Town of Reading
Meeting Posting with Agenda

2018-07-16 LAG

Board - Committee - Commission - Council:

RMLD Citizens Advisory Board

Date: 2019-01-23 Time: 6:30 PM

Building: Reading Municipal Light Building Location: Winfred Spurr Audio Visual Room

Address: 230 Ash Street Agenda:

Purpose: General Business

Meeting Called By: Dennis Kelley, Chair

Notices and agendas are to be posted 48 hours in advance of the meetings excluding Saturdays, Sundays and Legal Holidays. Please keep in mind the Town Clerk's hours of operation and make necessary arrangements to be sure your posting is made in an adequate amount of time. A listing of topics that the chair reasonably anticipates will be discussed at the meeting must be on the agenda.

All Meeting Postings must be submitted in typed format; handwritten notices will not be accepted.

Topics of Discussion:

1. Call Meeting to Order – D. Kelley, Chair

2. General Manager's Update – C. O'Brien, General Manager
   - Town Meetings
   - Organizational Study Update

3. Engineering & Operations Report – H. Jaffari, Director of Engineering & Operations
   - Reliability Report Update
   - New Wilmington Substation

4. Update Payment to the Town of Reading Sub-Committee – G. Hooper

5. Review of Coverage for Upcoming Meetings – D. Kelley, Chair

6. Adjournment – D. Kelley, Chair

Attachment 1 - Agenda Item 3: Engineering & Operations Report

ENGINEERING & OPERATIONS REPORT

Hamid Jaffari, Director of Engineering & Operations

RMLD Citizens' Advisory Board Meeting

January 23, 2019

Major Construction Projects
(Currently Underway or Recently Completed)

- **Pole Line Upgrade – Woburn Street, Wilmington -** *Project Completed*

- **Remote Racking Device Installed at Station 3 -** *Project Completed*

- **Martins Landing, North Reading** (450 Residential Condominiums)
  RMLD recently installed five new poles, built two risers, and delivered three transformers (energizing two). Work will continue as the development progresses over the next few years.

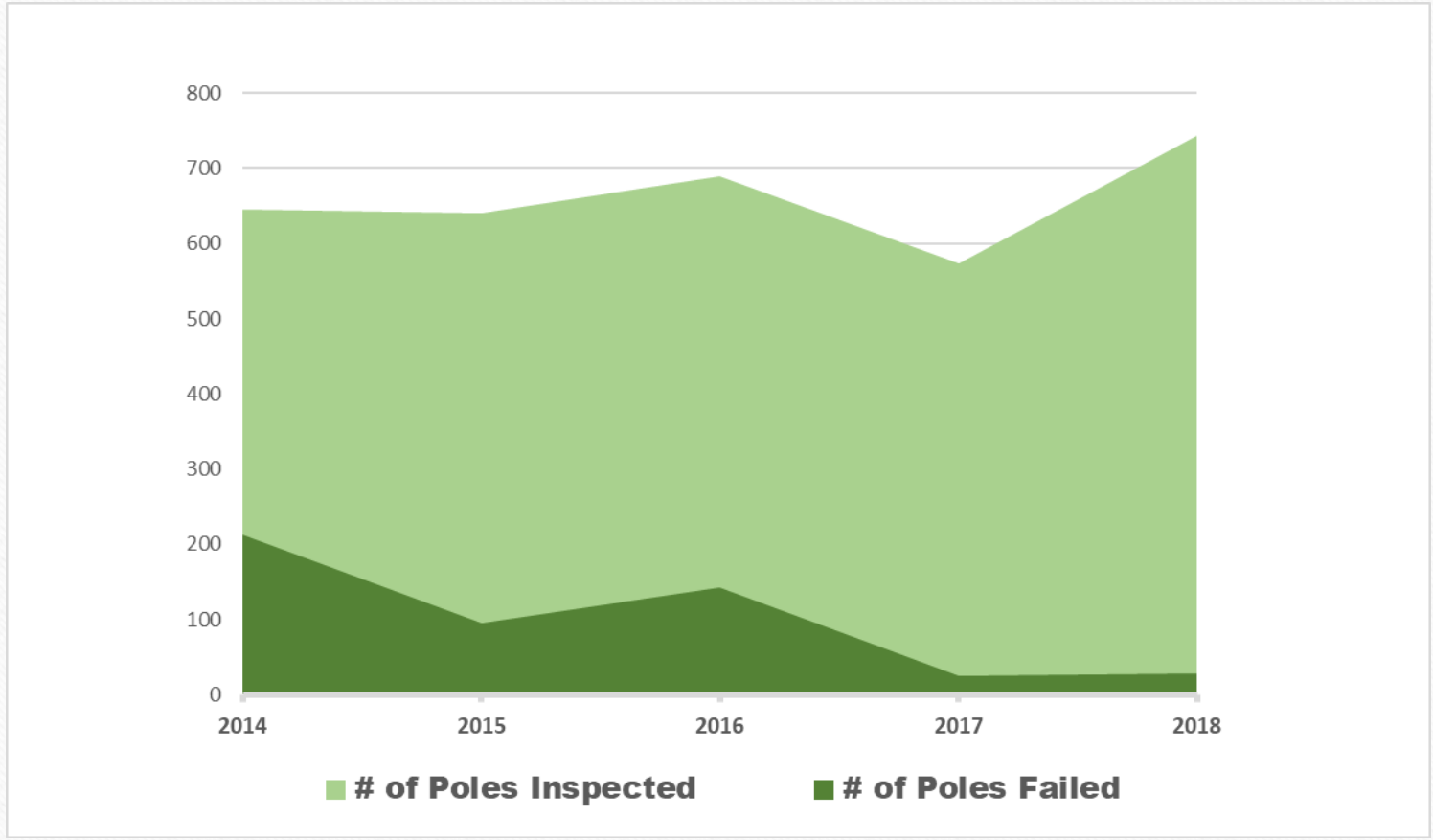
- **4W5/4W12 Getaway Improvements at Station 4**
  The overhead portion of this project has continued into 2019 (completion expected within Q1 of 2019). Procurement for materials for the construction within Station 4 has begun. Construction within the station will commence in Q1 of 2019.

- **3W13 Repairs**
  A motor vehicle accident caused a faulted riser on 3W13. Repairs are under way.

Maintenance Programs

- Aged Transformer Replacement – Pad-mount: 33.68% replaced Overhead: 23% replaced
  (through November 2018)
- Pole Inspection/Replacement Program – 256 poles set 229 transfers completed
- Tree Trimming – 493 spans YTD through December (Nov: 84 spans Dec: 152 spans)
- 2019 Inspection of Feeders – 3W5, 3W6, 3W7, 3W8, 3W13, 3W14, 3W15 and 3W18 Inspected
- Infrared Scans – Completed through December - No Hot Spots Found
- Manhole Inspection – on-going
- Porcelain Cutout Replacement – on-going

POLE INSPECTION PROGRAM



Year	# of Poles Inspected	# of Poles Failed	% Failed
2014	645	213	33%
2015	640	95	15%
2016	689	142	21%
2017	573	24	4%
2018	744	28	4%
TOTAL	***3,291***	***502***	***15%***

CURRENT STATUS:

- 256 FAILED POLES HAVE BEEN REPLACE (OF THOSE POLES REPLACED)
- 229 TRANSFERS HAVE BEEN COMPLETED

Double Poles

Per NJUNS

(as of 1/16/18)

LYNNFIELD

"Next to Go"		# of Tickets
RMLD		**21**
Transfer	21	
Pull Pole		
CMCTNR - Comcast		**4**
Transfer	4	
LFLDFD - Lynnfield Fire Dept.		**5**
Transfer	5	
GRAND TOTAL		**30**

READING

"Next to Go"		# of Tickets
VZNESA – Verizon		**8**
Transfer	8	
RMLD		**45**
Transfer	27	
Pull Pole	18	
CMCTNR - Comcast		**8**
Transfer	8	
RDNGFD - Reading Fire Dept.		**8**
Transfer	8	
LTFMA - Lightower Fiber		**1**
Transfer	1	
NP3PMA - Non-Participating 3rd Party Attachee		**4**
Transfer	4	
GRAND TOTAL		**74**

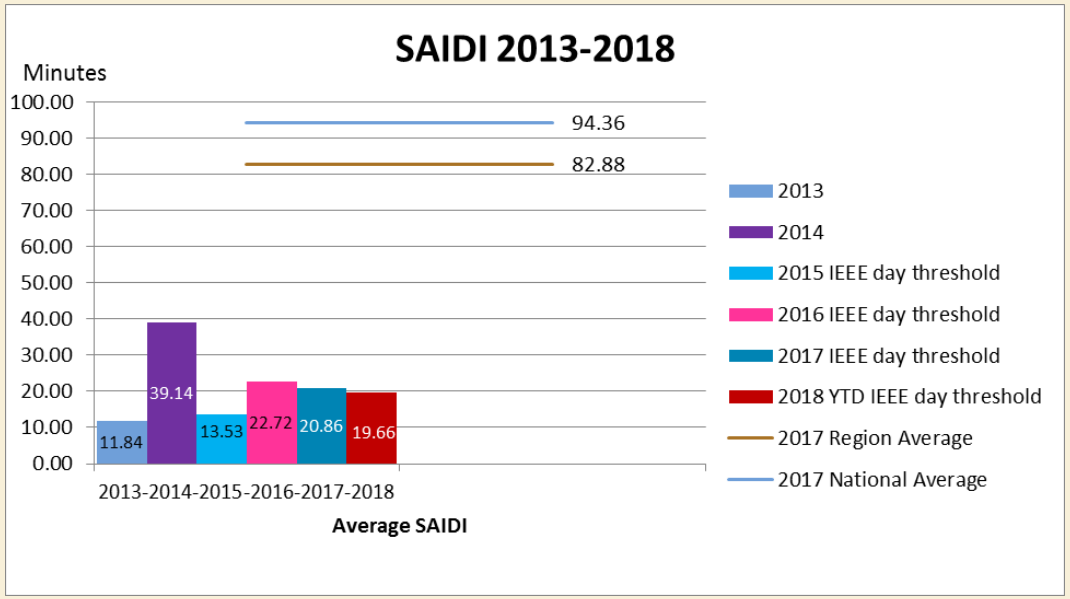
NORTH READING

"Next to Go"		# of Tickets
VZNEDR – Verizon		**10**
Transfer	10	
RMLD		**22**
Transfer	8	
Pull Pole	14	
CMCTNR - Comcast		**7**
Transfer	7	
NRDGFD - North Reading Fire Dept.		**1**
Transfer	1	
LTFMA - Lightower Fiber		**1**
Transfer	1	
GRAND TOTAL		**41**

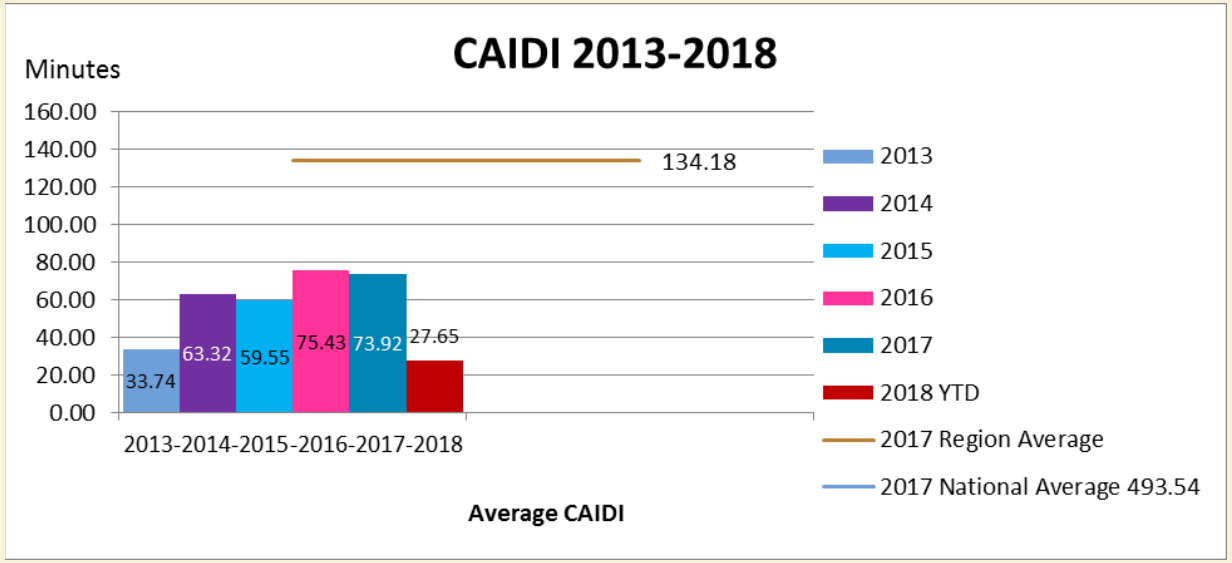
WILMINGTON

"Next to Go"		# of Tickets
VZNEDR – Verizon		**9**
Transfer	7	
Pull Pole	2	
RMLD		**32**
Transfer	28	
Pull Pole	4	
CMCTNR - Comcast		**17**
Transfer	17	
WMGNFD - Wilmington Fire Dept.		**38**
Transfer	38	
LTFMA - Lightower Fiber		**1**
Transfer	1	
VZBMA - Verizon Business		**1**
Transfer	1	
NP3PMA - Non-Participating 3rd		**0**
Transfer		
GRAND TOTAL		**98**

RMLD Reliability Indices



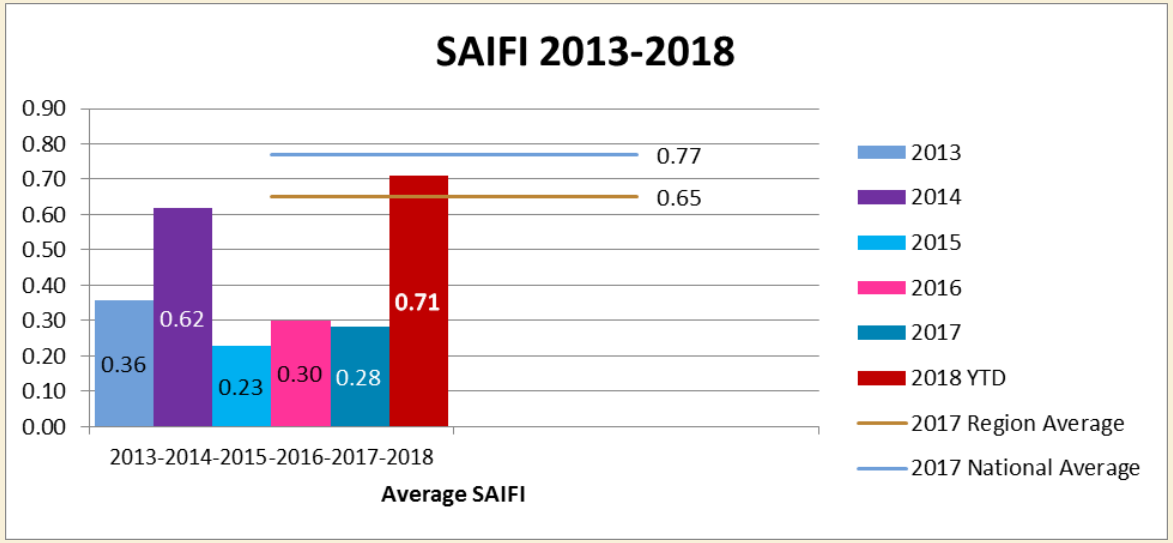
$$SAIDI\ (Minutes) = \frac{Total\ Duration of\ Customer\ Interruptions}{Total\ Number of\ Customers\ Served}$$



$$CAIDI\ (Minutes) = \frac{Total\ Duration of\ Customer\ Interruptions}{Total\ Number of\ Customers\ Interruptions}$$

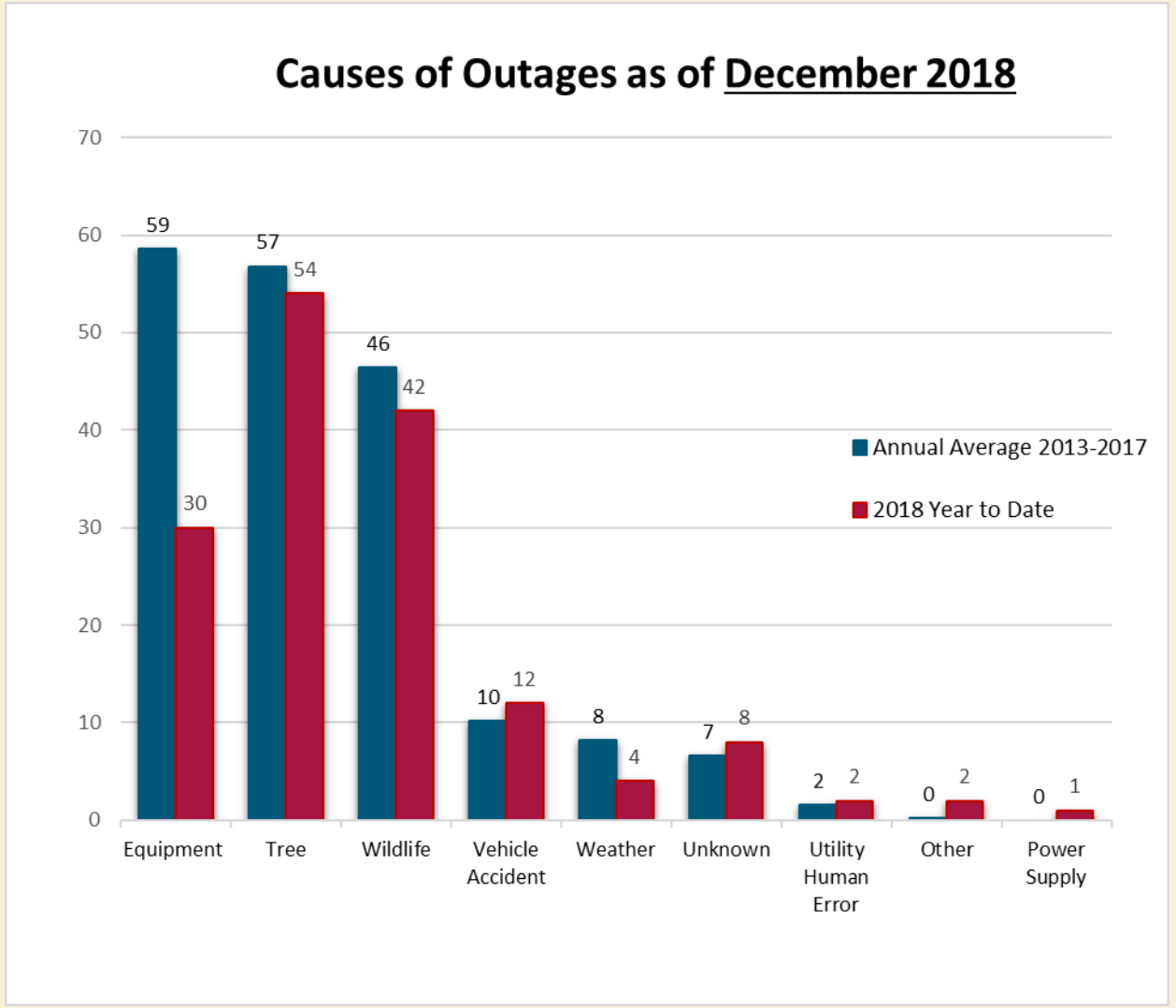
Note: The major event (ME) threshold allows a utility to remove outages that exceed the IEEE 2.5 beta threshold for events. These events could be severe weather, which can lead to unusually long outages in comparison to your distribution system's typical outage.

$$SAIFI = \frac{Total\ Number of\ Customer\ Interruptions}{Total\ Number of\ Customers\ Served}$$



Regional and national averages have been updated for 2017.

Outages



Recent Significant Outage Events: January 1, 2019 - motor vehicle accident on Elm Street at Pleasant in North Reading, 1,270 customers out.

Attachment 2 - Agenda Item 3: Reliability Report Update

BOOTH AND ASSOCIATES - 2015 RELIABILITY STUDY - RECOMMENDATIONS

CONSULTANT RECOMMENDATION			YEAR	COST (Booth Estimate)	RECOMMENDATION		STATUS	RMLD WORK PLAN
					ACCEPTED	ALTERNATE SOLUTION		
1	BOOTH	Replace cable trench covers at Sub 4 (should be expense, but most put large investments in capital)	2015-16	$100,000	✓		completed	
2	BOOTH	Sub 5 bus duct from transformer to switchgear has reached the end of useful life and should be replaced with the switchgear replacement	2015-16	$400,000		✓	completed	
3	BOOTH	Replace fence at Sub 4 and fix grounding issues	2015-16	$100,000	✓		completed	
4	BOOTH	Rebuild pole line along Lowell Street	2015-16	$375,000	✓		completed	
5	BOOTH	Complete AMI Upgrade and RF Mesh Network	2015-16	$350,000	✓		in progress	Five gateways installed. Relays installed. Additional meters in stock. Working on communicating issue with (1) deployed meter. System consists of 300+ meters. Working to establish end of line voltage for all RMLD circuits. 14 circuits completed.
6	BOOTH	Implement GIS Upgrade Program	2015-16	$350,000 - $750,000	✓		completed	
7	BOOTH	Implement Arc Flash Study Analysis	2015-16	$30,000	✓		completed	
8	BOOTH	Develop construction standards	2015-16	in-house	✓		in progress	
9	BOOTH	Update Joint-Use Agreement with Verizon	2015-16	in-house	✓		in progress	
10	BOOTH	Replace bushings on Sub 4 transformer.	2015-16	$150,000	✓		completed	
11	BOOTH	CT wiring at Sub 3 should be fixed. The CT circuits should only be bonded on grounding in exactly one spot	2015-16	O&M	✓		completed	CT's are grounded in only one location.
12	BOOTH	Sub 3 has NO under-frequency trips. Relay is not programmed to trip.	2015-16	O&M		✓	completed	Station 3 has UF capability. RMLD is in compliance with ISO's UF requirement.
13	BOOTH	Fence grounding is not up to code@ Station 4. Fabric and barbed wire should be grounded.	2015-16	O&M	✓		completed	
14	BOOTH	Earth/gravel around fence at Sub 5	2015-16	O&M	✓		completed	
15	BOOTH	Interface CIS with GIS platform	2015-16	in-house	✓		in progress	Cogsdale CIS automation script is being tested.
16	BOOTH	Create Milsoft Windmil® model	2015-16	in-house	✓		completed	The model has been created from updated GIS and is being tested.
17	BOOTH	Complete SCADA software and hardware upgrade	2015-17	$350,000	✓		completed	nDimensions cyber security software complete.
18	BOOTH	Upgrade main feeder of Circuit 5W9 to 795 to address voltage and conductor capacity issues (1.6 miles)	2015-17	$240,000	✓		in planning	On hold pending construction of the new Wilmington substation.
19 (1)	BOOTH	Upgrade UG circuit 3W5, 3W13, 4W9, 3W14, 4W14, 4W16, 4W23, 4W24, 4W28, 4W30, 5W4 exits to parallel 750 Cu	2015-19	$850,000		✓	in planning	Can't parallel up the feeder getaways at Station 4 and Station 5, no spare conduits available. Can't parallel up the feeder getaways at Station 3, no room for the second set of cables in the back of the switchgear. Solution: Load relief by feeder switching and/or new Wilmington Substation.
20	BOOTH	Replace breakers at Sub 4 due to age and condition	2015-20	$3,000,000	✓		completed	All 26 breakers were replaced by 1/10/2016.
21	BOOTH	Pole inspection and replacement program. RMLD currently inspects 10% of RMLD-owned poles per year. Negotiate with Verizon to address Verizon-owned poles. Total 13,000 poles.	2015-24	$9,000,000	✓		in progress	FY: 2015/2016/2017/2018 inspections completed. Pole replacement in-progress.
22	BOOTH	Continued implementation of Grid Modernization Plan (GMP)	2015-24					
		• Outage Management (OMS)		$100,000	✓		in progress	OMS installed in 2018. The system is being tested in 2019.
		• Transformer Loading Management (TLM)		$100,000	✓		in progress	
		• Demand Response (DR)		$100,000	✓		in progress	
		• Demand Side Management (DSM)		$100,000	✓		in progress	
		• Distributed Generation Program		$11,000,000	✓		in planning	New 4.5 MW battery storage unit will be installed in 2019 ($1M DOER Grant)
23 (1)	BOOTH	Upgrade UG circuit exit 4W7 to parallel 750 Cu	2016	$70,000		✓	in planning	Can't parallel up the feeder getaway at Station 4, no spare conduits available. Solution: Load relief by feeder switching and/or new Wilmington Substation.
24	BOOTH	Upgrade main feeder for Circuit 5W5 to 795 to address voltage and conductor capacity issues (2.5 miles)	2016-17	$375,000		✓	in planning	On hold pending construction of the new Wilmington substation.
25	BOOTH	New Wilmington Substation (land acquisition and design)	2016-17	$750,000	✓		in progress	Searching for land in Wilmington

CONSULTANT RECOMMENDATION			YEAR	COST (Booth Estimate)	RECOMMENDATION		STATUS	RMLD WORK PLAN
					ACCEPTED	ALTERNATE SOLUTION		
26	BOOTH	Upgrade main feeder of Circuit 4W24 to 795 to address voltage and conductor capacity issues (1.5 miles)	2016-17	$225,000	✓		in planning	Scheduled for upgrade in CY24 - Pending construction of the new Wilmington substation.
27	BOOTH	Complete comprehensive distribution system analysis upon GIS completion	2016-17	in-house	✓		ongoing	GIS overhaul was completed in 2017. Milsoft completed in May 2018. Since Booth study in 2015 a number of engineering reliability studies has been conducted to improve voltage in Wilmington and Lynnfield on the end-of-line feeders.
28	BOOTH	Complete the 4 kV Conversion Program	2016-19	$1,500,000	✓		in progress	Ongoing since 2015: Multiple year project. 32+/- stepdown areas in the service territory.
29	BOOTH	Sub 3 does have SEL relays but they are all legacy models that don't provide the function (especially communication) of today's versions. If the plan is to have a fully-automated system then: replace the SEL relays with the modern version. Should be able to replace in existing hole and wiring.	2016-19	$200,000	✓		completed	
30	BOOTH	New Wilmington Substation (procurement, design, construction and commission)	2017-19	$4,250,000	✓		in progress	Searching for land near 115 kV lines in Ballardvale/Upton Drive area
31 (1)	BOOTH	Sub 5 Switchgear is at the end of useful life. The relaying needs to be updated for the system automation project. The existing breakers are 2008 vintage but should not be reused. They can be sold on the open market.	2017-19	$1,200,000		✓	in planning	As part of the planning for the proposed substation in Wilmington the need for the Wildwood substation will be reviewed.
32 (1)	BOOTH	Upgrade UG circuit exits 3W7, 4W5, 5W5, 5W9 to parallel 750 Cu to increase circuit capacity	2017-19	$280,000		✓	in planning	Can't parallel up the feeder getaways at Station 4 and Station 5, no spare conduits available. Can't parallel up the feeder getaways at Station 3, no room for the second set of cables in the back of the switchgear. Solution: Load relief by feeder switching and/or new Wilmington Substation.
33	BOOTH	Feeder Automation - complete System Coordination Study in conjunction	2017-24	$4,000,000	✓		ongoing	Substation Automation at Substations 3 and 4 are completed.
34	BOOTH	Upgrade main feeder of Circuit 4W28 to 1000 Cu to address voltage and conductor capacity issues (0.3 miles)	2018	$60,000		✓	completed	4W28 is the dedicated circuit for Analog Devices (ADI). Any type of load relief for feeder 4W28 required the reconfiguration of ADI's distribution system or an additional RMLD feeder to the site. Analog transferred some load from 4W28 to 4W12 in 2018 to provide load relief.
35	BOOTH	Substation automation	2019	$112,000	✓		complete	Completed as part of relay upgrade project at Station 3 and Station 4.
36 (1)	BOOTH	Upgrade UG circuit exits 4W6, 5W8 to parallel 750 to increase circuit capacity.	2019	$120,000		✓	in planning	Can't parallel up the feeder getaways at Station 4 and Station 5, no spare conduits available. Can't parallel up the feeder getaways at Station 3, no room for the second set of cables in the back of the switchgear. Solution: Load relief by feeder switching and/or new Wilmington Substation.
37	BOOTH	Upgrade main feeder of Circuit 4W23 to 795 to address voltage and conductor capacity issues (1.1 miles)	2020	$165,000		✓	in planning	New Wilmington substation will take 30% of the feeder load. 2MW solar at 1 Burlington Avenue has significantly lightened the load.
38 (1)	BOOTH	Upgrade UG circuit exits 3W18, 4W4, 4W10, 4W18 to parallel 750 to increase circuit capacity.	2021-23	$370,000		✓	in planning	Can't parallel up the feeder getaways at Station 4 and Station 5, no spare conduits available. Can't parallel up the feeder getaways at Station 3, no room for the second set of cables in the back of the switchgear. Solution: Load relief by feeder switching and/or new Wilmington Substation.
39	BOOTH	Upgrade main feeder of Circuit 4W9 to 795 to address voltage and conductor capacity issues.	2021-23	$75,000	✓		in planning	On hold pending construction of the new Wilmington substation.
40	BOOTH	Review and upgrade electric system comprehensive analysis	2024	$100,000	✓		ongoing	
41	BOOTH	Transformer D and E replacement at both Sub 4 and Sub 5. They are approaching their end of useful life.	2024-25	$3,400,000	✓		in planning	RMLD is planning to construct a new substation in the Ballardvale or Route 125 area in Wilmington to transfer load and provide some load relief for both Substation 4 and Substation 3.
42	BOOTH	Install oil containment for Transformer D and E at Sub 4	2024-25	$100,000	✓		completed	
43 (1)	BOOTH	Upgrade UG circuit exits 3W8, 4W12 to parallel 750 Cu to increase circuit capacity.	2024-26	$180,000		✓	in planning	Can't parallel up the feeder getaways at Station 4, no spare conduits available. Can't parallel up the feeder getaways at Station 3, no room for the second set of cables in the back of the switchgear. Solution: Load relief by feeder switching and/or new Wilmington Substation.
44	BOOTH	Upgrade main feeder of Circuit 4W30 to 795 to address voltage and conductor capacity issues.	2024-26	$165,000	✓		in planning	Underground getaway was upgraded to 740 MCM cable. Overhead conductor will be upgraded to 556/795 AL spacer.

CONSULTANT RECOMMENDATION			YEAR	COST (Booth Estimate)	RECOMMENDATION		STATUS	RMLD WORK PLAN
					ACCEPTED	ALTERNATE SOLUTION		
45	BOOTH	Replace control panels for Ring bus at Sub 4	2024-26	$200,000	✓		completed	Construction 100% completed in early March 2017.
46	UPG	Station 3 Transformers: #3. Adjust timing delay on the winding temperature trip.			✓		completed	
47	UPG	Station 3 Transformers: #4. Add a low oil trip to transformers so they trip before any winding damage can occur.			✓		completed	
48	UPG	Station 3 Transformers: #5. Replace LTC main braking rollers with the new design that has a brass sleeve for the roller to ride on.			✓		completed	
49	UPG	Station 3 Transformers: #6. Repair LTC control displays for #TA and #TB			✓		completed	LTC controls repaired and installed.
50	UPG	Station 3 Transformers: #7. Replace or repair the Trans-TB Hydran unit.			✓		in planning	
51	UPG	Station 3 Transformers: #8. Repair the Trans TB temperature differential unit which is in failure mode.			✓		completed	Unit replaced.
52	UPG	Station 3 15 kV Breakers #2: the close spring assembly needs to be replaced.			✓		completed	
53	UPG	Station 3 15 kV Breakers: #3. DC control power fuses for trip, close, motor should be separated.			✓		completed	
54	UPG	Station 3 15 kV Breakers: #4. Control handle trip should be separated from relay and should trip breaker directly.			✓		completed	
55	UPG	Station 3 Relays: #1. The DC negative feed to the differential relay for the digital inputs should be altered to tie a DC negative via a fuse.			✓		completed	
56	UPG	Station 3 Relays: #2. Review and alter the under voltage transfer scheme so that it operates like the same schemes at the other stations.			✓		completed	
57	UPG	Station 4 115 kV Breakers: #1 (GCB1). Replace the breaker.			✓		completed	
58	UPG	Station 4 Transformers: #1. Repair trans #110D cooling contactor for stage #2.					completed	
59	UPG	Station 4 Transformers: #2. Replace the trans #110D main tank pressure relief device contact.			✓		completed	
60	UPG	Station 4 Transformers: #3. Replace the trans #110D main tank low oil gauge.			✓		completed	
61	UPG	Station 4 Transformers: #4. Repair the DC control power supply control cabling.			✓		completed	
62	UPG	Station 4 Transformers: #5. Replace the trans 110E main tank low oil and pressure relief device cables from the devices to the conduit bodies.			✓		completed	
63	UPG	Station 4 Transformers: #6. Replace the trans 110E cooling fan mounted top left.			✓		completed	
64	UPG	Station 4 Transformers: #7. Replace all four bushings of Trans #110E and #110D.			✓		completed	See Item #10 (Booth Recommendation)
65	UPG	Station 4 15kV Breakers: #2. check circuit 4W11 on a normal basis to insure that the heaters remain on to keep the breakers above ambient temperature so that no moisture condenses on the breaker insulation.			✓		completed	
66	UPG	Station 4 Breakers: #4. Replace the ground stab on 4W22.			✓		completed	
67	UPG	Station 5 Transformers: #1. Replace the trans #D main tank low oil and pressure relief divide output cable. Reconnect the LTC low oil level gauge wiring in the conduit body where the device cable terminates.					completed	
68	UPG	Station 5 15kV Breakers: #1. Take bus out of service and check alignment and correct if possible.			✓		completed	
69	UPG	Station 5 15kV Breakers: #2. Remove breaker 5W9, inspect for corrosions, and correct misalignment of the Breaker contact Rosette and cell stab during maintenance cycle.			✓		completed	

CONSULTANT RECOMMENDATION			YEAR	COST (Booth Estimate)	RECOMMENDATION		STATUS	RMLD WORK PLAN
					ACCEPTED	ALTERNATE SOLUTION		
70	UPG	Station 5 15kV Breakers: #3. Take bus out of service and check alignment and correct if possible.			✓		completed	
71	UPG	Station 5 15kV Breakers: #4. Take bus tie breaker out of service and check alignment and correct if possible.			✓		completed	

Note: Recommendations and priorities are based on existing system conditions. Should conditions change, these priorities will likely require re-evaluation.

(1) New Substation in Wilmington will address these recommendations; alternate solution provided in the meantime.