Line 3041 and Line 3754 Structure Replacements – Project Update

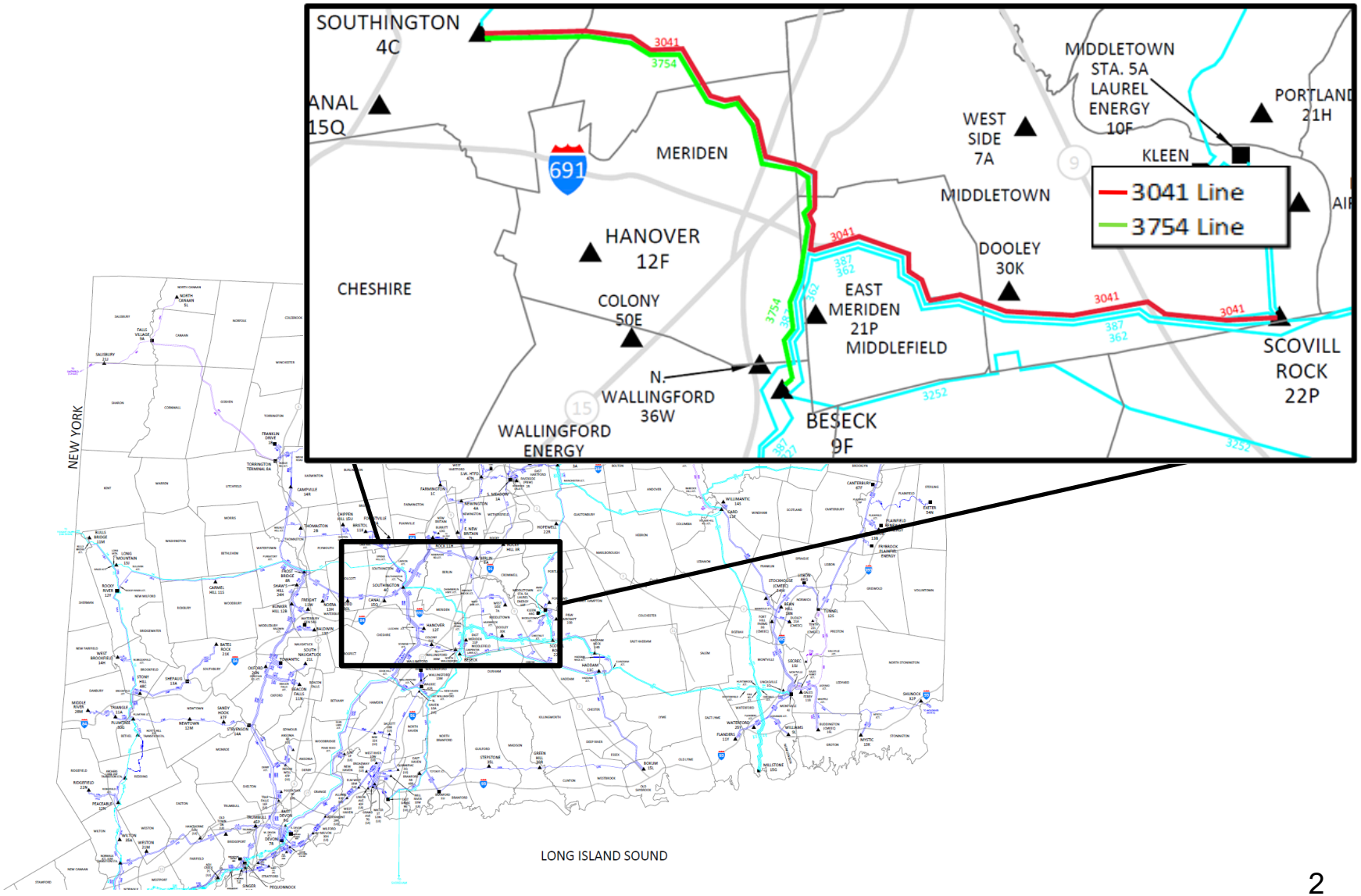
Planning Advisory Committee Meeting

July 17, 2024

Agenda

- Project Location
- Line 3041
  - Project Background
  - Project Photos
  - Scope Update
  - Cost Update
  - Lessons Learned
- Line 3754
  - Project Background
  - Project Need
  - Project Photos
- Projects Summary

Locations – Connecticut 3041 and 3754 Lines



Background – Line 3041

- Line 3041 is a 345 kV line running 19.3 miles between Southington substation in Southington, CT and Scovill Rock substation in Middletown, CT
  - Line Details
    - Originally constructed in 1972 (52 years old)
    - Total structures: 162
      - Combination of steel lattice tower, wood, and steel H-Frame/3-Pole/monopole structures
    - Conductor: 2-954 ACSR
    - Shield wire: 2-3/8" Alumoweld
- The Line 3041 project is addressing asset condition structure concerns stemming from recent inspections in accordance with Electric Power Research Institute (EPRI) guidelines
  - *A: Nominal Defect , B: Minimal Defect, C: Moderate Defect, D: Severe Defect*
  - Structures identified for replacement were constructed in 1972 and are priority C or B
- For additional details, please see the November 15, 2022 PAC presentation

Project Photos – Line 3041 Asset Condition Structure Replacements

Line 3041 - Structure 9500
Foundation Deterioration

Line 3041 - Structure 9551
Section Loss

Project Photos – Line 3041 Asset Condition Structure Replacements

Line 3041 - Structure 30020
Splitting Pole Top

Line 3041 - Structure 9564
Leaning Poles & Washout Concerns

Line 3041 Asset Condition Structure Replacements - Project Scope Update

Line 3041 (Southington Substation to Scovill Rock Substation)	
Original Scope	**Updated Scope**
Replace 19 total structures as follows: • Six 345 kV steel lattice structures • Thirteen 345 kV wood H-Frame structures • Install strut insulators on six existing structures to mitigate conductor swing **In-service Date, Original: Q2 2024** **PTF Cost Estimate: $11.6M**	Replace 22 total structures as follows: • Six 345 kV steel lattice structures • Thirteen 345 kV wood H-Frame structures • Three 345 kV wood Three-Pole structures • Install strut insulators on five existing structures to mitigate conductor swing **In-service Date, Updated: Q4 2025** **PTF Cost Estimate: $32.2M**

Line 3041 Asset Condition Structure Replacements - Project Cost Update

Line 3041		
Item	**$M**	**Explanation**
2022 As-Presented PTF Costs	**$11.6**	
Construction & Materials	12.9	Cost increases based on updated labor rates based on 2023-2025 Master Service Agreements, significant increase in civil work, higher than anticipated costs of materials/steel poles, and additional structure replacements (3).
Siting Approvals & Permits	0.3	Increase in costs for siting and permits due to environmentally sensitive areas. NDDB* approval on other projects in same ROW are 3+ years awaiting approval.
Mitigation plan	0.2	Mitigation plan approval required for NDDB approval. Cost includes implementation and monitoring for future years.
Indirects / Overheads	7.2	Additional overhead / indirect costs due to direct project cost increases mentioned above
2024 Estimated PTF Cost Increase	**$20.6**	
2024 Estimated Total PTF Cost	**$32.2**	

* Connecticut Department of Energy and Environmental Protection (DEEP) – Natural Diversity Data Base (NDDB) Determination

Line 3041 – Lessons Learned

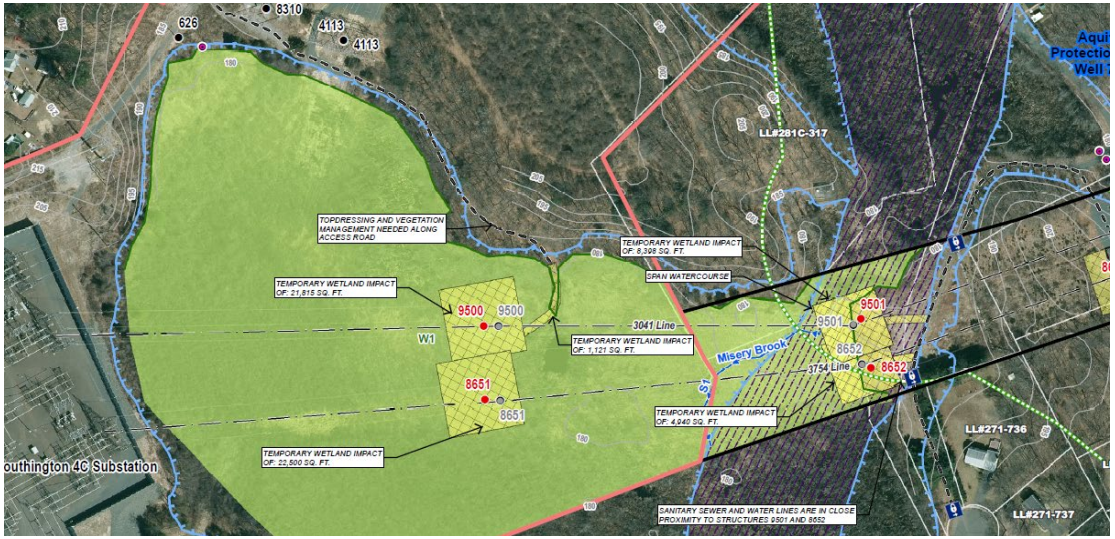
- The development of this project has experienced many challenges due to the complexity of the terrain and the environment of the Right of Way (RoW). These challenges have included:
  - Materials – This project requires 9 engineered structures (Concrete drilled pier foundations) that are significantly more expensive than standard poles
  - Grading – Lattice towers are situated on hillsides that have created complexities in moving materials to the work areas, requiring additional tiered matting
  - Wetlands – Have driven a significant increase in matting needs to access structures. In some cases, more than 5 layers of matting will be required.
  - Environmentally Sensitive Areas – Project includes work sites in an environmentally sensitive area owned by The Nature Conservancy. Special considerations towards construction means and methods must be given to perform safely and with minimal environmental impact.
  - NDDB determination – The permitting review process has drastically impacted the project schedule. The initial application for this project was submitted over three (3) years ago and has taken longer than anticipated.
- The Eversource Licensing & Permitting team is in continuous talks with Connecticut Department of Energy & Environmental Protection (DEEP) in an effort to properly develop scopes for future projects as we continue to have work in sensitive areas. These conversations will enable us to have more accurate estimates and more predictability about mitigations associated with particular species identified on the Natural Diversity Data Base.

* Over one million square feet of matting will be used to avoid permanent environmental impacts

ROW – Terrain and Wetland

Left - Examples of seasonal growth within wetland
Right – Seasonal growth and terrain within ROW

ROW – Terrain and Wetland (Cont.)



Above – Wetland locations east of the Southington SS

Below – Topographical contour lines demonstrating elevation complications located within the ROW

Background – Line 3754

- Line 3754 is a 345 kV line running 11.9 miles between Southington substation in Southington, CT and Beseck substation in Wallingford, CT
  - Originally constructed in 1969 (55 years old)
  - Total structures: 105
    - Combination of steel lattice tower, wood, and steel H-Frame/3-Pole/monopole structures
  - Conductor: 2-954 ACSR
  - Shield wire: 3/8” Alumoweld and OPGW
- Inspections of line 3754 have identified asset condition concerns of existing structures within the proximity of the planned work on Line 3041

Line 3754 - Asset Condition Structure Replacements Project Need

- Inspections were performed of all structures on the Line 3754 in accordance with Electric Power Research Institute (EPRI) guidelines:
  - *A: Nominal Defect – No action required*
  - *B: Minimal Defect – Monitor degradation*
  - *C: Moderate Defect – Rehabilitation recommended as scheduled maintenance*
  - *D: Severe Defect – Repair, reinforce, or replace as soon as possible*
- One priority D and two priority C rated lattice tower structures were identified with one or more of the following age-related degradations, leading to decreased load carrying capability
  - Foundation damage, steel sectional loss in direct embedded installation, and/or rust corrosion
    - The priority D structure has been temporarily reinforced while its replacement is developed
- In total, this project will address the asset condition concerns identified via:
  - Replacement of three 345 kV lattice towers, vintage 1969 (55 years old)
  - Strut insulators will be installed on one (1) structure to mitigate conductor swing caused by adjacent structure replacements
- This project was not previously presented to PAC as it was originally estimated to be below $5M. The project experienced similar rising costs as the 3041 associated with labor, civil construction cost, and materials.

Project Photos – Line 3754 Asset Condition Structure Replacements

Line 3754 - Structure 8717
Deteriorated concrete, steel foot of structure leg exposed with rust and corrosion

Line 3754 – Structure 8717
Rust and pitting of galvanized steel structures

Projects Scope and Summary

- Line 3041
  - Replace a total of 22 structures:
    - Six steel lattice structures and sixteen wood structures with a combination of thirteen 2-pole H-Frame structures and nine engineered structures
  - Install strut insulators on five existing structures to mitigate conductor swing
  - PTF Cost: **$32.2M (-25% / +50%)**
  - Project In-service Date: **Q4 2025**

- Line 3754
  - Replacement of three lattice tower structures with a combination of steel monopole structures and light duty steel H-frame structures
  - Installation of strut insulators on one structure
  - Development and implantation of an extensive site-specific mitigation plan
  - PTF Cost: **$7.4M (-25% / +50%)**
  - Project In-service Date: **Q1 2025**

Questions