Horton Cove Asset Condition and OPGW Project

Planning Advisory Committee Meeting

July 22, 2020

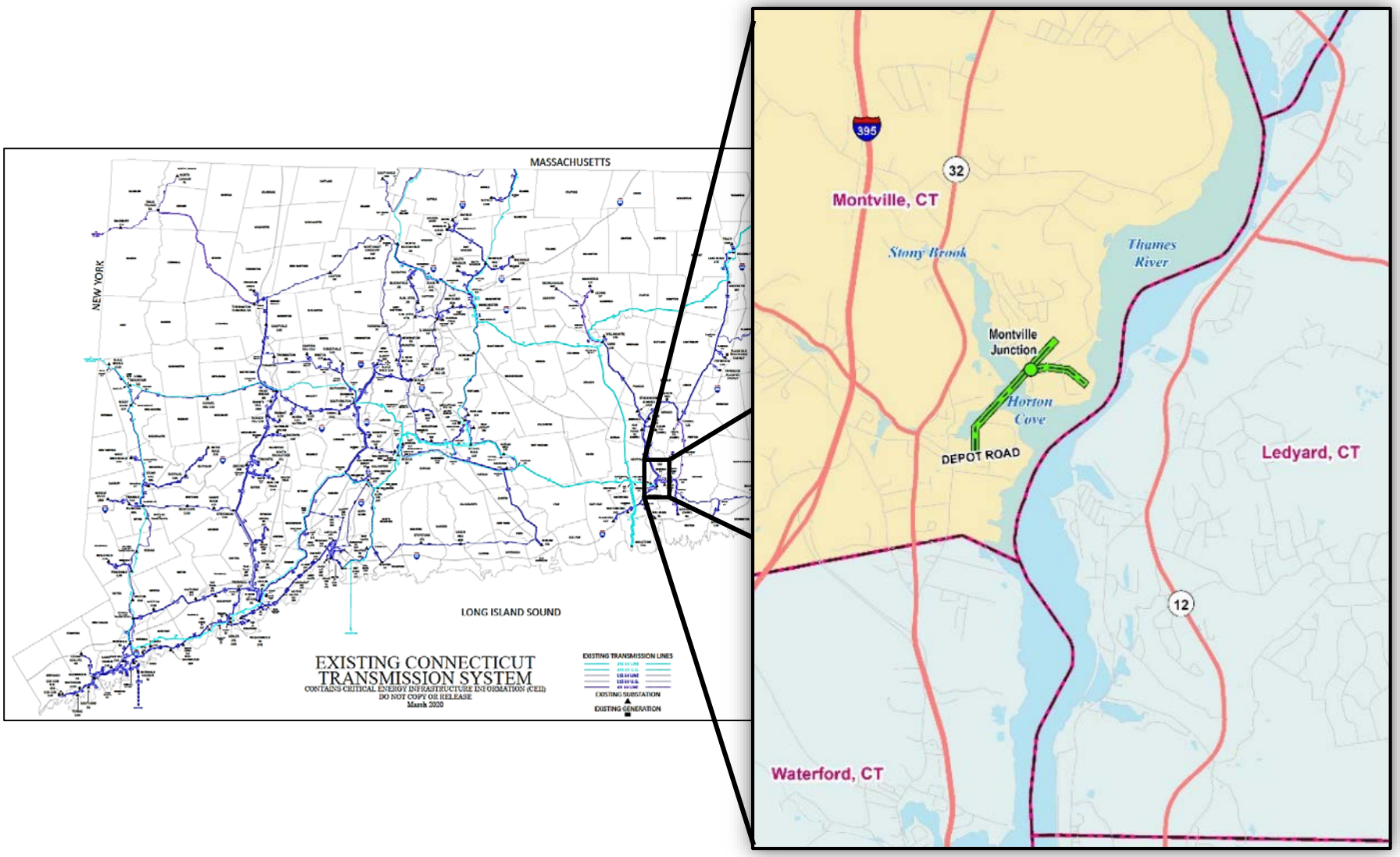
Agenda

- Project Background
- Project Location
- Existing Configuration
- Project Needs
- Project Scope
  - Preferred Solution
  - Alternatives
- Summary

Project Background

- Three 115 kV lines (Lines 1080, 1280, and 1410) and one 69 kV line (Line 100) cross Horton Cove adjacent to the Thames River in Montville, CT
- 100 and 1410 lines were originally constructed in the 1920s
  - Currently 556 kcmil ACSR
- 1080 and 1280 lines were constructed in the early 1960s
  - Currently 1272 kcmil ACSR
- All lines are supported by a mix of double-circuit lattice towers, quad-circuit lattice towers, and single-circuit H-frame structures
  - Quad-circuit lattice towers were built in 1963 and only have two shield wire positions for four circuits

Project Location



Existing Configuration

South of Horton Cove (Looking North-East)

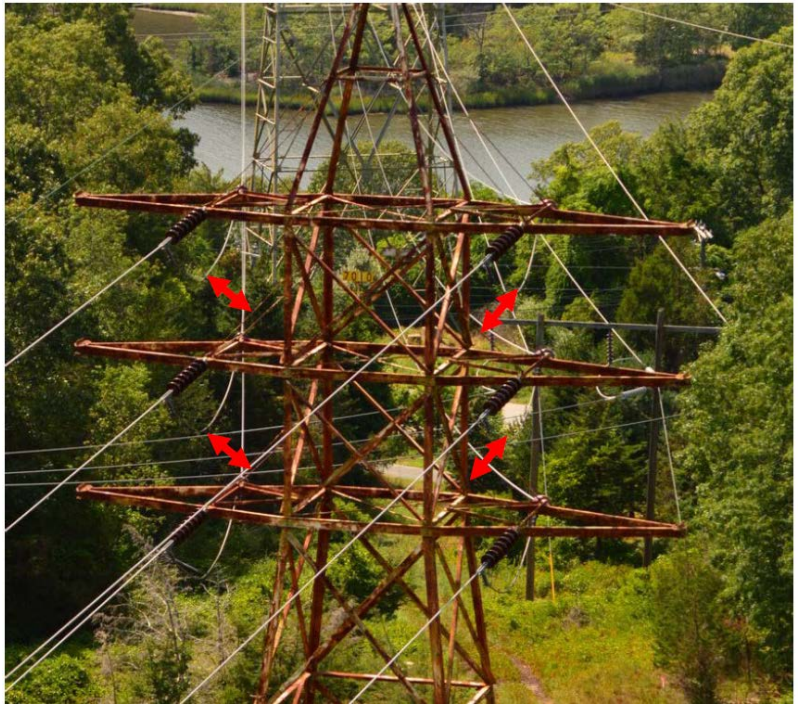
Structure #7008 – Quad-Circuit Lattice Tower
Structures #6306/7007 – Double-Circuit Lattice Towers

North of Horton Cove (Looking East)

Structure #7009 – Quad-Circuit Lattice Tower
Structure #6309 – Single-Circuit H-Frame

Project Needs: Reliability

- Quad-circuit lattice towers and adjacent structures create the potential for disturbances on multiple circuits
- Structure geometry creates small phase-ground clearances and an increased probability of faults due to lightning strikes
- 19 total disturbances since 2010 caused by lightning strikes and/or shield wire failure
- Three instances in the last four years where a single event caused a multiple-line transmission outage
- Multi-circuit outages required to perform maintenance or repairs
- Lack of optical ground wire (OPGW) precludes high-bandwidth, low latency, secure and reliable network operations



Structure #7010 – Reduced Air Gaps (<30”)
Priority Rating C

Project Needs: Asset Condition

- H-frame and lattice structures are deteriorating and outdated
  - Split pole tops and cracks
  - Woodpecker damage
  - Deteriorating steel components
- Temporary fix (“bushing-buddies”) on quad-circuit lattice towers to address deteriorating steel plates
  - Deterioration is continuing and bushing-buddies were not intended to be a permanent solution

Structure #8343 – Split pole tops, woodpecker damage, cracks, burnt at base

Structure #8345 – Split pole tops, woodpecker damage

Project Scope: Preferred Solution

- **Structure Replacement Scope:**
  - Replace 11 existing quad, double, and single circuit structures with 2 Double-Circuit Steel Monopoles, 12 Single-Circuit Steel Monopoles, and 5 Single-Circuit Steel H-Frames
  - Installation of lightning arrestors
  - Installation of counterpoise
- **OPGW Scope:**
  - Replacement of 2 existing Shield Wires with OPGW on all four circuits
    - Introduce a 3rd and 4th shield wire position to include shielding on lines 1280 and 1410
- **Reconductor Scope:**
  - 1080 & 1280 Lines
    - Reconductor approximately 0.6 miles of 1272 kcmil ACSR with 1590 kcmil ACSS
  - 1410 & 100 Lines
    - Reconductor approximately 0.85 miles of 556 kcmil ACSR with 1590 kcmil ACSS
- Project construction, engineering, and outage sequence will be coordinated with the Eastern Connecticut Solutions

Project Scope: Alternatives

- Replace only the quad-circuit river crossing structures with 4 deadend monopole structures
  - Does not meet Eversource design criteria for river crossings – failure of deadend hardware would drop conductor into river
  - Would require taller and more expensive structures to address clearance and tension issues
  - Does not address poor lightning performance on structures approaching the river

Summary

- Line circuit separation, structure replacement and reconductor of approximately 1 mile of four (4) 115-kV transmission lines in Montville, CT
  - Replace 11 existing quad, double, and single circuit structures with 19 new double and single circuit steel structures.
  - Replace 2 existing shield wires with 4 new OPGWs
  - Reconductor approximately 0.6 miles on the 1080 and 1280 115 kV lines of existing 1272 kcmil ACSR with 1590 kcmil ACSS
  - Reconductor approximately 0.85 miles on the 1410 115 kV and 100 69 kV lines of existing 556 kcmil ACSR with 1590 kcmil ACSS

Estimated Cost = $13.4 Million (-25% / +50%)

Projected in-service date: Q3 2021

Questions