

Public Service Company of New Hampshire d/b/a Eversource Energy  
2021 Vegetation Management Plan and Performance Report  
March 1, 2022

As required by Section 9.3 of the Settlement Agreement approved by the New Hampshire Public Utilities Commission (the “Commission”) in Docket DE 19-057, Order No. 26,433 (December 15, 2020) (the “Settlement”), Public Service Company of New Hampshire d/b/a Eversource Energy (“Eversource” or the “Company”) provides the following vegetation management report for calendar year 2021.

The Company has included the relevant planned and actual vegetation management work by circuits and miles for 2021 in the supporting tables below.

Scheduled Maintenance Trimming (“SMT”) Program: The Company’s SMT cycle is based on an approximately 12,000-mile distribution overhead system and is performed, in part, by third-party contractors. The previous 4-year SMT contract expired on December 31, 2020. Eversource Energy released a request for proposal (“RFP”) for the next 4 years in both Massachusetts and New Hampshire. The bids came back with rates and totals substantially higher than previous levels.

One of the contributing factors to the cost increase is crew availability. This topic has been discussed with the Commission and the Department of Energy Staff for the last few years. Costs associated with police details also included in the bids received in response to the RFP. Every year, the number of roads that require traffic control increases. It can be difficult for contractors to project which towns and “new” roads will require police details. Contractors are diligent in controlling risk, and as a result, the competitive bid pricing reflects that through increased costs.

The Company awarded work to a new contractor in 2021 (Lucas Tree), along with the historic contractors Asplundh, Lewis, and Northern. New opportunities then allowed the Company to add four other tree contractors in 2021 to assist in completing the vegetation management plan and programs. These contractors were Distinctive Tree (providing specialized equipment), Nelson Tree (awarded the annual Enhanced Tree Trimming (“ETT”) bid), Stanley Tree (SMT and traffic control pilot), and Wright Tree (SMT and Hazard Tree).

The Company’s plan for 2021 was to have tree contractors perform SMT on 2,447 miles and the initial budgets were constructed around that plan. The table below provides the 2021 proposed SMT trimming miles per region, as compared to the 2021 actual miles trimmed.

<b>Eversource 2021 SMT</b>		
<b><u>Region</u></b>	<b><u>Plan Miles<sup>1</sup></u></b>	<b><u>Actual Miles</u></b>
Southern	339.36	320
Central	433.13	346.94
Western	638.58	645.79
Eastern	557.22	547.89
Northern	478.69	482.6
<b><u>Total Annual Miles</u></b>	<b><u>2,446.98</u></b>	<b><u>2,343.22</u></b>

<sup>1</sup> Docket No. DE 21-029, Exhibit RDA/LGL-3, “2021 Vegetation Management Plan Proposal,” at 1, as filed on March 1, 2021. Adjusted Central region, where Plan Proposal included circuit 34w18 twice, totaling 23.37 miles.

Maintenance Enhanced Tree Trimming (“METT”) Program: METT is maintenance trimming performed on miles that were previously subject to ETT. The amount of METT changes each year based on the circuit schedule. As with the SMT, this work was also part of the 4-year contract that was put out to bid in 2020.

<b><u>Eversource 2021 METT</u></b>		
<b><u>Region</u></b>	<b><u>Plan Miles<sup>2</sup></u></b>	<b><u>Actual Miles</u></b>
Southern	33.08	36.53
Central	24.44	26.03
Western	59.67	59.67
Eastern	11.39	52.82
Northern	76.00	76.01
<b><u>Total Annual Miles</u></b>	<b><u>204.58</u></b>	<b><u>251.06</u></b>

Mid-cycle work is additional work completed on a circuit in between the standard cycle under the SMT. This can include vine removal and “cycle buster” type trees. This program is an emergent one and the budget is minimal as the Company is prioritizing the SMT cycle work with the funding available. If the need arises to address circuit miles with this application, the Company will utilize funds from the allocated budget.

<b><u>Eversource 2021 Mid Cycle</u></b>		
<b><u>Region</u></b>	<b><u>Plan Miles<sup>3</sup></u></b>	<b><u>Actual Miles</u></b>
Southern	0.00	0
Central	0.00	0
Western	0.00	0
Eastern	0.00	2.81
Northern	0.00	0
<b><u>Total Annual Miles</u></b>	<b><u>0.00</u></b>	<b><u>2.81</u></b>

Customer Request work is work that is generated or initiated to address an issue identified by a customer rather than as part of the scheduled or planned circuit miles. Most often, these are service trimming requests. The amount of Customer Request work changes every year. Eversource has encouraged customers through social media to hire professionals to handle their tree issues. The pandemic has changed interactions with our customers. However, due to the prevalence of invasive insects and diseases, the Company sometimes learns about problematic trees or groups of trees from customers. The work needed to mitigate the issues posed by these trees is often performed by Company contractors.

<b><u>Eversource 2021 Customer Request Work</u></b>		
<b><u>Region</u></b>	<b><u>Plan Spend</u></b>	<b><u>Actual Spend</u></b>
Southern	\$0	\$41,724
Central	\$0	\$27,315
Western	\$0	\$21,450
Eastern	\$0	\$41,930
Northern	\$0	\$4,544
<b><u>Total Annual Spend</u></b>	<b><u>\$208,000<sup>4</sup></u></b>	<b><u>\$136,963</u></b>

<sup>2</sup> Id. at 2.

<sup>3</sup> Id.

<sup>4</sup> Id. at 3. The plan total is not available by region as the work is emergent and dependent on developments in the field.

The Hot Spot Program addresses tree growth in between cycles. If there is a reliability concern that is caused by a tree prior to its next scheduled trim, we will assess and mitigate if needed.

<b>Eversource 2021 Hot Spot</b>		
<b>Region</b>	<b>Plan Miles<sup>5</sup></b>	<b>Actual Miles</b>
Southern	0	0.77
Central	0	1.28
Western	0	0.00
Eastern	0	1.63
Northern	0	0.24
<b>Total Annual Miles</b>	<b>0.00</b>	<b>3.92</b>

The rights of way (“ROW”) maintenance program includes mowing and side trimming. The acres listed were mowed, and during the quality control inspection of the mowing, any tree limbs that were within 20 feet of the line were noted and a crew was sent to trim the limbs.

<b>Eversource 2021 ROW Maintenance</b>				
<b>Region</b>	<b>Plan Side Trim Miles<sup>6</sup></b>	<b>Actual Side Trim Miles</b>	<b>Plan Acres (Mow)<sup>7</sup></b>	<b>Actual Acres (Mow)</b>
Southern	2.87	2.87	35.03	35.03
Central	14.31	19.83	173.69	240.46
Western	1.37	1.82	16.60	22.10
Eastern	27.25	47.61	332.62	595.23
Northern	33.25	46.93	405.92	551.08
<b>Total Annual Miles/Acres</b>	<b>79.05</b>	<b>119.06</b>	<b>963.86</b>	<b>1,443.90</b>

The Full Width Clearing of ROW identifies ROWs where enhanced clearing will benefit customers and workers. This work is competitively bid. The tree contractor clears brush and trees to the full easement width. At the edge of the easement, the bordering trees are trimmed from ground to sky. The Company’s arborists work closely with abutting property owners to communicate the work needed and the final product.

<b>Eversource 2021 ROW FWC</b>		
<b>Region</b>	<b>Plan Miles<sup>8</sup></b>	<b>Actual Miles</b>
Southern	0.00	5.70
Central	0.00	8.98
Western	5.02	12.30
Eastern	0.00	0.00
Northern	1.10	4.70
<b>Total Annual Miles</b>	<b>6.12</b>	<b>31.68</b>

<sup>5</sup> Id. at Page 3 of 16.

<sup>6</sup> Id. at Page 15 of 16.

<sup>7</sup> Id. at Page 4 of 16, adjusted for ROW Circuit #319 (Loudon Concord), moved 108.85 acres from Southern to Northern Region.

<sup>8</sup> Id. at 4.

The Company identified 60.54 miles of planned three phase circuits for ETT in 2021. These miles were competitively bid. Actual miles completed totaled 51.01 miles.

<b><u>Eversource 2021 ETT</u></b>		
<b><u>Region</u></b>	<b><u>Plan Miles</u></b> <sup>9</sup>	<b><u>Actual Miles</u></b>
Southern	2.67	2.67
Central	11.22	13.91
Western	2.45	2.87
Eastern	26.21	19.51
Northern	17.99	12.05
<b><u>Total Annual Miles</u></b>	<b><u>60.54</u></b>	<b><u>51.01</u></b>

The Company profiles the SMT circuits for hazard trees. Hazard trees are trees that are dangerously diseased or damaged that should be removed rather than trimmed due to their potential to impact the electric system. It is best practice to remove the troublesome trees while trimming the circuit. The customers on whose property the hazard trees grow, and who, therefore, own the hazard trees, are engaged in one conversation for both programs. The total number of trees removed are compiled monthly. The Company's 2021 plan included SMT and METT on 2,447 and 204.6 trimming miles, respectively, as compared to the 2021 actuals for SMT and METT of 2,343 and 251 trimmed miles, respectively.

<b><u>Eversource 2021 Total Number of Hazard Trees</u></b>		
<b><u>Region</u></b>	<b><u>Plan Trees</u></b>	<b><u>Actual Trees</u></b>
Southern	0	8,366
Central	0	7,630
Western	0	6,138
Eastern	0	3,620
Northern	0	5,257
<b><u>Total Annual Trees</u></b>	<b><u>0</u></b>	<b><u>31,011</u></b>

While Eversource currently has experienced professionals managing its VMP, there are longer-term concerns with the work force. There are very few programs in high school or college to attract students to Arboriculture/Forestry. It is a difficult job performed in all types of weather, usually aloft. This has had a direct impact on the work the Company does and the availability of trained individuals to do it, and, as has been seen in recent bids, has had a material impact on costs.

<sup>9</sup> Id. at 5, adjusted for 1.61 miles reclassified from Eastern to Northern Region.

**Table 1. Summary of Eversource's 2021 Planned vs. Actual Vegetation Management Program Costs**

Line	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	Reference
	VMP Activity	2021 Plan			2021 Actual			Variance			
		Gross Cost	Reimbursements	Net Cost	Gross Cost	Reimbursements	Net Cost	Gross Cost	Reimbursements	Net Cost	
1	Scheduled Maintenance Trim (SMT)	\$ 16,554,080	\$ (3,310,816)	\$ 13,243,264	\$ 15,502,557	\$ (3,274,730)	\$ 12,227,827	\$ 1,051,523	\$ (36,086)	\$ 1,015,437	Tables 2-6
2	METT	1,379,808	(275,962)	1,103,846	1,541,781		1,541,781	(161,973)	(275,962)	(437,935)	Tables 2-6
3	Mid Cycle Review	350,000		350,000	22,467		22,467	327,533	-	327,533	Table 7
4	Customer Work	208,000		208,000	136,963		136,963			71,037	
5	Hot Spot Work	350,000		350,000	31,451		31,451	318,549		318,549	Table 8
6	Police/Flagging	-		-	-		-			-	
7	Sub Transmission (Mowing/Side Trim)	1,350,000		1,350,000	3,278,863		3,278,863	(1,928,863)		(1,928,863)	Table 9
8	<b>Distribution SMT Total</b>	<b>\$ 20,191,888</b>	<b>\$ (3,586,778)</b>	<b>\$ 16,605,110</b>	<b>\$ 20,514,082</b>	<b>\$ (3,274,730)</b>	<b>\$ 17,239,352</b>	<b>\$ (322,194)</b>	<b>\$ (312,048)</b>	<b>\$ (634,242)</b>	
9	Full Width Rights-of-Way (ROW) Clearing	\$ 1,500,000	\$ -	\$ 1,500,000	\$ 2,097,963		\$ 2,097,963	\$ (597,963)	\$ -	\$ (597,963)	Table 10
10	Hazard Tree Removal	13,000,000	(6,500,000)	6,500,000	10,686,632	(5,017,157)	5,669,475	2,313,368	(1,482,843)	830,525	Table 12
11	Enhanced Tree Trimming (ETT)	2,600,000	(85,200)	2,514,800	1,290,173		1,290,173	1,309,827	(85,200)	1,224,627	Table 11
12	<b>Subtotal</b>	<b>\$ 17,100,000</b>	<b>\$ (6,585,200)</b>	<b>\$ 10,514,800</b>	<b>\$ 14,074,768</b>	<b>\$ (5,017,157)</b>	<b>\$ 9,057,611</b>	<b>\$ 3,025,232</b>	<b>\$ (1,568,043)</b>	<b>\$ 1,457,189</b>	
13	<b>Vegetation Management Program Total</b>	<b>\$ 37,291,888</b>	<b>\$ (10,171,978)</b>	<b>\$ 27,119,910</b>	<b>\$ 34,588,850</b>	<b>\$ (8,291,887)</b>	<b>\$ 26,296,963</b>	<b>\$ 2,703,038</b>	<b>\$ (1,880,091)</b>	<b>\$ 822,947</b>	
14	2021 Miles (SMT/METT)	2,675			2,594			81			
15	2021 Total VMP Cost	\$37,291,888	\$ (10,171,978)	\$ 27,119,910	\$34,588,850	\$ (8,291,887)	\$26,296,963	\$2,703,038	\$ (1,880,091)	\$ 822,947	

**Table 2. 2021 Vegetation Management Program Actual vs. Plan - Scheduled Maintenance Trimming (SMT) and Maintenance Enhanced Tree Trimming (METT)  
Eastern Region (Rochester, Portsmouth, Epping and Chocorua Area Work Centers)**

Trim Year	Circuit	SMT Plan	SMT Actual	METT Plan	METT Actual	Primary Town	AWC	Plan Total Circuit Miles	Actual Total Circuit Miles
2021	17H1_45	5.46	5.46	0.00	0.00	Tuftonboro	Chocorua	5.46	5.46
2021	336X_45	6.55	5.14	7.12	7.26	Conway	Chocorua	13.67	12.40
2021	395X_45	0.00	1.61	0.00	0.00	Conway	Chocorua	0.00	1.61
2021	19W2-45	99.83	85.77	0.00	14.06	Freedom	Chocoura	99.83	99.83
2021	395X1_45	2.07	2.07	0.00	0.00	Conway	Chocorua	2.07	2.07
2021	2H1_63	7.93	0.00	0.00	0.00	Rye	Portsmouth	7.93	0.00
2021	2W4_63	6.40	6.40	0.00	0.00	Rye	Portsmouth	6.40	6.40
2021	2W5_63	13.93	13.93	0.00	0.00	New Castle	Portsmouth	13.93	13.93
2021	3105X1_63	10.16	10.16	0.00	0.00	Portsmouth	Portsmouth	10.16	10.16
2021	3105X3_63	0.04	0.04	0.00	0.00	Greenland	Portsmouth	0.04	0.04
2021	3105X4_63	0.49	0.49	0.00	0.00	Greenland	Portsmouth	0.49	0.49
2021	3112_63	0.00	7.57	0.00	0.00	Greenland	Portsmouth	0.00	7.57
2021	3111X1	0.00	5.60	0.00	0.00	Portsmouth	Portsmouth	0.00	5.60
2021	3172X1_63	0.00	21.32	0.00	2.20	North Hampton	Portsmouth	0.00	23.52
2021	3191X4_63	0.25	0.25	0.00	0.00	Greenland	Portsmouth	0.25	0.25
2021	339X1_63	0.39	0.39	0.34	0.34	Portsmouth	Portsmouth	0.73	0.73
2021	339X2_63	0.37	0.37	0.00	0.00	Portsmouth	Portsmouth	0.37	0.37
2021	367X2	0.00	2.55	0.00	0.00	Newington	Portsmouth	0.00	2.55
2021	3850X4_63	0.90	0.90	0.00	0.00	Newington	Portsmouth	0.90	0.90
2021	3850X7_63	8.66	8.66	0.00	0.00	Newington	Portsmouth	8.66	8.66
2021	48H1	0.00	8.53	0.00	0.00	Rye	Portsmouth	0.00	8.53
2021	48H2_63	5.43	5.43	0.00	0.00	Rye	Portsmouth	5.43	5.43
2021	64W1_63	4.32	4.32	0.00	0.00	Portsmouth	Portsmouth	4.32	4.32
2021	64W2_63	4.86	4.86	0.00	0.00	Portsmouth	Portsmouth	4.86	4.86
2021	67W1	0.00	15.65	0.00	0.00	Rye	Portsmouth	0.00	15.65
2021	6H1_63	2.72	2.72	0.00	0.00	North Hampton	Portsmouth	2.72	2.72
2021	6H2_63	8.86	8.92	0.00	0.00	North Hampton	Portsmouth	8.86	8.92
2021	71W1_63	5.41	5.41	0.00	0.00	Portsmouth	Portsmouth	5.41	5.41
2021	71W4_63	5.77	5.77	0.00	0.00	Portsmouth	Portsmouth	5.77	5.77
2021	115_61	3.87	0.65	0.00	3.22	Somersworth	Rochester	3.87	3.87
2021	3148X1	0.00	5.42	0.00	0.00	Dover	Rochester	0.00	5.42
2021	3148x3_61	0.00	0.80	0.00	0.00	Rollinsford	Rochester	0.00	0.80
2021	3148x4_61	4.24	4.24	0.00	0.00	Dover	Rochester	4.24	4.24
2021	3157X1_61	70.69	64.17	0.00	0.00	Milton	Rochester	70.69	64.17
2021	3157x2_61	1.48	0.00	0.00	0.00	Milton	Rochester	1.48	0.00
2021	32X1_61	0.85	0.85	0.00	0.00	Somersworth	Rochester	0.85	0.85
2021	32X4_61	5.93	3.37	0.00	2.20	Somersworth	Rochester	5.93	5.57
2021	340_61	0.00	0.50	0.00	0.00	Rochester	Rochester	0.00	0.50
2021	340X2_61	0.29	0.29	0.00	0.00	Rochester	Rochester	0.29	0.29
2021	340x4_61	0.48	0.00	0.00	0.00	Rochester	Rochester	0.48	0.00
2021	34W3_61	3.74	6.39	0.00	0.00	Rochester	Rochester	3.74	6.39
2021	371D_61	0.00	1.14	0.00	0.00	Somersworth	Rochester	0.00	1.14
2021	371X14_61	16.22	10.06	0.00	6.10	Somersworth	Rochester	16.22	16.16

**Table 2. 2021 Vegetation Management Program Actual vs. Plan - Scheduled Maintenance Trimming (SMT) and Maintenance Enhanced Tree Trimming (METT)  
Eastern Region (Rochester, Portsmouth, Epping and Chocorua Area Work Centers)**

Trim Year	Circuit	SMT Plan	SMT Actual	METT Plan	METT Actual	Primary Town	AWC	Plan Total Circuit Miles	Actual Total Circuit Miles
2021	371X4_61	7.21	5.34	0.00	1.87	Rochester	Rochester	7.21	7.21
2021	371X8_61	3.91	1.96	0.00	1.95	Somersworth	Rochester	3.91	3.91
2021	371X9_61	5.73	5.73	0.00	0.00	Somersworth	Rochester	5.73	5.73
2021	38W1_61	8.24	6.04	3.93	3.93	Dover	Rochester	12.17	9.97
2021	392_61	0.00	4.00	0.00	0.00	Rochester	Rochester	0.00	4.00
2021	392X4_61	9.95	9.95	0.00	0.00	Rochester	Rochester	9.95	9.95
2021	392X5_61	10.37	10.37	0.00	0.00	Rochester	Rochester	10.37	10.37
2021	399X1_61	5.50	5.50	0.00	0.00	Dover	Rochester	5.50	5.50
2021	399X10_61	0.04	0.04	0.00	0.00	Dover	Rochester	0.04	0.04
2021	399X14_61	0.54	0.54	0.00	0.00	Dover	Rochester	0.54	0.54
2021	399X15_61	10.81	10.81	0.00	0.00	Madbury	Rochester	10.81	10.81
2021	399X17_61	0.05	0.05	0.00	0.00	Dover	Rochester	0.05	0.05
2021	399X18_61	10.05	6.27	0.00	3.78	Dover	Rochester	10.05	10.05
2021	399X19_61	3.23	3.23	0.00	0.00	Dover	Rochester	3.23	3.23
2021	399X3_61	0.92	0.92	0.00	0.00	Dover	Rochester	0.92	0.92
2021	399X42_61	0.04	0.04	0.00	0.00	Dover	Rochester	0.04	0.04
2021	399X5_61	0.04	0.04	0.00	0.00	Dover	Rochester	0.04	0.04
2021	399X6_61	0.05	0.21	0.00	0.00	Madbury	Rochester	0.05	0.21
2021	399X7_61	0.01	0.00	0.00	0.00	Madbury	Rochester	0.01	0.00
2021	399X8_61	2.80	2.80	0.00	0.00	Dover	Rochester	2.80	2.80
2021	399X87_61	0.18	0.18	0.00	0.00	Dover	Rochester	0.18	0.18
2021	40H1_61	5.91	5.91	0.00	0.00	Somersworth	Rochester	5.91	5.91
2021	42H1_61	11.25	11.25	0.00	0.00	Somersworth	Rochester	11.25	11.25
2021	42H2_61	2.63	2.63	0.00	0.00	Somersworth	Rochester	2.63	2.63
2021	3148x	8.56	0.00	0.00	0.00	Dover	Rochester	8.56	0.00
2021	3174x1	4.07	4.07	0.00	0.00	Farmington	Rochester	4.07	4.07
2021	371x22	3.07	3.07	0.00	0.00	Somersworth	Rochester	3.07	3.07
2021	371x30	5.57	4.68	0.00	0.00	Somersworth	Rochester	5.57	4.68
2021	399x11	2.78	2.78	0.00	0.00	Dover	Rochester	2.78	2.78
2021	3157x2	1.48	0.76	0.00	0.00	Milton	Rochester	1.48	0.76
2021	340x4	0.48	0.48	0.00	0.00	Rochester	Rochester	0.48	0.48
2021	3115X7_65	12.44	11.24	0.00	0.00	Raymond	Epping	12.44	11.24
2021	3115X9_65	6.00	6.00	0.00	0.00	Raymond	Epping	6.00	6.00
2021	3152X1_61	12.06	12.11	0.00	0.00	Durham	Epping	12.06	12.11
2021	3137X4_65	0.21	0.21	0.00	0.00	Northwood	Epping	0.21	0.21
2021	3191X10_65	1.44	1.44	0.00	0.00	Durham	Epping	1.44	1.44
2021	3191X5_65	2.08	2.62	0.00	0.00	Newmarket	Epping	2.08	2.62
2021	3191X6_65	3.33	2.21	0.00	0.00	Newmarket	Epping	3.33	2.21
2021	3191X7_65	0.31	0.31	0.00	0.00	Durham	Epping	0.31	0.31
2021	3191X8_65	0.69	0.17	0.00	0.00	Newmarket	Epping	0.69	0.17
2021	377X10_65	3.27	3.27	0.00	0.00	Epping	Epping	3.27	3.27
2021	377X16_65	10.40	8.52	0.00	0.00	Epping	Epping	10.40	8.52
2021	377X19_65	3.64	3.64	0.00	0.00	Epping	Epping	3.64	3.64

**Table 2. 2021 Vegetation Management Program Actual vs. Plan - Scheduled Maintenance Trimming (SMT) and Maintenance Enhanced Tree Trimming (METT)  
Eastern Region (Rochester, Portsmouth, Epping and Chocorua Area Work Centers)**

Trim Year	Circuit	SMT Plan	SMT Actual	METT Plan	METT Actual	Primary Town	AWC	Plan Total Circuit Miles	Actual Total Circuit Miles
2020	377X2	0.00	16.12	0.00	5.91	Epping	Epping	0.00	22.03
2021	377X20_65	18.20	18.20	0.00	0.00	Epping	Epping	18.20	18.20
2021	377X5_65	1.21	0.48	0.00	0.00	Raymond	Epping	1.21	0.48
2021	377X6_65	8.30	8.30	0.00	0.00	Newmarket	Epping	8.30	8.30
2021	377X9_65	1.55	1.55	0.00	0.00	Raymond	Epping	1.55	1.55
2021	3137x80	8.81	0.00	0.00	0.00	Northwood	Epping	8.81	0.00
2021	377x1	4.90	0.00	0.00	0.00	Epping	Epping	4.90	0.00
2021	377x29	4.12	0.00	0.00	0.00	Epping	Epping	4.12	0.00
2021	377x3	16.52	0.00	0.00	0.00	Epping	Epping	16.52	0.00
2021	380X3_65	3.68	3.68	0.00	0.00	Durham	Epping	3.68	3.68
<b>Total</b>		<b>557.22</b>	<b>547.89</b>	<b>11.39</b>	<b>52.82</b>			<b>568.61</b>	<b>600.71</b>

**Table 3. 2021 Vegetation Management Program Actual vs. Plan - Scheduled Maintenance Trimming (SMT) and Maintenance Enhanced Tree Trimming (METT)  
Southern Region (Nashua and Derry Area Work Centers)**

Trim Year	Circuit	SMT Plan	SMT Actual	METT Plan	METT Actual	Primary Town	AWC	Plan Total Circuit Miles	Actual Total Circuit Miles
2021	314X19	0.52	0.52	0.00	0.00	Milford	Nashua	0.52	0.52
2021	3155X	0.00	27.78	0.00	1.68	Milford	Nashua	0.00	29.46
2021	3155X9	0.05	0.05	0.00	0.00	Greenville	Nashua	0.05	0.05
2021	353X1	0.17	0.17	0.00	0.00	Nashua	Nashua	0.17	0.17
2021	3241	2.85	0.00	0.00	0.00	Merrimack	Nashua	2.85	0.00
2021	3155X7	32.31	32.31	3.70	3.70	Mason	Nashua	36.01	36.01
2021	3155X3	9.10	9.10	0.00	0.00	Milford	Nashua	9.10	9.10
2021	3155X8	18.83	18.83	0.00	0.00	Mason	Nashua	18.83	18.83
2021	3020X	19.39	19.39	1.60	1.60	Merrimack	Nashua	20.99	20.99
2021	30H2	3.86	3.86	6.50	6.50	Milford	Nashua	10.36	10.36
2021	314X12	18.54	18.54	0.00	0.00	Milford	Nashua	18.54	18.54
2021	378	0.00	1.87	0.00	0.00	Milford	Nashua	0.00	1.87
2021	314X14	6.14	6.14	0.00	0.00	Milford	Nashua	6.14	6.14
2021	314X3	6.58	6.58	0.00	0.00	Milford	Nashua	6.58	6.58
2021	383	0.00	1.60	0.00	0.00	Hudson	Nashua	0.00	1.60
2021	314X23	23.01	23.01	0.00	0.00	Wilton	Nashua	23.01	23.01
2021	3891	0.00	0.50	0.00	0.00	Nashua	Nashua	0.00	0.50
2021	314X26	2.75	2.75	1.92	1.92	Wilton	Nashua	4.67	4.67
2021	314X46	2.61	2.61	0.00	0.00	Wilton	Nashua	2.61	2.61
2021	314X22	1.06	1.06	0.00	0.00	Milford	Nashua	1.06	1.06
2021	314X21	0.14	0.14	0.00	0.00	Milford	Nashua	0.14	0.14
2021	314X35	1.22	1.22	0.00	0.00	Wilton	Nashua	1.22	1.22
2021	3159	0.00	0.93	0.00	0.00	Merrimack	Nashua	0.00	0.93
2021	2H1	5.60	8.25	0.00	0.00	Nashua	Nashua	5.60	8.25
2021	3H1	5.62	5.62	2.42	2.42	Nashua	Nashua	8.04	8.04
2021	3H2	3.02	3.02	1.37	1.37	Nashua	Nashua	4.39	4.39
2021	32w4	0.00	1.56	0.00	0.00	Derry	Derry	0.00	1.56
2021	27H3	3.71	3.71	0.00	0.00	Greenville	Nashua	3.71	3.71
2021	3175x	13.14	0.00	2.75	0.00	Hudson	Nashua	15.89	0.00
2021	3175x1	17.55	0.00	0.00	0.00	Hudson	Nashua	17.55	0.00
2021	383X1	21.31	0.00	0.00	0.00	Hudson	Nashua	21.31	0.00
2021	314	0.00	7.30	0.00	0.00	Wilton	Nashua	0.00	7.30
2021	9H2	0.00	3.67	0.00	0.00	Nashua	Nashua	0.00	3.67
2021	3010X	22.79	21.56	0.00	4.52	Merrimack	Nashua	22.79	26.08
2021	3211X	39.02	39.02	0.00	0.00	Hudson	Derry	39.02	39.02
2021	365	0.00	1.40	0.00	0.00	Derry	Derry	0.00	1.40
2021	3133X	58.47	45.93	12.82	12.82	Windham	Derry	71.29	58.75
<b>Total</b>		<b>339.36</b>	<b>320</b>	<b>33.08</b>	<b>36.53</b>			<b>372.44</b>	<b>356.53</b>

**Table 4. 2021 Vegetation Management Program Actual vs. Plan - Scheduled Maintenance Trimming (SMT) and Maintenance Enhanced Tree Trimming (METT)  
Central Region (Bedford and Hooksett Area Work Centers)**

Trim Year	Circuit	SMT Plan	SMT Actual	METT Plan	METT Actual	Primary Town	AWC	Plan Total Circuit Miles	Actual Total Circuit Miles
2021	3271X2_12	60.83	53.91	8.91	7.64	Weare	Bedford	69.74	61.55
2021	311X1_12	35.76	33.68	0.00	2.08	Weare	Bedford	35.76	35.76
2021	23X2_12	7.62	7.62	0.00	0.00	Amherst	Bedford	7.62	7.62
2021	23X6_12	0.00	1.00	0.00	0.00	Milford	Bedford	0.00	1.00
2021	317	0.00	6.55	0.00	0.00	Hopkinton		0.00	6.55
2021	317X1_12	0.00	13.00	0.00	0.00	Warner	Bedford	0.00	13.00
2021	317X7_12	5.69	5.69	0.00	0.00	Hopkinton	Bedford	5.69	5.69
2021	311X2_12	6.51	6.17	0.00	0.00	Henniker	Bedford	6.51	6.17
2021	322X54_12	0.83	0.83	0.00	0.00	Bedford	Bedford	0.83	0.83
2021	13W1_12	7.25	7.25	0.00	0.00	Manchester	Bedford	7.25	7.25
2021	311X8_12	4.38	4.38	0.00	0.00	Henniker	Bedford	4.38	4.38
2021	311_12	0.00	9.80	0.00	0.00	Henniker		0.00	9.80
2021	360X4_12	3.02	2.51	0.00	0.00	Goffstown	Bedford	3.02	2.51
2021	311X6_12	7.88	5.45	0.00	0.00	Henniker	Bedford	7.88	5.45
2021	387_12	1.50	1.50	0.00	0.00	Manchester	Bedford	1.50	1.50
2021	312X_12	1.21	1.21	0.00	0.00	Manchester	Bedford	1.21	1.21
2021	312X4_12	0.01	0.01	0.00	0.00	Manchester	Bedford	0.01	0.01
2021	3108	59.60	0.00	0.00	0.00	Weare	Bedford	59.60	0.00
2021	322X14_12	2.21	2.21	0.00	0.00	Goffstown	Bedford	2.21	2.21
2021	322X15_12	0.02	0.02	0.00	0.00	Goffstown	Bedford	0.02	0.02
2021	328X8_12	0.21	0.21	0.00	0.00	Goffstown	Bedford	0.21	0.21
2021	328X13_12	0.19	0.19	0.00	0.00	Goffstown	Bedford	0.19	0.19
2021	360X10_12	1.10	1.10	0.00	0.00	Goffstown	Bedford	1.10	1.10
2021	311X4_12	0.19	0.19	0.00	0.00	Henniker	Bedford	0.19	0.19
2021	3271x1_12	52.39	51.71	6.32	5.65	Dunbarton	Bedford	58.71	57.36
2021	328x9_12	16.71	16.71	3.61	3.61	Goffstown	Bedford	20.32	20.32
2021	37w1_12	48.87	48.87	5.12	5.12	Hopkinton	Bedford	53.99	53.99
2021	335x12	0.93	0.12	0.00	0.81	Hooksett	Bedford	0.93	0.93
2021	34W18	24.88	0.00	0.00	0.00	Epsom	Hooksett	24.88	0.00
2021	393X20	12.39	11.75	0.00	0.64	Londonderry	Hooksett	12.39	12.39
2021	318X2_11	30.28	0.00	0.00	0.00	Pembroke	Hooksett	30.28	0.00
2021	29H1_11	1.68	1.68	0.48	0.48	Manchester	Hooksett	2.16	2.16
2021	3750	0.00	1.40	0.00	0.00	Merrimack	Hooksett	0.00	1.40
2021	14H4_11	3.29	3.29	0.00	0.00	Manchester	Hooksett	3.29	3.29
2021	393_11	0.00	4.48	0.00	0.00	Manchester	Hooksett	0.00	4.48
2021	14H8_11	2.79	2.79	0.00	0.00	Manchester	Hooksett	2.79	2.79
2021	335_11	0.00	2.30	0.00	0.00	Bow	Hooksett	0.00	2.30
2021	3614	0.00	0.33	0.00	0.00	Hooksett	Hooksett	0.00	0.33
2021	23W2_11	1.74	1.74	0.00	0.00	Manchester	Hooksett	1.74	1.74
2021	334R	0.00	3.55	0.00	0.00	Hooksett	Hooksett	0.00	3.55
2021	318X2_11	28.58	28.58	0.00	0.00	Pembroke	Hooksett	28.58	28.58
2021	387_11	0.00	0.57	0.00	0.00	Manchester	Hooksett	0.00	0.57

**Table 4. 2021 Vegetation Management Program Actual vs. Plan - Scheduled Maintenance Trimming (SMT) and Maintenance Enhanced Tree Trimming (METT)  
Central Region (Bedford and Hooksett Area Work Centers)**

<b>Trim Year</b>	<b>Circuit</b>	<b>SMT Plan</b>	<b>SMT Actual</b>	<b>METT Plan</b>	<b>METT Actual</b>	<b>Primary Town</b>	<b>AWC</b>	<b>Plan Total Circuit Miles</b>	<b>Actual Total Circuit Miles</b>
2021	14H7_11	2.59	2.59	0.00	0.00	Manchester	Hooksett	2.59	2.59
<b>Total</b>		<b>433.13</b>	<b>346.94</b>	<b>24.44</b>	<b>26.03</b>			<b>457.57</b>	<b>372.97</b>

**Table 5. 2021 Vegetation Management Program Actual vs. Plan - Scheduled Maintenance Trimming (SMT) and Maintenance Enhanced Tree Trimming (METT)  
Western Region (Keene and Newport Area Work Centers)**

Trim Year	Circuit	SMT Plan	SMT Actual	METT Plan	METT Actual	Primary Town	AWC	Plan Total Circuit Miles	Actual Total Circuit Miles
2021	3139x	128.79	123.18	14.23	14.23	Chesterfield	Keene	143.02	137.41
2021	28W1	42.08	42.08	6.10	6.10	Jaffrey	Keene	48.18	48.18
2021	3155x9	38.75	38.75	8.97	8.97	Temple	Keene	47.72	47.72
2021	3155X4	77.70	77.70	6.24	6.24	New Ipswich	Keene	83.94	83.94
2021	51W1	32.86	32.86	0.00	0.00	Dublin	Keene	32.86	32.86
2021	313X3	8.50	8.50	0.00	0.00	Jaffrey	Keene	8.50	8.5
2021	313X8	3.19	3.19	0.00	0.00	Jaffrey	Keene	3.19	3.19
2021	382X2	15.59	15.59	0.00	0.00	Jaffrey	Keene	15.59	15.59
2021	382	0.00	8.60	0.00	0.00	Troy	Keene	0.00	8.6
2021	3120x4	65.77	60.19	8.20	8.20	Rindge	Keene	73.97	68.39
2021	316	149.05	158.85	11.21	11.21	New London	Newport	160.26	170.06
2021	382x3	28.85	28.85	4.72	4.72	Jeffrey	Keene	33.57	33.57
2021	3140X1	32.91	32.91	0.00	0.00	Stoddard	Keene	32.91	32.91
2021	3140X3	14.54	14.54	0.00	0.00	Stoddard	Keene	14.54	14.54
<b>Total</b>		<b>638.58</b>	<b>645.79</b>	<b>59.67</b>	<b>59.67</b>			<b>698.25</b>	<b>705.46</b>

**Table 6. 2021 Vegetation Management Program Actual vs. Plan - Scheduled Maintenance Trimming (SMT) and Maintenance Enhanced Tree Trimming (METT)  
Northern Region (Berlin, Lancaster and Tilton Area Work Centers)**

Trim Year	Circuit	SMT Plan	SMT Actual	METT Plan	METT Actual	Primary Town	AWC	Plan Total Circuit Miles	Actual Total Circuit Miles
2021	348X19	2.81	2.81	0.67	0.67	Stark	Lancaster	3.48	3.48
2021	348X20	15.66	15.66	4.40	4.40	Landaff	Lancaster	20.06	20.06
2021	348x2	0.00	1.15	0.00	0.00	Sugar Hill	Lancaster	0.00	1.15
2021	348X4	9.92	9.92	0.00	0.00	Bethlehem	Lancaster	9.92	9.92
2021	384x1	32.45	32.45	0.00	0.00	Stark	Lancaster	32.45	32.45
2021	355X	0.00	3.76	0.00	0.00	Colebrook	Lancaster	0.00	3.76
2021	355X10	109.13	105.51	10.07	10.07	Pittsburg	Lancaster	119.20	115.58
2021	3525X5	39.41	39.41	20.07	20.07	Errol	Berlin	59.48	59.48
2021	3525X5G	0.18	0.18	0.00	0.00	Wentworths Location	Berlin	0.18	0.18
2021	3525X	12.46	7.49	0.00	0.00	Berlin	Berlin	12.46	7.49
2021	3525X1	3.16	3.16	2.80	2.80	Berlin	Berlin	5.96	5.96
2021	3525X2	13.33	13.33	7.14	7.14	Milan	Berlin	20.47	20.47
2021	3525X3	0.12	0.12	2.65	2.65	Dummer-Milan	Berlin	2.77	2.77
2021	3525X6	1.69	1.69	0.82	0.82	Berlin	Berlin	2.51	2.51
2021	3114W1	72.09	70.92	0.00	1.17	Hebron	Tilton	72.09	72.09
2021	345X1	22.37	22.37	0.00	0.00	New Hampton	Tilton	22.37	22.37
2021	10W1	3.20	3.20	5.10	5.10	Laconia	Tilton	8.30	8.30
2021	318	0.00	4.78	0.00	0.00	Concord	Tilton	0.00	4.78
2021	2W1	18.50	18.50	5.57	5.57	Tilton-Belmont	Tilton	24.07	24.07
2021	2W2	42.29	42.29	5.33	5.33	Sanbornton	Tilton	47.62	47.62
2021	3025	0.00	4.15	0.00	0.00	Concord	Tilton	0.00	4.15
2021	310X3	12.57	12.57	4.86	4.86	Gilford	Tilton	17.43	17.43
2021	319	0.00	13.14	0.00	0.00	Loudon	Tilton	0.00	13.14
2021	310X4	0.04	0.04	0.00	0.00	Gilford	Tilton	0.04	0.04
2021	338	0.00	12.00	0.00	0.00	Moultonborough	Tilton	0.00	12.00
2021	310X5	4.11	4.11	0.00	0.00	Gilford	Tilton	4.11	4.11
2021	337X6	4.34	4.34	0.00	0.00	Franklin	Tilton	4.34	4.34
2021	345X4	0.88	0.88	0.00	0.00	Laconia	Tilton	0.88	0.88
2021	3548X11	9.59	9.59	0.00	0.00	Tilton	Tilton	9.59	9.59
2021	3548X9	8.55	8.55	0.00	0.00	Tilton	Tilton	8.55	8.55
2021	49W2	5.34	5.34	0.00	0.00	New Hampton	Tilton	5.34	5.34
2021	3525X	0.00	2.50	0.00	0.00	Berlin	Berlin	0.00	2.50
2021	3525x4	27.81	0.00	1.16	0.00	Berlin	Berlin	28.97	0.00
2021	9W1	6.69	6.69	5.36	5.36	Laconia	Tilton	12.05	12.05
<b>Total</b>		<b>478.69</b>	<b>482.6</b>	<b>76.00</b>	<b>76.01</b>			<b>554.69</b>	<b>558.61</b>

TABLE 7 - MidCycle 2021							
Division	AWC	Town	Circuit	Line Cost	Planned	Actual	Voltage (kV)
Eastern	Rochester	Dover	38W2	\$1,340	0.0	0.17	34.5
Eastern	Rochester	Dover	399X1	\$1,800	0.0	0.22	34.5
Eastern	Epping	Durham	3162	\$1,372	0.0	0.17	34.5
Eastern	Epping	Durham	3162X1	\$10,834	0.0	1.35	34.5
Eastern	Epping	Durham	377X1	\$5,094	0.0	0.64	34.5
Eastern	Rochester	Farmington	362X1	\$1,497	0.0	0.19	34.5
Eastern	Epping	Madbury	38W2	\$529	0.0	0.07	34.5
			<b>Total</b>	<b>\$22,467</b>	<b>0.0</b>	<b>2.81</b>	

TABLE 8 - Hot Spot Trim 2021							
Division	AWC	Town	Circuit	Line Cost	Planned	Actual	Voltage (kV)
Central	Bedford	Bedford	360X1	\$449	0.0	0.06	34.5
Central	Bedford	Bedford	3W2	\$715	0.0	0.09	34.5
Northern	Tilton	Danbury	3173X1	\$1,955	0.0	0.24	34.5
Central	Bedford	Deering	360X1	\$1,375	0.0	0.17	34.5
Southern	Derry	Derry	32W4	\$3,034	0.0	0.38	34.5
Eastern	Epping	Durham	377X1	\$3,166	0.0	0.40	34.5
Eastern	Epping	Durham	377X2	\$306	0.0	0.04	34.5
Eastern	Epping	Epping	3103X1	\$1,214	0.0	0.15	34.5
Eastern	Epping	Epping	377X1	\$2,984	0.0	0.37	34.5
Central	Bedford	Goffstown	322X1	\$179	0.0	0.02	34.5
Central	Bedford	Goffstown	360X1	\$597	0.0	0.07	34.5
Central	Hooksett	Hooksett	3615X3	\$2,135	0.0	0.27	34.5
Central	Bedford	Hopkinton	37W1	\$60	0.0	0.01	34.5
Eastern	Epping	Madbury	38W2	\$2,462	0.0	0.31	34.5
Central	Hooksett	Manchester	325	\$1,067	0.0	0.13	34.5
Central	Bedford	Milford	23X5	\$3,697	0.0	0.46	34.5
Southern	Nashua	Nashua	3020X	\$1,635	0.0	0.20	34.5
Southern	Nashua	Nashua	3154X2	\$312	0.0	0.04	34.5
Southern	Nashua	Nashua	3168X	\$1,180	0.0	0.15	34.5
Eastern	Epping	Newmarket	3191X6	\$289	0.0	0.04	34.5
Eastern	Epping	Raymond	3115X	\$1,344	0.0	0.17	34.5
Eastern	Epping	Raymond	3115X7	\$1,298	0.0	0.16	34.5
			<b>Total</b>	<b>\$31,452</b>	<b>0.00</b>	<b>3.93</b>	

**Table 9. 2021 Vegetation Management Program Actual vs. Plan - Right of Way (ROW) Maintenance**

Division	AWC	Town(s)	ROW Number	ROW Name/Circuit	Planned Acreage	Actual Acreage	Plan Side Trimming (miles)	Actual Side Trimming (miles)	Voltage (kV)	ROW Width (Feet)	Maint. In Transmission (%)
Southern	Nashua	Nashua	353	353	35.03	35.03	2.87	2.87	34.5kv	100	0%
Northern	Tilton	Loudon Concord	319	319	108.85	108.85	8.90	8.90	34.5kv	100	0%
Eastern	Rochester	Rochester Farmington	3174	3174	50.30	50.30	4.12	4.12	34.5kv	100	0%
Central	Bedford	Goffstown	3271	3271	60.60	60.60	4.97	5.00	34.5kv	100	0%
Eastern	Rochester	Dover	32	32	114.04	129.94	9.35	9.35	34.5kv	100	0%
Eastern	Rochester	Rochester Farmington	340	340	33.08	13.90	2.71	1.14	34.5kv	100	0%
Eastern	Rochester	Somersworth	122/115	122/115	0.00	10.74	0.00	0.88	34.5kv	100	0%
Central	Hooksett	Hooksett	355X56	355X56	0.00	5.55	0.00	0.45	34.5kv	100	0%
Eastern	Epping	Littleworth sub	3425	3425	33.33	33.33	2.73	2.73	34.5kv	100	0%
Eastern	Rochester	Somersworth	371D	371D	26.77	26.77	2.19	2.19	34.5kv	100	0%
Eastern	Epping	Durham to Epping	377	377	0.00	158.78	0.00	13.10	34.5kv	100	0%
Eastern	Epping	Raymond	3115	3115	0.00	33.33	0.00	2.75	34.5kv	100	0%
Central	Hooksett	Hooksett	334G	334G	0.00	2.44	0.00	0.20	34.5kv	100	0%
Eastern	Portsmouth	Portsmouth	3111	3111	0.00	12.12	0.00	1.00	34.5kv	100	0%
Central	Bedford	Bedford	3151	3151	0.00	58.78	0.00	4.85	34.5kv	100	0%
Eastern	Portsmouth	Rye Portsmouth	3102	3102	0.00	38.80	0.00	3.20	34.5kv	100	0%
Eastern	Portsmouth	Portsmouth	339	339	0.00	12.12	0.00	1.00	34.5kv	100	0%
Northern	Lancaster	Franconia	348X1	348X1	24.24	24.24	1.99	2.00	34.5kv	100	0%
Northern	Lancaster	Bethlehem	348X3	348X3	117.45	113.30	9.62	9.69	34.5kv	100	0%
Western	Keene	Keene	W110	W110	0.00	5.50	0.00	0.45	34.5kv	100	0%
Northern	Tilton	Laconia	310	310	0.00	83.63	0.00	6.90	34.5kv	100	0%
Northern	Tilton	Plymouth Rumney	343	343	0.00	90.49	0.00	8.70	34.5kv	100	0%
Northern	Tilton	Laconia	368	368	0.00	8.48	0.00	0.70	34.5kv	100	0%
Eastern	Rochester	Rochester	3228	3228	68.60	68.60	5.62	5.62	34.5kv	100	0%
Eastern	Rochester	Dover	3148x3	3148x3	6.50	6.50	0.53	0.53	34.5kv	100	0%
Northern	Berlin	Gorham	350	350	44.85	44.85	3.68	3.68	34.5kv	100	0%
Northern	Berlin	Gorham	351/352	351/352	21.33	21.33	1.75	1.76	34.5kv	100	0%
Western	Newport	Claremont	61w2	61w2	8.48	8.48	0.70	0.70	34.5kv	100	0%
Western	Newport	Claremont	4411	4411	2.42	2.42	0.20	0.20	34.5kv	100	0%
Western	Newport	Claremont	4181	4181	5.70	5.70	0.47	0.47	34.5kv	100	0%
Northern	Tilton	Tilton	3216	3216	32.24	32.24	2.64	2.66	34.5kv	100	0%
Central	Bedford	Concord Warner	317	317	113.09	113.09	9.34	9.33	34.5kv	100	0%
Northern	Tilton	Tuftonboro	390	390	56.96	23.67	4.67	1.94	34.5kv	100	0%
<b>Total</b>					<b>963.86</b>	<b>1,443.90</b>	<b>79.05</b>	<b>119.06</b>			

**Table 10. 2021 Vegetation Management Program Actual vs. Plan - Right of Way (ROW) Full Width Clearing**

<u>Division</u>	<u>AWC</u>	<u>Feeder/Circuit</u>	<u>Scheduled Miles</u>	<u>Actual Miles</u>	<u>ROW Width (Feet)</u>	<u>Primary Town</u>	<u>VOLTAGE (KV)</u>	<u>Percent Distribution</u>
Northern	Lancaster	376	0.00	0.50	100	Northumberland	34.5	100%
Northern	Lancaster	351X1	1.10	1.10	100	Whitefield	34.5	100%
Central	Bedford	3410	0.00	0.50	100	Warner	34.5	100%
Western	Keene	3178	5.02	4.80	100	Winchester	34.5	100%
Central	Hooksett	334R	0.00	6.80	100	Bow/Hooksett	34.5	100%
Southern	Nashua	3110	0.00	2.70	100	Nashua	34.5	100%
Western	Keene	313X4	0.00	7.50	100	Peterborough Dublin	34.5	100%
Northern	Berlin	350X	0.00	3.10	100	Gorham	34.5	100%
Central	Bedford	3271	0.00	1.68	100	Goffstown	34.5	100%
Southern	Nashua	329	0.00	3.00	100	Hollis Nashua	34.5	100%
<b>Total FWC Miles</b>			<b>6.12</b>	<b>31.68</b>				

Table 11. 2021 Vegetation Management Program Plan - Enhanced Tree Trimming (ETT)							
Division	AWC	Circuit	Planned Miles	Actual Miles	Town	Tree SAIDI	Tree SAIFI
Central	Bedford	317X1	1.53	1.53	Warner	0	0.06
Central	Bedford	311X5	2.10	2.10	Henniker	0.03	0.12
Central	Bedford	3151X49	0.55	0.55	Bedford	-	-
Northern	Berlin	351X8	1.22	1.22	Gorham	-	-
Eastern	Chocorua	347B	2.14	2.14	Madison	-	-
Eastern	Chocorua	347A	0.99	0.99	Conway	-	-
Eastern	Chocorua	333X	0.95	0.95	Conway	0.28	0.94
Eastern	Epping	3152X1	1.64	0.00	Durham	-	-
Eastern	Epping	380X2	0.66	0.00	Durham	-	-
Eastern	Epping	380X3	0.36	0.00	Durham	-	-
Eastern	Epping	63W1	0.74	0.74	Northwood	0.28	0.63
Eastern	Epping	3191X1B	1.38	1.38	Newmarket	0	0.02
Eastern	Epping	377X16	1.88	1.88	Epping	0.07	0.87
Eastern	Epping	3115x7	1.20	1.20	Raymond	0.02	0.21
Eastern	Epping	3103	3.16	3.16	Brentwood	0.11	0.69
Eastern	Epping	49W1	1.91	1.91	Northwood	0.11	2.68
Eastern	Epping	3137X8	0.52	0.52	Northwood	0.02	0.27
Eastern	Epping	3191X6	1.12	1.12	Newmarket	0.02	0.54
Eastern	Epping	3191X8	0.52	0.52	Newmarket	-	-
Eastern	Epping	377X5	0.73	0.73	Raymond	-	-
Eastern	Epping	377X11	1.00	1.00	Epping	0	0.01
Eastern	Epping	3115X11	0.77	0.77	Raymond	-	-
Central	Hooksett	318X2	1.70	1.70	Pembroke	0.24	1.21
Central	Hooksett	334X18	2.29	2.26	Pembroke	0.02	0.11
Central	Hooksett	34W18	1.51	4.23	Pembroke	0.03	0.11
Central	Hooksett	29H2	0.65	0.65	Manchester	0.02	0.05
Western	Keene	53H1	0.53	0.00	Harrisville	-	-
Western	Keene	51W1	1.15	1.15	Dublin	0.16	1.04
Northern	Lancaster	348X4	1.27	1.27	Bethlehem	0.03	1.2
Northern	Lancaster	376X1	1.88	1.88	Whitefield	0.01	0.25
Northern	Lancaster	351X1	0.85	0.85	Whitefield	-	-
Southern	Nashua	314X46	0.60	0.60	Wilton	0	0.29
Southern	Nashua	3144X3	0.81	0.81	Hudson	0.03	0.11
Southern	Nashua	40W1	1.26	1.26	Nashua	0	0.01
Western	Newport	42x1	0.00	0.95	New London	-	-
Western	Newport	48W1	0.77	0.77	New London	0.76	2.06
Eastern	Rochester	3148X3	0.50	0.50	Dover	0.25	1.07
Eastern	Rochester	399X8	0.74	0.00	Dover	-	-
Eastern	Rochester	38W1	2.20	0.00	Dover	-	-
Eastern	Rochester	54H2	1.10	0.00	Dover	-	-
Northern	Tilton	30W2	2.48	2.48	Chichester	0.36	1.57
Northern	Tilton	337X6	0.22	0.00	Franklin	-	-
Northern	Tilton	3548X11	0.24	0.00	Tilton	-	-
Northern	Tilton	39H1	1.43	0.00	Franklin	-	-
Northern	Tilton	345x1	0.00	0.61	New Hampton	0.02	0.23
Northern	Tilton	398X3	3.74	3.74	Belmont	0.03	0.1
Northern	Tilton	337X7	1.83	0.00	Franklin	-	-
Northern	Tilton	3157X2	0.72	0.00	Milton	-	-
Northern	Tilton	371X30	0.89	0.00	Somersworth	-	-
Northern	Tilton	337X10	1.22	0.00	Tilton	-	-
Central	Bedford	18w3	0.89	0.89	Goffstown	-	-
	<b>Total</b>		<b>60.54</b>	<b>51.01</b>			

**Table 12. 2021 Vegetation Management Program Actual vs. Plan - Hazard Tree/Enhanced Tree Removal**

Division	AWC	Circuit	Plan Number of Trees	Actual Number of Trees	Town
Central	Hooksett			1,596	
Central	Bedford			6,034	
Southern	Nashua			6,235	
Southern	Derry			2,131	
Western	Keene			5,533	
Western	Newport			605	
Northern	Tilton			2,594	
Northern	Chocorua			770	
Eastern	Rochester			1,622	
Eastern	Portsmouth			1,277	
Eastern	Epping			721	
Northern	Lancaster			1,270	
Northern	Berlin			623	
<b>Total</b>			<b><u>0</u></b>	<b><u>31,011</u></b>	

**Public Service Company of New Hampshire d/b/a Eversource Energy  
2022 Vegetation Management Plan for review by the Department of Energy**

November 15, 2021

Consistent with the terms of the Settlement Agreement in Docket No. DE 19-057, Public Service Company of New Hampshire d/b/a Eversource Energy (“Eversource” or the “Company”) Is providing the vegetation management plan for calendar year 2022 for review by and discussion with the Department of Energy staff.<sup>1</sup>

As required by Section 6.2 of the Settlement Agreement, in November of each year Eversource is to file a proposed vegetation management plan setting out the proposed vegetation management work for the coming calendar year. That plan filing shall include the following:

- A. A summary of budgeted costs by program (i.e. ETT/Hazard Tree Removal, SMT and Full-Width ROW Clearing).
- B. Detailed information on each program as follows:
  - i. ETT/Hazard Tree Removal: Town; Circuit Number; Total Circuit Miles; Scheduled Circuit Miles; and Circuit Ranking by SAIDI and SAIFI (Tree Related only).
  - ii. SMT (Scheduled Maintenance Trimming, Mid-Cycle Trimming, Side Trimming and Customer Request Work, Hot Spot / Trouble Work, and Maintenance ETT): Town; Circuit Number; Total Circuit Miles; and Scheduled Circuit Miles.
  - iii. SMT (ROW Maintenance Mowing and Side Trimming): ROW Number; ROW Name; Voltage; and Total Acreage; and the percentage of the clearing attributable to distribution if transmission ROW.
  - iv. ROW Clearing: ROW Number; ROW Name; Voltage; and Total Miles; ROW Width; and the percentage of the clearing attributable to distribution if transmission ROW.

Included in the narrative below is a presentation of the proposed plan and estimated budgets using information known at this time. The detailed information on each program is provided at the end of the narrative and reflects the scheduled miles for the Company to maintain a 5-year maintenance cycle, in line with the 5-year cycle pruning requirements of the Commission’s rule Puc 307.10. This plan is also based on the current pricing as agreed upon in the 2021-2024 contract with Eversource’s vendors. Additionally, in the detailed plan at the end of this report the Company has included the relevant circuits and miles planned for 2022. The Company looks forward to discussing this plan with the Department of Energy.

**2022 Projected Budget:**

The table below provides a summary of the 2022 planned vegetation management program. The \$36 million budget is a gross budget and does not include any reimbursements received from telephone company providers related to scheduled maintenance trim and hazard tree removal activities.

<sup>1</sup> In light of the transfer of the much of the Commission’s personnel and responsibilities to the Department of Energy as of July 1, 2021, Eversource is providing to this plan to the Department Staff instead of the Commission’s staff.

<b>Eversource 2022 Planned Vegetation Management Activities</b>	
<u>VM Activity</u>	<u>Cost</u>
Scheduled Maintenance Trim	\$21,164,400
METT	\$2,133,720
Mid Cycle	\$250,000
Customer Work	\$150,000
Hot Spot Work	\$200,000
Police/Flagging	\$100,000
Sub Transmission (Mowing/Side Trim)	\$850,000
<b><u>Distribution SMT Total</u></b>	<b>\$24,848,120</b>
Full Width Clearing	\$1,000,000
Hazard Tree Removal	\$9,000,000
Enhanced Tree Trimming	\$1,150,000
<b><u>Vegetation Management Program Total</u></b>	<b>\$35,998,120</b>

**Scheduled Maintenance Trimming (“SMT”) Program**

The Company’s SMT cycle is based on a 12,000-mile distribution overhead system. The Company’s plan for 2022 is to have tree contractors perform SMT on 2,304.25 miles and the budgets were constructed around that plan. The table immediately below shows the proposed SMT trimming dollars and miles. The other programs will each have a respective table.

<b><u>Eversource SMT Miles</u></b>		
<u>Total Miles = 2,304.25</u>	<u>Region</u>	<u>2022 Miles</u>
<b>Budget \$21,164,400</b>	SOUTHERN	530.69
	CENTRAL	462.17
	WESTERN	593.25
	EASTERN	427.25
	NORTHERN	290.89
	<b><u>Total Annual Miles</u></b>	<b><u>2,304.25</u></b>

**Maintenance Enhanced Tree Trimming (“METT”) Program**

METT is maintenance trimming performed on miles that were previously subject to Enhanced Tree Trimming (“ETT”). The amount of METT changes each year based on the circuit schedule. As with the SMT, this work was also part of the 4-year contract that was put out to bid in 2020 and the budget and miles reflect the current pricing.

<b><u>Eversource METT Miles</u></b>		
	-	-
<b><u>Total Miles = 248.6</u></b>	<b><u>Region</u></b>	<b><u>2022 Miles</u></b>
<b>Budget \$2,133,720</b>	<b>SOUTHERN</b>	83.63
	<b>CENTRAL</b>	46.26
	<b>WESTERN</b>	51.14
	<b>EASTERN</b>	44.42
	<b>NORTHERN</b>	23.18
	<b><u>Total Annual Miles</u></b>	<b><u>248.6</u></b>

**Mid-Cycle Work**

Mid-cycle work is additional work completed on a circuit in between the standard cycle under the SMT. This can include vine removal and “cycle buster” type trees. This program is an emergent one and the budget is minimal as the Company is prioritizing the SMT cycle work with the funding available. If the need arises to address circuit miles with this application, the Company will work within the allocated budget to redistribute these funds.

<b><u>Eversource Mid-cycle Miles</u></b>		
	-	-
<b><u>Total Miles = TBD</u></b>	<b><u>Region</u></b>	<b><u>2022 Miles</u></b>
<b>Budget \$250,000</b>	<b>SOUTHERN</b>	
	<b>CENTRAL</b>	
	<b>WESTERN</b>	
	<b>EASTERN</b>	
	<b>NORTHERN</b>	
	<b><u>Total Annual Miles</u></b>	<b><u>0</u></b>

### Customer Request Work

Customer Request work is generated or instigated to address an issue identified by a customer rather than as part of the scheduled or planned circuit miles. Most often, these are service trimming requests. The amount of Customer Request work changes every year. Eversource has encouraged customers through social media and the Company’s website to consider hiring professionals to handle their tree concerns. However, due to the prevalence of invasive insects and diseases in New Hampshire, the Company sometimes learns about outbreaks and problematic trees or groups of trees from customers. The work needed to mitigate the issues posed by these trees is often performed by Eversource’s contractors. Eversource has estimated \$150,000 of expense related to customer work for 2022.

<b><u>Eversource Customer Work</u></b>		
<b><u>Total Miles = TBD</u></b>	<b><u>Region</u></b>	<b><u>2022 Miles</u></b>
<b>Budget \$150,000</b>	SOUTHERN	
	CENTRAL	
	WESTERN	
	EASTERN	
	NORTHERN	
	<b><u>Total Annual Miles</u></b>	<b><u>TBD</u></b>

### Hot Spot Program

The Hot Spot program addresses tree growth in between cycles. The Company has not allocated funds for this program, and any proposed circuit miles have not yet been identified. Eversource has estimated \$200,000 of expense related to hot spot work for 2022.

<b><u>Eversource Hot Spot Work</u></b>		
<b><u>Total Miles = TBD</u></b>	<b><u>Region</u></b>	<b><u>2022 Miles</u></b>
<b>Budget \$200,000</b>	SOUTHERN	
	CENTRAL	
	WESTERN	
	EASTERN	
	NORTHERN	
	<b><u>Total Annual Miles</u></b>	<b><u>TBD</u></b>

**Police/Flagging Program**

Police and flagging expenses are typically included in the cost of the individual programs and paid for by the contractors. However, there are times where emergent police and flagging costs are incurred. The Company has estimated \$100,000 in funding for this work. Specific circuit miles are not relevant to these expenditures.

<b><u>Eversource Police/Flagging</u></b>		
<b><u>Total Miles = N/A</u></b>	<b><u>Region</u></b>	<b><u>2022 Miles</u></b>
<b>Budget \$100,000</b>	<b>SOUTHERN</b>	
	<b>CENTRAL</b>	
	<b>WESTERN</b>	
	<b>EASTERN</b>	
	<b>NORTHERN</b>	
	<b><u>Total Annual Miles</u></b>	<b><u>N/A</u></b>

**ROW Maintenance**

The ROW maintenance program includes mowing and side trimming. The acres listed will be mowed. During the Quality Control inspection of the mowing, any tree limbs that are within 20 feet of the line will be noted and a crew will be sent to remove the limb(s).

<b><u>Eversource ROW Maintenance</u></b>		
<b><u>Total Acres = 1,226.19</u></b>	<b><u>Region</u></b>	<b><u>2022 Acres</u></b>
<b>Budget \$850,000</b>	<b>SOUTHERN</b>	22.78
	<b>CENTRAL</b>	144.43
	<b>WESTERN</b>	123.32
	<b>EASTERN</b>	131.84
	<b>NORTHERN</b>	803.82
	<b><u>Total Annual Acres</u></b>	<b><u>1,226.19</u></b>

**Full Width Clearing of ROW**

This program identifies ROWs where enhanced clearing will benefit customers and workers. This work is competitively bid annually. The tree contractor clears brush and trees to the full easement width. At the edge of the easement, the bordering trees are trimmed from ground to sky. The Company’s arborists work closely with abutting property owners to communicate the work needed.

<b><u>Eversource Full Width ROW</u></b>	<b><u>Region</u></b>	<b><u>2022 Miles</u></b>
<b><u>Total Miles = 10.32</u></b>	<b>SOUTHERN</b>	
<b>Budget \$1,000,000</b>	<b>CENTRAL</b>	2.92
	<b>WESTERN</b>	
	<b>EASTERN</b>	
	<b>NORTHERN</b>	7.4
	<b>Total Annual Miles</b>	<b>10.32</b>

**ETT Program**

The Company has identified 56.26 miles of three phase circuits for ETT in 2022. These miles will be competitively bid annually. If the pricing allows for additional miles to be done, the Company will review the circuit list and identify more miles.

<b><u>Eversource ETT Miles</u></b>		
	<b><u>Region</u></b>	<b><u>2022 Miles</u></b>
<b><u>Total Miles = 56.26</u></b>	<b>SOUTHERN</b>	2.06
<b>Budget \$1,150,000</b>	<b>CENTRAL</b>	8.47
	<b>WESTERN</b>	18.36
	<b>EASTERN</b>	20.69
	<b>NORTHERN</b>	6.68
	<b>Total Annual Miles</b>	<b>56.26</b>

## Hazard Tree Program

The Company profiles the SMT circuits for hazard trees. Hazard trees are trees that should be removed rather than trimmed due to their potential to impact the electric system. It is a best practice to remove the dead, diseased and dying trees while trimming the circuit. The customers on whose property the hazard trees grow, and who, therefore, own the hazard trees, are engaged in a conversation for both programs. The total number of trees removed will be compiled monthly.

<b>Eversource Hazard Tree Miles</b>		
<b>Total Miles = 2,552.88</b>	<b>Region</b>	<b>2022 Miles</b>
<b>Budget \$9,000,000</b>	<b>SOUTHERN</b>	614.32
	<b>CENTRAL</b>	508.43
	<b>WESTERN</b>	644.39
	<b>EASTERN</b>	471.67
	<b>NORTHERN</b>	314.07
	<b>Total Annual Miles</b>	<b>2,552.88</b>

### The work force:

While Eversource currently has experienced professionals managing its Vegetation Management programs there are some longer-term concerns with the work force. There are very few programs in high school or college to attract students to Arboriculture/Forestry. It is a difficult job performed in all types of weather, usually aloft. This has had a direct impact on the work the Company does and the availability of trained individuals to do it, and, as has been seen in recent bids, has had a material impact on costs.

As noted above, the Company commenced a 4-year contract for SMT in NH and the pricing was dramatically higher than expected. Eversource’s procurement agents worked diligently with the tree contractors to refine their bid prices. However, the final pricing in this competitive process required the Company to adjust the budget for SMT and METT. This cost does not include ROW mowing nor the emergent programs that are also included in the existing budget and plans for 2022.

Additionally, one of Eversource’s contractors has alerted the Company that it cannot complete all of the awarded 2022 miles due to limited crew resources. This has required the Company to put the Nashua AWC SMT and METT miles back out to bid. The bids are due back in mid-November 2021. The final pricing for these miles (266) will determine if further redistribution of budgeted dollars is necessary.

Of additional note, Eversource continued to look for solutions with two newer pieces of equipment in 2021. Three mechanical trimmers (aka Jaraff, or SkyTrim) were utilized for selected miles of SMT. These units consist of a hydraulic boom mounted on a large tractor. At the end of the boom is an articulating circular saw. This tool works well in the right application, but it will probably not replace human occupied bucket trucks. The other new tool was a Rotor Blade helicopter unit. The helicopter has 10 saws attached to the helicopter and the unit can be used to “hedge/side trim” difficult-to-access ROW lines. Both units have a future in New Hampshire as “work force multipliers” and the Company will continue to explore other tools as they become available to improve vegetation management in New Hampshire.

In 2021 the Company contracted with tree companies that have not previously worked for Eversource in New Hampshire. This was necessary due to the lack of tree crew resources available in the Northeast. The additional companies are Nelson Tree Service in Dayton, OH, Stanley Tree Service in Smithfield, RI and Wright Tree Service in West Des Moines, IA. The Company also brought in a specialized tree removal team from Distinctive Tree Care in South Windsor, CT to assist in removing hazardous Emerald Ash Borer infected trees.

The Company will continue to look for tree companies with the crew resources and skills to work on our system. There are emerging developments in equipment that can reduce the amount of workers needed to complete a tree task, and as they become available the Company will ask to be included in any field testing or trials of these tools to help assess their safety, efficiency and effectiveness. Vegetation Management is a vitally important component of safe, reliable electric service and the cost to perform this work continues to increase.

## Eversource 2022 Planned Vegetation Management Activities Detail

<b>Eversource 2022 Vegetation Management Activities Budget Summary</b>	
<b>VM Activity</b>	<b>Cost</b>
Scheduled Maintenance Trim	\$21,164,400
METT	\$2,133,720
Mid Cycle	\$250,000
Customer Work	\$150,000
Hot Spot Work	\$200,000
Police/Flagging	\$100,000
Sub Transmission (Mowing/Side Trim)	\$850,000
<b><u>Distribution SMT Total</u></b>	<b>\$24,848,120</b>
Full Width Clearing	\$1,000,000
Hazard Tree Removal	\$9,000,000
Enhanced Tree Trimming	\$1,150,000
<b><u>Vegetation Management Program Total</u></b>	<b>\$35,998,120</b>

### 2022 Scheduled Maintenance Trimming

AWC	TOWN	CIRCUIT	TOTAL CIRCUIT MILES	SMT MILES	METT MILES
EPPING	Newmarket	13H1_65	0.3	0.30	
EPPING	Newmarket	13H2_65	6.44	6.44	
EPPING	Raymond	3103X_65	20.65	20.65	
EPPING	Fremont	3103X1_65	49.01	38.30	10.71
EPPING	Raymond	3115X14_65	6.15	6.15	
EPPING	Lee	3137X10_65	14.62	14.62	
EPPING	Northwood	3137X80_65	8.81	8.81	
EPPING	Durham	3152X_65	18.51	18.51	
EPPING	Durham	3162X1_65	20.88	20.88	
EPPING	Durham	377X1_65	4.9	3.08	1.82
EPPING	Epping	377X11_65	4.12	4.12	
EPPING	Epping	377X12_65	0.39	0.39	
EPPING	Epping	377X13_65	0.29	0.29	
EPPING	Epping	377X14_65	0.12	0.12	
EPPING	Epping	377X17_65	0.04	0.04	
EPPING	Epping	377X18_65	0.59	0.59	
EPPING	Lee	377X29_65	4.12	4.12	
EPPING	Epping	377X3_65	16.52	16.52	
EPPING	Epping	377X7_65	16.94	9.51	7.43
EPPING	Durham	380X2_65	4.63	4.63	
PORTSMOUTH	Portsmouth	16W4_63	4.07	4.07	
PORTSMOUTH	Portsmouth	3102X1_63	0.52	0.52	
PORTSMOUTH	North Hampton	3112X3_63	4.77	4.77	
PORTSMOUTH	North Hampton	3172X2_63	5.06	5.06	
PORTSMOUTH	Greenland	3191X9_63	3.68	2.05	1.63
PORTSMOUTH	Portsmouth	339X3_63	0.95	0.95	
PORTSMOUTH	Portsmouth	339X8_63	2.92	1.46	1.46
PORTSMOUTH	Newington	3850X5_63	1.66	0.81	0.85
PORTSMOUTH	Portsmouth	58W1_63	2.35	0.54	1.81
ROCHESTER	Dover	3148X3_61	14.5	14.50	
ROCHESTER	New Durham	3174X4_61	34.99	28.14	6.85
ROCHESTER	Rochester	340X11_61	0.62	0.62	
ROCHESTER	New Durham	362X2_61	76.61	45.96	
ROCHESTER	Farmington	362X3_61	2.24	2.24	
ROCHESTER	Farmington	362X4_61	5.55	5.55	
ROCHESTER	Rochester	371X6_61	0.16	0.16	
ROCHESTER	Rochester	371X7_61	0.3	0.30	
ROCHESTER	Dover	38W2_61	32.06	27.19	4.87
ROCHESTER	Rochester	392X_61	2.81	2.81	
ROCHESTER	Strafford	392X1_61	65.63	61.68	3.95
ROCHESTER	Rollinsford	51H1_61	8.83	5.79	3.04
ROCHESTER	Dover	54H1_61	4.64	4.64	
ROCHESTER	Dover	54H2_61	6.02	6.02	
ROCHESTER	Milton	57W1_61	23.35	23.35	
NASHUA	Nashua	3154X1_21	22.62	21.47	1.15
NASHUA	Hollis	3154X2_21	38.99	34.76	4.23
NASHUA	Wilton	314X4_22	97.5	91.53	5.97
NASHUA	Nashua	40W1_21	11.21	11.21	
NASHUA	Merrimack	3159X_21	48.25	48.25	
NASHUA	Nashua	353X3_21	3.37	3.37	
NASHUA	Nashua	353X4_21	3.59	3.59	
NASHUA	Nashua	353X5_21	4.72	4.72	
NASHUA	Nashua	353X6_21	1.08	1.08	
NASHUA	Litchfield	383X2	8.91	8.91	
NASHUA	Hudson	389X8_21	1.17	1.17	
NASHUA	Hudson	3175X3_21	1.72	1.72	
NASHUA	Hudson	3175X5_21	1.89	1.89	
NASHUA	Nashua	3168X_21	21.19	21.19	
DERRY	Litchfield	383X1_21	0.02	0.02	
DERRY	Litchfield	383X2_21	8.97	8.93	
DERRY	Hudson	383X3_21	6.76	6.76	
DERRY	Derry	32W1_23	26.15		4.89
DERRY	Derry	32W3_23	10.31		4.65
DERRY	Derry	32W4_23	21.16		3.23
DERRY	Derry	32W5_23	31.88		5.33
DERRY	Derry	8W1_23	3.96	3.96	
DERRY	Derry	26W1_23	7.67	7.25	0.42

Region	SMT Miles	METT Miles	Total Miles
Eastern	427.25	44.42	471.67
Southern	530.69	83.63	614.32
Northern	290.89	23.18	314.07
Central	462.17	46.26	508.43
Western	593.25	51.14	644.39
<b>Total</b>	<b>2,304.25</b>	<b>248.63</b>	<b>2,552.88</b>

**2022 Scheduled Maintenance Trimming**

AWC	TOWN	CIRCUIT	TOTAL CIRCUIT MILES	SMT MILES	METT MILES
DERRY	Londonderry	365X_23	23.63		3.61
DERRY	Londonderry	3128X_23	83.79	76.38	7.41
DERRY	Derry	3141X_23	125.44	96.46	28.98
DERRY	Hampstead	3818_23	84.02	76.07	7.95
DERRY	Londonderry	3184X_23	32.05		5.81
BERLIN	Milan	3525X4_77	28.97	27.81	1.16
BERLIN	Gorham	350X1_77	4.11	2.86	1.25
BERLIN	Gorham	350X2_77	18.97	7.92	11.05
BERLIN	Shelburne	350X3_77	15.7	15.70	
BERLIN	Gorham	351X3_77	2.92	0.63	2.29
BERLIN	Randolph	351X4_77	20.1	20.10	
BERLIN	Randolph	351X5_77	0.22	0.22	
BERLIN	Berlin	3521_77	7.48	7.48	
LANCASTER	Dalton	348X8_76	7.92	7.92	
LANCASTER	Whitefield	351X1_76	4.43	4.43	
LANCASTER	Northumberland	355X1_76	12.97	12.97	
LANCASTER	Northumberland	355X2_76	3.02	3.02	
LANCASTER	Stratford	355X3_76	16.53	16.53	
LANCASTER	Stratford	355X4_76	0.72	0.72	
LANCASTER	Stratford	355X5_76	7.87	7.87	
LANCASTER	Columbia	355X6_76	9.82	9.82	
LANCASTER	Columbia	355X7_76	5.15	5.15	
LANCASTER	Whitefield	376X1_76	12.36	12.36	
LANCASTER	Northumberland	376X2_76	4.5	4.50	
LANCASTER	Northumberland	376X3_76	0.96	0.96	
LANCASTER	Northumberland	376X4_76	0.91	0.91	
LANCASTER	Northumberland	376X5_76	1.85	1.85	
LANCASTER	Lancaster	376X6_76	8.92	6.83	2.09
LANCASTER	Piermont	45W1_43	9.73	9.73	
TILTON	Tilton	337X10_42	2.25	2.25	
TILTON	Laconia	345X5_41	6.7	3.91	2.79
TILTON	Northfield	3798X2_42	14.99	14.99	
TILTON	Belmont	398X2_41	31.09	31.09	
TILTON	Franklin	39H1_42	6.83	6.83	
CHOCORUA	Ossipee	19W1_45	46.08	43.53	2.55
Hooksett	Pembroke	34W18_11	20.65	20.65	
Hooksett	Pembroke	334X18_11	8.34	8.34	
Hooksett	Pembroke	334X8_11	1.6	1.60	
Hooksett	Pembroke	44W2_11	26.54	26.54	
Hooksett	Allenstown	334X17_11	3.18	3.18	
Hooksett	Allenstown	334X163_11	0.07	0.07	
Hooksett	Pembroke	334X11_11	0.16	0.16	
Hooksett	Allenstown	334X6_11	0.02	0.02	
Hooksett	Allenstown	334X43_11	0.18	0.18	
Hooksett	Hooksett	14X38_11	0.32	0.32	
Hooksett	Auburn	14W7_11	15.9	12.59	3.31
Hooksett	Manchester	16W3_11	21.43	19.41	2.02
Hooksett	Manchester	16W1_11	8.97	8.97	
Hooksett	Auburn	14X126A_11	8.41	4.28	4.13
Hooksett	Manchester	3615X3_11	16.89	13.09	3.80
Hooksett	Manchester	3130X_11	25.21	22.31	2.90
Hooksett	Manchester	393X8_11	2.65	1.03	1.62
Hooksett	Londonderry	324X8_11	8.51	8.51	
Hooksett	Manchester	324X10_11	12.67	12.67	
Hooksett	Londonderry	324X12_11	1.88	0.84	1.04
Hooksett	Londonderry	324X4_11	0.98	0.98	
Hooksett	Manchester	393X11_11	2.22	2.22	
Hooksett	Manchester	393X3_11	1.55	1.55	
Hooksett	Manchester	22W1_11	8.36	8.36	
Hooksett	Manchester	22W2_11	7.86	6.56	1.30
Hooksett	Manchester	370X_11	7.25	5.64	1.61
Hooksett	Manchester	14W2_11	7.73	7.73	
Hooksett	Manchester	325X7_11	8.38	8.38	
Hooksett	Manchester	14X118_11	1.07	1.07	
Hooksett	Manchester	14X188_11	8.66	8.66	
Hooksett	Manchester	325X2_11	3.92	3.92	
Hooksett	Manchester	14X109_11	2.5	2.50	

**2022 Scheduled Maintenance Trimming**

AWC	TOWN	CIRCUIT	TOTAL CIRCUIT MILES	SMT MILES	METT MILES
Hooksett	Manchester	14X121_11	0.49	0.49	
Hooksett	Manchester	14X126B_11	0.5	0.50	
Hooksett	Manchester	14X128A_11	0.03	0.03	
Hooksett	Manchester	14X130_11	0.05	0.05	
Hooksett	Manchester	14X134_11	0.03	0.03	
Hooksett	Manchester	14X135_11	1.37	1.37	
Hooksett	Manchester	14X135Y_11	0.08	0.08	
Hooksett	Manchester	14X136_11	0.74	0.74	
Hooksett	Manchester	14X178_11	1.94	1.94	
Hooksett	Manchester	19X6_11	0.22	0.22	
Hooksett	Manchester	393X10_11	0.02	0.02	
Hooksett	Manchester	393X10A_11	0.04	0.04	
Hooksett	Manchester	393X32_11	0.53	0.53	
Hooksett	Manchester	393X33_11	0.02	0.02	
Hooksett	Manchester	393X38_11	0.02	0.02	
Hooksett	Manchester	393X4_11	0.3	0.30	
Hooksett	Manchester	393X40_11	0.33	0.33	
Hooksett	Manchester	393X44_11	0.28	0.28	
Hooksett	Manchester	19X5_11	0.26	0.26	
Hooksett	Manchester	325_11	3.5	3.50	
Bedford	Weare	3108_12	59.1	55.98	3.12
Bedford	New Boston	85W1_12	65.03	63.42	1.61
Bedford	Weare	3108X1_12	10.5	7.65	2.85
Bedford	Goffstown	360X11_12	8.21	8.21	
Bedford	New Boston	79W4_12	11.94	7.68	4.26
Bedford	New Boston	360X7_12	18.43	16.90	1.53
Bedford	Goffstown	334X2_12	16.55	13.28	3.27
Bedford	Goffstown	3151X2_12	0.77	0.77	
Bedford	Goffstown	327X8_12	4.33	4.33	
Bedford	Goffstown	360X13_12	0.62	0.62	
Bedford	Goffstown	327X9_12	1.57	1.57	
Bedford	Goffstown	322X3_12	2.44	2.44	
Bedford	Merrimack	3164X3_12	16.49	13.45	3.04
Bedford	Bedford	3151X49_12	1.23	1.23	
Bedford	Bedford	3151X9_12	3.13	3.13	
Bedford	Bedford	3151X10_12	7.19	5.69	1.50
Bedford	Manchester	3151X52_12	3.2	3.20	
Bedford	Manchester	21W1_12	4.58	1.23	3.35
Bedford	Hooksett	335X1_12	8.4	8.40	
Bedford	Manchester	18W1_12	8.99	8.99	
Bedford	Manchester	335X4_12	0.02	0.02	
Bedford	Manchester	3142_12	0.47	0.47	
Bedford	Hooksett	335X8_12	0.34	0.34	
Bedford	Hooksett	335X7_12	0.03	0.03	
Bedford	Hooksett	335X6_12	0.06	0.06	
KEENE	Nelson	76W7_31	169.91	157.08	12.83
KEENE	Harrisville	53H1_31	34.01	34.01	
KEENE	Hancock	33W1_36	55.75	50.55	5.20
KEENE	Rindge	3120X3_36	14.05	11.58	2.47
KEENE	Keene	W185_31	20.65	15.11	5.54
KEENE	Winchester	3178X5_31	10.07	10.07	
NEWPORT	Newport	42X3_32	75.01	73.31	1.70
NEWPORT	Bradford	3410_32	153.87	138.59	15.28
NEWPORT	New London	48W1_32	36.87	36.87	
NEWPORT	Newbury	316X2_32	39.28	33.88	5.40
NEWPORT	Croydon	315X2_32	15.88	15.88	
NEWPORT	Sunapee	3410X1_32	7.23	7.23	
NEWPORT	Claremont	61W2_32	7.06	4.34	2.72
NEWPORT	Newport	42X1_32	1.09	1.09	
NEWPORT	Claremont	46W1_32	3.66	3.66	
<b>Total</b>			<b>2,701.23</b>	<b>2,304.25</b>	<b>248.63</b>

## 2022 Distribution ROW Maintenance Mowing

Central AWCs	Circuit/Location	Voltage	ACRES
Bedford	323 Reeds Ferry S/s - Kinsman In 323/53	34.5kV	35.39
Bedford	3614x3 N. Union Tap	34.5kV	14.50
Hooksett	3614 Huse Rd S/S - Pine Hill S/S	34.5kV	26.42
Bedford	3194 Greggs S/S - New Boston Tracking Station S/S	34.5kV	68.12
Southern AWCs	Circuit/Location	Voltage	ACRES
Derry	365X Ash St S/S - Str. 365X/38	34.5kV	22.78
Eastern AWCs	Circuit/Location	Voltage	ACRES
Rochester	3157 N. Rochester S/S - Sanbornville S/S	34.5kV	108.48
Rochester	399 Knox Marsh S/S - Str. 399/103B	34.5kV	12.12
Rochester	399 Str. 399/94A - 399/87	34.5kV	4.24
Rochester	399 Stark Ave Tap	34.5kV	7.00
Western AWCs	Circuit/Location	Voltage	ACRES
Newport	315 North Road S/S - Newport S/S	34.5kV	46.97
Keene	W110 Keene S/S - Bradford Road	34.5kV	34.30
Keene	W-15 Str. 15/68 - Str. 15/95	34.5kV	25.33
Keene	W185 Str. 185/49 -	34.5kV	16.72
Northern AWCs	Circuit/Location	Voltage	ACRES
Lancaster	355 Canaan S/S - Lyman Falls S/S	34.5kV	313.22
Lancaster	355x1 Lost Nation S/S - Lyman Fall S/S	34.5kV	100.19
Lancaster	384 Lost Nation S/S - Groveton Paper	34.5kV	9.81
Tilton	Franklin Tap 3548 Franklin S/S - 3548x2 TAP	34.5kV	6.67
Tilton	337 Quint-T Tap: J-125 T ROW - Quint T S/S	34.5kV	11.15
Tilton	337 S Laconia Tap: S Laconia S/S - J-125 T ROW	34.5kV	14.07
Tilton	3625 Messer St S/S - Opeechee S/S	34.5kV	23.03
Tilton	345 Opeechee S/S - Ayers Island S/S	34.5kV	203.87
Tilton	338 Ashland S/S - NHEC Meredith	34.5kV	105.45
Chocorua	336X K124 115KV - Swan Falls Hydro Freyburg	34.5kV	16.36

Region	Acres
Central	144.43
Southern	22.78
Eastern	131.84
Western	123.32
Northern	803.82
<b>Total</b>	<b>1,226.19</b>

Note: All ROWs are considered distribution

## 2022 Full Width Clearing of ROW

<u>AWC</u>	<u>Feeder</u>	<u>Scheduled Miles</u>	<u>ROW Width</u>	<u>Primary Town</u>	<u>Voltage</u>
Tilton	319	7.4	100	Loudon	34.5kv
Bedford	323	2.92	100	Merrimack	34.5kv
<b>Total Miles</b>		<b>10.32</b>			

Note: All ROWs are considered distribution

**Eversource ETT 2022 Work Plan**

AWC	Circuit	Total Circuit Miles	Scheduled Circuit Miles	Town	Circuit Ranking by Tree SAIDI	Circuit Ranking by Tree SAIFI
Bedford	27W2_12	12.06	0.82	Goffstown	79	59
Bedford	311X1_12	35.8	2.75	Henniker	180	151
Bedford	3173X1_12	69.03	1.39	Hillsborough	57	84
Bedford	3164X2_12	1.43	0.21	Merrimack	379	394
Bedford	360X13_12	0.62	0.62	Goffstown	N/A	N/A
Bedford	3151X9_12	2.95	0.35	Bedford	N/A	N/A
Bedford	3142_12	0.28	0.38	Manchester	N/A	N/A
Bedford	12W2_12	4.3	0.53	Manchester	N/A	N/A
Bedford	12W3_12	4.77	0.42	Manchester	325	386
Nashua	23W7_22	7.62	1.88	Milford	419	420
Nashua	23H3_22	3.06	0.18	Milford	N/A	N/A
Hooksett	14X188_11	8.66	1	Manchester	N/A	N/A
Keene	313X4_36	10.69	0.38	Peterborough	359	312
Keene	3140_36	58.21	2.94	Hillsborough	86	100
Keene	55H1_36	13.81	1.5	Peterborough	271	291
Keene	3155X9_22	57.8	0.95	Greenville	124	155
Newport	46W1_32	3.66	1.99	Claremont	N/A	N/A
Newport	42X4_32	10.6	10.6	Goshen	N/A	N/A
Epping	3191X5_65	2.09	0.65	Newmarket	235	222
Epping	377X10_65	3.29	0.29	Epping	408	402
Portsmouth	3102X6_63	2.59	1.4	Portsmouth	N/A	N/A
Portsmouth	3850X7_63	11.49	1.71	Newington	281	274
Portsmouth	71W3_63	8.44	2.56	Portsmouth	431	440
Portsmouth	3112X1_63	3.65	2.11	North Hampton	284	66
Rochester	73W1_61	39.37	1.77	Wakefield	29	92
Rochester	392X2_61	9	0.43	Rochester	123	36
Rochester	399X13_62	4.83	1.2	Dover	250	186
Rochester	362X1_61	12.8	0.73	Rochester	301	284
Rochester	392X4_61	9.95	0.26	Rochester	136	150
Rochester	392X5_61	11.66	0.73	Rochester	302	324
Rochester	3157X2_61	1.48	0.72	Rochester	335	73
Rochester	54H1_61	4.73	0.68	Dover	N/A	N/A
Rochester	42H2_61	2.64	1.32	Somersworth	442	410
Rochester	340X1_61	5.12	1.62	Rochester	385	367
Rochester	340X5_61	5.93	2.21	Rochester	N/A	N/A
Rochester	340X2_61	0.3	0.3	Rochester	N/A	N/A
Tilton	20W1_42	56.58	2.41	Bristol	74	153
Tilton	31W2_64	38.4	1.28	Loudon	65	98
Tilton	337X8_42	11.18	0.94	Franklin	215	196
Tilton	3798X4_42	8.67	0.61	Tilton	N/A	N/A
Tilton	90H1_64	10.77	1.17	Pittsfield	416	422
Tilton	310X5_41	4.14	0.27	Gilford	306	205

Region	ETT Scheduled Miles
Central	8.47
Southern	2.06
Western	18.36
Eastern	20.69
Northern	6.68
<b>Total</b>	<b>56.26</b>

N/A is when SAIDI/SAIFI = 0

Note: N/A indicates that the circuit is not ranked on the 2020 Tree Related Outages Circuit Hit List

# EVERSOURCE

## Annual Reliability Report

### 2021 Report to the NH Public Utilities Commission

March 1, 2022

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# Eversource

## 2021 Reliability Report

### Executive Summary

## Executive Summary

This report has been prepared in accordance with the terms of the October 9, 2020 Settlement Agreement approved by the New Hampshire Public Utilities Commission (“Commission” or “PUC”) in Docket No. DE 19-057 (the “Settlement Agreement”) including Appendix 4 of the Settlement Agreement. It provides information on Public Service of New Hampshire d/b/a Eversource Energy’s (“Eversource” or the “Company”) distribution system reliability and activities undertaken by the Company in calendar year 2021 focused on reliability.

Section 1 provides graphs of various reliability indices as specified in Appendix 4 of the Settlement Agreement. All graphs are based on IEEE reporting criteria, which was adopted by the NH Public Utilities Commission in 2014.

Section 2 provides a summary of specific operations and maintenance (“O&M”) activities undertaken in 2021 which are generally targeted at maintaining or improving reliability. These activities include patrols of overhead distribution lines, inspections of underground developments and padmounted equipment, inspections of wood distribution poles for decay, and repairs of non-capital items on distribution lines related to the National Electrical Safety Code.

Section 3 provides information on capital projects targeting reliability, with information on the replacement of wooden distribution poles found to be defective through inspection, replacement of direct buried underground cable with new cable in conduit, and other capital reliability projects with spending greater than \$100,000 in the calendar year. This last category is further broken down into new projects initiated in 2021, and projects with spend in 2021 over the threshold but which were established in prior years. Projects established in 2021 also have project descriptions included. Projects included in Section 3 include any locations where reliability was listed as an objective of the project, even if the project had other justifications such as replacing obsolete assets or safety concerns. Spending in 2021 on defective pole replacements totaled \$2.03M. Spending on five projects replacing direct buried cable totaled \$1.68M. Spending on new reliability projects totaled \$14.36M, and on continued projects from prior years amounted to \$33.68M

Section 4 contains the Company’s annual report on the 50 worst performing circuits for the previous year.

The Company’s reliability has improved over time, with reductions in the overall frequency of outages (SAIFI), the duration of outages (SAIDI), and the number of customers impacted when outages do occur (CIII). Improvements in SAIFI and CIII have led to a general increase in CAIDI. Summary charts are provided in Section 1.1.

Preventing outages from occurring and reducing the number of customers impacted by those outages are methods to improve SAIFI and CIII. Company work in areas such as tree trimming, the installation of covered wire, pole top distribution automation, and other activities have resulted in the improvements shown. The increasing penetration of pole top distribution automation has the unfortunate impact of resulting in a general increase in CAIDI, as more customers are restored in under five minutes and the remaining customers are subject to the full duration of the outages that require lineworkers to effect repairs. Company initiatives to reduce CAIDI include expanding the regions of the state with troubleshooters to provide 24 hour coverage, utilizing the System Operations Center to manage the distribution system at voltages below 34.5 kV, adding SCADA control to lower voltage substations, and continued penetration of pole top Distribution Automation which can help identify a fault location while crews are en route to the outage.

# Section 1

## Distribution System Reliability

The following is a brief description of the reliability graphs contained in this section. All graphs represent data for the time period 2017 through 2021 and reflect IEEE criteria, adopted by the NHPUC in the second quarter of 2014.

Section 1.1 shows Eversource NH SAIFI, CAIDI, SAIDI, and CIII. All graphs are based on IEEE criteria, and include only outages on the distribution system. The Company SAIFI and SAIDI have shown much improvement since 2017, although SAIFI and SAIDI did experience an uptick in 2020 compared with 2019; 2019 was the best year of the last five. SAIDI performance of 82.8 in 2019 is comparable to 1991 and 1992, which have been the best years since at least 1989. SAIDI in 2019 was also the first time since 1993 that SAIDI has been under 100. The reliability impact of 2019 minor storms was relatively low.

Eversource tracks metrics on minor storm days that are not defined by the PUC major storms (IEEE Major Exclusion Days (“MEDs”)). The impact of minor storms is included in all presented data. Eversource experienced a total of 49 minor storm days in 2021 compared to 46 in 2020, 28 in 2019, 39 in 2018, and 36 in 2017. The impacts of these storms are included in the reported statistics. These storms contributed 56 minutes to Eversource’s SAIDI performance in 2021, compared to 53 minutes in 2020, 27 minutes in 2019, 47 minutes in 2018, and 36 minutes in 2017.

Section 1.2 depicts CAIFI and CTAIDI over the 2016 through 2021 time period. These are new indices for Eversource. Their use began in 2020. CAIFI is designed to show trends in customers interrupted and shows the number of customers affected out of the whole customer base. It is calculated by dividing the total number of customer interruptions by the number of distinct customers interrupted. CTAIDI is the average total duration of interruption for customers who had at least one interruption during the period of analysis and is calculated by dividing the total number of customer minutes of interruptions in the period by the number of distinct customers interrupted. Therefore, both CAIFI and CTAIDI indices refer only to customers who have experienced a service interruption in the period. For 2017 through 2020, CAIFI was in the range of 2.17 to 2.5. Similarly, 2017-2020 CTAIDI has been in the range of 3.95 to 4.64. Both experienced upticks in 2016 and 2021. These two years experienced high minor storm activity.

Section 1.3 depicts Eversource tree related statistics. The largest cause group for outages is trees and limbs, primarily from outside of the clearance area, therefore all four indices closely follow the total distribution system indices shown in Section 1.1. More than half of all tree related outages included in the reporting metrics occur during minor storm events and, therefore, tend to be longer duration outages. All four metrics remained relatively stable in 2021 compared to 2020, with CAIDI showing some improvement.

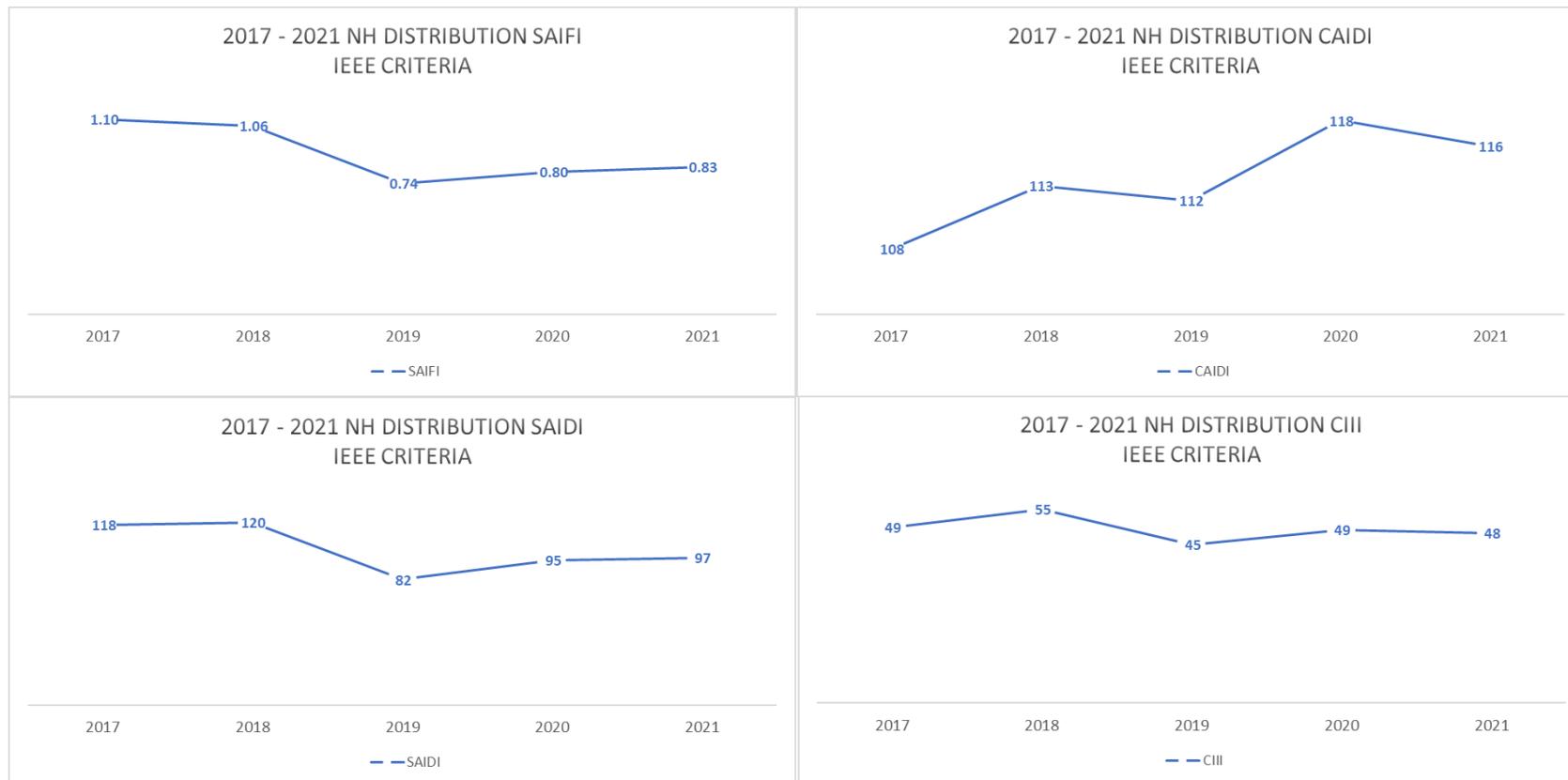
Section 1.4 shows Eversource equipment related statistics on the distribution system. These statistics exclude substation equipment, which are presented separately in the Section 1.5. Equipment failures have been the second or third leading cause for SAIDI and SAIFI for the presented time period. SAIFI, SAIDI and CIII have been on a downward trend over the period, with CAIDI trending downward since 2019.

Section 1.5 shows results for substation equipment failures. Power outages caused by equipment failures inside substations typically affect many customers and can be long in duration. That said, the reliability impact from substation outages has been minimal over the presented time period. There was one equipment failure event in 2021, compared to one in 2020, three in 2019, one in 2018, and two in 2017. The 2021 event involved failed transformer bushings inside Saco Valley Substation. A stepped restoration was utilized to restore as many customers as possible while minimizing the number that remained isolated.

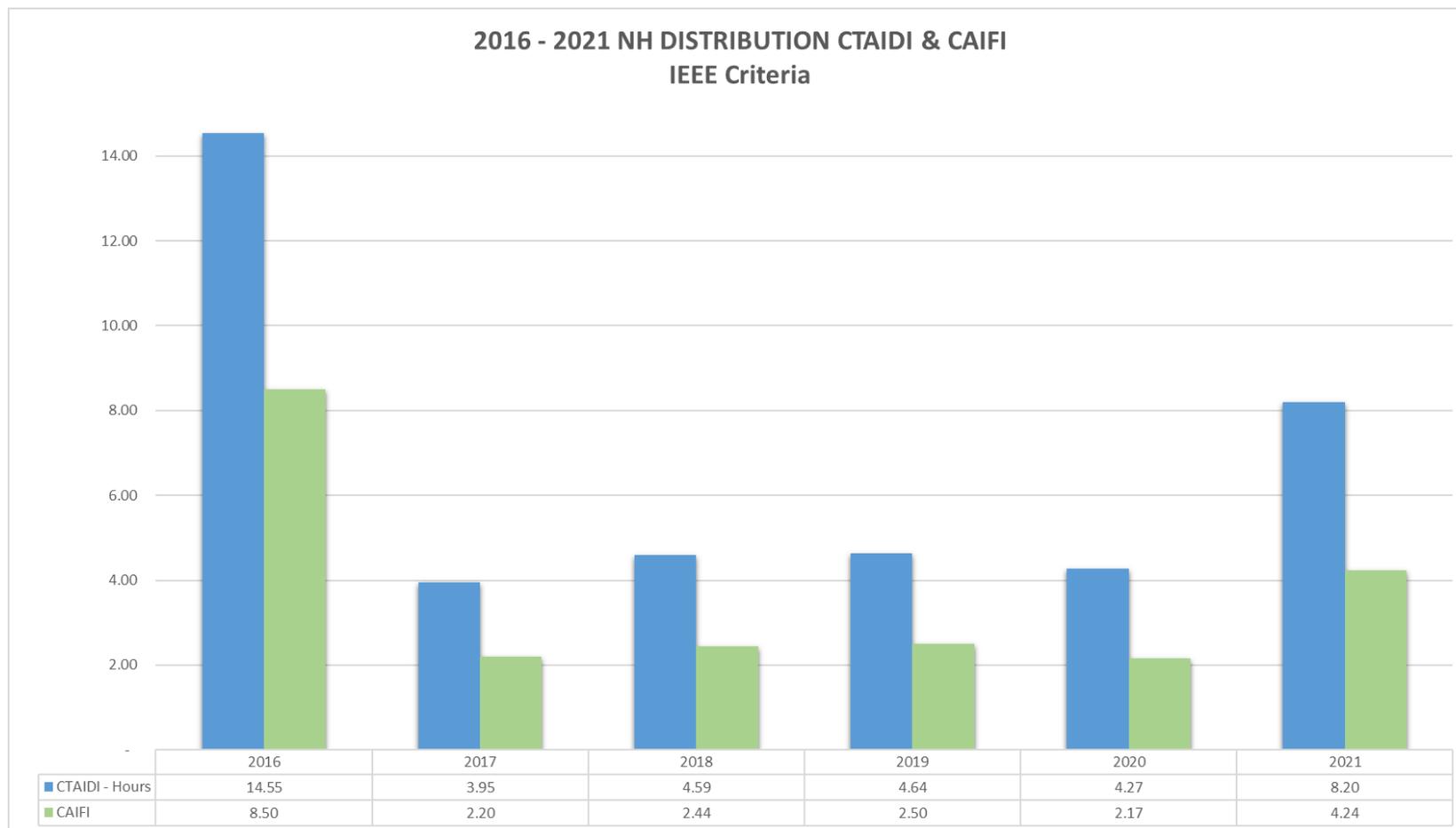
Section 1.6 shows Total SAIDI and Equipment Failure SAIDI that occurred on IEEE MEDs. The reliability impact of these major storms is not included in Eversource statistics presented elsewhere.

Section 1.7 shows SAIDI and SAIFI broken down by cause for each year 2017 through 2021. Tree related outages are the top driver of both statistics for the entire period, averaging 61 SAIDI minutes per year. Second, third and fourth places include Equipment Related, Action by Others and Other. Outages due to equipment related causes averaged 11 SAIDI minutes per year. Action by Others, which includes causes such as motor vehicle accidents, customers and contractors digging into underground cables or felling trees on lines, vandalism, etc., averaged 10 SAIDI minutes per year. The "Other" category includes Public Safety Intentional Outages, Load Shedding, Planned Interruptions and Miscellaneous and averaged 12 SAIDI minutes per year over the time period.

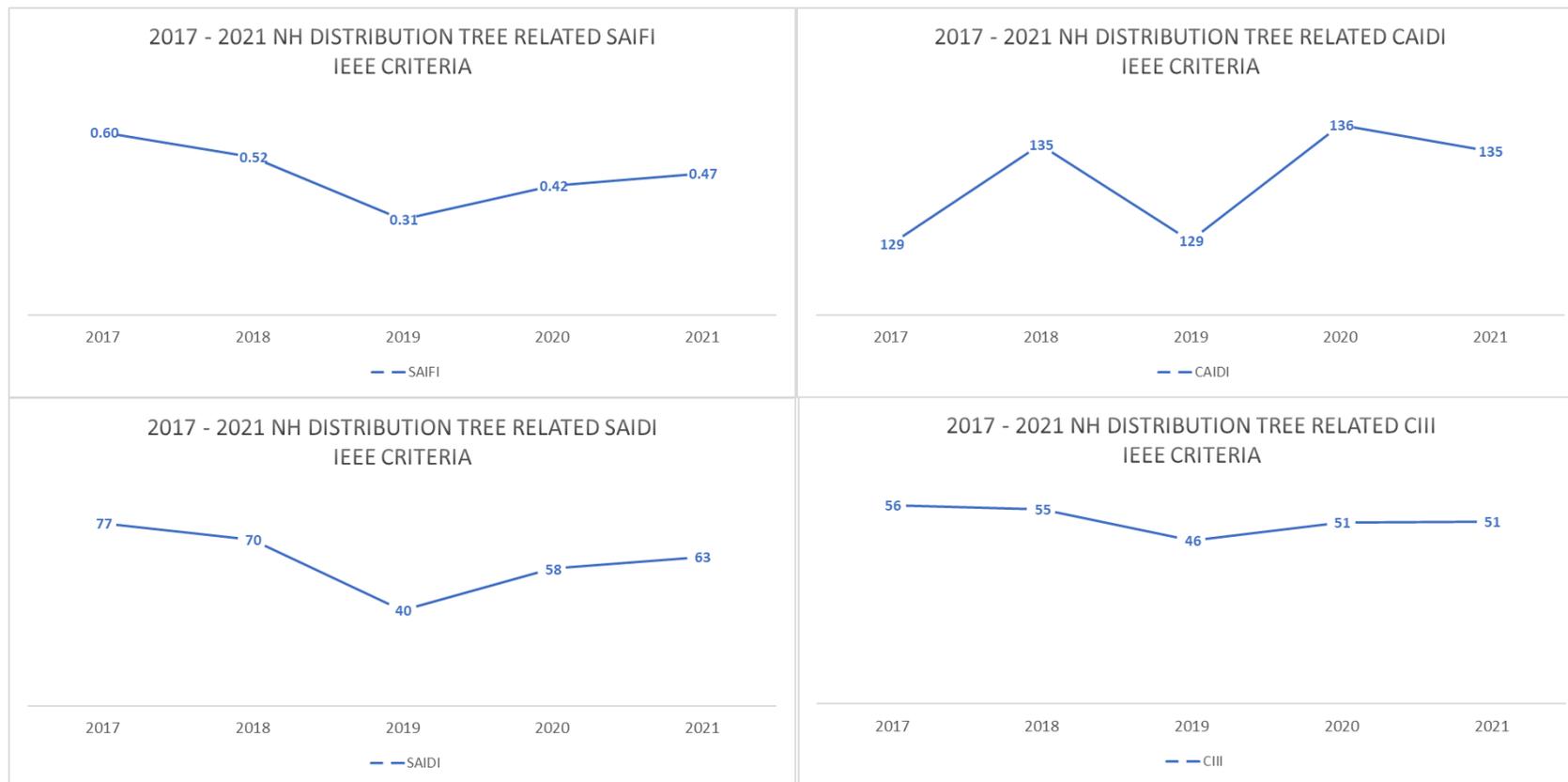
### Section 1.1 SAIFI, SAIDI, CAIDI, CIII – Distribution System Only



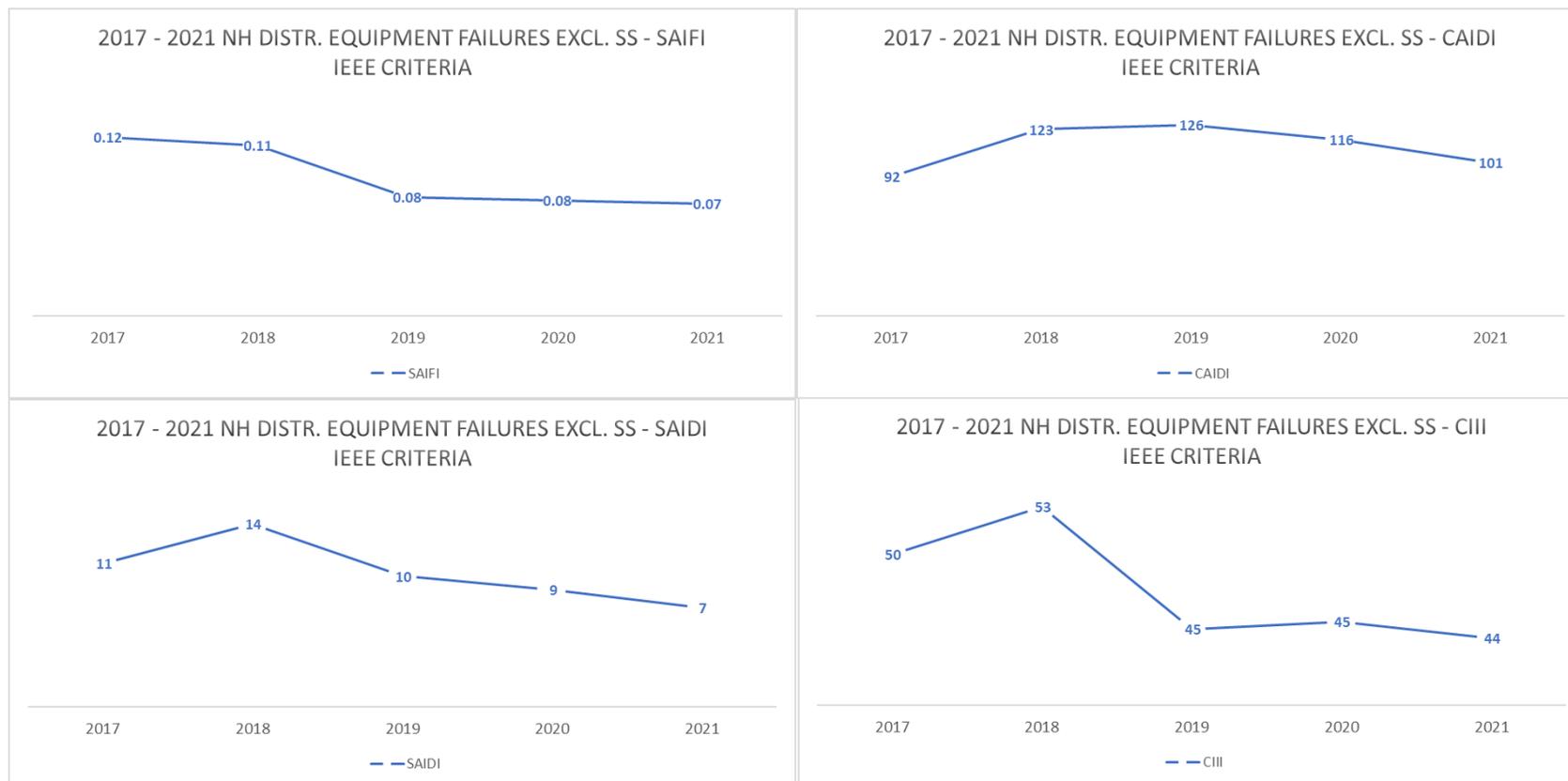
### Section 1.2 CAIFI, CTAIDI – Distribution System Only



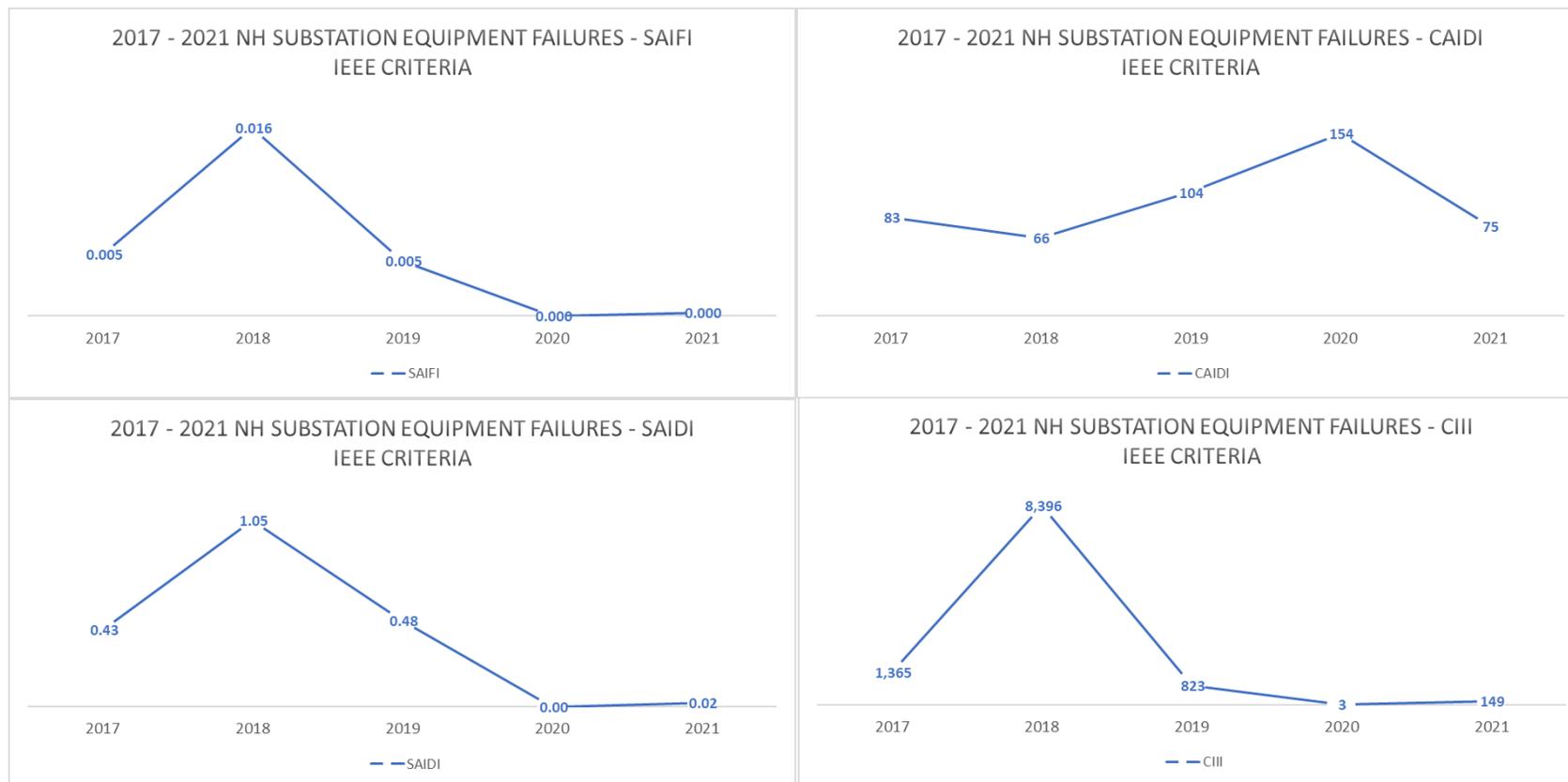
### Section 1.3 SAIFI, SAIDI, CAIDI, CIII – Distribution System – Tree Related



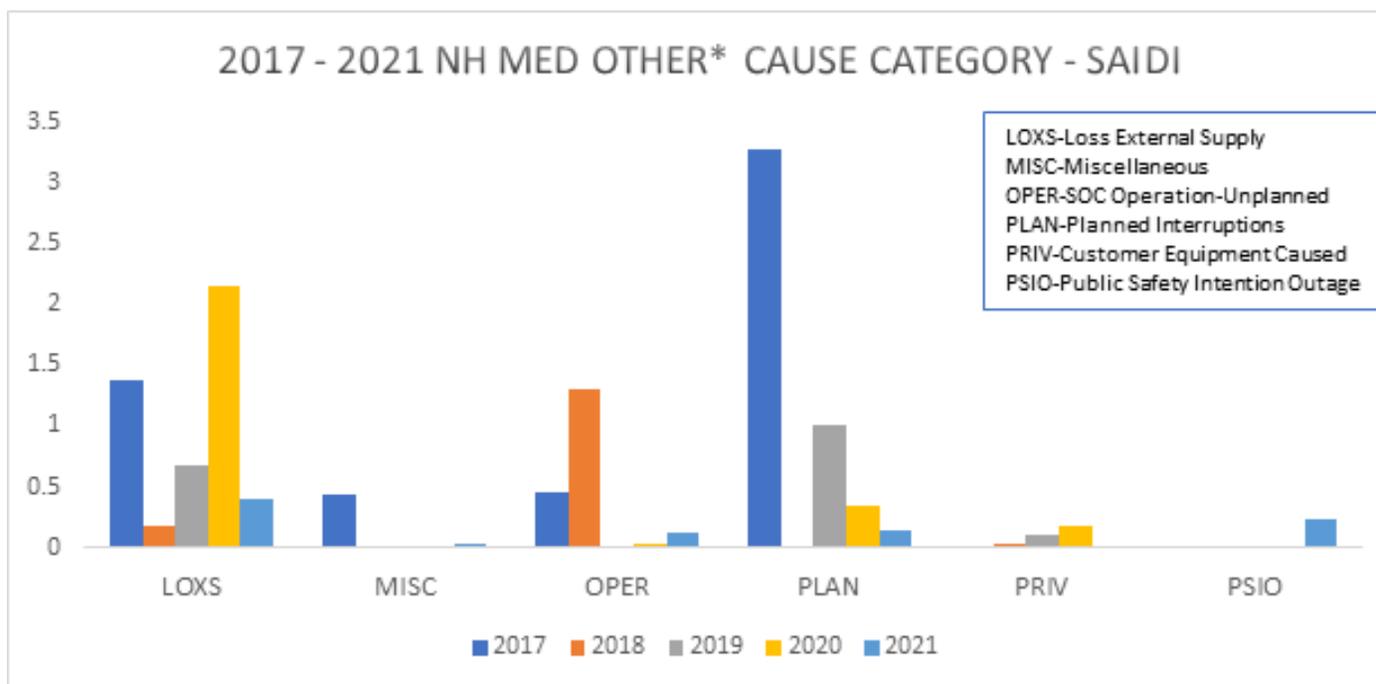
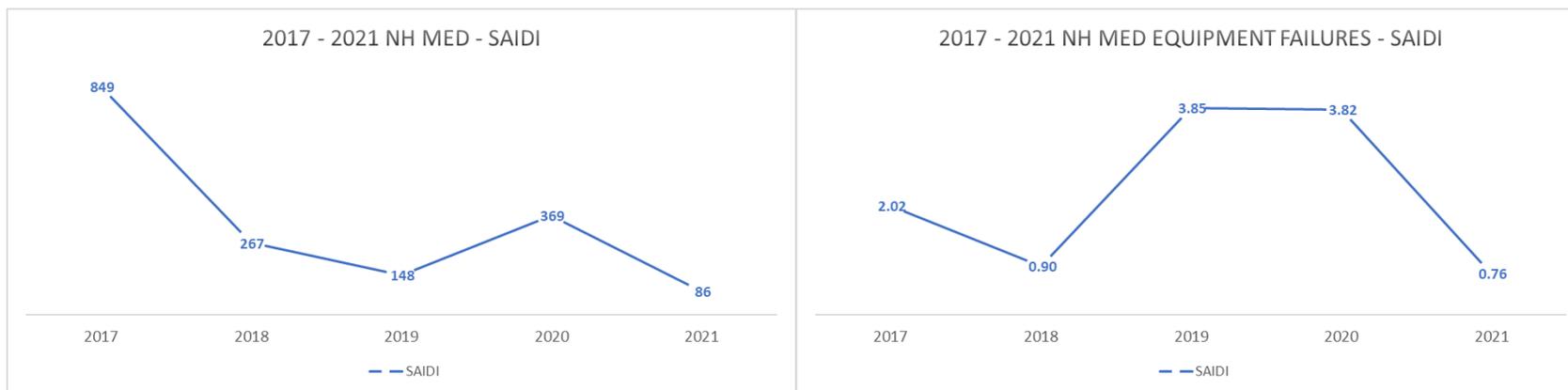
### Section 1.4 SAIFI, SAIDI, CAIDI, CIII – Distribution (excluding Substation) Equipment Failure



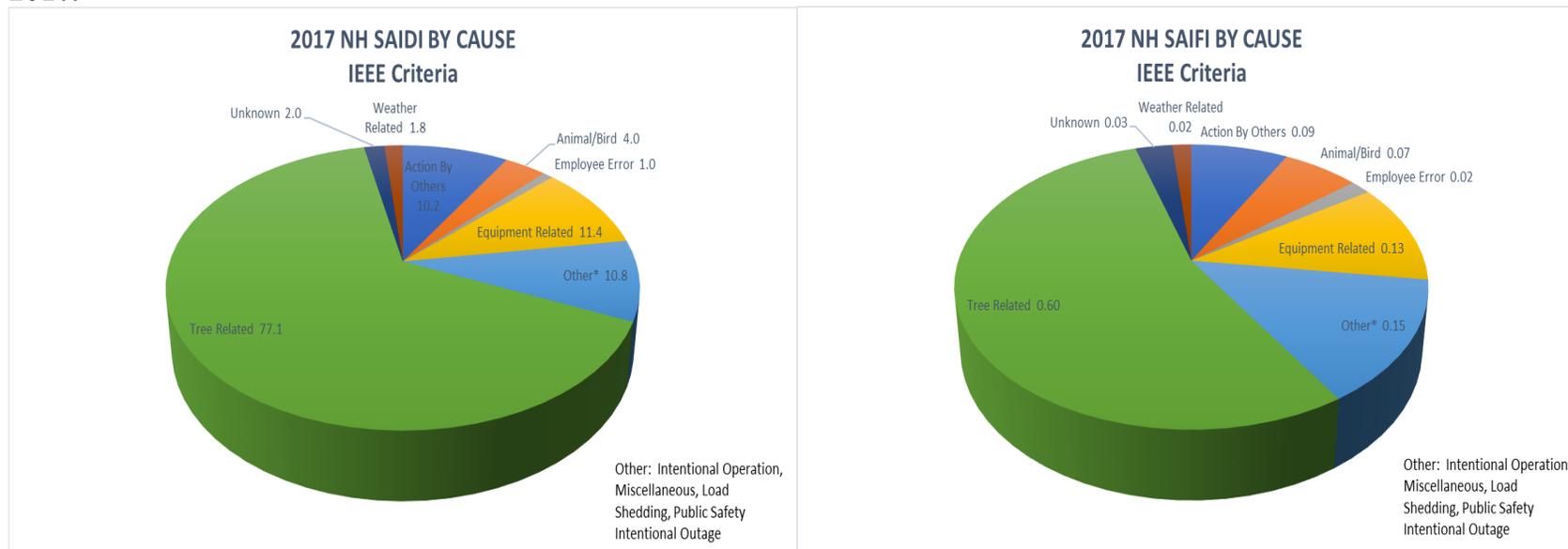
### Section 1.5 SAIFI, SAIDI, CAIDI, CIII –Substation Equipment Failures



### Section 1.6 SAIDI (IEEE MED) – Storm MED; Equipment Failure MED



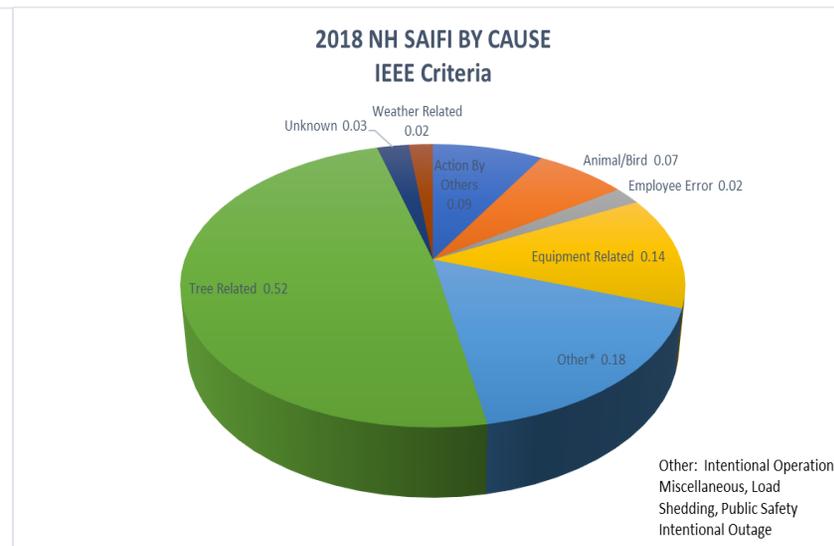
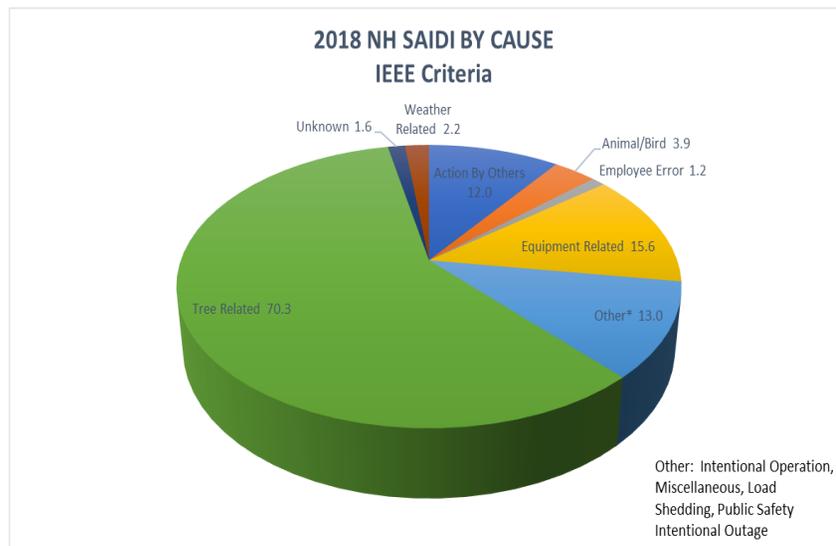
**Section 1.7 SAIDI and SAIFI by Cause  
2017:**



Cause	SAIDI
Tree Related	77.1
Equipment Related	11.4
Other	10.8
Action By Others	10.2
Animal/Bird	4.0
Unknown	2.0
Weather Related	1.8
Employee Error	1.0

Cause	SAIFI
Tree Related	0.60
Other	0.15
Equipment Related	0.13
Action By Others	0.09
Animal/Bird	0.07
Unknown	0.03
Employee Error	0.02
Weather Related	0.02

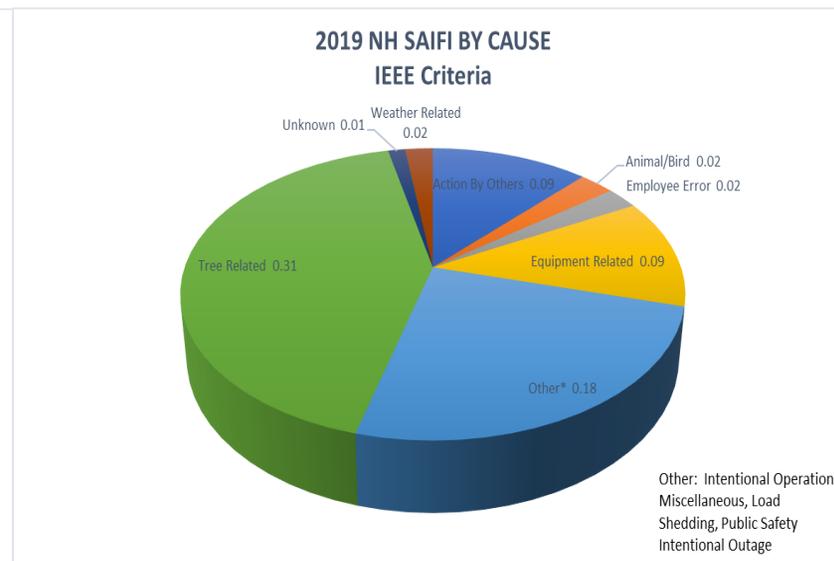
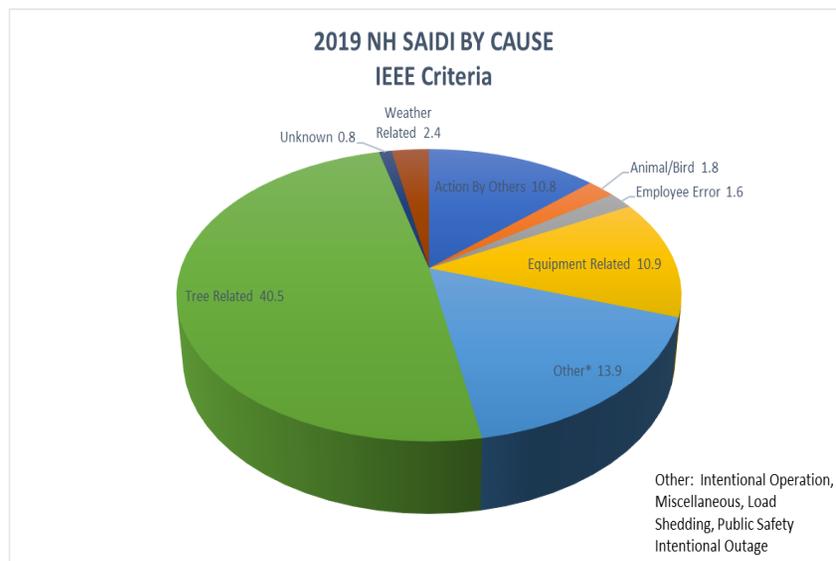
**Section 1.7 cont'd SAIDI and SAIFI by Cause  
2018:**



Cause	SAIDI
Tree Related	70.3
Equipment Related	15.6
Other	13.0
Action By Others	12.0
Animal/Bird	3.9
Weather Related	2.2
Unknown	1.6
Employee Error	1.2

Cause	SAIFI
Tree Related	0.52
Other	0.18
Equipment Related	0.14
Action By Others	0.09
Animal/Bird	0.07
Unknown	0.03
Employee Error	0.02
Weather Related	0.02

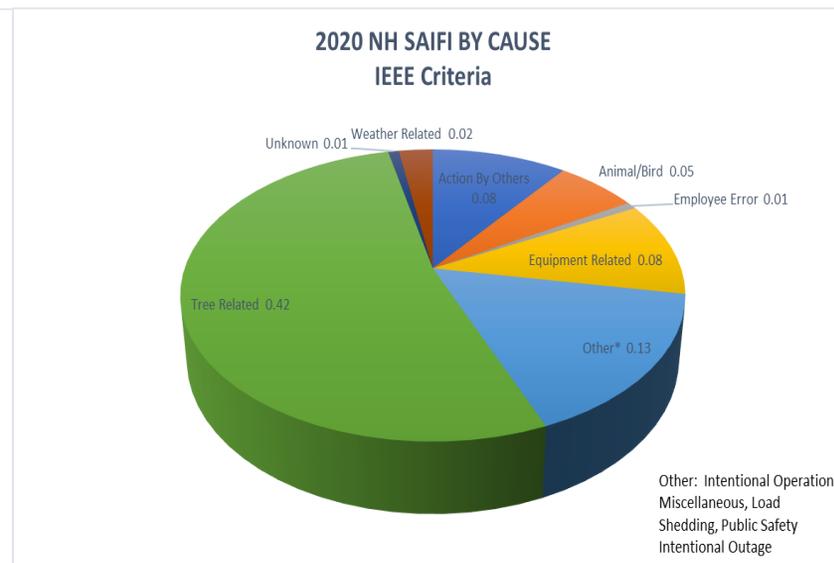
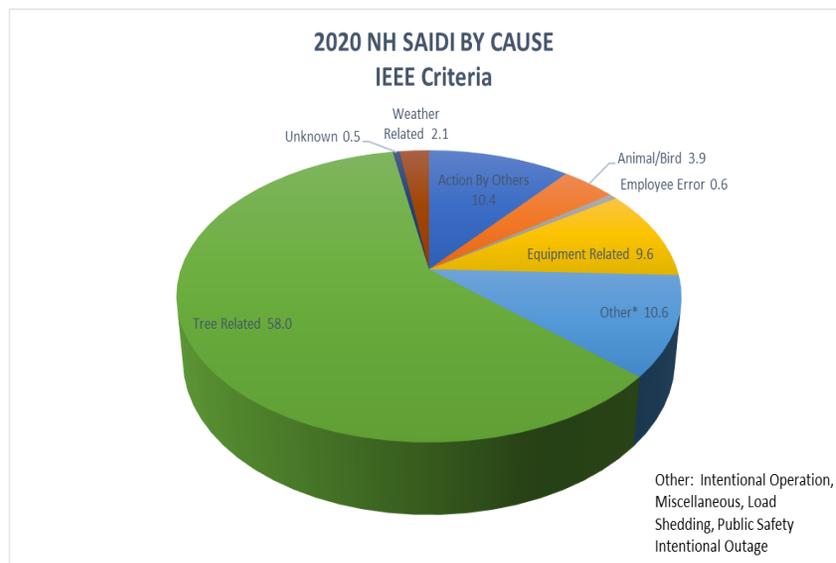
**Section 1.7 cont'd SAIDI and SAIFI by Cause  
2019:**



Cause	SAIDI
Tree Related	40.5
Other	13.9
Equipment Related	10.9
Action By Others	10.8
Weather Related	2.4
Animal/Bird	1.8
Employee Error	1.6
Unknown	0.8

Cause	SAIFI
Tree Related	0.31
Other	0.18
Action By Others	0.09
Equipment Related	0.09
Animal/Bird	0.02
Employee Error	0.02
Weather Related	0.02
Unknown	0.01

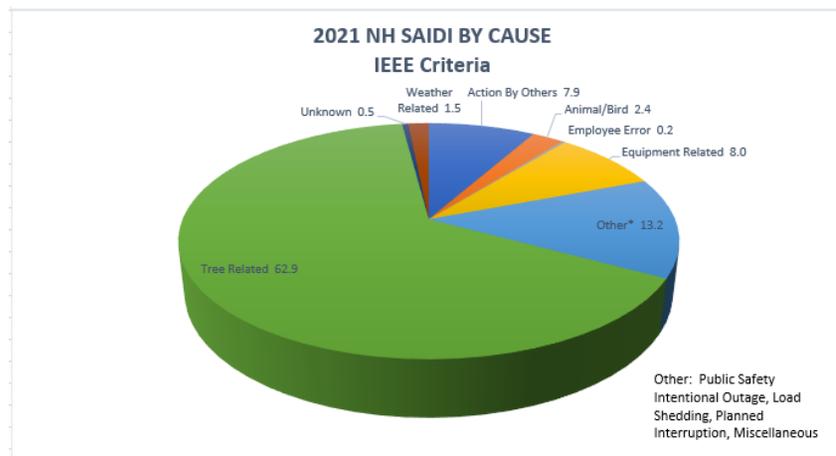
**Section 1.7 cont'd SAIDI and SAIFI by Cause  
2020:**



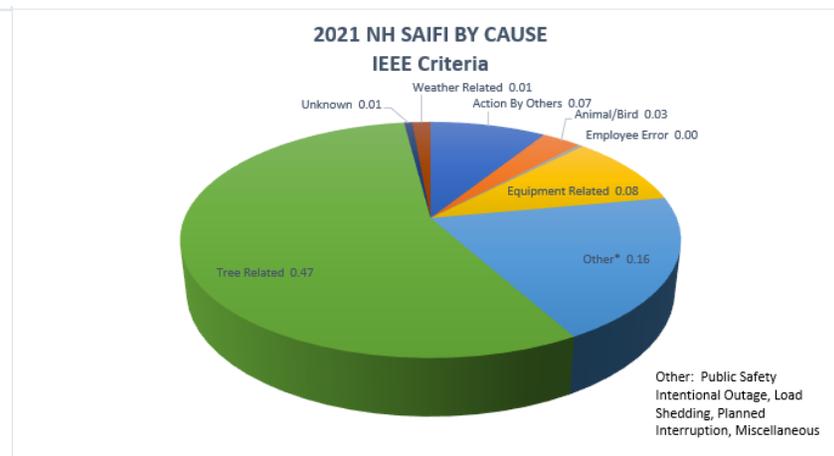
Cause	SAIDI
Tree Related	58.0
Other	10.6
Action By Others	10.4
Equipment Related	9.6
Animal/Bird	3.9
Weather Related	2.1
Employee Error	0.6
Unknown	0.5

Cause	SAIFI
Tree Related	0.42
Other	0.13
Action By Others	0.08
Equipment Related	0.08
Animal/Bird	0.05
Weather Related	0.02
Employee Error	0.01
Unknown	0.01

**Section 1.7 cont'd SAIDI and SAIFI by Cause  
2021:**



Cause Category	SAIDI
Tree Related	62.9
Other*	13.2
Equipment Related	8.0
Action By Others	7.9
Animal/Bird	2.4
Weather Related	1.5
Unknown	0.5
Employee Error	0.2



Cause Category	SAIFI
Tree Related	0.47
Other*	0.16
Equipment Related	0.08
Action By Others	0.07
Animal/Bird	0.03
Weather Related	0.01
Unknown	0.01
Employee Error	0.00

## Section 2

# O&M Activity Summary January 1, 2021 – December 31, 2021

**Section 2.1 Pole Inspections**

- Program Description:** Inspect for decayed or damaged poles to ensure reliable and safe use of this asset.
- Total Unit Population:** Eversource is responsible for ground line inspection of approximately 250,000 poles. Eversource performs ground line inspection of poles in Eversource set areas only. A visual overhead inspection is performed on all poles to which the Company is attached.
- Maintenance Cycle:** Wood poles are inspected on a 10-year cycle in accordance with Eversource Maintenance Plan Chapter 5.61 and Intracompany Operating Procedures in place with joint owners in the State of NH.
- Reliability Benefit:** Replacement of decayed poles results in a more reliable and resilient distribution system.
- Results:** Pole inspection plans are developed based on the total number of poles in the towns to be inspected. Copper, Chrome, Arsenic (“CCA”) treated poles less than 20 years old, and those treated with other preservatives and less than 10 years old, are not checked for ground line decay (sound and bore and/or ground line excavation). In 2021, 19,324 poles were ground line inspected plus an additional 26,770 poles in joint owner maintenance area were visually inspected for overhead issues.

<b>\$ Plan</b>	<b>\$ Actual</b>	<b>\$ Variance</b>
\$689,000	\$625,744	(\$63,256)

Expenses were lower than anticipated due to the number of newer poles which did not require inspection, based on age, in the towns inspected in 2021.

**Section 2.2 National Electrical Safety Code (NESC) Repairs**

- Program Description:** Repair non-capital items documented as part of circuit inspections or other NESC compliance surveys such as during surveys for third party attachments.
- Total Unit Population:** Eversource has approximately 12,200 miles of overhead distribution line and approximately 2,000 miles of underground distribution line.
- Results:** In 2021, 22 NESC repair maintenance orders were completed and 12 corrective maintenance orders are outstanding. Extensive repairs were completed as part of make-ready work for CATV expansion into the Lakes Region area as well other areas of concentrated third-party activity.

<b>\$ Plan</b>	<b>\$ Actual</b>	<b>\$ Variance</b>
n/a*	n/a*	n/a*

\*Budgets are not developed or tracked at this level or for this activity. Work is completed under a variety of Field Work Orders (“FWOs”)

**Section 2.3 Underground Circuit Inspections**

**Program Description:** Inspect Direct Buried facilities including cable in conduit installations. Periodic inspections of Direct Buried and associated equipment at the specified interval allows preventative and corrective actions to be performed prior to situations becoming hazardous to the public or resulting in equipment failure.

**Total Unit Population:** Eversource is responsible for approximately 28,800 assets which are located in underground developments or are underground facilities providing service from the company’s overhead system totaling approximately 2,000 miles of underground line.

**Maintenance Cycle:** Direct buried (including cable in conduit) facilities are inspected on a 10-year cycle, in accordance with Eversource Maintenance Plan chapter 5.11. As needed, replace fault indicators on a scheduled basis at the time of inspection.

**Reliability Benefit:** Proactively inspect underground developments, padmounted transformers, and associated equipment to identify potential issues and to ensure they function when needed.

**Results:** In 2021, 1,873 assets were inspected.

<b>\$ Plan</b>	<b>\$ Actual</b>	<b>\$ Variance</b>
n/a*	n/a*	n/a*

\*Budgets are not developed or tracked at this level or for this activity. Inspection work is completed under a variety of Field Work Orders (FWOs).

**Section 2.4 Overhead Circuit Patrols**

**Program Description:** Patrol overhead distribution lines. Patrols may be done for a variety of reasons including infrared patrols, post-storm patrols, or other reasons. Each reason for patrolling has different criteria regarding how far into the circuit the patrol is performed. For example, infrared patrols cover only the backbone while post-storm patrols may include all circuitry out to a certain size protective device.

**Total Unit Population:** Eversource has approximately 12,200 miles of overhead distribution line.

**Maintenance Cycle:** Overhead roadside distribution line backbones are inspected with infrared imaging equipment at least once annually in accordance with Eversource Maintenance Plan chapter 5.22. Aerial patrols of lines in rights-of-way (ROW) are completed at least once per year in accordance with the Eversource Maintenance Plan chapter 5.45

**Reliability Benefit:** Infrared patrols are intended to identify overheated equipment which may cause an outage or damage other equipment. Post-storm patrols are intended to find leftover damage not repaired during the storm or imminent dangers, either of which may cause an outage in the future. Aerial ROW patrols are intended to identify items needing repair which may cause an outage in the future.

**Results:** Patrols completed in 2021:  
  
ROW aerial patrols: All ROW lines or line segments were patrolled in February, March and August of 2021, with additional patrols of certain lines over the course of the year associated with project work or in response to momentary events. A list of lines patrolled is included in Section 2.4(a) below.

Patrols of four poor performing roadside circuits were conducted in 2021. Specific items for which these patrols were conducted included bent pins, broken or cracked crossarms, broken or loose guy wires, broken poles, locations where temporary repairs had been made, broken insulator ties, damaged or broken insulators, primary conductor which had become unattached from the supporting insulator (floating primary), danger trees or branches hanging from primary conductors, and locations where vines were climbing a pole or guy wire.

In addition, focused post storm circuit sweeps were conducted following multiple weather events throughout the year. Only circuits with moderate or higher impacts were patrolled. Three phase backbone and large single and three phase laterals were patrolled. These patrols were conducted to identify anything which might cause an imminent outage, a danger to public safety, Eversource debris left beside the road, limbs on or over the primary, and broken or uprooted trees leaning on or over the primary conductors. All items were addressed immediately by entry and tracking in the Outage Management System.

The vegetation management (“VM”) organization performs post event assessments following all tree related events that result in a permanent outage affecting 100 or more customers to ensure no additional VM follow up is required. Additionally, VM performs a “reliability” assessment of the system during the 100% quality control inspection of the trimming that is completed annually. Arborists record locations where they observe electrical hardware issues and report them into the System Operations Center.

The roadside circuits patrolled are listed below in Section 2.4(b).

Infrared (“IR”) patrols were not completed in 2021 due to COVID-19 precautions in place in the summer of 2021 (IR inspections require a camera operator and vehicle driver to occupy the cab of the same vehicle).

<b>\$ Plan</b>	<b>\$ Actual</b>	<b>\$ Variance</b>
n/a*	n/a*	n/a*

\*Budgets are not developed or tracked at this level or for this activity.

Section 2.4(a) ROW Patrols

AWC	Circuit
BEDFORD	312
BEDFORD	3138
BEDFORD	3194
BEDFORD	3108_12
BEDFORD	311 Tap
BEDFORD	3151_12
BEDFORD	3164_12
BEDFORD	317 Tap
BEDFORD	3194X1
BEDFORD	3194X2
BEDFORD	322_12
BEDFORD	323_12
BEDFORD	3271_12
BEDFORD	328_12
BEDFORD	335_12
BEDFORD	335X56
BEDFORD	3392_12
BEDFORD	3467_12
BEDFORD	358_12
BEDFORD	359_12
BERLIN	350X
BERLIN	350X2
BERLIN	3521_77
BERLIN	3525X
CHOCORUA	3218_45
CHOCORUA	336X
CHOCORUA	346X2
CHOCORUA	347_45
CHOCORUA	395_45
DERRY	3184X
DERRY	3184X10
DERRY	32W1_23
DERRY	32W4_23
DERRY	32W5_23

AWC	Circuit
DERRY	365X
EPPING	3103_65
EPPING	3137X
EPPING	3152X
EPPING	3162_65
EPPING	377_65
EPPING	380_65
EPPING	49W1_65
HOOKSETT	370
HOOKSETT	3142_12
HOOKSETT	3182_12
HOOKSETT	321_11
HOOKSETT	324_12
HOOKSETT	325_11
HOOKSETT	334G_12
HOOKSETT	334R_12
HOOKSETT	356_11
HOOKSETT	357_11
HOOKSETT	3613_11
HOOKSETT	3614_11
HOOKSETT	372_12
HOOKSETT	387_12
HOOKSETT	393_11
KEENE	311_12
KEENE	313_36
KEENE	313X4
KEENE	3140X1
KEENE	3178_31
KEENE	3235_31
KEENE	382_31
KEENE	382X2
KEENE	4W1_31
KEENE	76W1_31
KEENE	76W3_31

**ROW Patrols (cont'd)**

<b>AWC</b>	<b>Circuit</b>
KEENE	76W4_31
KEENE	76W7_31
KEENE	W110_31
KEENE	W15_31
KEENE	W185_31
KEENE	W2_31
KEENE	W9_31
LANCASTER	355
LANCASTER	348_76
LANCASTER	348X2
LANCASTER	348X3
LANCASTER	351_76
LANCASTER	352_77
LANCASTER	355X10
LANCASTER	376L_76
LANCASTER	376W_76
LANCASTER	384_76
LANCASTER	384X1
NASHUA	3110
NASHUA	3136
NASHUA	3143
NASHUA	3155
NASHUA	3159
NASHUA	3175
NASHUA	3177
NASHUA	3212
NASHUA	3217
NASHUA	3445
NASHUA	3020X
NASHUA	314_22
NASHUA	3144_21
NASHUA	3146_21
NASHUA	3147_21
NASHUA	314X12

<b>AWC</b>	<b>Circuit</b>
NASHUA	3154_21
NASHUA	3168X
NASHUA	3222X
NASHUA	329_22
NASHUA	353_21
NASHUA	3750_21
NASHUA	378_22
NASHUA	383_21
NASHUA	389_21
NASHUA	3891_21
NEWPORT	315_32
NEWPORT	316_32
NEWPORT	3410_32
NEWPORT	4181_32
NEWPORT	4435_32
NEWPORT	55W2_32
NEWPORT	61W2_32
PORTSMOUTH	3102_63
PORTSMOUTH	3105_63
PORTSMOUTH	3106_63
PORTSMOUTH	3111_63
PORTSMOUTH	3112_63
PORTSMOUTH	3153X
PORTSMOUTH	3165_63
PORTSMOUTH	3171_63
PORTSMOUTH	3172_63
PORTSMOUTH	3191_63
PORTSMOUTH	3214_63
PORTSMOUTH	3229_65
PORTSMOUTH	339_63
PORTSMOUTH	367_63
PORTSMOUTH	3850_63
ROCHESTER	392
ROCHESTER	3148X

**ROW Patrols (cont'd)**

<b>AWC</b>	<b>Circuit</b>
ROCHESTER	3157_61
ROCHESTER	3174_61
ROCHESTER	32_62
ROCHESTER	3228_61
ROCHESTER	340_61
ROCHESTER	3425_65
ROCHESTER	362_61
ROCHESTER	371_62
ROCHESTER	386_61
ROCHESTER	386A_61
ROCHESTER	399_62
ROCHESTER	399X1
TILTON	3798
TILTON	3025_64
TILTON	310_41
TILTON	3122_64
TILTON	3149_42
TILTON	317_64
TILTON	318_12
TILTON	319_64
TILTON	3196_42
TILTON	337_41
TILTON	338_42
TILTON	342A_41
TILTON	342B_41
TILTON	343_41
TILTON	345_42
TILTON	346_45
TILTON	3548_42
TILTON	3625_41
TILTON	368_41
TILTON	398_41

Section 2.4(b) Roadside Circuit Patrols

Area Work Center	Circuit
Bedford	23X2_12
Bedford	23X4_12
Bedford	23X6_22
Bedford	27W2_12
Bedford	3108_12
Bedford	311X1_12
Bedford	312X_12
Bedford	3164X3_12
Bedford	3173X1_12
Bedford	317X1_12
Bedford	317X2
Bedford	3194X1_12
Bedford	3197X_12
Bedford	322X12_12
Bedford	323X5_12
Bedford	3271X1_12
Bedford	3271X5_12
Bedford	327X8_12
Bedford	328X1_12
Bedford	328X2_12
Bedford	328X7_12
Bedford	328X9_12
Bedford	335X2_12
Bedford	360X1_12
Bedford	360X7_12
Bedford	360X9_12
Bedford	37W1_12
Bedford	3W2_12
Bedford	45H1_12
Bedford	5W2_12
Bedford	85W1_12
Berlin	25W1_77
Berlin	351X4_77
Chocorua	19W1_45
Chocorua	19W2_45
Chocorua	3116X1_45
Chocorua	3181_45
Chocorua	3218_45
Chocorua	333X_45

Area Work Center	Circuit
Chocorua	336X_45
Chocorua	346X1_45
Derry	26W1_23
Derry	3115X_23
Derry	3128X_23
Derry	3133X_23
Derry	3141X_23
Derry	3184X_23
Derry	32W4_23
Derry	32W5_23
Derry	365X_23
Derry	3818_23
Epping	3103_65
Epping	3103X1_65
Epping	3137X_65
Epping	3137X1_65
Epping	3162X1_65
Epping	3191X1B_65
Epping	3191X2_65
Epping	377X15_65
Epping	377X2_65
Epping	377X29_65
Epping	377X7_65
Epping	49W1_65
Hooksett	14W7_11
Hooksett	16W3_11
Hooksett	19X6_11
Hooksett	318X2_11
Hooksett	321X11_11
Hooksett	325X7_11
Hooksett	34W18_11
Hooksett	370X_11
Keene	24X1_36
Keene	3120_31
Keene	3120X2_31
Keene	3120X3_36
Keene	313X1_36
Keene	313X2_36
Keene	313X4_36

**Roadside Circuit Patrols (cont.)**

<b>Area Work Center</b>	<b>Circuit</b>
Keene	313X7_36
Keene	3140_36
Keene	3140X1_36
Keene	3140X2_36
Keene	3155X4_36
Keene	3155X9_22
Keene	3173_36
Keene	3178_31
Keene	382X2_36
Keene	382X3_36
Keene	51W1_36
Keene	53H2_36
Keene	55H1_36
Keene	76W1_31
Keene	76W7_31
Keene	W175_31
Lancaster	12W1_43
Lancaster	348X3_76
Lancaster	348X5_76
Lancaster	355X10_76
Lancaster	376W_76
Lancaster	41W1_43
Lancaster	43W1_43
Nashua	24W1_21
Nashua	3136X_21
Nashua	3143X_22
Nashua	3144X1_21
Nashua	3147_21
Nashua	314X12_22
Nashua	314X15_22
Nashua	314X4_22
Nashua	314X54_22
Nashua	3154_21
Nashua	3154X1_21
Nashua	3154X2_21
Nashua	3155X_22
Nashua	3155X2_22
Nashua	3155X3_22
Nashua	3155X7_22

<b>Area Work Center</b>	<b>Circuit</b>
Nashua	3155X8_22
Nashua	3175X1_21
Nashua	3177X1_21
Nashua	3445X_21
Nashua	3750_21
Newport	316X1_32
Newport	316X2_32
Newport	3410_32
Newport	42X3_32
Newport	44H1_32
Newport	48W1_32
Newport	75W2_32
Portsmouth	2W4_63
Portsmouth	3112_63
Portsmouth	3172_63
Portsmouth	3172X1_63
Portsmouth	3191X3_63
Portsmouth	339X8_63
Portsmouth	3850_63
Portsmouth	3850X1_63
Portsmouth	64W2_63
Portsmouth	71W4_63
Rochester	3148X3_62
Rochester	3157X1_61
Rochester	3174X1_61
Rochester	3174X2_61
Rochester	340X5_61
Rochester	34W4_61
Rochester	362X1_61
Rochester	362X2_61
Rochester	362X3_61
Rochester	362X4_61
Rochester	371X1_61
Rochester	371X4_61
Rochester	38W2_62
Rochester	392X1_61
Rochester	392X4_61
Rochester	392X7_62
Rochester	399X18_61

**Roadside Circuit Patrols (cont.)**

<b>Area Work Center</b>	<b>Circuit</b>
Rochester	399X8_61
Rochester	39W2_61
Rochester	56H2_61
Rochester	57W1_61
Rochester	73W1_61
Rochester	73W2_61
Tilton	11W2_41
Tilton	1X4_42
Tilton	20W1_42
Tilton	20W2_42
Tilton	29X1_41
Tilton	2W2_41
Tilton	30W2_64
Tilton	3114W1_42
Tilton	3114X_42
Tilton	319X1_64
Tilton	31W1_64
Tilton	3216_42
Tilton	3222X_41
Tilton	337X7_42
Tilton	345X5_41
Tilton	3548_42
Tilton	3548X2_42
Tilton	3548X9_42
Tilton	3798X3_42
Tilton	3798X4_42
Tilton	398X3_41
Tilton	39H1_42
Tilton	47H7_41
Tilton	70W2_41
Tilton	90H1_64

## Section 3

# Capital Activity Summary January 1, 2021 – December 31, 2021

## **CAPITAL - 2021**

### **REJECT POLE REPLACEMENT:**

**Program Description:** Replace poles determined to be defective during the annual inspection cycle.

Eversource maintains approximately 250,000 poles on its system. These are inspected every 10 years or an average of 25,000 poles per year

**Total Unit Population:** Depending upon inspection results, Eversource estimates 500 poles to replace each year which corresponds to a 2% failure rate.

**Results:** In 2021, 19,324 poles were inspected within the Eversource maintenance area with 95 found to be defective requiring replacement (0.5 % defective rate).

<b>\$ Plan</b>	<b>\$ Actual</b>	<b>\$ Variance</b>
\$2,500,000	\$2,033,523	(\$466,477)

### **DIRECT BURIED CABLE REPLACEMENT:**

**Program Description:** Replace direct buried cable with cable in conduit.

Approximately 2,000,000 feet of direct buried cable was installed at Eversource prior to 1985 with earliest vintages from 1970. Cable insulation is subject to age failure and bare concentric neutral conductors are subject to corrosion. Testing has indicated that in many locations the concentric neutral is no longer sufficient to provide a path to ground for the electric system. This project is to replace unjacketed direct buried cable in specific developments which have experienced a high failure rate. Live front transformers and/or pre-1987 elbows are replaced along with the cable.

**Results:** Five cable replacement projects were completed in 2021.

Pine Isle Drive – a 1970s vintage direct-buried unjacketed cable URD with multiple problems, including inaccessible live-front transformers, a history of cable failures, and safety issues such as an overhead transformer on a slab inside a metal cabinet.

Apple Tree Cinema URD - The underground primary facilities serving these customers were severely deteriorating due to contact with water runoff. Several of the cabinets fail NESC because they cannot be secured closed due to rot. Others were built on top of cinder blocks. Two of the transformers were live front.

Riverway Place Cable Replacement - This project reconfigured Riverway Place underground development in Bedford to eliminate approximately 1,750 feet of 38-year-old failing direct buried three phase cable, and to restore a currently unusable backfeed, due to a failed direct buried cable. The mixed commercial and residential use area is comprised of 77 total customers including three medical buildings, restaurants, and apartments. The cable has had multiple failures over the course of its life with the last being June 3rd, 2021.

Monadnock Trailer Park URD - Monadnock Park is a 72-site mobile home cooperative located on Route 202 in Rindge, NH. The park was built in the early 1970s with all utilities underground. Primary, secondary, and service lines are direct buried. Many of the secondary runs were “daisy-chained” together and were not run directly to customer meter pedestals. Customers have experienced voltage flicker problems due to the cycling of the pumps for the park water

distribution system. This project serves the water pump station from its own transformer and independent service. This project includes two single phase pad mount transformers. A sector cabinet and additional conduits were added to allow the removal of some direct buried cables and to take advantage of open trenches for future improvements.

Maplewood Ave DB Cable Replacement - This underground development in Portsmouth has had a history of failed direct buried cable. There have been two cable failures in the last three years. Each failure causes 50 customers to be radially fed. This project will restore the loop for these 50 customers and increase the reliability for these customers by replacing unjacketed direct buried cable with new jacketed cable in conduit

<b>\$ Plan</b>	<b>\$ Actual</b>	<b>\$ Variance</b>
\$1,631,000	\$1,680,774	\$49,774

**OTHER CAPITAL RELIABILITY PROJECTS:**

**Category Description:** This category includes all projects with spending in 2021 in excess of \$100,000 which were at least partially justified based on reliability.

In addition to the Cable Replacement Projects described above, there were 19 projects with greater than \$100,000 spent which were established in 2021 to improve reliability. These projects are listed below. Project descriptions are included in Section 3.1.

<b>Project #</b>	<b>Project Title</b>	<b>Amount Authorized</b>	<b>2021 Spend</b>	<b>Status (12/31/21)</b>
A21C01	REPLACE DEGRADED MANHOLE ROOFS	79,000	112,212	Completed
A21C04	GOFFSTOWN SS CONVERSION	1,696,000	1,865,906	Under Construction
A21C07	MALVERN VALLEY HANOVER CIRCUIT TIE	831,000	304,526	Under Construction
A21C11	CIRCUIT TIE 14X188 TO 3248	676,000	351,631	Under Construction
A21C74	LINE 321/3182 LAMINATED WOOD STRUCTURE REPLACEMENT	388,000	551,857	Under Construction
A21C91	393 LINE ROW SECTION REBUILD	3,723,000	463,288	Under Construction
A21DA	DISTRIBUTION AUTOMATION POLE TOP	7,500,000	5,168,016	Completed
A21E08	CIRCUIT TIE 3191X1B TO 377X2	944,000	534,224	Completed
A21E09	CIRCUIT TIE 3191X3 TO 3191X	579,000	853,144	Under Construction
A21E87	49W1 TIMCO ROW TAP REMOVAL	316,000	116,961	Completed
A21LS	DISTRIBUTION AUTOMATION LINE SENSOR	360,000	372,904	Completed
A21N45	ASHLAND S/S-PLC REPLCMNT& P&C UPGRADE	400,000	149,004	Under Construction
A21S06	CONSTRUCT NEW FEED FOR RTE 122	323,000	308,417	Completed
A21S17	34.5 kV CAPACITOR BANK SWTCH REPLACEMENT BROAD ST	1,378,000	186,592	Under Construction
A21W36	REMOVE LATTICE STEEL TOWERS W15	250,000	252,110	Completed
A21W75	HIGH IMPEDANCE GROUND FAULT DETECTION - N KEENE SS	396,000	181,566	Completed
A21X44	2021 CIRCUIT PATROL REPAIRS	1,200,000	1,053,962	Completed
A21X79	2021 WOOD POLE TREATMENT	478,000	411,820	Completed
A21X93	2021 CIRCUIT PATROL REPAIRS PHASE 2	1,000,000	1,117,561	Under Construction
<b>Total 2021 Amount for projects initiated in 2021</b>		<b>22,517,000</b>	<b>14,355,700</b>	
(Note that Authorized Amount includes the total for Multi-year projects)				

In addition, there were 29 reliability projects established in prior years with spending in 2021 in excess of \$100,000. Project descriptions for these projects are included in Section 3.2.

<b>Project #</b>	<b>Project Title</b>	<b>2021 Spend</b>
A08N10	Portsmouth S/S - add transformer	1,036,082
A14N08	GORHAM SS-GENERATION DIVESTITURE	165,080
A14W01	EMERALD STREET SUBSTATION	2,871,262
A16C08	Brook St S/S - 13TR1 Replacement	164,205
A17C30	Pack Monadnock Rebuild Single-Phase Line	1,273,079
A17E09	ROCHESTER 4 kV CONVERSION	2,929,630
A17S03	MILLYARD SS REPLACEMENT	3,573,558
A18C07	EDDY SS CONTROL HOUSE	6,180,483
A18N03	WHITE LAKE SS REBUILD	149,246
A19E07	Downtown Portsmouth UG System Improvements	135,048
A19S40	AMHERST S/S - PLC AUTOMATION REPLACEMENT	1,498,489
A19X36	34.5 kV OCB BREAKER AND ANCILLARY EQUIPMENT REPLACEMENT	444,239
A19X61	HIGH IMPEDANCE GROUND FAULT DETECTION NH	341,002
A20C40	MANCHESTER NETWORK CABLE REPLACEMENT	1,968,368
A20C46	317 Line ROW Section Rebuild	759,600
A20DA	DISTRIBUTION AUTOMATION POLE TOP	1,987,438
A20E47	CODFISH CORNER ROAD LOOP	427,043
A20N01	Rebuild Berlin UG System	103,155
A20N45	REPLACE CT TRANSFORMER BERLIN EASTSIDE SS	388,657
A20S02	Millyard SS Distribution Line Work	176,983
A20S12	Replace 3891X Cable along Railroad Track	754,159
A20W18	317/3410 RECONDUCTOR BRADFORD TO WARNER	1,038,924
A20W33	PACK MONADNOCK SUMMIT SOLUTION	291,407
A20W34	BYRD AVE SS UPGRADES	221,883
A20W36	SUGAR RIVER SS UPGRADES	1,332,322
A20W44	NEWPORT SS RECLOSER PROJECT	1,023,070
A20X21	NH DMS – Multiyear Project	2,479,900
A20X26	SPARE 345-34.5 kV TRANSFORMER	645,006
A20X38	2020 CIRCUIT PATROL REPAIRS	1,633,476
A20X39	NH T&D IEC 61850 SIMULATOR	171,664
<b>Total 2021 spend on projects initiated in previous years</b>		<b>33,684,558</b>

## Section 3.1

### 2021 Projects

### **A21C01 Replace Degraded Manhole Roofs – Construction Complete**

This project is to address manhole roofs that have been identified as requiring immediate replacement due to their poor condition. Two manholes (16 and 20) on Hampshire Lane in Manchester were identified. The 34.5 kV 388 circuit, as well as network primary and secondary conductors, are in both manholes.

### **A21C04 Goffstown SS Conversion – 45H1 – Under Construction**

This project is Phase 1 to retire Goffstown Substation. Phase 1 will convert the 45H1 circuit to 34.5 kV. The existing substation transformers are over 64 years old. A recent condition assessment on Goffstown Substation classified each of its transformers as a unit with a high failure risk index and nearing the end of its expected life. Also, 2021 forecasted loads show that the Goffstown transformers are projected to exceed their nameplate rating and these transformers cannot be offloaded because they lack circuit ties to other substations. This solution allows for the elimination of a substantial portion of the non-standard 3.74 kV system and future creation of a circuit tie between converted 45H1 and 27W2, improving system reliability in the Goffstown area. Phase 2 is expected to be completed in 2022 for approximately \$2,000,000 and will be established as a separate project. This project will be completed in early 2022.

### **A21C07 Malvern Valley Hanover SS Circuit Tie – Under Construction**

This project creates a 2,900-foot circuit tie between the Hanover Street Substation 16W1 and Malvern Street Substation 23W2 circuits. It will also create a 12 kV tie between Malvern 23W2 and Valley Street Substation 22W2 circuits. Hanover, Malvern, and Valley Substations are located in Manchester, New Hampshire and feed 12 kV load in the city. This new circuit tie increases the backup capability through the 12 kV system for Valley, Malvern, and Hanover Substations so that load will not remain isolated for a single contingent loss of a substation transformer. This project will be completed in early 2022.

### **A21C11 Circuit Tie 14X188 to 3248 – Under Construction**

This project converts twenty sections (2,250 ft) of three phase main line on River Road in Manchester to create a tie between the 14X188 and 3248 circuits. The tie will be used whenever there are outages between the tap and the mid-point DA device of either circuit, thereby allowing restoration from the adjoining circuit benefiting over 1,150 customers. The project will also replace 3-phase 2/0 Cu primary with 477 Spacer cable, thereby hardening the circuit against potential tree and animal related outages. The project cost is estimated at \$675,500 (including one tie DA device), and cost per customer minute (CCMS) saved is \$10.73 (no circuit tie presently exists). This project will be completed in early 2022.

### **A21C74 Line 321/3182 Laminated Wood Structure Replacement – Under Construction**

This project replaces 27 Laminated Wood System (LWS) structures and four (4) round wood structures for a total of 31 structure replacements out of the 46 structures on the double circuited 115 kV M164, 34.5 kV lines 321/3182 that runs 2.12 miles from Bedford Substation in Bedford, NH to Huse Road Substation in Manchester, NH. The integrity of the LWS structures cannot be measured by conventional visual inspection and the remaining strength cannot be estimated because most of the wood is rotting from within or under mounting brackets. This type of damage is not visible during an aerial or ground inspection and structures receive a priority rating of A or B based on visual inspections standard EPRI guidelines since splits have to be in high stress / attachment points to be identified for replacement with a priority rating C or D. Given the evidence of previously replaced LWS structures, a Laminated Wood System (LWS) Replacement Program was established to retire all LWS structures from the Eversource transmission system. This project funds the distribution portion of this project. The project will be completed in early 2022.

### **A21C91 393 Line ROW Section Rebuild – Under Construction**

This two-year project replaces structures along the 393 line in right of way between Huse Road Substation and Mammoth Road in Manchester, NH. Twenty-One (21) aged wooden poles and associated hardware will be replaced with new steel structures. This replacement project strengthens the system for 5,082 customers, representing more than 22 MW of load under normal conditions or 31 MW and over 9,200 customers under contingency conditions. The majority of the structures proposed for replacement

were constructed in 1969 and are over 52 years old. This line is located in ROW and access is limited due to significant wetland conditions. The project will be completed in 2022.

#### **A21DA Distribution Automation Pole Top – Construction Complete**

This project funds the installation of 75 pole top SCADA controlled devices in 2021. These devices provide indication of circuit conditions and allow for remote operation to sectionalize the system and restore power remotely. Installation of these devices over the last five years has significantly reduced the impact and duration of outages on the distribution system.

#### **A21E08 Circuit Tie 3191X1B to 377X2 – Construction Complete**

This project created a new circuit tie between the 2019 Hit List circuits 3191X1B and 377X2. The 3191X1B is a radial circuit feeding 1,178 customers and experiences, on average, one fault on the backbone each year impacting the whole circuit. This project reconducted and converted 2,300 feet of #4 bare Cu conductor with 477 spacer cable on the 377X2 on Exeter Road to create a new 34.5 kV circuit tie between the 3191X1B and the 377X2 on Bennett Way in Newmarket, providing a back feed to the 3191X1B from the 377 line. The project has a cost per customer minute saved is calculated to be \$2.20.

#### **A21E09 Circuit Tie 3191X3 to 3191X – Under Construction**

This project creates a circuit tie between the radially fed 3191X3 and the 3191 main line along Post Road in Greenland, NH. Approximately 1,700 feet of the 3112X4 circuit is being reconducted with 1/0 spacer cable and converted from 4.16 kV to 34.5 kV. The 3191X3 has a history of outages with long restoration times. This tie creates a backup for 1,564 customers on the 3191X3 and for the 36 customers being converted on the 3112X4. This project will also set up a future tie between the 3191X3 and the 3112 and allow for the removal of 34.5 kV to 4.16 kV, 500 kVA step transformers. The project adds two DA devices for switching. The cost per customer minute saved is calculated to be \$4.86.

#### **A21E87 49W1 Timco ROW Tap Removal – Construction Complete**

This project removed the Timco Tap, a 1.5-mile distribution off-road line extending from Barnstead, NH to Pittsfield, NH. The project removed forty-two (42) aged wooden poles, 7,900 feet (1.5 miles) of 3-1/0 ACSR primary conductor. The off-road distribution line feeds no customers and has no plan for use in the future. The line has no benefit to customers and is difficult to maintain. Vegetation management spends approximately \$40,000 every four years to maintain this section of the line.

#### **A21LS Distribution Automation Line Sensor – Construction Complete**

This project installed Aclara line sensors at various locations on the distribution system throughout the state. The sensors monitor current at the installation location and capture critical data for engineering and operations. These devices increase visibility into the distribution system and provides information used to design projects to improve reliability on circuits, reveal load imbalance or low voltage situations that need to be resolved, or monitor step transformer loading.

#### **A21N45 Ashland SS – PLC Replacement & P&C Upgrade – Under Construction**

This project replaces the Programmable Logic Controller (PLC) based automation scheme at Ashland Substation in Ashland, NH. The PLC based automation scheme is obsolete (approximately 16 years old) and has difficult to update and maintain. There are two (2) substations remaining on the Eversource system that require replacement of the PLC based automation scheme, including Ashland Substation. The other is Great Bay Substation, which will be addressed under a separate future project. There are numerous software, firmware, design and equipment issues with this legacy system.

#### **A21S06 Construct New Feed for Re 122 – Construction Complete**

This project improved the reliability of the single phase 19.9 kV radial tap off the 3212X circuit that runs south along Route 122 in Amherst and Hollis, NH. This tap feeds 770 customers and is continuing to grow with three new developments in 2020. Tapping the 3217X ROW at the Hayden Road crossing and converting the existing 2.4 kV primary to 19.9 kV along Hayden Road and Federal Hill Road to the existing 19.9 kV on Plain Road allows half the customers to be transferred to a new feed, as well as

provides back up feeds for both sections of the line. The cost per customer minute saved is calculated to be \$2.38.

### **A21S17 34.5 kV Capacitor Bank Switch Replacement Broad Street – Under Construction**

The need for a 34.5 kV Capacitor Bank Switch Replacement Program was identified in 2008. There were 21 vacuum switches identified as needing replacement at that time. These vacuum switches were prioritized based on age, condition, operating problems, and uniqueness. A program was established in 2019 to replace the remaining switches. Seven (7) of these capacitor switches are to be replaced as part of this program. This Program Release is to replace the 34.5 kV capacitor bank switch at Broad Street Substation in Nashua, NH with a vacuum circuit breaker.

### **A21W36 Remove Lattice Steel Towers W15 – Construction Complete**

This project removed lattice steel towers on the W15 line. The specific work has been identified based on current lattice tower conditions and line sections classified as a potential risk to safety. Work in 2021 was to remove structures on the abandoned section of the W15 circuit in the towns of Marlborough, Harrisville, and Dublin, NH. There are additional removals to be done and funding will be sought in future years.

### **A21W75 High Impedance Ground Fault Detection N. Keene SS – Construction Complete**

The Eversource engineering groups in all three (3) states are looking at the high-impedance ground fault detection technologies presently available on the market and evaluating whether any viable methods exist to securely detect, and subsequently clear, high impedance faults on the distribution system. The program will make use of three relay products currently available on the market from the following manufacturers: ABB (REF615), GE (F60) and SEL (SEL-751). The focus for the pilot program will be the evaluation of these relays based on detecting these faults with a high level of security. Equipment protection tripping for these high impedance ground faults will not (for now) be part of the pilot program; however, indication of the presence of these faults will be sent via SCADA to the system electric centers for notification. For the New Hampshire pilot projects, two (2) circuits have been selected to be part of the pilot program: 3133X out of Lawrence Road Substation, and 76W7 out of North Keene Substation. The scope of work for both New Hampshire projects calls for the installation, test, and commissioning of one (1) ABB relay, one (1) GE relay, and one (1) SEL relay at each of the two (2) substations. Protection and Controls (P&C) engineering will subsequently review distribution system events on these feeders to observe and document how each High Impedance Ground Fault Detection algorithm responded for the evaluation. This project addresses work at the North Keene Substation.

### **A21X44 2021 Circuit Patrol Repairs – Construction Complete**

This project repaired or replaced distribution plant discovered to be deficient as a result of the circuit patrols completed in April and May of 2020. A total of approximately 1,500 items were identified to be repaired or replaced, including broken, leaning, or damaged poles, broken or decayed crossarms and braces, damaged primary conductors, broken or loose guy wires and anchors, damaged insulators or bent pins, and broken insulator ties. Work was performed by contractors at unit prices.

### **A21X79 2021 Wood Pole Treatment – Complete**

This project funded wood pole treatment of 1,899 structures located on 14 distribution Right of Way lines in the state of New Hampshire. The treatment is designed to provide a “booster shot” of preservatives to improve the expected performance of the wood pole through the application of a new preservative product that provides additional protection against decay and extends the useful life of the pole. Systematic and programmatic implementation of Distribution Wood Pole Treatment has been proven to substantially lengthen the service life of wood pole assets. The wood pole treatment cycle is ten (10) years.

**A21X93 2021 Circuit Patrol Repairs Phase 2 – Construction Complete**

This project repaired or replaced distribution plant discovered to be deficient as a result of the circuit patrols on poor performing circuits completed in the Fall, 2021. Repairs and replacements include broken, leaning, or damaged poles, broken or decayed crossarms and braces, damaged primary conductors, broken or loose guy wires and anchors, damaged insulators or bent pins, and broken insulator ties. Work was performed by contractors at unit prices.

## Section 3.2

# Prior Years' Projects

### **A08N10 Portsmouth SS Second Transformer – Construction Complete**

This project installed a second company standard 115-34.5 kV 62.5 MVA transformer at Portsmouth Substation. It includes the installation of a 115 kV breaker and 115 kV bus rework to install the new transformer. The project also replaces the existing 44.8 MVA transformer with a 62.5 MVA unit. The addition of a second transformer at Portsmouth Substation will allow for the installation of a bus restoral scheme resulting in improved reliability for the customers served.

### **A14N08 Gorham SS – Generation Divestiture Construction Complete**

This project separated the generation and distribution assets from the hydro building and substation yard to support the divestiture of generation. This included the installation of two new reclosers outside of the substation and the removal of two breakers currently located inside the substation. All miscellaneous line work was included in this project as well as environmental cleanup and the addition of a transfer-trip scheme.

### **A14W01 Emerald Street SS -- Construction Complete (Distribution)**

In September 2014, the plan to construct a new North Keene Substation and the rebuild of Emerald Street Substation in Keene was approved to address loading, fault duty and asset condition issues at Emerald Street. North Keene Substation was placed in service in October 2016. The distribution scope of work at Emerald Street Substation includes the removal of (4) four (of five) smaller, aged transformers, the installation of (2) two new 30 MVA 115-12.47 kV transformers, the removal of the existing 12.47 kV switchgear, and the installation of new metal clad switchgear along with new protection and control equipment.

### **A16C08 Brook St SS – 13TR1 Replacement – In Design**

A major portion of the downtown Manchester area is fed by a 33 transformer 120/208 volt network grid which is powered by two transformer/switchgear lineups (13TR1 and 13TR2) at Brook Street Substation. In the past 10 years, all 33 of the network transformers and protectors have been replaced and one of the two transformers at Brook Street Substation feeding the network system (13TR1) has been replaced. However, the 13TR1 switchgear at Brook St Substation is 65 years old and has experienced multiple equipment failures over the last 10 years causing the network system to completely lose power. This project will replace the old 13TR1 switchgear with new 15 kV metal clad switchgear to provide a reliable power source to the network system.

### **A17C30 Pack Monadnock Rebuild Single-Phase Line - Construction Complete**

This project constructed a new 5,200 foot overhead line to the summit of Pack Monadnock. The line was originally installed in the 1930s by Greenville Electric Light Company and New England Telephone and Telegraph Company. In April of 2017, PUC Director of Safety and Security visited the location and cited many safety violations on both the electric and communication facilities. The existing pole line and primary cable in conduit laying on the ground will be removed. The electric facilities at the summit of the mountain were addressed under a separate project.

### **A17E09 Rochester 4 kV Conversion – Under Construction**

This project will improve the reliability of the distribution system in the city of Rochester by converting three 4 kV circuits to 12.47 kV, establishing new circuit ties between four 12.47 kV circuits in Rochester and allowing for the use of distribution automation. This project will be completed in early 2022.

### **A17S03 Millyard SS Replacement – Under Construction**

This multiyear project rebuilds the Millyard Substation at a new site in Nashua, NH. The existing substation transformers are 68 and 71 years old and the switchgear is of the same vintage. Additionally, over the last few years 3 of the 6 circuit feeders have failed. The substation currently serves 2,700 customers. This project is expected to be completed in 2022.

### **A18C07 Eddy SS Control House – Under Construction**

This project is to build a control house in the Eddy Substation yard. The existing control house is in the

Amoskeag Power House adjacent to the Eddy Substation. The Amoskeag generation facilities were sold in 2018 as a result of the generation divestiture in NH. The new control house is needed to house transmission and distribution protection and control systems in a secure building under Eversource access and control. The project will be completed in 2022.

### **A18N03 White Lake SS Rebuild – In design**

White Lake Substation in Tamworth, NH became a two (2) transformer 115-34.5 kV substation in the mid-1950s when a 115 kV line (B-112) was constructed as a source to the area. A combustion turbine (CT) generator was added to the substation in 1968 to provide black start capability to the system. The White Lake CT was sold in 2018. This project rebuilds the White Lake SS to address, capacity deficiency, aging equipment, and generation divestiture issues.

### **A19E07 Downtown Portsmouth UG – TD Bank - Construction Complete**

This project replaced a 300 kVA live front transformer and associated direct buried cable with a new 750 kVA transformer. The new transformer is used to feed TD Bank and several other customers and eliminates two overhead transformer banks on Porter Street in downtown Portsmouth. The project installed approximately 260 feet of two 5-inch primary conduit, 200 feet of four 4-inch secondary conduit, two 30x30-inch secondary hand holes, and all associated primary and secondary cable to transfer the load to the new transformer.

### **A19S40 Amherst SS – PLC Automation Replace - Under Construction**

This project engineers and replaces the PLC designed automation scheme at Amherst Substation. The PLC designed automation scheme is outdated and a challenge to update and maintain. There are numerous software, firmware, design and equipment issues with this legacy system.

### **A19X36 34.5 kV OCB Breaker and Ancillary Equipment – In Design**

This project is used to support initial funding to support the 34.5 kV Oil Circuit Breaker (OCB) replacement program. The spending in 2021 was associated with developing the OCB replacement projects at Garvins Substation and Saco Valley Substation.

### **A19X61 High Impedance Ground Fault Detection NH - Lawrence Road SS - Construction Complete**

The Eversource engineering groups in all three (3) states are looking at the high-impedance ground fault detection technologies presently available on the market and evaluating whether any viable methods exist to securely detect and subsequently clear high impedance faults on the distribution system. The program will make use of three relay products currently available on the market from the following manufacturers: ABB (REF615), GE (F60) and SEL (SEL-751). The focus for the pilot program will be the evaluation of these relays based on detecting these faults with a high level of security. Equipment protection tripping for these high impedance ground faults will not (for now) be part of the pilot program; however, indication of the presence of these faults will be sent via SCADA to the system electric centers for notification. For the New Hampshire pilot projects, two (2) circuits have been selected to be part of the pilot program: 3133X out of Lawrence Road Substation, and 76W7 out of North Keene Substation. The scope of work for both New Hampshire projects calls for the installation, test, and commissioning of one (1) ABB relay, one (1) GE relay, and one (1) SEL relay at each of the two (2) substations. Protection and Controls (P&C) engineering will subsequently review distribution system events on these feeders to observe and document how each High Impedance Ground Fault Detection algorithm responded for the evaluation. This project addresses work at the Lawrence Road Substation.

### **A20C40 Manchester Network Cable Replacement – Under Construction**

While the network has historically been a highly reliable distribution system due to its inherent redundancy, it has recently experienced a significant number of primary circuit outages. Since December 2018, there have been 10 instances of cable or splice failures. The cabling on the four 13.8 kV circuits is primarily Paper Insulated Lead-sheathed Cable (PILC), and dates to the 1950s. This project will replace all four primary circuit cables (13A/B/C/D) in the Nutfield Lane area (Zone 1). It is the first of four zones

identified for complete primary circuit reconductoring of the Manchester network. Project to be completed in early 2022.

#### **A20C46 317 Line ROW Section Rebuild – Under Construction**

This project is the reconstruction of a portion, approximately 5,000 feet, of the 317 line in right of way between Warner Substation and the line crossing at Route 103. This project replaces 27 aged wooden poles and deteriorated crossarms, 5,000 feet of 83-year-old #2 copper conductor with 477 MCM spacer cable and added a neutral to an existing 3 wire system, providing improved fusing protective margins. Project to be completed in early 2022.

#### **A20DA 2020 Pole Top Distribution Automation - Construction Complete**

This project installed 111 pole top SCADA controlled devices in 2020 and early 2021. These devices provide indication of circuit conditions and allow for remote operation to sectionalize the system and restore power remotely. Installation of these devices over the last four years has significantly reduced the impact and duration of outages on the distribution system.

#### **A20E47 Codfish Corner Road – Construction Complete**

This project replaced failed direct buried cable on the 3105X1 to put the Portsmouth Trailer Park loop back into service and remove an overhead primary riser from a customer's backyard. It also replaced two live-front transformers to help complete the loop and allow switching without having to de-energize customers.

#### **A20N01 Replace Berlin Underground System – Construction Complete**

A portion of the Berlin downtown was fed from a 1960s vintage underground system. Two risers fed three live-front pieces of switch gear that fed out to eight transformers, most of which were live front. In 2019, there were four system failures. The condition of the equipment is poor. The new system replaced all live front equipment with dead front units. The switchgear has been replaced with sector cabinets. A loop will be maintained with the two risers, eliminating the need for switchgear.

#### **A20N45 Replace CT Transformer Berlin Eastside SS – Construction Complete**

This project replaced two (2) sets of three (3) ABB 115 kV current transformers (CTs) on the J83 and J115 circuit switcher terminals at Berlin Eastside Substation in Berlin, NH. These ABB (TB-123) units were the only SF6 insulated CT units on the 115 kV system in NH and sent an alarm when the temperature fell below the manufacturer's tolerance range. It was determined that replacing each of the six (6) CTs with an oil insulated CT (Trench IOSK123) was the appropriate solution.

#### **A20S02 Millyard SS Distribution Line Work – Under Construction**

This project is the distribution line work associated with the Millyard Substation rebuild project.

#### **A20S12 Replace 3891X Cable Along Railroad Track - Construction Complete**

This project scope was reduced due to delays in obtaining the necessary easements. The project completed added a pole top SCADA controlled device at Front Street Substation, installed a manhole, and replaced of a section of direct buried cable to a new riser to support the new pole top device.

#### **A20W18 317/3410 Reconductor Bradford to Warner - Construction Complete**

The 317/3410 line runs 13.5 miles in ROW from Davisville (Bedford AWC) to Bradford (Newport AWC). The assets are in poor condition and in an area where the terrain is a mixture of year-round water bodies and ravines. Access to the line is challenging for maintenance and emergency repairs. The line does not have a neutral. This project funded the first phase of improving the 317/3410 line. This project constructed a new 2.5 mile roadside 477 MCM spacer cable line from Bradford switching station along Route 103 into Warner.

### **A20W33 Pack Monadnock Summit Solution - Construction Complete**

This project is associated with project A17C30 Pack Monadnock Rebuild Single-Phase Line. The Summit Solution is the final piece of the Pack Monadnock project. This project addressed the electric power distribution deficiencies at the summit of this New Hampshire State Park.

### **A20W34 Byrd Avenue SS Upgrades – Construction Complete**

Byrd Avenue , River Road , Spring Street , and Sugar River Substations were acquired in 2004 from the former Connecticut Valley Electric Company (“CVEC”). These substations had equipment that was defined as obsolete and replacement parts were no longer available according to Station Operations. This project replaced several disconnect switches, lightning arresters, and voltage regulators at Byrd Avenue Substation.

### **A20W36 Sugar River SS Upgrades – Construction Complete**

Byrd Avenue , River Road , Spring Street , and Sugar River Substations were acquired in 2004 from CVEC. These substations had equipment that was defined as obsolete and replacement parts were no longer available according to Station Operations. This substation upgrade involved the integration and automation of the protection and control devices to provide remote metering, status points, alarms and controls features at Sugar River Substation.

### **A20W44 Newport SS Recloser Project - Construction Complete**

This project constructed a NOVA three phase recloser on Line 315 to utilize the circuit tie constructed between the 315 and the 42X1 and reduce outage times via SCADA. The recloser was installed inside the Newport Substation fence to ensure maximum bus protection from faults. The existing 42X1 VWVE recloser was also replaced with a NOVA three phase recloser since the VWVE recloser is not bi-directional and cannot be used to energize Newport Substation in the event of a fault on the 315 line.

### **A20X21 NH DMS – Multi-year project, Under Construction**

This project will implement a Distribution Management System (“DMS”) in New Hampshire. The DMS is comprised of hardware and software that is necessary to evaluate system conditions and provide data and information to distribution system operators, which will allow them to more effectively manage the distribution system in real time.

### **A20X26 Spare 345-34.5 kV Transformer – Under Construction**

Eversource has five (5) 140 MVA 345-34.5 kV transformers on the system. There are two (2) at Timber Swamp Substation, two (2) at Amherst Substation, and one (1) at Lawrence Road Substation. This is a full funding request to procure a spare 140 MVA 345-34.5 kV transformer, to be designed and installed at Timber Swamp Substation in Hampton, NH. The design and installation will include a new foundation, oil containment, AC power, and alarm inputs to the transformer.

### **A20X38 Circuit Patrol Repairs – Construction Complete**

Circuit patrols of overhead distribution circuits were completed in April and May of 2020, following a spring storm, and identified damaged equipment which may result in future outages. The list of items found was assembled and prioritized. Approximately 900 items were repaired or replaced. Items which were reported but are not likely to caused outages, such as clearance issues and double poles, will be addressed through the normal course of business and are not part of this project.

### **A20X39 NH T&D IEC 61850 Simulator – Construction Complete**

This project expands the existing NH Transmission IEC 61850 Protocol Simulator to include the addition of distribution relay and control panels at the 1250 Hooksett Road, Hooksett, NH Eversource facility. This protection and control simulator will support the development and training of existing and future NH Station Operations staff that utilize the IEC 61850 protocol.

## Section 4

# Worst Performing Circuit Lists

2021 Circuit Hit List - Ranked By COSAIDI - IEEE Criteria

Rank	Circuit	Customers Served By Circuit	COSAIDI	Circuit SAIDI	Circuit SAIFI	Circuit MBI	CAIDI	CILI	# Outages	Customers Interrupted (CI)	Customer Minutes (CMI)	Circuit Miles	Region	AWC
1	355X10_76	2,363	2.39	546.2	4.49	2.7	122	128	83	10,617	1,290,303	122.2	NH NORTHERN	LANCASTER AWC
2	3137X1_65	1,721	2.24	701.6	3.11	3.9	226	122	44	5,346	1,207,666	64.3	NH EASTERN	EPPING AWC
3	3128X_23	6,443	1.97	164.6	1.36	8.8	121	83	106	8,775	1,060,666	149.2	NH SOUTHERN	DERRY AWC
4	316X1_32	3,464	1.93	301.1	2.71	4.4	111	82	114	9,372	1,042,883	157.8	NH WESTERN	NEWPORT AWC
5	19W1_45	1,263	1.42	607.9	3.77	3.2	161	125	38	4,758	767,831	47.8	NH NORTHERN	CHOCORUA AWC
6	3140X2_36	1,650	1.37	448.9	2.69	4.5	167	57	78	4,440	740,627	94.9	NH WESTERN	KEENE AWC
7	3141X_23	4,873	1.34	148.5	0.84	14.4	178	48	85	4,070	723,671	115.0	NH SOUTHERN	DERRY AWC
8	76W7_21	3,422	1.29	203.6	1.72	7.0	119	44	133	5,874	696,798	180.0	NH WESTERN	KEENE AWC
9	23X5_22	3,886	1.18	163.2	1.00	12.0	163	41	95	3,885	633,972	162.6	NH CENTRAL	BEDFORD AWC
10	3525X5_77	852	1.15	725.7	4.28	2.8	169	174	21	3,651	618,400	60.0	NH NORTHERN	BERLIN AWC
11	3139X_31	2,653	1.12	227.9	2.21	5.4	103	35	167	5,864	604,604	150.9	NH WESTERN	KEENE AWC
12	3525X2_77	1,664	1.08	348.5	3.29	0.9	106	421	13	5,470	579,929	21.1	NH NORTHERN	BERLIN AWC
13	317X3_12	1,356	0.98	387.7	3.07	3.9	126	91	46	4,167	525,788	69.1	NH CENTRAL	BEDFORD AWC
14	3173X1_12	1,539	0.97	341.3	2.09	5.7	163	39	83	3,222	525,178	72.1	NH CENTRAL	BEDFORD AWC
15	19W2_45	2,587	0.95	198.6	1.95	6.2	102	90	56	5,044	513,795	101.7	NH NORTHERN	CHOCORUA AWC
16	382X3_36	2,111	0.93	237.3	1.43	8.4	166	79	38	3,014	500,935	37.2	NH WESTERN	KEENE AWC
17	355X_76	3,832	0.92	129.3	1.00	0.2	129	3,832	1	3,832	495,644	37.6	NH NORTHERN	LANCASTER AWC
18	3W2_12	1,269	0.92	389.5	3.04	3.9	128	97	40	3,861	494,182	39.1	NH CENTRAL	BEDFORD AWC
19	313X1_36	2,421	0.91	201.7	1.58	7.6	128	38	102	3,828	488,327	118.9	NH WESTERN	KEENE AWC
20	3159X_21	2,752	0.90	175.5	1.04	11.5	168	67	43	2,867	483,012	65.6	NH SOUTHERN	NASHUA AWC
21	392X7_62	2,644	0.87	178.0	1.42	8.4	125	39	97	3,763	470,642	97.9	NH EASTERN	ROCHESTER AWC
22	W15_31	1,711	0.87	273.0	1.97	6.1	139	67	50	3,370	467,274	78.4	NH WESTERN	KEENE AWC
23	73W2_61	2,411	0.86	191.4	1.39	8.6	138	60	56	3,355	461,457	69.3	NH EASTERN	ROCHESTER AWC
24	392X1_61	1,935	0.83	231.8	2.81	4.3	83	121	45	5,432	448,402	68.4	NH EASTERN	ROCHESTER AWC
25	316_32	3,272	0.82	135.0	1.30	9.2	104	47	90	4,253	441,664	171.9	NH WESTERN	NEWPORT AWC
26	3108_12	1,812	0.77	229.5	1.89	6.3	121	72	48	3,432	415,922	61.4	NH CENTRAL	BEDFORD AWC
27	48W1_32	1,138	0.76	360.8	2.14	5.6	169	59	41	2,434	410,588	37.2	NH WESTERN	NEWPORT AWC
28	3103X1_65	2,380	0.75	169.0	1.29	9.3	131	79	39	3,078	402,137	65.8	NH EASTERN	EPPING AWC
29	3410_32	3,855	0.74	103.8	0.88	13.6	118	28	123	3,400	400,007	178.3	NH WESTERN	NEWPORT AWC
30	33W1_36	936	0.74	425.7	3.35	3.6	127	50	63	3,140	398,593	58.2	NH WESTERN	KEENE AWC
31	319_64	3,927	0.73	100.0	1.00	0.0	100	3,927	1	3,927	392,700	12.4	NH NORTHERN	TILTON AWC
32	31W1_64	1,420	0.71	270.4	3.35	3.6	81	67	71	4,757	384,059	72.7	NH NORTHERN	TILTON AWC
33	3133X_23	4,871	0.70	77.3	0.60	20.0	129	44	66	2,921	376,376	126.0	NH SOUTHERN	DERRY AWC
34	3155X9_22	1,067	0.69	348.8	3.18	3.8	110	141	24	3,394	372,061	50.5	NH WESTERN	KEENE AWC
35	24X1_36	2,050	0.68	179.5	1.84	6.5	97	39	98	3,779	368,151	122.2	NH WESTERN	KEENE AWC
36	336X1_45	343	0.66	1,041.9	5.01	2.4	208	101	17	1,717	356,854	30.3	NH NORTHERN	CHOCORUA AWC
37	3271X1_12	1,145	0.63	294.8	4.17	2.9	71	111	43	4,777	337,609	61.9	NH CENTRAL	BEDFORD AWC
38	3155X4_36	2,144	0.63	157.2	0.93	12.9	169	66	30	1,992	337,181	90.0	NH WESTERN	KEENE AWC
39	314X4_22	1,541	0.62	218.3	1.18	10.1	184	25	74	1,825	336,385	98.4	NH SOUTHERN	NASHUA AWC
40	53H1_31	545	0.61	603.7	4.20	2.9	144	57	40	2,291	329,184	35.1	NH WESTERN	KEENE AWC
41	1X4_42	917	0.60	354.4	2.90	4.1	122	102	26	2,660	324,858	36.1	NH NORTHERN	TILTON AWC
42	85W1_12	1,472	0.59	216.9	1.38	8.7	157	51	40	2,027	319,173	70.2	NH CENTRAL	BEDFORD AWC
43	323X5_12	3,001	0.58	104.1	0.96	12.5	109	61	47	2,877	312,406	60.5	NH CENTRAL	BEDFORD AWC
44	348X20_43	816	0.56	370.1	2.54	4.7	146	94	22	2,070	301,966	20.8	NH NORTHERN	LANCASTER AWC
45	362X2_61	2,194	0.55	134.8	0.89	13.5	152	46	42	1,944	295,867	64.7	NH EASTERN	ROCHESTER AWC
46	336X_45	635	0.54	456.6	7.66	1.6	60	541	9	4,865	289,932	21.0	NH NORTHERN	CHOCORUA AWC
47	335X2_12	1,832	0.53	156.9	0.87	13.8	180	133	12	1,594	287,514	27.4	NH CENTRAL	BEDFORD AWC
48	39H1_42	894	0.53	317.7	1.03	11.7	309	184	5	919	284,111	6.9	NH NORTHERN	TILTON AWC
49	32W5_23	2,748	0.52	102.0	1.19	10.1	86	99	33	3,265	280,406	45.4	NH SOUTHERN	DERRY AWC
50	319X1_64	2,435	0.48	106.4	1.02	11.7	104	30	84	2,494	258,977	114.0	NH NORTHERN	TILTON AWC

2021 Circuit Hit List - Ranked By COSAIFI - IEEE Criteria

Rank	Circuit	Customers Served By Circuit	COSAIDI	Circuit SAIDI	COSAIFI	Circuit SAIFI	Circuit MBI	CAIDI	CIII	# Outages	Customers Interrupted (CI)	Customer Minutes (CMI)	Circuit Miles	Region	AWC
1	355X10_76	2,363	2.39	546.2	0.0197	4.49	2.7	122	128	83	10,617	1,290,303	122.2	NH NORTHERN	LANCASTER AWC
2	316X1_32	3,464	1.93	301.1	0.0174	2.71	4.4	111	82	114	9,372	1,042,883	157.8	NH WESTERN	NEWPORT AWC
3	3128X_23	6,443	1.97	164.6	0.0163	1.36	8.8	121	83	106	8,775	1,060,666	149.2	NH SOUTHERN	DERRY AWC
4	76W7_31	3,422	1.29	203.6	0.0109	1.72	7.0	119	44	133	5,874	696,798	180.0	NH WESTERN	KEENE AWC
5	3139X_31	2,653	1.12	227.9	0.0109	2.21	5.4	103	35	167	5,864	604,604	150.9	NH WESTERN	KEENE AWC
6	3525X2_77	1,664	1.08	348.5	0.0101	3.29	0.9	106	421	13	5,470	579,929	21.1	NH NORTHERN	BERLIN AWC
7	392X1_61	1,935	0.83	231.8	0.0101	2.81	4.3	83	121	45	5,432	448,402	68.4	NH EASTERN	ROCHESTER AWC
8	3137X1_65	1,721	2.24	701.6	0.0099	3.11	3.9	226	122	44	5,346	1,207,666	64.3	NH EASTERN	EPPING AWC
9	19W2_45	2,587	0.95	198.6	0.0094	1.95	6.2	102	90	56	5,044	513,795	101.7	NH NORTHERN	CHOCORUA AWC
10	336X_45	635	0.54	456.6	0.0090	7.66	1.6	60	541	9	4,865	289,932	21.0	NH NORTHERN	CHOCORUA AWC
11	3271X1_12	1,145	0.63	294.8	0.0089	4.17	2.9	71	111	43	4,777	337,609	61.9	NH CENTRAL	BEDFORD AWC
12	19W1_45	1,263	1.42	607.9	0.0088	3.77	3.2	161	125	38	4,758	767,831	47.8	NH NORTHERN	CHOCORUA AWC
13	31W1_64	1,420	0.71	270.4	0.0088	3.35	3.6	81	67	71	4,757	384,059	72.7	NH NORTHERN	TILTON AWC
14	3140X2_36	1,650	1.37	448.9	0.0082	2.69	4.5	167	57	78	4,440	740,627	94.9	NH WESTERN	KEENE AWC
15	316_32	3,272	0.82	135.0	0.0079	1.30	9.2	104	47	90	4,253	441,664	171.9	NH WESTERN	NEWPORT AWC
16	317X3_12	1,356	0.98	387.7	0.0077	3.07	3.9	126	91	46	4,167	525,788	69.1	NH CENTRAL	BEDFORD AWC
17	3141X_23	4,873	1.34	148.5	0.0075	0.84	14.4	178	48	85	4,070	723,671	115.0	NH SOUTHERN	DERRY AWC
18	319_64	3,927	0.73	100.0	0.0073	1.00	0.0	100	3,927	1	3,927	392,700	12.4	NH NORTHERN	TILTON AWC
19	23W5_22	3,886	1.18	163.2	0.0072	1.00	12.0	163	41	95	3,885	633,972	162.6	NH CENTRAL	BEDFORD AWC
20	3W2_12	1,269	0.92	389.5	0.0072	3.04	3.9	128	97	40	3,861	494,182	39.1	NH CENTRAL	BEDFORD AWC
21	355X_76	3,832	0.92	129.3	0.0071	1.00	0.2	129	3,832	1	3,832	495,644	37.6	NH NORTHERN	LANCASTER AWC
22	313X1_36	2,421	0.91	201.7	0.0071	1.58	7.6	128	38	102	3,828	488,327	118.9	NH WESTERN	KEENE AWC
23	24X1_36	2,050	0.68	179.5	0.0070	1.84	6.5	97	39	98	3,779	368,151	122.2	NH WESTERN	KEENE AWC
24	392X7_62	2,644	0.87	178.0	0.0070	1.42	8.4	125	39	97	3,763	470,642	97.9	NH EASTERN	ROCHESTER AWC
25	3525X5_77	852	1.15	725.7	0.0068	4.28	2.8	169	174	21	3,651	618,400	60.0	NH NORTHERN	BERLIN AWC
26	3108_12	1,812	0.77	229.5	0.0064	1.89	6.3	121	72	48	3,432	415,922	61.4	NH CENTRAL	BEDFORD AWC
27	3410_32	3,855	0.74	103.8	0.0063	0.88	13.6	118	28	123	3,400	400,007	178.3	NH WESTERN	NEWPORT AWC
28	3155X9_22	1,067	0.69	348.8	0.0063	3.18	3.8	110	141	24	3,394	372,061	50.5	NH WESTERN	KEENE AWC
29	W15_31	1,711	0.87	273.0	0.0063	1.97	6.1	139	67	50	3,370	467,274	78.4	NH WESTERN	KEENE AWC
30	73W2_61	2,411	0.86	191.4	0.0062	1.39	8.6	138	60	56	3,355	461,457	69.3	NH EASTERN	ROCHESTER AWC
31	3168X_21	4,748	0.31	35.1	0.0061	0.69	17.4	51	205	16	3,280	166,700	25.7	NH SOUTHERN	NASHUA AWC
32	32W5_23	2,748	0.52	102.0	0.0061	1.19	10.1	86	99	33	3,265	280,406	45.4	NH SOUTHERN	DERRY AWC
33	3173X1_12	1,539	0.97	341.3	0.0060	2.09	5.7	163	39	83	3,222	525,178	72.1	NH CENTRAL	BEDFORD AWC
34	33W1_36	936	0.74	425.7	0.0058	3.35	3.6	127	50	63	3,140	398,593	58.2	NH WESTERN	KEENE AWC
35	3212X_22	2,078	0.47	122.2	0.0058	1.50	8.0	82	104	30	3,113	253,905	39.8	NH SOUTHERN	NASHUA AWC
36	3103X1_65	2,380	0.75	169.0	0.0057	1.29	9.3	131	79	39	3,078	402,137	65.8	NH EASTERN	EPPING AWC
37	382X3_36	2,111	0.93	237.3	0.0056	1.43	8.4	166	79	38	3,014	500,935	37.2	NH WESTERN	KEENE AWC
38	3271X2_12	1,848	0.47	136.8	0.0055	1.60	7.5	85	41	72	2,963	252,793	74.0	NH CENTRAL	BEDFORD AWC
39	3133X_23	4,871	0.70	77.3	0.0054	0.60	20.0	129	44	66	2,921	376,376	126.0	NH SOUTHERN	DERRY AWC
40	398X3_41	2,191	0.32	77.9	0.0054	1.32	9.1	59	103	28	2,886	170,703	45.8	NH NORTHERN	TILTON AWC
41	323X5_12	3,001	0.58	104.1	0.0053	0.96	12.5	109	61	47	2,877	312,406	60.5	NH CENTRAL	BEDFORD AWC
42	3159X_21	2,752	0.90	175.5	0.0053	1.04	11.5	168	67	43	2,867	483,012	65.6	NH SOUTHERN	NASHUA AWC
43	3137X_65	1,818	0.37	109.6	0.0052	1.54	7.8	71	50	56	2,806	199,228	69.3	NH EASTERN	EPPING AWC
44	1X4_42	917	0.60	354.4	0.0049	2.90	4.1	122	102	26	2,660	324,858	36.1	NH NORTHERN	TILTON AWC
45	319X1_64	2,435	0.48	106.4	0.0046	1.02	11.7	104	30	84	2,494	258,977	114.0	NH NORTHERN	TILTON AWC
46	42X3_32	2,130	0.43	108.1	0.0046	1.17	10.3	92	54	46	2,493	230,355	76.8	NH WESTERN	NEWPORT AWC
47	3120X4_36	1,792	0.36	109.7	0.0046	1.38	8.7	80	43	57	2,466	196,472	79.1	NH WESTERN	KEENE AWC
48	48W1_32	1,138	0.76	360.8	0.0045	2.14	5.6	169	59	41	2,434	410,588	37.2	NH WESTERN	NEWPORT AWC
49	20W1_42	2,424	0.41	91.9	0.0045	1.00	12.0	92	54	45	2,430	222,848	62.8	NH NORTHERN	TILTON AWC
50	23X6_22	2,186	0.35	86.6	0.0043	1.07	11.2	81	49	48	2,334	189,361	41.0	NH CENTRAL	BEDFORD AWC