms of the Company's Standard Offer Adjustment Provision, whether or not the Customer is taking or has taken Standard Offer Service.

Energy Efficiency Programs

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Energy Efficiency Program Provision as from time to time effective in accordance with law.

Infrastructure, Safety and Reliability Provision

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Infrastructure, Safety and Reliability Provision as from time to time effective in accordance with law.

Customer Credit Provision

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Customer Credit Provision as from time to time effective in accordance with law.

LIHEAP Enhancement Plan Provision

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's LIHEAP Enhancement Plan Provision as from time to time effective in accordance with law.

Revenue Decoupling Mechanism Provision

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Revenue Decoupling Mechanism Provision as from time to time effective in accordance with law.

THE NARRAGANSETT ELECTRIC COMPANY

STREET AND AREA LIGHTING – CUSTOMER OWNED EQUIPMENT S-05
RETAIL DELIVERY SERVICE

Net Metering Provision and Qualifying Facilities Power Purchase Rate

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Net Metering Provision and Qualifying Facilities Power Purchase Rate as from time to time effective in accordance with law.

Pension Adjustment Mechanism Provision

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Pension Adjustment Mechanism Provision as from time to time effective in accordance with law.

STANDARD OFFER SERVICE

Any Customer served under this rate who is eligible for Standard Offer Service shall receive such service pursuant to the Standard Offer Service tariff.

GROSS EARNINGS TAX

A Rhode Island Gross Earnings Tax adjustment will be applied to the charges determined above in accordance with Rhode Island General Laws.

DETERMINATION OF MONTHLY BILL

The monthly bill will be based on the following:

1. ENERGY CHARGES

The Energy Charges for customer-owned street and area lighting are determined by multiplying the current energy rates by the aggregation of Billable kWh Delivered for each light per billing period.

The monthly billable kWh delivered shall be determined by allocating the Annual Billable kWh Delivered to each month based upon the Monthly Operating Hour Equivalents for lights and Operating Schedule as shown below. Applicable to lights under each Operating Schedule, the sum of the monthly billable kWh delivered for each light equals the annual billable kWh delivered in this tariff. Each month's daily kWh amount is determined from the monthly amount by dividing the monthly kWh by the number of days in the month. The daily kWh amount is multiplied by the actual number of days for each month during the billing period as measured from the prior billing date to the current billing date, and then multiplied by the energy charges per kWh.

Hours of Operation

The Customer's street and area lighting may be operated for the hours and at the light level of the Customer's choice. However, for billing purposes all individual street and area lighting sources will be billed on an applicable Operating Schedule based upon the nature of the street and area lighting services as follows:

1. Continuous – Street and area lights operate continuously each day of the year, a total of approximately 8,760 hours each year.

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STREET AND AREA LIGHTING – CUSTOMER OWNED EQUIPMENT S-05
RETAIL DELIVERY SERVICE

2. Dusk-To-Dawn – Street and area lights operate daily at full energy requirements from approximately one-half hour after sunset until approximately one-half hour before sunrise, a total of no greater than 4,175 hours each year.

Hours of Operation (continued)

3. Dimming – Street and area lights operate daily at full energy consumption from approximately one-half hour after sunset until a time equal to the mid-point of the previous Dusk-To-Dawn service period, then an assumed 30% reduction in wattage and energy requirements for a period of reduced light output not to exceed four hours, as necessary, at which time returning to full energy requirements until approximately one-half hour before sunrise, determined to be a total of 2,715 hours at full energy requirements and 1,460 hours at reduced energy requirements, respectively, for a total annual hourly equivalent of no greater than 3,737 hours each year.

4. Part-Night – Street and area lights operate daily from approximately one-half hour after sunset then turn off at a time equal to the mid-point of the previous Dusk-To-Dawn service period and, as necessary, turn back on four hours later until approximately one-half hour before sunrise, a total of no greater than 2,715 hours each year.

Customers requesting a change in Hours of Operation of a light due to installation or removal of a control device will be required to provide the estimated annual operating hours and energy reduction conditions it anticipates that the control device will provide as defined by the manufacturer's specifications. The Company will assign the Customer to the appropriate Operating Schedule based upon the Customer's light source type, billable wattage and expected annual operating hours.

Monthly Operating Hour Equivalents

The Monthly Operating Hour Equivalents provided below represents the equivalent time of full energy deliveries to an individual light following the defined Hours of Operation defined above:

Table of Monthly Operating Hour Equivalents (Hrs)

		Operating Schedule			
Month	Days	Continuous	Dusk-To-Dawn	Dimming-70%	Part-Night-4hr
January	31	744	442	401	316
February	28	672	367	332	254
March	31	744	363	326	238
April	30	720	309	273	188
May	31	744	280	244	156
June	30	720	251	218	132
July	31	744	267	233	146
August	31	744	301	267	179
September	30	720	338	300	218
October	31	744	392	353	268
November	30	720	418	379	297
December	31	744	447	411	323
Annual	365	8,760	4,175	3,737	2,715

2. OTHER FEES AND CHARGES

Individual charges for specific Customer requested services will be identified as adjustments on the bill. The representation of applicable fees associated with specific agreements, or license terms and conditions between the Customer and the Company will be imposed according to the agreements, licenses, or as specified in the Terms and Conditions for Distribution Service and presented as adjustments on the Customer's bill.

THE NARRAGANSETT ELECTRIC COMPANY

STREET AND AREA LIGHTING – CUSTOMER OWNED EQUIPMENT S-05
RETAIL DELIVERY SERVICE

INVENTORY OF LIGHTS

The Customer shall be responsible for reporting to the Company the quantity, type of light source, Operating Schedule, type of luminaires by location, and the applicable Customer identification reference for all lights that are operating at any time. The Customer shall provide the Company with a complete listing of all luminaires served under this rate within thirty (30) days following the beginning of each calendar year of all facilities in-service as of December 31 of the preceding calendar year. Such reporting is necessary to ensure that the Company bills the Customer accurately for the cost of distribution, transmission, transition, energy efficiency, and any other applicable delivery service charges and, where appropriate, Standard Offer Service. The Company may perform random confirmation of operating lights in a municipality to ensure the accuracy of such reports. If the Customer fails to meet the referenced reporting requirements or the identification of unreported lights by the Company, the Company will bill the Customer for all charges that would have been billed pursuant to the provisions of the tariff, plus interest charges at a rate of one and one quarter percent per month, from the point in time that the change(s) was estimated to have occurred until the point in time when the change(s) is reflected in the Company's billing system.

TERMINATION OF SERVICE

If a Customer that has purchased designated Company street and area lighting facilities subsequently chooses to terminate the service provided by the Company under this tariff, the Customer must provide six months advance written notice of such termination.

TERMS AND CONDITIONS

The Company's Terms and Conditions in effect from time to time, where applicable hereto and not inconsistent with any specific provisions hereof, are a part of this rate.

Effective: August 1, 2014

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GENERAL STREET AND AREA LIGHTING SERVICE (S-14)
RETAIL DELIVERY SERVICE

AVAILABILITY

General Street and Area Lighting Service is available under this rate to any city, town, governmental entity, or other public authority hereinafter referred to as the Customer, in accordance with the provisions and the specifications hereinafter set forth:

1. For municipal-owned or accepted roadways, including those classified as "private areas" for which a municipal Customer has agreed to supply street and area lighting service.

2. Service under this rate is contingent upon Company ownership and maintenance of street and area lighting facilities.

3. Service under this rate is not available for locations inaccessible by standard Company motorized equipment, limited access highways, bridges, tunnels and the access and egress ramps thereto.

4. Service under this rate is available to a private contractor, developer, or association of customers, wherein the municipality has agreed in writing to accept responsibility for future payment of such lights upon acceptance of applicable streets and areas.

5. Street and area lighting is available under this rate to any Customer where the necessary luminaires can be supported on the Company's existing poles and where such service can be supplied directly from existing secondary voltage circuits. Where the necessary luminaires cannot be supported on existing utility infrastructure, wood poles may be furnished in place in accordance with the schedule of Support and Accessory Charges listed below under RATE, Section 2, provided no such pole is more than one span from an existing secondary distribution facility.

6. In applications where revenue from the planned street or area lighting facilities will be insufficient to compensate for the excessive incremental installation costs associated with, but not limited to, rock excavation or hardscape restoration, the Company, at its sole discretion, may elect not to provide street or area lighting service or the Customer agrees to compensate the Company for the incremental installation costs as a contribution in aid of construction in accordance with all applicable Company policies.

7. Temporary Turn Off Service under this tariff is available to any municipal Customer that has requested to temporarily discontinue street and area lighting service received under this rate. Temporary Turn Off Service under this tariff provides for the Company's lighting facilities to remain in place in anticipation of reinstatement of General Street and Area Lighting – Full Service. The Customer shall be allowed to temporarily turn off General Street and Area Lighting – Full Service and will be billed under this tariff in accordance with the Temporary Turn Off Service provision included in this tariff, provided that the Customer has complied with all provisions and terms of the Company's General Street and Area Lighting – Full Service provision of this tariff and any related service agreements.

8. The permanent discontinuance of General Street and Area Lighting Service is available under this tariff to any Customer that has complied with all provisions and terms of this tariff, any related service agreements and has requested permanent discontinuance, whereas, such discontinuance is the cessation of this tariff service and constitutes the complete removal or in-place retirement of the Company's facilities at the location at which this service is discontinued. Permanent discontinuance of service is further described below.

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9. The management of vegetation and/or other adjacent physical conditions which obstruct the normal distribution of light from the specified street and area lighting facilities is the responsibility of the Customer.

10. At the request of the Customer, the Company shall take reasonable actions to procure and install the necessary ancillary equipment, including but not limited to shields, visors, louvers and protective devices, for the purpose of providing special control of light distribution or vandal prevention of the facilities, provided all ancillary equipment costs and associated service charges are the responsibility of the Customer.

I. GENERAL STREET AND AREA LIGHTING – FULL SERVICE

RATE

The annual charges enumerated in R.I.P.U.C. No. 2095, Summary of Retail Delivery Rates, Sheet 3, are applicable to all street and area lighting facilities that have not been discontinued, permanently or temporarily, at the request of the Customer.

1. Luminaire Charges:

Lamp Type Luminaire Type	Lumen Rating	Nominal Wattage	Description	Annual kWh
Incandescent*				
Roadway	1,000*	105	LUM INC RWY 105W	438
	2,500*	205	LUM INC RWY 205W	856
Mercury Vapor*				
Roadway	4,400*	100	LUM MV RWY 100W	543
	8,500*	175	LUM MV RWY 175W	881
	13,000*	250	LUM MV RWY 250W	1,282
	23,000*	400	LUM MV RWY 400W	1,991
	63,000*	1,000	LUM MV RWY 1000W	4,572
Floodlight	23,000*	400	LUM MV FLD 400W	1,991
	63,000*	1,000	LUM MV FLD 1000W	4,572
Post Top	8,500*	175	LUM MV POST 175W	881
Metal Halide				
Floodlight	32,000	400	LUM MH FLD 400W	1,883
	107,800*	1,000	LUM MH FLD 1000W	4,502

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GENERAL STREET AND AREA LIGHTING SERVICE (S-14)
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RATE (Continued)

Lamp Type Luminaire Type	Lumen Rating	Nominal Wattage	Description	Annual kWh
High Pressure Sodium Vapor				
Roadway				
	4,000	50	LUM HPS RWY 50W	255
	6,300	70	LUM HPS RWY 70W	359
	9,600	100	LUM HPS RWY 100W	493
	16,000	150	LUM HPS RWY 150W	722
	27,500	250	LUM HPS RWY 250W	1,269
	50,000	400	LUM HPS RWY 400W	1,962
Wallighter				
	27,500 (24 Hr)	250	WALL HPS 250W 24 HR	2,663
Post Top				
	4,000**	50	LUM HPS POST 50W	255
	9,600**	100	LUM HPS POST 100W	493
Floodlight				
	27,500	250	LUM HPS FLD 250W	1,269
	50,000	400	LUM HPS FLD 400W	1,962

* No further installation or replacement of designated luminaires will take place after the effective date of this rate. Conversion of existing Incandescent or Mercury Vapor luminaires to an equivalent High Pressure Sodium Vapor luminaire may also be done at the request of the Customer.

** Post top luminaire installations will only be permitted for the "Traditional" luminaire style and only in underground development areas after the effective date of this rate.

2. Support and Accessory Charges:

An additional annual charge as enumerated in R.I.P.U.C. No. 2095, Summary of Retail Delivery Rates, Sheet 3, will be applied to each luminaire type as stated in Section 1 – Luminaire Charges, where the Company is requested to furnish a suitable wood pole, standard, foundation or other accessory, and applicable delivery service as identified below, for the sole purpose of supporting a luminaire assembly.

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RATE (Continued)

Service Type / Support Type	Description
Overhead Service	
Non-Distribution Pole	
Wood Pole	POLE-WOOD
Underground Service	
Non-Metallic Standard	
Fiberglass without Foundation*	POLE FIBR PT EMB<25
Fiberglass with Foundation <25 feet	POLE FIBER PT <25' (Or) POLE FIBER RWY<25'
Fiberglass with Foundation =>25 feet	POLE FIBER RWY =>25
Metallic Standard	
Metallic Direct Embedded (No Fdn.)*	POLE METAL EMBEDDED
Metallic with Foundation	POLE METAL =>25FT

* No further installation or relocation of the designated support will take place after the effective date of this rate.

Accessory Type
None

3. Other Fees and Charges:

Additional fees or charges as enumerated below in the schedule of fee and charge prices will be applied per unit application pursuant to applicable Customer requests and/or in association with terms and conditions of separate agreements specific to attachments to the foregoing support types as stated in Section 2 – Support and Accessory Charges. Applicable charges are assessed where the Company is requested by the Customer to provide an individual site visit for the purpose of; investigation and determination of operational malfunction, preventative or proactive maintenance to address vandalism or lighting control, the performance of other specified services, or other such actions which, unless requested by the Customer would otherwise have not been warranted. A charge will not be assessed if, in the sole discretion of the Company, the conditions which created the need for the Customer request were determined to be the result of Company facilities or systems. Applicable fees are assessed on a regular billing schedule based on the terms and conditions of the agreement or license from which they are specified.

Fee or Charge Type	Charge Amount
Lighting Service Charge	See Terms and Conditions for Distribution Service

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RATE ADJUSTMENT PROVISIONS

Transmission Service Charge Adjustment

The prices under this rate as set forth under "Monthly Charge" may be adjusted from time to time in the manner described in the Company's Transmission Service Cost Adjustment Provision.

Transition Charge Adjustment

The prices under this rate as set forth under "Monthly Charge" may be adjusted from time to time in the manner described in the Company's Non-Bypassable Transition Charge Adjustment Provision.

Standard Offer Adjustment

All Customers served on this rate must pay any charges required pursuant to the terms of the Company's Standard Offer Adjustment Provision, whether or not the Customer is taking or has taken Standard Offer Service.

Energy Efficiency Programs

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Energy Efficiency Program Provision as from time to time effective in accordance with law.

Infrastructure, Safety and Reliability Provision

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Infrastructure, Safety and Reliability Provision as from time to time effective in accordance with law.

Customer Credit Provision

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Customer Credit Provision as from time to time effective in accordance with law.

LIHEAP Enhancement Plan Provision

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's LIHEAP Enhancement Plan Provision as from time to time effective in accordance with law.

Revenue Decoupling Mechanism Provision

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Revenue Decoupling Mechanism Provision as from time to time effective in accordance with law.

Net Metering Provision and Qualifying Facilities Power Purchase Rate

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Net Metering Provision and Qualifying Facilities Power Purchase Rate as from time to time effective in accordance with law.

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Pension Adjustment Mechanism Provision

The amount determined under the preceding provisions shall be adjusted in accordance with the Company's Pension Adjustment Mechanism Provision as from time to time effective in accordance with law.

STANDARD OFFER SERVICE

Any Customer served under this rate who is eligible for Standard Offer Service shall receive such service pursuant to the Standard Offer Service tariff.

GROSS EARNINGS TAX

A Rhode Island Gross Earnings Tax adjustment will be applied to the charges determined above in accordance with Rhode Island General Laws.

HOURS OF OPERATION

All street and area lights shall be operated through the use of a photoelectric device nightly from approximately one-half hour after sunset until approximately one-half hour before sunrise, a total of approximately 4,175 hours each year.

DETERMINATION OF MONTHLY BILL FOR GENERAL STREET AND AREA LIGHTING – FULL SERVICE

The monthly bill will be based on the following:

1. Facility Charges

The Luminaire Charges and the Support and Accessory Charges will be based on the annual rates above divided by the number of days in the calendar year to arrive at a daily rate and multiplied by the actual number of days in the billing period as measured from the date immediately following the prior bill to the current bill date.

2. Energy Charges

Charges per kWh will be based on the annual kWh per luminaire above and include the watts for the ballast and photoelectric control. The monthly kWh amount shall be determined by allocating the number of annual operating hours for lights among the months, as shown below. The sum of the monthly kWh for each light equals the annual kWh in this tariff. A daily kWh amount is determined from the monthly amount by dividing the monthly kWh by the number of days in a month. The daily kWh amount is multiplied by the actual number of days for each calendar month during the billing period as measured from the date immediately following the prior bill to the current bill date and then multiplied by the charge per kWh.

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Monthly Operating Hours

January	442	July	267
February	367	August	301
March	363	September	338
April	309	October	392
May	280	November	418
June	251	December	447

3. Other Fees and Charges

Individual charges for specific Customer requested services will be identified as adjustments on the bill. The representation of applicable fees associated with specific agreement or license terms and conditions between the Customer and the Company will be imposed according to the agreements, licenses, or as specified in the Terms and Conditions for Distribution Service and presented as adjustments on the Customer's bill.

DISCLAIMER OF LIABILITY

The Company's duties and obligations under this tariff extend only to the Customer, and not to any third parties. The Company does not assume and specifically disclaims any liability to third parties arising out of Company's obligations to Customer under this section.

EXCESSIVE DAMAGE

Excessive damage due to wanton or malicious acts shall be charged to the Customer at the actual cost of labor and material required to repair or replace the unit. Excessive damage is defined as any lighting facility component such as pole, standard, lamp, luminaire, accessory or conductors being broken or damaged more than once in a twelve month period. Notification of excessive damage will be made to the Customer by the Company prior to billing for repairs.

ATTACHMENTS

The Company has exclusive rights of ownership of the facilities defined within this tariff and reserves the privilege and sole discretion to permit the use of such facilities for the support and physical attachment of other, non-company owned equipment under the terms and conditions of a separate agreement or license. The Company may, at its sole discretion, provide electric delivery service as applicable under another tariff. The Company will have no responsibility for the attachments except as defined in the separate agreement or license. The attachment will not adversely impact the street and area lighting as defined in this tariff.

RELAMPING

All inoperable lamps and/or photoelectric controls which are owned and maintained by the Company will be spot replaced. The Customer is responsible for notifying the Company of malfunctioning lights.

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RETAIL DELIVERY SERVICE

FAILURE OF LIGHTS TO OPERATE

Should any light or lights, which are owned and maintained by the Company, fail to operate the full period provided therefore, except as hereinafter specified, a deduction will be made from the charges under this rate, other than the Support and Accessory Charge, for such light or lights, upon presentation of a claim therefore from the Customer, equivalent to such part of the annual price thereof, as is equal to the ratio that the time of any outage bears to the annual operating time of such light or lights. The provisions of this paragraph will apply only if such failure is due to some cause or condition which might reasonably have been prevented by the Company and without limiting the generality of the foregoing will not apply in case such failure is due to an act of nature or an act or order of any public authority or accidental or malicious breakage; provided, however, that in the latter case the necessary repairs are made with reasonable dispatch upon notification by the Customer.

LOCATION OF STREET AND AREA LIGHTS

The Customer bears sole responsibility for determining where street and area lights will be placed and the type of lamp/luminaire used at each location. The Company bears no responsibility for, and makes no representations or warranties concerning, the locations and lamps/luminaires selected by the Customer or the adequacy of the resulting lighting. The Customer, by requesting and accepting service under this rate, hereby shall provide, grant and confer to the Company, all necessary easement, rights-of-way and/or consent rights and privileges as is necessary to provide such service in a manner satisfactory to the Company. All applicable permits, fees and/or other charges by others associated with the facilitation of service under this rate are the responsibility of the Customer.

PERMANENT DISCONTINUANCE OF LIGHTING FACILITIES

A Customer may permanently discontinue lighting facilities, owned by the Company, at no cost to the Customer, limited to a quantity not to exceed one (1) percent of the total number of lighting assemblies assigned to the Customer's billing account under this tariff within the given calendar year. The request by a Customer for the permanent discontinuance of the lighting in excess of one (1) percent as stated above may be performed by mutual agreement upon payment by the Customer to the Company in an amount equal to the sum of the unamortized balance of the original installation cost, removal and restoration costs, and any street light reconfiguration costs to maintain all other active lights.

RELOCATION OF LIGHTING FACILITIES

A Customer may request the relocation of existing street and area lighting facilities, owned by the Company, to another Customer specified location which meets all aforementioned terms and conditions of this tariff. The Customer will be responsible for all costs associated with the relocation as determined by the Company including but not limited to the removal/retirement costs of non-transferable facilities, the installation of new facilities as required, the relocation of existing facilities, any electric system reconfiguration and all site restoration. The relocated facilities will continue to be billed under the Customer account as originally represented prior to relocation.

TERM OF AGREEMENT

The initial term of agreement for General Street and Area Lighting Service under this tariff is two (2) years. Upon expiration of the initial term, the agreement will be continuously renewed until such time as

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RETAIL DELIVERY SERVICE

either party has given to the other written notice, not less than six (6) months prior to the date on which the party desires to have the agreement terminated.

TERMS AND CONDITIONS

The Company's Terms and Conditions in effect from time to time, where applicable hereto and not inconsistent with any specific provisions hereof, are a part of this rate.

II. GENERAL STREET AND AREA LIGHTING – TEMPORARY TURN OFF SERVICE

RATE

Upon the Company's temporary turn-off of retail delivery service to municipal Customers requesting temporary turn off of the Company's street and area lighting facilities, the Company shall bill the municipal Customer the charges enumerated in R.I.P.U.C. No. 2095, Summary of Retail Delivery Rates, Sheet 3, for the temporary turn off.

1. Luminaire Charges:

Lamp Type / Luminaire Type	Lumen Rating	Nominal Wattage	Description	Annual kWh
Incandescent				
Roadway				
	1,000	105	LUM INC RWY 105WTT	n/a
	2,500	205	LUM INC RWY 205WTT	n/a
Mercury Vapor				
Roadway				
	4,400	100	LUM MV RWY 100W TT	n/a
	8,500	175	LUM MV RWY 175W TT	n/a
	13,000	250	LUM MV RWY 250W TT	n/a
	23,000	400	LUM MV RWY 400W TT	n/a
	63,000	1,000	LUM MV RWY 1000WTT	n/a
Floodlight				
	23,000	400	LUM MV FLD 400W TT	n/a
	63,000	1,000	LUM MV FLD 1000WTT	n/a
Post Top				
	8,500	175	LUM MV POST 175W TT	n/a

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RETAIL DELIVERY SERVICE

RATE (Continued)

Lamp Type / Luminaire Type	Lumen Rating	Nominal Wattage	Description	Annual kWh
Metal Halide				
Floodlight				
	32,000	400	LUM MH FLD 400W TT	n/a
	107,800	1,000	LUM MH FLD 1000W TT	n/a
High Pressure Sodium Vapor				
Roadway				
	4,000	50	LUM HPS RWY 50W TT	n/a
	6,300	70	LUM HPS RWY 70W TT	n/a
	9,600	100	LUM HPS RWY 100W TT	n/a
	16,000	150	LUM HPS RWY 150W TT	n/a
	27,500	250	LUM HPS RWY 250W TT	n/a
	50,000	400	LUM HPS RWY 400W TT	n/a
Wallighter				
	27,500 (24 Hr)	250	WALL HPS 250W 24 TT	n/a
Post Top				
	4,000	50	LUM HPS POST 50W TT	n/a
	9,600	100	LUM HPS POST 100W TT	n/a
Floodlight				
	27,500	250	LUM HPS FLD 250W TT	n/a
	50,000	400	LUM HPS FLD 400W TT	n/a

2. Support and Accessory Charges:

Service Type / Support Type	Description
Overhead Service	
Non-Distribution Pole	
Wood Pole	POLE – WOOD TEMPOFF

THE NARRAGANSETT ELECTRIC COMPANY
GENERAL STREET AND AREA LIGHTING SERVICE (S-14)
RETAIL DELIVERY SERVICE

RATE (Continued)

Service Type / Support Type	Description
Underground Service	
Non-Metallic Standard	
Fiberglass without Foundation	POLE FIBR EMB<25TT
Fiberglass with Foundation < 25 ft.	POLE FIBER PT <25TT (Or) POLE FIBER RWY <25TT
Fiberglass with Foundation =>25 ft.	POLE FIBER RWY =>25TT
Metallic Standard	
Metallic Direct Embedded (No Fdn.)	POLE METAL EMB TT
Metallic with Foundation	POLE METAL=>25' TT

3. Other Fees and Charges:

Fee or Charge Type	Charge Amount
Reactivation Charge	$25.00
Crew Protection	Customer Responsibility

DETERMINATION OF MONTHLY BILL FOR TEMPORARY TURN OFF SERVICE

The monthly bill will be based on the annual Temporary Turn Off Charges above. The monthly charge will be based on the annual charge divided by the number of days in the calendar year to arrive at a daily rate and multiplied by the actual number of days in the billing period as measured from the date immediately following the prior bill to the current bill date.

MAINTENANCE

Temporary Turn Off Service under this tariff does not include routine maintenance of lighting facilities temporarily discontinued by the Customer.

NOTICE FOR TEMPORARY TURN OFF SERVICE

In order for a municipal Customer to be served under the Temporary Turn Off Service provision of this tariff, the municipal Customer must provide written notice to the Company requesting such temporary turn off service. Such notice shall take the form of that provided by the Company and shall include the specific identification of Company street and area lighting facilities to be temporarily turned off and the estimated length of the temporary discontinuance, however, will be not less than one year and not more than three years. Such identification shall include sufficient information for the Company to easily locate its street and area lighting facilities to be temporarily turned off for the purpose of turning off (red capping) the facilities.

THE NARRAGANSETT ELECTRIC COMPANY
GENERAL STREET AND AREA LIGHTING SERVICE (S-14)
RETAIL DELIVERY SERVICE

The Company shall use its best effort to turn off retail delivery service to its street and area lighting facilities within a reasonable length of time after receipt of the written notice required above. Depending upon the number of street and area lighting facilities to be temporarily turned off and the availability of the Company's crews, the Company may schedule such turn off over a period of time to allow for efficient operations. The Company reserves the right to be flexible in responding to the Customer's request. However, the Company shall complete all requests according to a mutually accepted schedule between the Customer and the Company upon receipt of written notice.

CREW PROTECTION

The Customer shall be responsible for the cost of any required police details or road flaggers for services provided under this option.

REINSTATEMENT OF GENERAL STREET AND AREA LIGHTING – FULL SERVICE

The provision of this service by the Company is predicated on the municipal Customer reinstating General Street and Area Lighting – Full Service. The Customer's request to reinstate all or a portion of the Company's street and area lighting facilities served under this rate, after complying with the term of service provision of this tariff, must be in written form and identify the specific street and area lighting facilities for the Company to reinstate. Upon receipt of the Customer's request, the Company shall use its best efforts to return the street and area lighting facilities to full lighting service as soon as possible after receiving the request. However, the Company reserves the right to flexibility in scheduling the reinstatement in an appropriate manner based on crew availability and the quantity of street and area lighting facilities requested to be reinstated. If the Customer requests reinstatement of the General Street and Area Lighting – Full Service prior to minimum term of one year, the Company will charge the Customer a Reactivation Charge per street or area lighting facility.

TERM OF SERVICE

The municipal Customer may remain on this provision of the General Street and Area Lighting tariff for a maximum period of three years. At the end of the three year period, the Customer must provide written notice for (i) the municipal Customer's return to General Street and Area Lighting – Full Service as provided for above, (ii) the permanent discontinuance of the street and area lighting facilities, as provided for above in Section I, or (iii) the Customer's ability to take advantage of another lighting tariff for retail delivery service to the street and area lighting facilities. The Company will continue to bill the Temporary Turn Off Charge until such time as the street and area lighting facilities are transferred to another delivery service selected by the Customer, or as assigned by the Company following the maximum three year term of service.

TERMS AND CONDITIONS

The Company's Terms and Conditions in effect from time to time, where applicable hereto and not inconsistent with any specific provisions hereof, are a part of this rate.

Effective: February 1, 2013

THE NARRAGANSETT ELECTRIC COMPANY
LIMITED SERVICE - PRIVATE LIGHTING (S-10)
RETAIL DELIVERY SERVICE

AVAILABILITY

Private lighting and floodlighting service under this rate is restricted to those locations having existing service on the effective date of this service offering. No new or additional private lighting customers are permitted on this rate, except for a new private lighting customer at a location that was previously served under this rate may request continuation of service under this rate provided that the request is made within a reasonable time of the new customer occupying the service location and the lighting facilities have not otherwise been removed by the Company.

1. Service under this rate is available where the necessary lighting facilities can be supported on the Company's existing utility infrastructure and provided delivery service at the appropriate secondary voltage, or as necessary, additional wood poles may be furnished in place in accordance with the schedule of Support and Accessory Charges listed below under RATE, Section 2, provided no such pole is more than one span from an existing overhead secondary facility.

2. Service under this rate is available where the selected Company lighting facilities require underground delivery service at the appropriate secondary voltage and are within a radial distance not to exceed 20 feet. In circumstances requiring underground delivery service in excess of 20 feet, the Customer is responsible to compensate the Company for such excess as a contribution in aid of construction in accordance with all applicable Company policies.

3. Service under this rate is contingent upon Company ownership and maintenance of street and area lighting facilities.

4. Service under this rate is not available for locations inaccessible by standard Company motorized equipment, limited access highways, bridges, tunnels and the access and egress ramps thereto.

5. In applications where revenue from the planned street and area lighting facilities will be insufficient to compensate for the excessive incremental installation costs associated with, but not limited to, rock excavation or hardscape restoration, the Company, at its sole discretion, may elect not to provide private lighting service or the Customer agrees to compensate the Company for the incremental costs as a contribution in aid of construction in accordance with all applicable Company policies.

6. The management of vegetation and/or other adjacent physical conditions which obstruct the normal distribution of light from the specified street and area lighting facilities is the responsibility of the Customer.

7. At the request of the Customer, the Company shall take reasonable actions to procure and install the necessary ancillary equipment, including but not limited to shields, visors, louvers and protective devices, for the purpose of providing special control of light distribution or vandal prevention of the facilities, provided all ancillary equipment costs and associated service charges are the responsibility of the Customer.

8. Customers receiving private area lighting service under this rate may request the addition, change or replacement of lighting facilities at the existing service location with facilities available as of the effective date of this tariff. The Company shall take reasonable actions to facilitate the Customer's request following all applicable provisions of this tariff.

THE NARRAGANSETT ELECTRIC COMPANY
LIMITED SERVICE - PRIVATE LIGHTING (S-10)
RETAIL DELIVERY SERVICE

RATE

The annual charges enumerated in R.I.P.U.C. No. 2095, Summary of Retail Delivery Rates, Sheet 3, are applicable to all street and area lighting facilities:

1. Luminaire Charges:

Lamp Type / Luminaire Type	Lumen Rating	Nominal Wattage	Description	Annual kWh
Incandescent*				
Roadway	1,000*	105	LUM INC RWY 105W	438
Mercury Vapor*				
Roadway	4,400*	100	LUM MV RWY 100W	543
	8,500*	175	LUM MV RWY 175W	881
	23,000*	400	LUM MV RWY 400W	1,991
	63,000*	1,000	LUM MV RWY 1000W	4,572
Floodlight	23,000*	400	LUM MV FLD 400W	1,991
	63,000*	1,000	LUM MV FLD 1000W	4,572
High Pressure Sodium Vapor				
Roadway	4,000	50	LUM HPS RWY 50W	255
	6,300	70	LUM HPS RWY 70W	359
	9,600	100	LUM HPS RWY 100W	493
	16,000	150	LUM HPS RWY 150W	722
	27,500	250	LUM HPS RWY 250W	1,269
	50,000	400	LUM HPS RWY 400W	1,962
Wallighter	27,500 (24 hr)	250	WALL HPS 250W 24 HR	2,663
Floodlight	27,500	250	LUM HPS FLD 250W	1,269
	50,000	400	LUM HPS FLD 400W	1,962
Post Top	4,000*	50	LUM HPS POST 50W	255
	9,600*	100	LUM HPS POST 100W	493
Shoebox	9,600*	100	LUM HPS REC 100W-C1	493
Metal Halide				
Floodlight	32,000	400	LUM MH FLD 400W	1,883
	107,800*	1,000	LUM MH FLD 1000W	4,502

THE NARRAGANSETT ELECTRIC COMPANY
LIMITED SERVICE - PRIVATE LIGHTING (S-10)
RETAIL DELIVERY SERVICE

RATE (Continued)

* No further installation or replacement of the designated luminaires will take place after the effective date of this rate.

2. Support and Accessory Charge

An additional annual charge as enumerated in R.I.P.U.C. No. 2095, Summary of Retail Delivery Rates, Sheet 3, will be applied to each luminaire type as stated in Section 1 – Luminaire Charges where the Company is requested to furnish a suitable wood pole, standard, foundation or other accessory and applicable delivery service as identified below, for the sole purpose of supporting a luminaire assembly.

Service Type / Support Type	Description
Overhead Service	
Non-Distribution Pole	
Wood Pole	POLE-WOOD
Underground Service	
Non-Metallic Standard	
Fiberglass without Foundation*	POLE FIBR PT EMB<25
Fiberglass with Foundation <25 ft.	POLE FIBER RWY <25'
Fiberglass with Foundation =>25 ft.	POLE FIBER RWY =>25
Metallic Standard	
Metallic with Foundation	POLE METAL =>25FT

Accessory Type
None

3. Other Fees and Charges

Additional fees or will be applied per unit application pursuant to applicable Customer requests and/or in association with terms and conditions of separate agreements specific to attachments to the foregoing support types as stated in Section 2 – Support and Accessory Charges. Applicable charges are assessed where the Company is requested by the Customer to provide an individual site visit for the purpose of; investigation and determination of operational malfunction, preventative or proactive maintenance to address vandalism or lighting control, the performance of other specified services, or other such actions which, unless requested by the Customer would otherwise have not been warranted. A charge will not be assessed if, in the sole discretion of the Company, the conditions which created the need for the Customer request were determined to be the result of the Company facilities or systems. Applicable fees are assessed on a regular billing schedule based on the terms and conditions of the agreement or license from which they are specified.

Fee or Charge Type	Charge Amount
Lighting Service Charge	See Terms and Conditions for Distribution Service

has been dishonored after being deposited for a second time.

Seasonal Customers

15. Seasonal Customers are those using local distribution services between June lst and September 30th only, or those using local distribution services principally between June lst and September 30th and incidentally or intermittently during the rest of the year.

Deposit and Security

16. The Company may require a cash deposit or other collateral satisfactory to it as security for prompt payment of the Customer's indebtedness to the Company. The rate of interest shall be adjusted on March lst annually. The interest rate in effect in any year shall be based on the average rate over the prior calendar year for 10-year constant maturity Treasury Bonds as reported by the Federal Reserve Board.

Payments for Line Extensions

17. The Company may require a Customer to pay for all or a portion of the cost of extending or installing poles, distribution lines, or equipment to the Customer's home, premises or facility, consistent with the terms of the Company's "Line Extension and Construction Advance Policies" on file with the Commission.

Lighting Service Charge

18. The Company may assess a Lighting Service Charge of $130.00 for Company services rendered in response to a Customer request in support of Customer equipment where the condition, service or connection is unrelated to the performance of facilities owned by the Company. A Lighting Service Charge per each occurrence will be assessed to the Customer on their subsequent bill.

Determining Customer's Demand

19. The demand is the maximum rate of taking electricity. Under ordinary load conditions it will be based upon one or more fifteen-minute peaks as herein defined. A fifteen-minute peak is the average rate of delivery of electricity during any fifteen-minute period as determined by any suitable instrument chosen by the Company. In the case of extremely fluctuating load, however, where the demand based on the average over fifteen minutes does not fairly represent the maximum demand imposed by the Customer, the demand will be based upon the instantaneous peak or the peak for a shorter period than fifteen minutes. Such measurements will be made by any suitable instrument chosen by the Company. The demand which is billed to the Customer is determined according to the terms of the appropriate tariffs approved by the PUC from time to time.

Customer Changing Rates