New Hampshire
Line X-178 Rebuild

Planning Advisory Committee Meeting

February 28, 2024

Agenda

- Project Background & Location
- Project Needs
- Solution Alternatives
- Outreach Efforts
- Project Summary
- Feedback & Next Steps
- Appendix – Permits & Project Approvals

Purpose

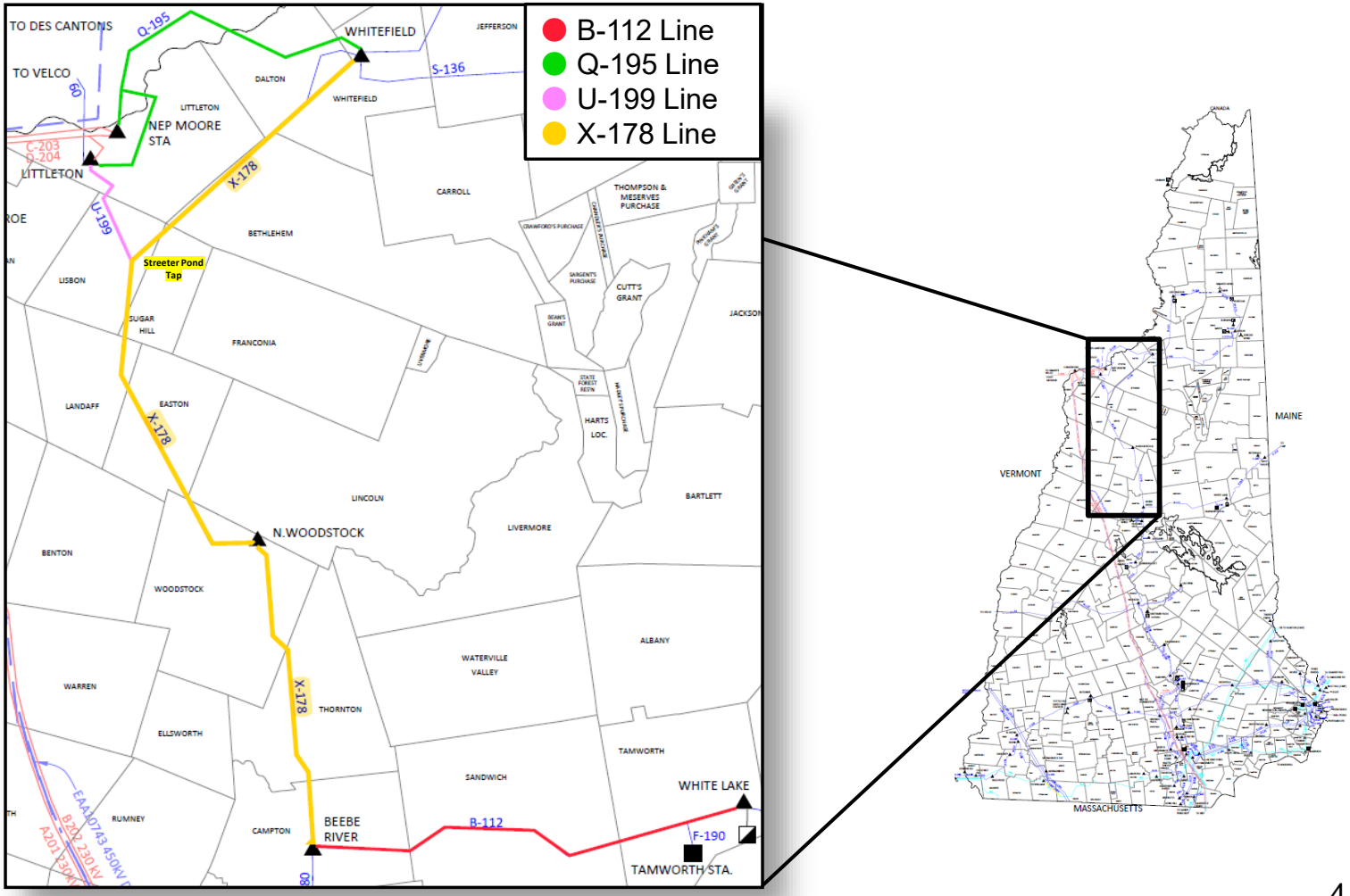
- Advise ISO-NE and the PAC stakeholder community of asset condition and reliability needs driving the proposed rebuild of the 115 kV X-178 Line in New Hampshire
- Discuss proposed solution alternatives
- Eversource takes a proactive approach to maintain long-term structural integrity and continued reliability of its transmission infrastructure through inspection-based asset management and holistic evaluation of present and future needs, as well as community and environmental impacts

Bog Pond within the White Mountain National Forest

Project Background

- Eversource serves 535,000 customers in New Hampshire, with 145 transmission and distribution substations,1,057 miles of transmission lines and 14,375 miles of distribution lines
- X-178 115 kV Line runs between Beebe River substation in Campton, NH and Whitefield substation in Whitefield, NH
  - First section of line built between Beebe River and North Woodstock in 1948
    - Majority of Streeter Pond tap to Whitefield built in 1969
    - Majority of Beebe River to Streeter Pond Tap built in 1985
  - Length: 49 miles
  - Structures: 594 structures
    - Combination of 579 natural wood, 2 laminate wood, 11 steel H-frame and 2 weathering steel
  - Average structure age: 45 years old
  - Conductor: 795 ACSR 26/7, 795 ACSR 36/1, and 1272 ACSS 54/19
  - Shield wire: 2 runs consisting of 7/16” Steel or 7#8 Alumoweld

Project Locations



Safety First and Always

Project Needs – Asset Condition

- 2022 inspections of this line graded condition of structures in accordance with Electric Power Research Institute (EPRI) guidelines
  - *A: Nominal Defect, B: Minimal Defect, C: Moderate Defect, D: Severe Defect*
  - Grade C structures showed one or more of the following age-related degradations, leading to decreased load carrying capability
    - Woodpecker damage, pole top rot, cracked arms, split pole top, and decay
- Additional structures were identified and prioritized for replacement based on Engineering requirements to meet current uplift standards, structure loading concerns, as well as efficiencies in required permitting approvals for replacing Grade C structures, and minimizing environmental impacts

Reason For Replacement	Total	Priority C	Priority B	Priority A
OPGW Loading / Clearance Failure	244	0	242	2
Asset Condition + Laminate	43	41	2	0
Access Opportunity	231	0	229	2
Additional Opportunity	62	0	62	0
Total Replacement Structures	**580**	**41**	**535**	**4**

Project Needs – Photos

Structure 212 – Pole Top Rot & Rusted Hardware

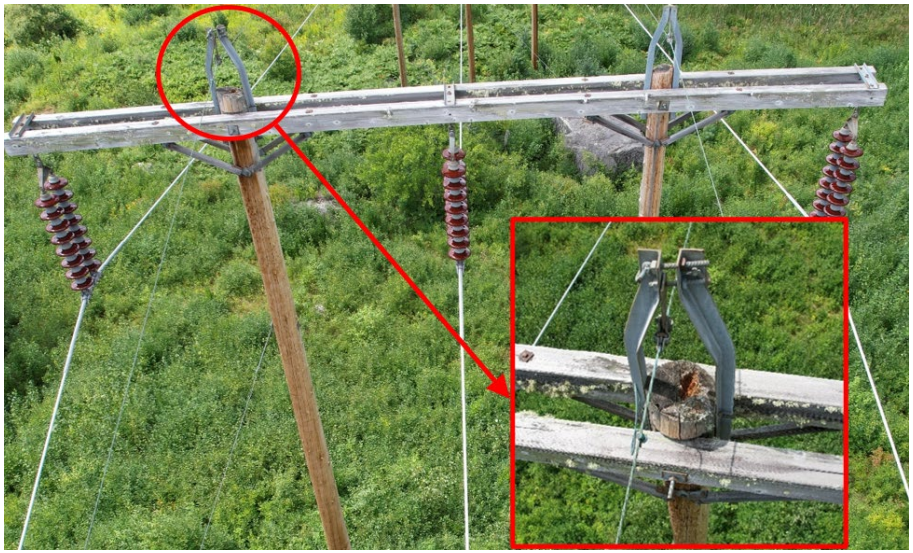
Structure 356 – Split Pole Top

Project Needs – Photos

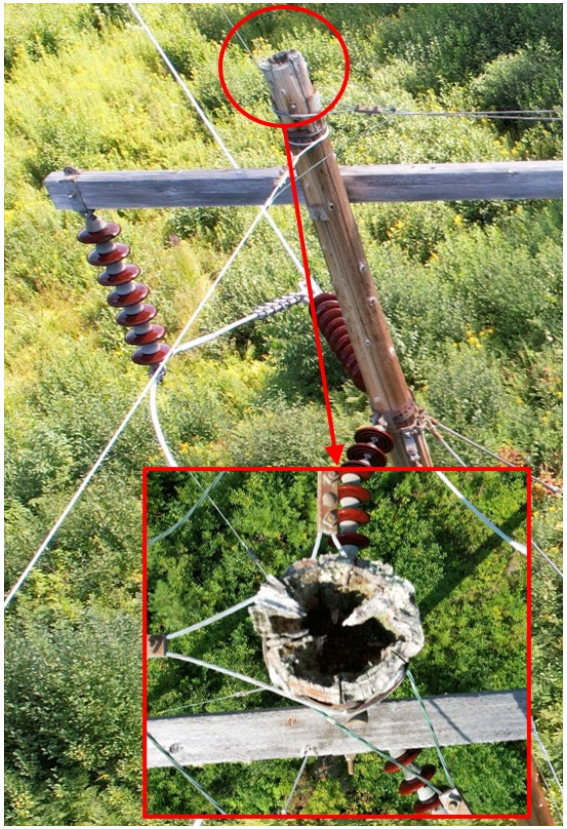
Structure 8 – Severe Structure Splitting

Structure 25 – Pole Top Rot and Splitting at Hardware Attachment Point

Project Needs – Photos



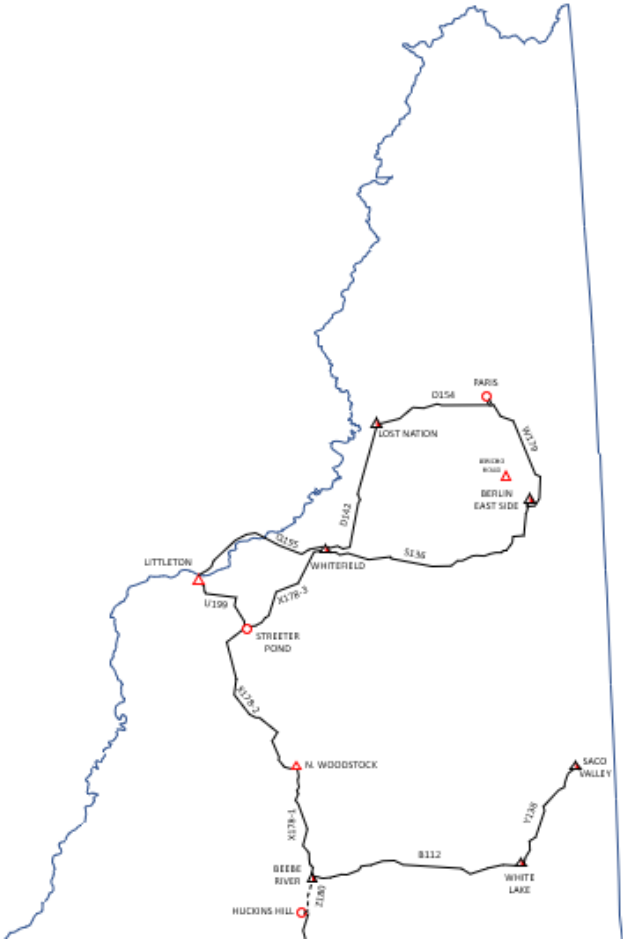
Structure 424 – Pole Top Checking and Large Hole in Pole Top



Structure 419 – Major Pole Top Rot

Project Needs – OPGW

- Eversource does not currently have a high-speed fiber communication path serving the North Country 115 kV loop
- The X-178 line is the connection between the Webster to Beebe corridor and the lines within the North Country (D-142, O-154, S-136, W-179, U-199 & Q-195)
- The installation of a fiber path on this line is important for current and future system reliability



Safety First and Always

Project Needs – OPGW

- OPGW installation expands a private Eversource OPGW / Synchronous Optical Networking (SONET) loop
  - Provides a controlled, alternate fiber communication path supporting the long-term buildout of the fiber optic network
  - Greatly reduces the reliance on leased services for protection, SCADA, and Phasor Measurement Unit (PMU) and Dynamic Disturbance Recorder (DDR) installations (ISO-NE OP-22)
  - A private network is segregated from third-party telecom services, improving the overall reliability and security of communications paths
- Critical Infrastructure Protection: Fiber provides the necessary bandwidth for physical security monitoring and triaging of alarms for BES Cyber Systems at medium and low impact substations

Solution Alternative 1

- Alternative 1: Install OPGW and only replace ACR and OPGW-overloaded structures
  - Scope:
    - Replace 287 structures (41 ACR + 2 LWS + 244 OPGW loading)
    - Replace 49 miles of Alumoweld shield wire with 49 miles of OPGW
  - Pros:
    - Addresses structural asset condition issues
    - Provides a fiber communication path to North Country 115 kV loop
    - Lower cost solution
  - Cons:
    - Re-entry into this right-of-way for future project work will incur significant additional expense and environmental/community impacts
      - The X-178 has some extremely long stretches of ROW corridor with no road crossings (Ex. 9 mile stretch in the WMNF)
      - Multiple miles of matting installation, requiring a significant cost and significant permitting effort may be required each time defective structures are found
      - Repeated permitting costs would be incurred for each individual round of ACR work
      - Outage coordination in northern New Hampshire is difficult due to limited lines flowing into the region
  - **Total estimated PTF cost:** $246.1M (-50/ +200%)

Solution Alternative 2 (Preferred)

- Alternative 2 (Preferred Solution): Full Rebuild
  - Remove 583 existing structures
    - 579 existing wood H frame, 2 laminate wood, 1 steel H frame, and 1 steel three pole H frame structures
  - Install 580 new structures
    - Combination of two-pole direct embedded single circuit, three-pole H frame steel direct embed, engineered steel monopole, engineered two-pole structures and engineering H-frame structures
    - 3 existing structures to be permanently removed
  - Replace 49 circuit miles of existing conductor with 49 miles of 1272 ACSS 54/19 “Pheasant” conductor
  - Replace existing shield wire with two 49 mile runs of OPGW
  - Utilize ADSS to tie into Beebe River Substation, North Woodstock Substation, Whitefield Substation and Streeter Pond Tap
  - Pros:
    - Addresses structural asset condition issues
    - Provides a fiber communication path to North Country 115 kV loop
    - Takes advantage of permitting and access efficiencies
      - Eliminates need for repeated re-entry into ROW over coming decades, mitigating impact to local communities, landowners, and sensitive environmental regions
  - Cons:
    - Higher up-front cost
  - **Total estimated PTF cost:** $384.61M (-50/ +200%)

Full Rebuild Benefits

- The X-178 line is a key asset for ensuring reliable 115 kV transmission service to northern New Hampshire
- Due to the combination of various reliability needs, Eversource has determined that a full rebuild of the line is the most cost-effective solution for long-term reliability
  - Addresses present structural asset condition issues
  - Incorporates OPGW to provide high-bandwidth, low latency, secure network operations
  - Replaces aging conductor with Eversource-standard conductor to ensure continued adequate transmission service capability

Existing Structure 267

Full Rebuild Benefits

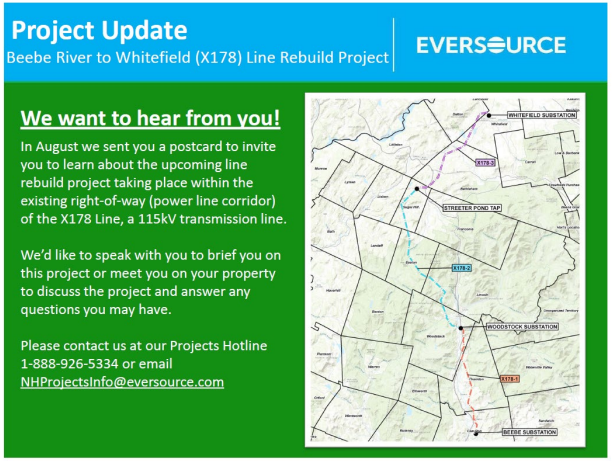
- A holistic approach to asset condition issues facilitates savings in long-term cost, siting, permitting and minimizes environmental impacts of working on protected land
  - Right-of-way access is limited; some access roads are several miles long
  - Repeated access is costly, time-consuming and more disruptive to the environment and abutting landowners
  - Approximately 12 miles of line is routed through the White Mountain National Forest
    - Right-of-way intersects with Appalachian Trail
  - Mitigates need for significant additional near-term work on this line

Pemi River Crossing in Woodstock, NH

Project Stakeholder Outreach

- Stakeholder outreach efforts began in April 2023
- Municipal briefings
  - Project Introduction briefings and meetings held with municipal leadership
  - Pre-Permitting communication and meetings with Town Conservation Commissions
- Two Public Information Sessions held August 2023
  - Pre-Construction Information Session upcoming spring 2024
- Regular project communication through mailings, door-to-door outreach, website and project phone/email hotline for questions/feedback
- Site visits held with property owners to discuss concerns and mitigation

X-178 Community Information Session



X-178 Project Update Postcard

Summary

- Eversource is planning a complete rebuild of the X-178 115 kV line in northern New Hampshire
  - Replace 583 existing structures with 580 structures of various types
  - Replace 49 circuit miles of existing conductor with 49 miles of 1272 ACSS 54/19 “Pheasant” conductor
  - Replace existing shield wire with two 49 mile runs of OPGW (98 miles total)
  - Utilize ADSS to tie into Beebe River Substation, North Woodstock Substation, Whitefield Substation and Streeter Pond Tap
- Full rebuild solution addresses all present and future predicted reliability needs on this line, facilitates long-term cost savings, and limits repeated disruptions to environment and local communities
- **Total estimated PTF cost:** $384.61M (-50/ +200%)
- **In-service date:** Q4 2026

Feedback and Next Steps

- Please submit any written comments on these projects to:
  - robin.lafayette@eversource.com
  - pacmatters@iso-ne.com

Presentation	Date	Description
Initial Presentation	Feb 28, 2024	Presentation on the rebuild of X-178 line
Questions/Feedback	Mar 14, 2024	Comment deadline
Follow-up Presentation	May 15, 2024	Follow-up presentation to address question and present project development updates

Questions

Appendix – Permits & Project Approvals

- Based on preliminary assessment, Eversource expects that permit review from the following agencies will be required for this project:
  - Federal
    - United States Army Corps of Engineers
    - United States Fish & Wildlife Service
    - Federal Aviation Administration
    - US Forest Service (NEPA) EA
  - State
    - NHDES Wetlands, Shoreland and Alteration of Terrain programs
    - NH Fish & Game Department
    - NH Natural Heritage Bureau
    - NH Department of Energy
    - NH Department of Natural & Cultural Resources
  - Local
    - Permitting pursuant to local land use ordinances as required

New England States Committee on Electricity

To:	**Eversource (Attn: Robin Lafayette)**
From:	**NESCOE Staff (Contact: Sheila Keane)**
Date:	**March 14, 2024**
Subject:	**New Hampshire Line X-178 Rebuild**
CC:	**ISO-NE; Planning Advisory Committee (PAC)**

NESCOE writes regarding Eversource's New Hampshire Line X-178 Rebuild asset condition project, which Eversource presented at the February 28, 2024, Planning Advisory Committee (PAC) meeting.[1] As part of the project, Eversource proposes to fully rebuild this line and replace 580 of the 594 existing structures for an estimated cost of $384.61 million (-50%/+200%).

As discussed below, NESCOE is troubled by the lack of compelling evidence to justify a project of this scale as well any consideration or discussion of lower cost, targeted intervention alternatives. This lack of support is compounded by the New England Transmission Owners' (NETOs) denial of NESCOE's recent request to stay on schedule and prioritize the Asset Condition Needs and Solutions Guidance Document (Guidance Document).[2] This project makes clear why a Guidance Document is critically important to meaningful progress toward improving asset condition processes in New England. The NETOs' failure to timely provide the Guidance Document leaves states, stakeholders, and consumers in the dark in understanding the hundreds of millions of dollars in potential costs associated with this project and others.

Based on Eversource's presentation and discussion of this project at PAC, it appears that the driver for this project is Eversource's desire to replace its leased communications circuits with an internally owned fiber communications system. Eversource's presentation suggests that only 43 of the 580 (or 7%) structures targeted for replacement on this line are actually deteriorated. Both of Eversource's solution alternatives focus primarily on the installation of optical ground wire (OPGW); addressing identified asset condition issues appears to be little more than an ancillary benefit in either scope. NESCOE acknowledges that a reliable communications system is an important part of transmission infrastructure. However, it does not necessarily follow that this or any other line should be rebuilt for the primary purpose of supporting OPGW when Eversource has provided no evidence of either poor performance of the current communications system or the cost-effectiveness of such a decision. The question of whether and to what extent communications needs should drive line rebuilds should be a subject of regional discussion.

Eversource's presentation also identifies "access opportunity" and "additional opportunity"[3] as reasons to replace more than half of the structures. Absent further information, neither upgrading

[1] Eversource New Hampshire Line X-178 Rebuild (Feb. 28, 2024), at https://www.iso-ne.com/static-assets/documents/100008/a05_2024_02_28_pac_line_x178_rebuild_presentation.pdf.

[2] NESCOE. *Request to Prioritize Asset Condition Guidance Document* (Feb. 8, 2024) at https://nescoe.com/wp-content/uploads/2024/02/Asset-Cond-Guidance-Document-Feb-2024f-1.pdf.

[3] While not clear from the presentation, we understand "additional opportunity" to refer to the opportunity to upgrade to current design standards.

to current design standards nor improved accessibility to structures in and of themselves appear to be a persuasive reason to substantially expand the solution scope. In particular, we understand that modern design considerations would normally, with limited exceptions, be considered as an enhancement to a proposed new or upgraded facility solution, which should be accompanied by a robust explanation of the incremental costs and benefits. Eversource provided no such explanation here.

We were pleased that a wide range of stakeholders engaged in the discussion and sought clarity on the relevance and priority of the underlying needs that Eversource seeks to address through its offered solution alternatives. NESCOE appreciates that Eversource committed to consider and address a number of stakeholder comments, and we look forward to Eversource's responses. NESCOE also requests that Eversource respond to the following questions:

1. **Provide a targeted (or minimum) solution alternative.** It is concerning that Eversource did not offer a targeted intervention alternative focused on resolving the identified asset condition needs without the communication system upgrades. Eversource should provide a targeted solution alternative that addresses only those priority asset condition needs that would be necessary to maintain the line in reliable, serviceable condition. If Eversource proposes any upgrades beyond the minimum required level, they should be described and justified individually with their associated costs.
2. **Describe in detail the applicable industry standards to determine communication system needs.** Describe how Eversource, when identifying needs related to existing or legacy communications infrastructure, determines which industry standards and criteria should be applied to assess that infrastructure's suitability for continued service. Similarly, when developing solution alternatives to address these identified needs, which additional standards and criteria would Eversource consider applicable?
3. **Provide additional detail on "access opportunity" and "additional opportunity" costs and benefits.** Eversource should clearly define what it means by these terms and include a robust explanation of the incremental costs and benefits associated with these opportunities. For example, what are matting and permitting costs to an order of magnitude?

NESCOE understands that Eversource plans to come back to PAC in May with a follow-up presentation to address questions and present project development updates. Based on the lack of information Eversource has presented to date about the timing and severity of any reliability risk, NESCOE requests that Eversource cease any further development of this project to allow time for it to address the many questions surrounding the project and for stakeholders to gain confidence that the project is appropriately sized.

Such a pause seems reasonable given that it appears the primary driver of this project is not a pressing asset condition need, but rather, Eversource's apparent desire for a different communications system. If, however, Eversource believes that nearer-term action is necessary, it should come to the PAC before May to establish the timing and severity of near-term electric system reliability risk of such a pause.

NESCOE looks forward to the continued discussions on this matter and the further development of the Guidance Document overall.

New Hampshire Line X-178 Rebuild Follow-Up

Planning Advisory Committee Meeting

June 20, 2024

Agenda

- Purpose
- Stakeholder Feedback and Responses
- Project Background
- Project Location
- Project Needs
- Solution Alternatives & Analysis
- Project Summary
- Questions

Purpose

- Advise ISO-NE and the PAC stakeholder community of asset condition and reliability needs driving the proposed rebuild of the 115 kV X-178 Line in New Hampshire
- Discuss additional solution alternatives developed in response to stakeholder feedback and provide analysis comparing all solution alternatives

Bog Pond within the White Mountain National Forest

Stakeholder Feedback and Responses

- Responses to written stakeholder feedback have been posted to the PAC webpage along with this presentation
  - Original PAC presentation on February 28, 2024
  - Stakeholder feedback response memo dated June 12, 2024

- Written responses cover topics including:
  - The history of the X-178 line
  - Telecommunications needs and analysis
  - Conductor reliability needs and analysis
  - Project reporting and outreach efforts
  - Development and analysis of solution alternatives

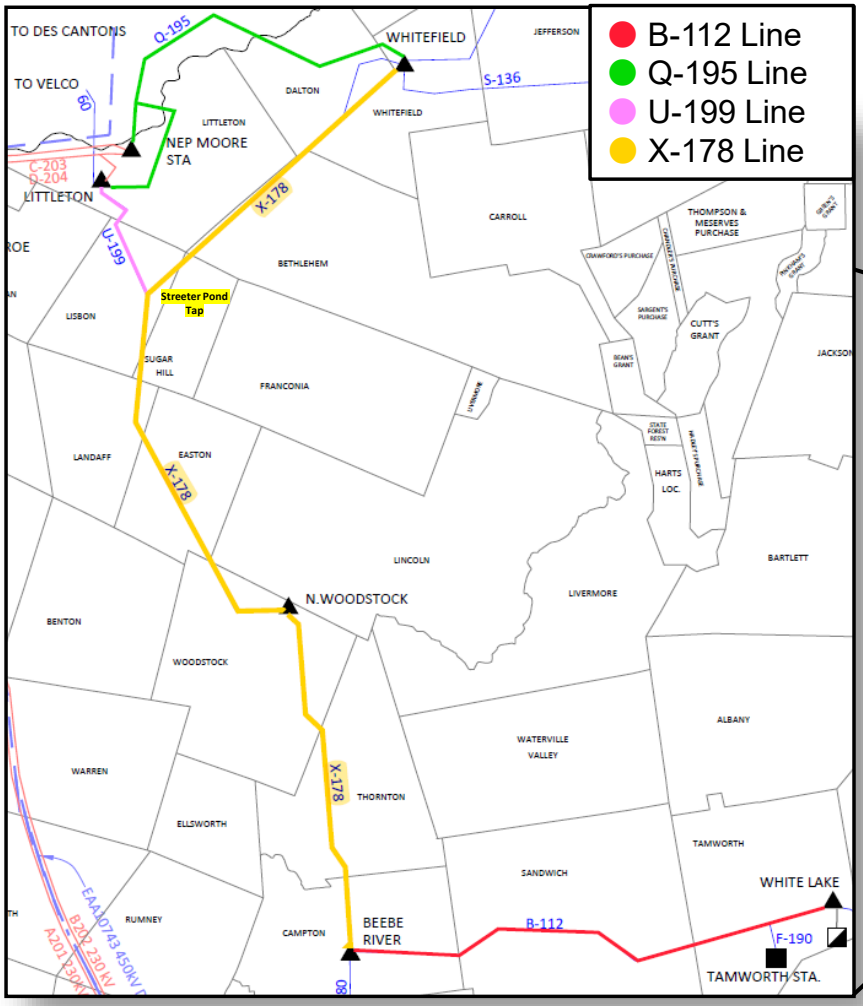
- Some questions received were beyond the scope of typical PAC discussions
  - Eversource follow-up contact information has been provided to facilitate further discussions with stakeholders

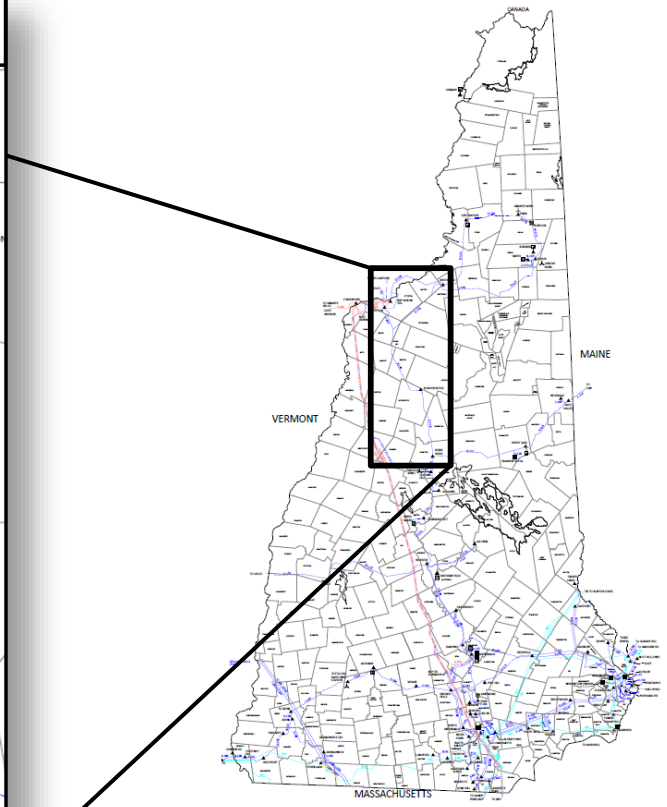
Project Background

- Eversource serves 535,000 customers in New Hampshire, with 145 transmission and distribution substations,1,057 miles of transmission lines and 14,375 miles of distribution lines

- X-178 115 kV Line runs between Beebe River substation in Campton, NH and Whitefield substation in Whitefield, NH
  - **Northern** line section between Streeter Pond Tap and Whitefield was originally constructed in the early 1950's and significantly reconstructed in 1969
  - **Middle** line section between North Woodstock and Streeter Pond Tap was originally constructed in the early 1950's and most recently reconstructed in 1985
  - **Southern** line section between Beebe River and North Woodstock was originally constructed in the early 1950's and most recently reconstructed in 1985
  - Overall length: 49 miles
  - Structures: 594 structures
    - Combination of 579 natural wood, 2 laminated wood, 11 steel H-frame and 2 weathering steel
  - Average structure age: 45 years old
  - Conductor: 795 ACSR 26/7, 795 ACSR 36/1, and 1272 ACSS 54/19
  - Shield wire: 2 runs consisting of 7/16" Steel or 7#8 Alumoweld

Project Location





Geographic location is approximate

Safety First and Always

Project Needs

- 2022 inspections of this line graded condition of structures in accordance with Electric Power Research Institute (EPRI) guidelines
  - *A: Nominal Defect, B: Minimal Defect, C: Moderate Defect, D: Severe Defect*
  - Priority C structures showed one or more of the following age-related degradations, leading to decreased load carrying capability
    - Woodpecker damage, pole top rot, cracked arms, split pole top, and/or decay
  - 43 structures (41 priority C structures and two LWS structures) identified for immediate replacement throughout the line
  - Additional replacements due to uplift will be required
    - Uplift triggered-replacements occur when a neighboring structure to one already deemed in need of replacement will not be able to handle the strain from height differences between structures
- 2024 drone inspections are ongoing and additional priority C structures may be identified

Project Needs – Photos

Structure 212 – Pole Top Rot & Rusted Hardware

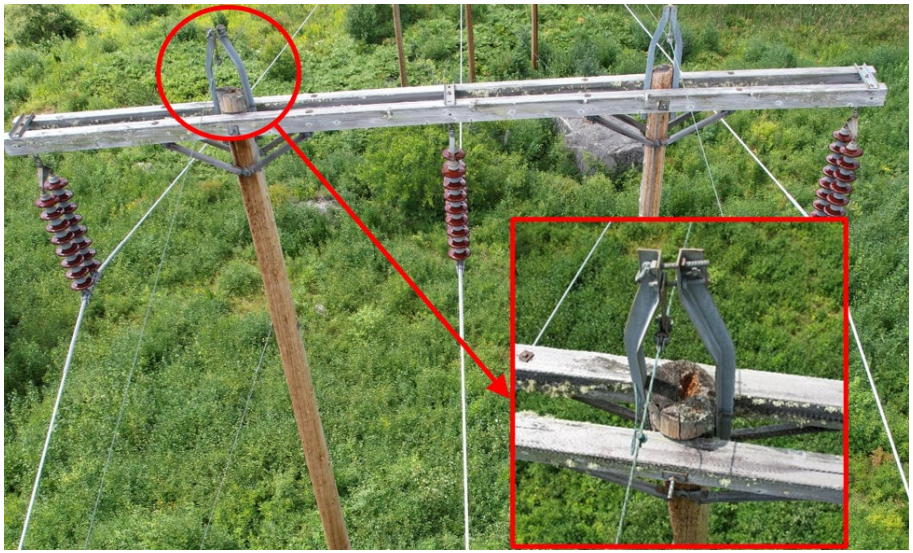
Structure 356 – Split Pole Top

Project Needs – Photos

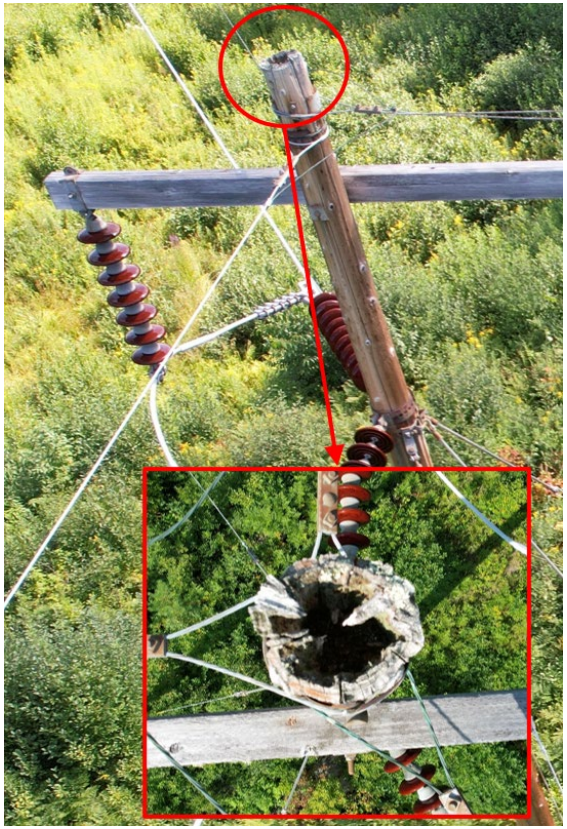
Structure 8 – Severe Structure Splitting

Structure 25 – Pole Top Rot and Splitting at Hardware Attachment Point

Project Needs – Photos



Structure 424 – Pole Top Checking and Large Hole in Pole Top



Structure 419 – Major Pole Top Rot

Approach to developing solution alternatives

- Eversource performed additional analysis of solution alternatives with reduced scope compared to the full rebuild presented at the February 28 PAC meeting
- Potential structure replacements were evaluated and classified as follows:
  - **Immediate replacement structures** – Structures requiring replacement due to priority C ratings from recent inspections or known performance issues (LWS structures are known to be problematic regardless of rating)
  - **Uplift structures** – Structures that become overstressed due to conductor and/or shield wire tensions created by replacement of one or more nearby structures. These structures must be replaced at the same time as the nearby structure(s) to ensure the integrity of the line
  - **Opportunity structures** – Structures that can be efficiently replaced due to construction activities necessary to access priority C and overstressed structures. All of these structures are older than 40 years and were rated priority B during the most recent inspection

Solution Alternatives Evaluated

- Alternative 1
  - Replace only immediate replacement structures and uplift structures
- Alternative 2
  - Replace structures included in Alternative 1, plus additional opportunity structures
- Alternative 3
  - Complete line rebuild, including replacement of all additional structures that are overloaded with the addition of OPGW
  - This was the preferred alternative presented to PAC on February 28

Elimination of Alternative 1 from further consideration

- Pursuing Alternative 1 would lead to many additional, future structure replacement projects on the line in the near-term as existing structures continue to deteriorate
  - Elevated reliability risk as many deteriorating and aging structures will remain present on the line
- Additional structure replacements under future projects would require access to the same portions of the ROW
  - Inefficient from a construction and cost perspective
  - Highest environmental and community impact due to repeatedly accessing the ROW over the course of several years

Solution Alternative 2

- Scope:
  - Replace immediate replacement and uplift structures
  - Replace all opportunity structures easily accessed during construction activities that would be necessary to replace immediate replacement and uplift structures
  - 170 total structure replacements
- Pros:
  - Lower initial cost
- Cons:
  - Additional structure replacements will be required in the near future as additional structures degrade and are rated as priority C in future inspections
  - Elevated reliability risk as many deteriorating and aging structures will remain present on the line
  - Additional re-entry into corridor will continue to cause additional environment and community impacts
  - Does not address capacity constraints
  - Does not address need for improved communications paths in northern New Hampshire
- **Total estimated PTF cost:** $91.7 M (-50%/+200%, in current dollars without escalation)

Additional future work beyond Alternative 2

- Alternative 2 would leave structures that are older than 40 years in place
  - These structures will continue to deteriorate and will eventually need to be replaced through future projects
  - Additional priority C structures *not included in Alternative 2* have already been identified during the 2024 inspection cycle (which remains ongoing)
- Based on our experience with other lines in New Hampshire, we developed cost estimates for hypothetical future projects that may be necessary as additional structures deteriorate
  - First additional project:
    - Assumed that approximately 50% of remaining older structures require replacement in approximately 2030
    - Total cost of $110.6 M (in current dollars, without escalation)
  - Second additional project:
    - Assumed that all remaining wood structures require replacement in approximately 2038
    - New conductor and OPGW would be installed at this time
    - Total cost of $234.3 M (in current dollars, without escalation)
- Total cost over time:
  - In current dollars: $436.6 M (-25%/+200%)
  - With assumed escalation to year of construction: $574.1 M (-25%/+200%)
    (Year of construction varies by project)

Solution Alternative 3

- Scope:
  - Remove 583 existing structures and install 580 new steel structures
    - 3 existing structures to be permanently removed
    - 11 existing steel structures would be reused and remain in place
  - Replace 49 circuit miles of existing conductor with 49 miles of 1272 ACSS 54/19 “Pheasant” conductor
  - Replace existing shield wire with two 49-mile runs of OPGW
  - Utilize ADSS to tie into Beebe River Substation, North Woodstock Substation, Whitefield Substation and Streeter Pond Tap
- Pros:
  - Addresses structural asset condition issues
  - Mitigates reliability risks and dramatically improves resiliency for a line exposed to among the highest elevations on the Eversource system
  - Provides a fiber communication path to northern New Hampshire, including North Country 115 kV loop
  - Takes advantage of permitting and access efficiencies
    - Reduces need for repeated re-entry into ROW over coming decades, mitigating impact to local communities, landowners, and sensitive environmental regions
- Cons:
  - Higher up-front cost
- **Total estimated PTF cost:**
  - $360.8 M (-25%/+50%, in current dollars, without escalation)
  - $384.6 M (-25%/+50%, in 2026 dollars) ← Estimate presented to PAC on February 28, 2024

Cost Comparison

- Alternative 2, plus additional future projects: $436.6 M (-50%/+200%)
- Alternative 3: $360.8 M (-25%/+50%)
  - Lower cost reflects construction efficiencies compared to Alternative 2 and additional future projects

- To support a comparison:
  - Values are presented here in current dollars, while cost estimates presented to PAC are typically escalated to the anticipated in-service year
    - For example, $384.6 M estimate presented in PAC in 2026 dollars becomes $360.8 M when expressed in current dollars
  - Alternative 2 and additional future project cost estimates are Order of Magnitude (-50%/+200%), but include similar percentage of contingency as Alternative 3 estimate, which is Conceptual (-25%/+50%)
- Total cost of Alternative 2 plus additional future projects has greater chance of increasing compared to estimate for Alternative 3
  - As noted above, additional contingency was *not* added to estimates for Alternative 2 and additional future projects
  - Additional future projects may be more frequent and less efficient than assumed (for example, projects every two years versus the assumed projects at years 5 and 13)

Environmental / Community Impact

- Right-of-way access is limited for the X-178 line; some access roads will be several miles long
- Repeated access is costly, time-consuming and more disruptive to the environment and abutting landowners
- Approximately 12 miles of line is routed through the White Mountain National Forest; some structures within this section can only be accessed via helicopter
- Alternative 3 limits the environmental and community impact to a single project
  - Short-term impact will be greater than Alternative 2, but will be significantly less over the long run when compared to several smaller projects

Existing Structure 267

Telecommunications Needs

- Third-party telecommunication services (i.e. leased lines) are becoming increasingly expensive and difficult to obtain
  - Third-party telecommunications providers have indicated that services may be discontinued before the end of the decade
  - Discontinuation of third-party telecommunications alternatives could require additional future investments in Eversource-owned telecommunication infrastructure
  - Installing OPGW as part of Alternative 3 enables an orderly transition to Eversource-owned communications and mitigates the risk of a potential future project
- OPGW greatly reduces reliance on leased, third-party telecommunications services for system protection, critical infrastructure protection, and other important services
- Several transmission substations will directly benefit from OPGW installation on the X-178 line
  - Fiber on the X-178 would be utilized to complete this ring, providing further redundancy and increased communication systems reliability
  - There is also a shared ring being planned between Eversource and National Grid that will provide communications to our northern New Hampshire substations

Long-term Capacity Needs

- The X-178 line was overloaded in some 2050* Study scenarios
  - Highest loading was 344 MVA under 2050 Winter peak scenario with 51 GW New England load**
  - Existing Long-Term Emergency (LTE) rating is 229 MVA (Summer) and 254 MVA (Winter)
- Achieving an LTE rating of at least 344 MVA would require upgrades to both the X-178 line conductor and associated substation equipment
  - Installation of 1272 ACSS 54/19 “Pheasant” as part of the full line rebuild would increase the LTE rating of the conductor to 518 MVA
  - The line would then be limited to 254 MVA LTE due to substation equipment, which could be addressed as part of a future project
- 1272 ACSS 54/19 “Pheasant” is a standard conductor for Eversource and would be installed as part of the line rebuild even without the 2050 Study results
  - ACSS conductor has excellent high-temperature performance; Eversource allows operation up to a 200 degrees C conductor temperature
  - Other conductor technologies (composite core, etc.) would be more costly and are not necessary on the X-178 line

** Results published to the ISO-NE website on February 14, 2024*

*** Excluding scenario with 57 GW winter peak load*

Solution Alternative Analysis

Key Factors	Alternative Solution 2	Alternative Solution 3
Description	**Partial structure replacement**	**Full line rebuild**
Lowest initial cost	✓	✗
Lowest long-term cost	✗	✓
Overall System Performance and Reliability	✗	✓
Expected ease of permitting	✗	✓
Ease of constructability	✓	✓
Shorter initial construction duration	✓	✗
Long-term environmental impact	✗	✓
Long-term abutter impact	✗	✓

Solution Alternative Selection

- In response to stakeholder feedback, Eversource evaluated the possibility of reducing the scope of the proposed X-178 line rebuild project
- A partial structure replacement project (Alternative 2) would:
  - Have lower initial costs, but higher anticipated costs over time as additional structures deteriorate
  - Have higher environmental and community impact over time due to repeated access to the ROW
  - Preclude the installation of new conductor and high-speed communications for many years
- A full line rebuild (Alternative 3) would:
  - Have higher initial costs but lower anticipated costs over time
  - Avoid future disruptions to the environment and local communities
  - Provide near-term improvement to telecommunications capabilities for northern New Hampshire substations and avoid potential future projects to install OPGW or upgrade conductor
- Eversource continues to select the full line rebuild (Alternative 3) as the preferred solution

Summary

- Eversource is planning a complete rebuild of the X-178 115 kV line in northern New Hampshire
  - Replace 583 existing structures with 580 structures of various types
  - Replace 49 circuit miles of existing conductor with 49 miles of 1272 ACSS 54/19 “Pheasant” conductor
  - Replace existing shield wire with two 49-mile runs of OPGW (98 miles total)
  - Utilize ADSS to tie into Beebe River Substation, North Woodstock Substation, Whitefield Substation and Streeter Pond Tap
- Full rebuild solution addresses all present and future predicted reliability needs on this line, facilitates long-term cost savings, and limits repeated disruptions to environment and local communities
- **Total estimated PTF cost:** $384.6 M (-25%/+50%)
- **In-service date:** Q4 2026

Questions

NEW HAMPSHIRE REVISED STATUTES ANNOTATED

1955

1970 REPLACEMENT EDITION

Volume 1

Constitutions

Chapters 1–40-A

FIRST EDITION

Prepared Under the Supervision of the Revision Commission

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EQUITY FOLLOWS THE LAW

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31:60 Grant of Power. For the purpose of promoting health, safety, morals, or the general welfare of the community, the legislative body of any city or town is empowered to regulate and restrict the height, number of stories and size of buildings and other structures, lot sizes, the percentage of lot that may be occupied, the size of yards, courts and other open spaces, the density of population and the location and use of buildings, structures and land for trade, industry, residence or other purposes.

HISTORY

Source. 1925, 92:1. PL 42:48. RL 51:50. RSA 31:60. 1969, 249:1, eff. Aug. 12, 1969.

Amendments—1969. Added reference to "lot sizes".

Grants of authority. By special legislation, zoning authority has been granted to North Walpole village precinct (1949, 399:1); Meredith village fire district (1947, 364:1; and the Rye water district (1949, 428:1).

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Aesthetic objectives or considerations as affecting validity of zoning ordinance. 21 ALR3d 1222.

Applicability of zoning regulations to governmental activities. 61 ALR2d 970.

Meaning of term "garage" as used in zoning regulation. 11 ALR3d 1107.

Motive in approving or adopting zoning ordinance or regulation as affecting its validity. 71 ALR2d 568.

Municipal regulation of storage or accumulation of lumber, straw, trash, etc. 64 ALR2d 1040.

Powers of zoning authorities respecting conditions in street or highway. 175 ALR 401.

Purchaser of real property as precluded from attacking validity of zoning regulations existing at the time of the purchase and affecting the purchased property. 17 ALR3d 743.

Zoning regulations as to filling stations. 75 ALR2d 168.

Municipal Corporations ⇦ 601 et seq., 625.

Towns ⇦ 15.

Zoning ⇦ 1 et seq.

CJS Municipal Corporations §§ 224–228.

CJS Towns §§ 34, 54.

CJS Zoning § 1 et seq.

1. Constitutionality

A legislative grant of power to cities to enact zoning ordinances is constitutional. Brady v. City of Keene (1939) 90 NH 99, 4 A2d 658.

This statute is a valid exercise of the police power. Sundeen v. Rogers (1928) 83 NH 253, 141 A 142, 57 ALR 950.

Adoption of ordinance requiring newly constructed buildings to be set back stated distance from public highway is within the general police powers of town. Town of Jaffrey v. Heffernan (1962) 104 NH 249, 183 A2d 246.

2. Enactment by town

Zoning ordinance may validly be enacted by vote of town meeting. Town of Jaffrey v. Heffernan (1962) 104 NH 249, 183 A2d 246.

Town in adoption of zoning ordinance is required to comply with provisions of enabling statute both in its enactment, and its regulations including provisions for its administration. Town of Jaffrey v. Heffernan (1962) 104 NH 249, 183 A2d 246.

A town ordinance containing comprehensive regulations which sought to restrict the use of three areas of a town to single and two-family residential buildings, to regulate the use of buildings, the size and percentage of lots and indirectly to regulate the size of yards and other open spaces and the density of population and

which contemplated that permits would be granted for nonconforming uses was held to be a zoning ordinance which could not be legally enacted except in compliance with the zoning regulations (RSA 31:60–89). Bisson v. Town of Milford (1969) 109 NH 287, 249 A2d 688.

Former building ordinances of a city do not settle the issue of reasonable use for all time, or estop the city from enacting a different rule. Sundeen v. Rogers (1928) 83 NH 253, 141 A 142, 57 ALR 950.

3. Nonconforming uses

A zoning ordinance is not discriminatory because it permits the continuation of existing structures and conditions while the creation of new structures or conditions of the same type are prohibited. Stone v. Cray (1938) 89 NH 483, 200 A 517.

A nonconforming use is a use which legally exists at date of adoption of zoning ordinance. Arsenault v. City of Keene (1962) 104 NH 356, 187 A2d 60.

A nonconforming use stands in no preferred position and it is general policy of zoning to carefully limit extension and enlargement of nonconforming uses. Arsenault v. City of Keene (1962) 104 NH 356, 187 A2d 60.

Municipalities are not authorized under their zoning powers to require the written consent of a certain percentage of abutting owners within a stated distance as a condition precedent to granting of extensions of nonconforming uses. Ackley v. Nashua (1960) 102 NH 551, 163 A2d 6.

4. Variances

The absence of any provision specifically authorizing the making of consent of property owners a condition precedent to a hearing for a variance does not preclude a city from imposing such a condition. Robwood Advertising Associates, Inc. v. City of Nashua (1959) 102 NH 215, 153 A2d 787.

5. Power of court

Ruling of Superior Court that if proposed ordinance limiting height and location of new buildings in certain town were enacted it would be invalid was not within jurisdiction of Court as Superior Court has no jurisdiction to give advisory opinions. Piper v. Town of Meredith (1969) 109 NH 328, 251 A2d 328.

Superior Court properly denied injunction to enjoin town from conducting special town meeting for purpose of enacting a proposed ordinance limiting height and location of new buildings as court had no power to interfere with proposed legislative action. Piper v. Town of Meredith (1969) 109 NH 328, 251 A2d 328.

6. Residential uses

A zoning ordinance requirement that the building superintendent issue a certificate of occupancy should be complied with, but the absence of such a certificate is not fatal. Bois v. City of Manchester (1964) 105 NH 300, 199 A2d 95.

A zoning ordinance which permits the use of premises in an apartment house district as a "hotel, provided it conforms to all the requirements of this ordinance for a dwelling", precludes the operation of a public dining room or restaurant, though it is permissible to furnish meals to persons residing therein permanently or temporarily, and to their guests. Foo v. City of Manchester (1952) 97 NH 346, 88 A2d 171.

A zoning ordinance prohibiting the erection or alteration of a building "except for use as a single family detached dwelling" precludes the remodeling of a single family residence so as to create two separate tenements, although it is the owner's purpose to use the property only for the accommodation of relatives and friends who may visit him. Sullivan v. Anglo-American Invest. Trust (1937) 89 NH 112, 193 A 225.

The rule which prevents revocation of a valid building permit following amendment of zoning ordinance where the owner has expended substantial sums of money in reliance upon the permit does not extend to cases where the issuing official exceeded his authority by issuing a permit in violation of the ordinance in effect at the time of its issuance. Hermer v. City of Dover (1965) 106 NH 534, 215 A2d 693.

7. Billboards

The prohibiting of billboards by a zoning ordinance, with the exception of those advertising products sold on the premises, and of signs exceeding 12 square feet in area, is not unreasonable where it further provides that such may be permitted if it is found not to be, under existing circumstances, injurious, offensive or detrimental to the neighborhood. Rockingham Hotel Co. v. North Hampton (1958) 101 NH 441, 146 A2d 253.

8. Junkyards

The defendant's operations in salvaging, breaking up, burning and storage of automobiles was held to have constituted a junk yard within the meaning of a zoning ordinance. McKinney v. Riley (1964) 105 NH 249, 197 A2d 218.

9. Trailers

The zoning provisions of a trailer ordinance may not be enforced against trailers introduced into the city prior to its enactment, where the effect would be to compel persons who incurred substantial expenditures in purchasing and installing trailer parks to move to new locations and to force those who established trailers on their own land to move them to trailer parks and pay rent to the owners of those parks. City of Manchester v. Webster (1957) 100 NH 409, 128 A2d 924.

A municipal ordinance prohibiting the erection of any building or trailer within one-fourth mile of the town common unless the selectmen approve the plans for construction and location "in order that the atmosphere of the Town . . . may be maintained" is a valid exercise of the police power granted by RSA 31:29; and the fact that no zoning ordinance of general application has been adopted by the town and that the regulation applies to a limited area of town does not invalidate the ordinance. Town of Deering ex rel. Bittenbender v. Tibbetts (1964) 105 NH 481, 202 A2d 232.

10. Cited

Cited in City of Keene v. Parenteau (1955) 99 NH 415, 112 A2d 667; Shell Oil Co. v. City of Manchester (1957) 101 NH 76, 133 A2d 501; City of Keene v. Blood (1958) 101 NH 466, 146 A2d 262.

31:61 Districts. For any or all of said purposes the local legislative body may divide the municipality into districts of such number, shape and area as may be deemed best suited to carry out the purposes hereof; and within such districts it may regulate and restrict the erection, construction, reconstruction, alteration, repair, or use of buildings, structures, or land. All such regulations shall be uniform for each class or kind of buildings throughout each district, but the regulations in one district may differ from those in other districts.

HISTORY

Source. 1925, 92:2. PL 42:49. RL 51:51.

ANNOTATIONS

Library references

Access to industrial, commercial, or business premises over premises differently zoned. 63 ALR2d 1446.

Spot zoning. 51 ALR2d 263; 128 ALR 740.

Municipal Corporations ⇦ 601, 621, 626, 669.

Zoning ⇦ 35, 162, 275–277, 290, 302–308.

CJS Municipal Corporations § 226(6), (8), (18), (19).

CJS Zoning §§ 34, 91, 151–154, 176–179.

1. Construction

The provisions of this section are permissive rather than mandatory, and the establishment of a single district for zoning purposes will not for that reason invalidate a zoning ordinance. Town of Plainfield v. Hood (1968) 108 NH 502, 240 A2d 60.

2. Classification by districts

The requirement that a zoning regulation shall be made in accordance with a comprehensive plan requires zoning to be by districts and not by individual pieces of property. Edgewood Civic Club v. Blaisdell (1948) 95 NH 244, 61 A2d 517.

A zoning ordinance does not comply with the statute unless the classification is by districts and not by individual pieces of property. Kimball v. Blanchard (1939) 90 NH 298, 7 A2d 394.

An ordinance placing certain property in a one-family dwelling residence district, which also established throughout such district five separate business districts each consisting of one separate piece of property, is discriminatory and illegal. Kimball v. Blanchard (1939) 90 NH 298, 7 A2d 394.

The proper zoning of an area as residential will not be affected by any invalid spot zoning of an adjoining area. Mater v. City of Dover (1951) 97 NH 13, 79 A2d 844.

3. Spot zoning

Spot zoning is the improper creation by municipal ordinance of a small zone of inconsistent use within a larger zone. Glidden v. Town of Nottingham (1968) 109 NH 134, 244 A2d 430.

An area is spot zoned when it is singled out for treatment different from that of similar surrounding land which cannot be justified on the basis of health, safety, morals or general welfare of the community and which is not in accordance with a comprehensive plan. Schadlick v. City of Concord (1967) 108 NH 319, 234 A2d 523.

The mere fact that an amendment of a zoning regulation zones a small area at the request of a single owner does not of itself make the result spot zoning, but is permissible if there is a public need for it or a compelling reason for it. Edgewood Civic Club v. Blaisdell (1948) 95 NH 244, 61 A2d 517.

The mere fact that an area is small and is zoned at the request of a single owner and is of greater benefit to him than to others does not make out a case of spot zoning if there is a public need for it or a compelling reason for it. Schadlick v. City of Concord (1967) 108 NH 319, 234 A2d 523.

4. Classifications of use

Motels may properly be classified separately from hotels for purposes of zoning. Spicer v. City of Claremont (1963) 104 NH 461, 189 A2d 496.

Where municipal zoning ordinance permitted operation of hotels and motels in residence district but placed restrictive definition and limitation on what constitutes a "hotel" by requiring minimum of twenty rooms, and failed to define "motels", restrictively or otherwise, it was intent of legislative body to treat motels as distinct from hotels and not to subject motels to the same limitations imposed on hotels. Spicer v. City of Claremont (1963) 104 NH 461, 189 A2d 496.

5. Cited

Cited in City of Keene v. Parenteau (1955) 99 NH 415, 112 A2d 667; City of Keene v. Blood (1958) 101 NH 466, 146 A2d 262; Stone v. Cray (1938) 89 NH 483, 200 A 517; Brady v. City of Keene (1939) 90 NH 99, 4 A2d 658.

31: 62 Purposes in View. Such regulations shall be made in accordance with a comprehensive plan and designed to lessen congestion in the streets; to secure safety from fires, panic and other dangers; to promote health and the general welfare; to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; to facilitate the adequate provision of transportation, water, sewerage, schools, parks and other public requirements. Such regulations shall be made with reasonable consideration, among other things, to the character of the district and its peculiar suitability for particular uses, and with a view to conserving the value of buildings and encouraging the most appropriate use of land throughout such municipality. A regulation made under this subdivision shall not apply to existing structures nor to the existing use of any building, but it shall apply to any alteration of a building for use for a purpose or in a manner substantially different from the use to which it was put before alteration. Structures used or to be used by a public utility may be exempted from the operation of any regulation made under this subdivision, if upon petition of such utility the public utilities commission shall after a public hearing decide that the

present or proposed situation of the structure in question is reasonably necessary for the convenience or welfare of the public.

HISTORY

Source. 1925, 92:3. PL 42:50. RL 51:52. 1951, 203:2, eff. Sept. 1, 1951.

ANNOTATIONS

Library references

Application of zoning regulations to motels or motor courts. 23 ALR3d 1210.

Constitutionality of zoning based on size of commercial or industrial enterprises or units. 7 ALR2d 1007.

Construction of zoning regulations requiring side or rear yards. 94 ALR2d 419.

Construction and effect of zoning provision permitting accessory use for "professional office." 24 ALR3d 1128.

Exclusion from municipality of industrial activities inconsistent with residential character. 9 ALR2d 683.

"Home occupation" or the like within accessory use provision of zoning regulation. 73 ALR2d 439.

Radio equipment as within zoning ordinance. 155 ALR 1134.

Regulation of billboards and outdoor advertising by zoning ordinances. 156 ALR 581.

Restrictions on location of undertaking establishment. 165 ALR 1112.

Validity of provisions for amortization of nonconforming uses. 22 ALR3d 1134.

Validity of building height regulations. 8 ALR2d 963.

Validity of front setback provisions in zoning ordinance or regulation. 93 ALR2d 1223.

Validity and construction of zoning regulations expressly referring to hospitals, sanitariums, nursing homes. 27 ALR3d 1022.

Validity of zoning regulations prescribing minimum dimensions of floor area of buildings. 149 ALR 1440.

Validity of zoning measure prohibiting or regulating removal or exploitation of oil, minerals, soil, sand, gravel, stone and other natural products within municipal limits. 168 ALR 1188.

Validity of zoning regulations requiring open side or rear yards. 94 ALR2d 398.

What enterprise or activity is permissible in business zone. 128 ALR 1214.

Zoning regulations as to gas filling stations. 18 ALR 101; 29 ALR 450; 34 ALR 507; 42 ALR 978; 49 ALR 767; 55 ALR 256; 79 ALR 918; 96 ALR 1337.

Zoning requirements describing conditions of business or manufacturing designed to avoid nuisance or annoyance. 173 ALR 271.

Zoning regulations prohibiting or limiting fences, hedges, etc. 66 ALR2d 1294.

Zoning regulations in respect of intoxicating liquors. 9 ALR2d 877.

Zoning regulations as to privately owned parking places. 29 ALR2d 867.

Zoning regulations as applied to schools, colleges, universities and the like. 36 ALR2d 653.

Zoning regulations applicable to tourist or trailer camps, motor courts or motels. 22 ALR2d 793.

Automobiles ⇦ 362 et seq.

Cemeteries ⇦ 1 et seq.

Constitutional Law ⇦ 278(1), 296(2).

Intoxicating Liquor ⇦ 11, 15, 17, 59, 112, 132.

Municipal Corporations ⇦ 61, 62, 600, 601(1)–601(3), 613, 621, 625, 626.

Towns ⇦ 15.

Zoning ⇦ 1 et seq.

CJS Cemeteries § 1 et seq.

CJS Constitutional Law §§ 602, 670.

CJS Intoxicating Liquor §§ 25, 26, 36, 38, 39, 53, 54, 136, 193, 215.

CJS Motor Vehicles § 715 et seq.

CJS Municipal Corporations §§ 138–182, 221, 224, 225, 226(1)–226(19), 227(1)–227(15), 264, 312.

CJS Towns § 34(2).

CJS Zoning § 1 et seq.

1. Construction

Zoning by its very nature is restrictive and regulatory as to the use of land and provisions which permit expansion and extension of existing uses are generally

strictly construed. McKinney v. Riley (1964) 105 NH 249, 197 A2d 218.

2. Generally

Property may be zoned not only to present conditions but also to the requirements of probable and desirable growth. Kimball v. Blanchard (1939) 90 NH 298, 7 A2d 394; Edgewood Civic Club v. Blaisdell (1948) 95 NH 244, 61 A2d 517.

A zoning regulation that auxiliary buildings, including garages, stables and the like, should be placed upon the rear half of the lot, is permissible. Sundeen v. Rogers (1928) 83 NH 253, 141 A 142, 57 ALR 950.

The fact that a single district for zoning purposes was created does not establish that the ordinance was not made "in accordance with a comprehensive plan". Town of Plainfield v. Hood (1968) 108 NH 502, 240 A2d 60.

3. Nonconforming uses

Zoning ordinance provisions which except existing uses are intended to favor uses which are both existing and lawful and not to aid users who have succeeded in evading previous restrictions. Arsenault v. City of Keene (1962) 104 NH 356, 187 A2d 60.

Where a zoning ordinance provided that a nonconforming use of an existing building may be changed to any use permitted in a district where such nonconforming use would be permitted and not more objectionable or detrimental to the area and no structural alterations are made therein, the defendants' nonconforming use of the premises in an apartment-house district as an automotive paint and repair shop was a use permitted in other districts and hence certain change in uses of the premises by the defendants not more objectionable or detrimental to the area and which involved no "structural alterations" did not constitute violation of the ordinance. Bois v. City of Manchester (1964) 105 NH 300, 199 A2d 95.

The enforcement of a zoning ordinance provision that "no junk yard may continue as a nonconforming use for more than one year after the effective date" of the ordinance "without special permit from the Board of Adjustment" where continued and greatly expanded operations constituted both a public and private nuisance was a valid exercise of the police power. McKinney v. Riley (1964) 105 NH 249, 197 A2d 218.

4. Billboards

The prohibiting of billboards by a zoning ordinance, with the exception of those advertising products sold on the premises, and of signs exceeding 12 square feet in area, is not unreasonable where it further provides that such may be permitted if it is found not to be, under existing circumstances, injurious, offensive or detrimental to the neighborhood. Rockingham Hotel Co. v. North Hampton (1958) 101 NH 441, 146 A2d 253.

5. Fire regulations

The fact that a city may have enacted special regulations for fire protection does not estop it from enacting zoning regulations with a view to securing safety from fire. Sullivan v. Anglo-American Invest. Trust (1937) 89 NH 112, 193 A 225.

6. Residential zoning

Zoning as residential all properties in the town not zoned as commercial or industrial is permissible where the bulk of the land in the town, apart from the sections zoned for business and industry, is rural, used primarily for farming and residential purposes. Hudson v. Paradise (1958) 101 NH 389, 143 A2d 421.

Zoning of property as residential impliedly precludes its use as a junk yard. Hudson v. Paradise (1958) 101 NH 389, 143 A2d 421.

7. Sale of produce

A zoning ordinance which permits the sale of farm produce on the premises includes not merely the agricultural products in their natural state but products manufactured therefrom, such as butter, cheese, etc. including ice cream. Kimball v. Blanchard (1939) 90 NH 298, 7 A2d 394.

8. Cited

Cited in City of Keene v. Parenteau (1955) 99 NH 415, 112 A2d 667; Stone v. Cray (1938) 89 NH 483, 200 A 517; Brady v. City of Keene (1939) 90 NH 99, 4 A2d 658.

31: 63 Method of Enactment in Cities. The legislative body of a city shall provide for the manner in which such regulations and restrictions and the boundaries of such districts shall be determined, established and enforced, and from time to time amended. No such regulation, restriction