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# E-183W 115kV Line Rebuild

ISO NE PAC Meeting October 18, 2023

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# Agenda



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## **Purpose: Discuss E-183W Franklin Sq – Wampanoag 115kV line needs and proposed solution**

- Project Background
- Maps/Diagrams
- Project Drivers
- Solution Alternatives
- Summary
- Feedback and Next Steps

# Project Background



- Rhode Island Energy (RIE) manages approximately 400 miles of overhead and underground transmission lines exclusively within the state of RI and applies a proactive asset management strategy to upgrade or rebuild aging transmission facilities to improve reliability and longevity of the system while reducing maintenance costs.
- System needs are identified through a combination of data collection activities including desktop review, ground inspections, aerial inspections, 3<sup>rd</sup> party condition assessments, etc.
- The E-183W Franklin Sq – Wampanoag 115kV line is a 3.7-mile line connecting Franklin Sq substation and Wampanoag substation with a tap to Phillipsdale Substation with an additional 2.5 miles (non-PTF).
- The E-183W line was originally constructed in 1969 (54 years old) and contains 1113 AAC conductor, 7#9 Alumoweld and 3/8” EHS OHGW, and 44 structures.
- The portion of the line that crosses the Seekonk and Providence Rivers, and Phillipsdale Tap to Franklin Square substation, was rebuilt in 2005 during the I-95 improvement project. This section is currently being evaluated for relocation and/or undergrounding. Any scope identified through this evaluation will be executed under a separate project.

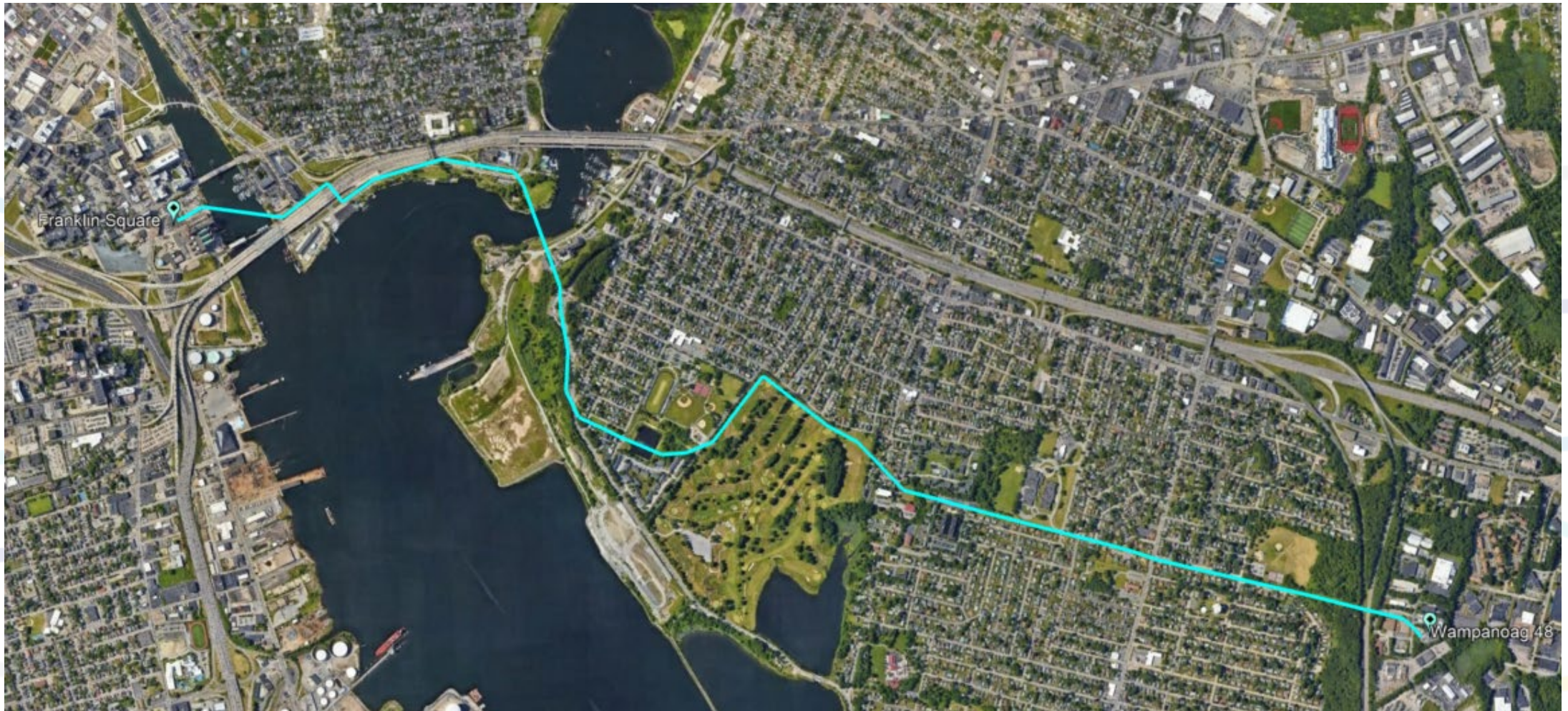
Material	PTF
Lattice	13
Steel	31
<b>Total</b>	<b>44</b>

**E-183W Structure Count by Material**

# E-183W Aerial View



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**E-183W Franklin Sq – Wampanoag**

# Project Driver



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- Aerial inspections identified evidence of physical deterioration on the structures such as severe paint chipping, active corrosion, and bent members.
- The majority of structures do not meet current lightning performance design standards and contain inadequate insulation, clearance, and grounding resulting in diminished performance. This line is one of RIE's worst performing circuits with 33 outages since 2011.
- Existing structure framing is extremely susceptible to avian interference – nesting, contacts, streamers, etc.
- Fiber installations along this corridor provide key communication links for a future system wide fiber deployment in support of protection networks, relaying, improving grid automation, and other device communications.
- The existing conductor was originally installed in 1969 (54 years old). AAC conductor loses mechanical strength over its service life due to corrosion and annealing, leading to an increased likelihood of broken strands and eventual conductor failure.

# Project Driver, cont.



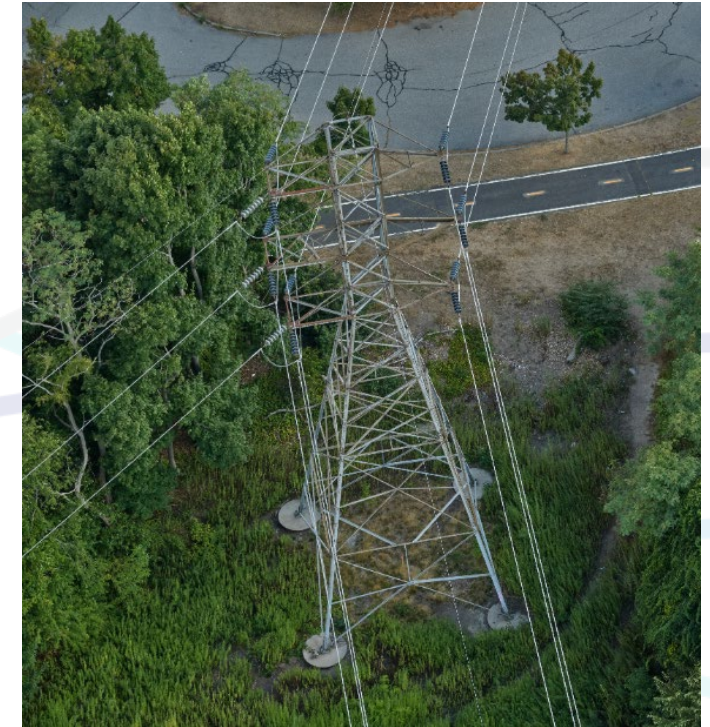
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**Flashed Insulator String with Insufficient Bell Count on E-183W Str 200**



**Severe Paint Chipping and Deterioration on E-183W Str 204**



**Deterioration on on E-183W Str 203**

# Solution Alternatives



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## Option 1: Structure Replacement & Optical Ground Wire (OPGW) Installation

- Replace 11 lattice towers and 26 steel structures along E-183W with 37 steel structures.
- Install approximately 2.6 miles of dual OPGW from Wampanoag to Franklin Sq.

### Benefits

- Lower initial construction cost
- Shorter outages

### Drawbacks

- Fails to address aging conductor
- Line would not have standard conductor size
- Transferring conductor increases risk of equipment failure
- Complicated construction sequence

**Estimated PTF Project Cost (+200%/-50%): \$8.6M**

# Solution Alternatives, cont.



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## **Option 2: Preferred Solution PTF Scope of Work - Structure Replacement, Conductor Replacement & OPGW Installation**

- Replace 11 lattice towers and 26 steel structures along E-183W with 37 steel structures.
  - The section of line rebuilt in 2005 during the I-95 relocation project is not included in this scope.
- Replace approximately 2.6 miles of 2-1113 AAC conductor with 1590 ACSS.
  - Existing conductor is not the limiting component. See next slide for ratings.
- Upgrade approximately 2.6 miles of OHGW with dual OPGW from Wampanoag to Franklin Sq.

Fully rebuilding the line takes advantage of efficiencies with respect to mobilization, permitting, public disruption, and environmental impacts to perform a more wholistic scope that would otherwise require additional future efforts.

**Estimated PTF Project Cost (+50%/-25%): \$10.6M**



# Solution Alternatives, cont.



## Option 2: Preferred Solution PTF Scope of Work - Structure Replacement, Conductor Replacement & OPGW Installation

### E183W Wampanoag to Phillipsdale Tap

	<b>Normal (MVA)</b>	<b>LTE (MVA)</b>	<b>STE (MVA)</b>
<b>Existing Circuit Ratings (Summer/Winter)</b>	397/487	468/520	501/581
<b>Existing Conductor Ratings: 2-1113 AAC (Summer/Winter)</b>	513/657	537/674	593/758
<b>Proposed Conductor Ratings: 1590 ACSS (Summer/Winter)</b>	565/612	565/612	703/783

### E183W Phillipsdale Tap to Franklin Sq

	<b>Normal (MVA)</b>	<b>LTE (MVA)</b>	<b>STE (MVA)</b>
<b>Existing Circuit Ratings(Summer/Winter)</b>	343/427	410/478	482/565
<b>Existing Conductor Ratings: 2-1113 AAC (Summer/Winter)</b>	513/657	537/674	593/758
<b>Proposed Conductor Ratings: 1590 ACSS (Summer/Winter)</b>	565/612	565/612	703/783

# Summary



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Rebuild approximately 2.6 miles of the E-183W 115kV mainline with steel monopoles, new 1590 ACSS conductor, and dual OPGW.

**Estimated PTF Project Cost (+50%/-25%): \$10.6M**

**Estimated Total Project Cost (+50%/-25%): \$10.6M**

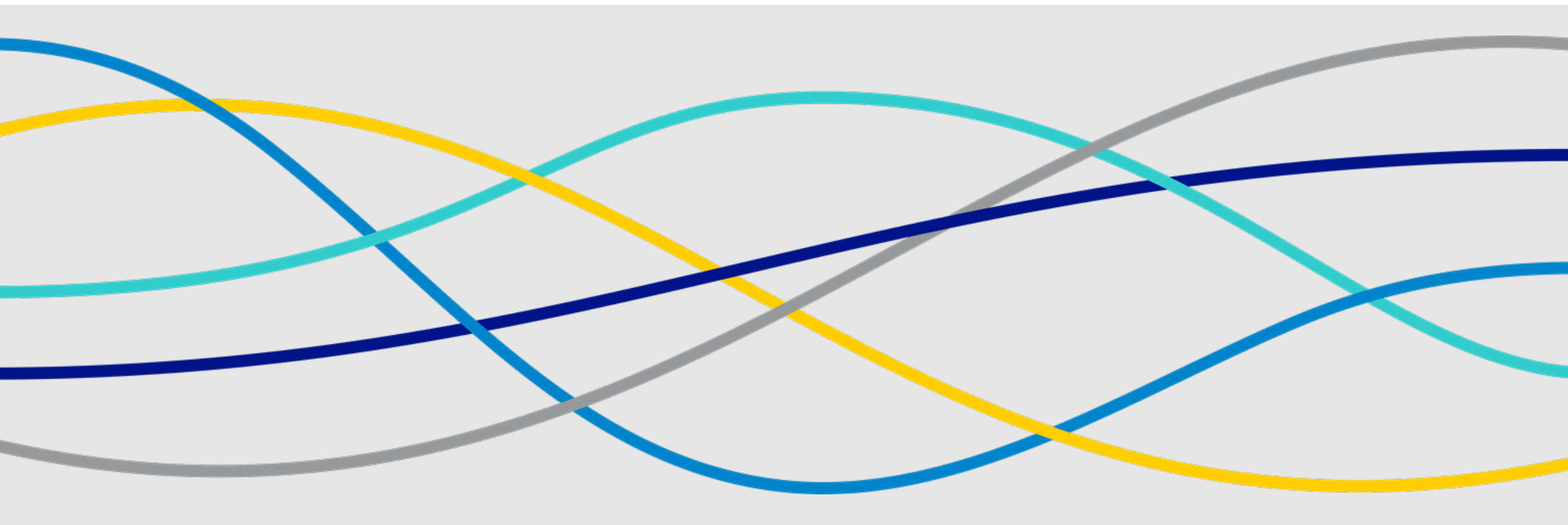
**Estimated Construction Start: Q3 2025**

**Project IS Date: Q4 2025**



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Please submit any written comments or feedback by November 2, 2023