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ACL 430: E-183W 115kV Line Rebuild Update

Kyra Lagunilla
Rhode Island Energy
ISO-NE Planning Advisory Committee Meeting
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Project Summary

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Project Drivers

- Physical deterioration such as severe paint chipping, active corrosion, and bent members
- Conductor approaching end of life and susceptible to loss of mechanical strength
- Does not meet current lightning performance design standards
- Susceptible to avian interference
- Fiber needed to support protection networks, relaying, improving grid automation, and other device communications
- View Original Presentation for additional details

Solutions

Solution	Description	Total Cost Estimate
Original Alternative (2005)	Rebuild 2.6 miles of E-183W mainline with steel monopoles, 1590 ACSS, and dual OPGW	$10.60M
BAS Alternative (2018)	Rebuild 4.2 miles of E-183W mainline and tap according to Bridge Alignment South (BAS) Agreement with steel monopoles, 1590 ACSS, and dual OPGW	$15.35M
Updated BAS Alternative (2025)	Rebuild 4.2 miles of E-183W mainline and tap according to BAS Agreement with steel monopoles,1590 ACSS, and dual OPGW. Additionally, portions of the mainline will be rebuilt underground to follow Energy Facility Siting Act S0981.	$34.44M

Outline

- Background Information
- Project Needs and Drivers
- Bridge Alignment South (BAS) Background
- BAS - Capital City Undergrounding Initiative
- Review of Transmission Studies
- Comparative Analysis of Alternatives
- Scope Change Explanation
- Schedule and Contact Information

Background Information

E-183W Wampanoag - Franklin Square & E-183W Phillipsdale Tap (Non-PTF)

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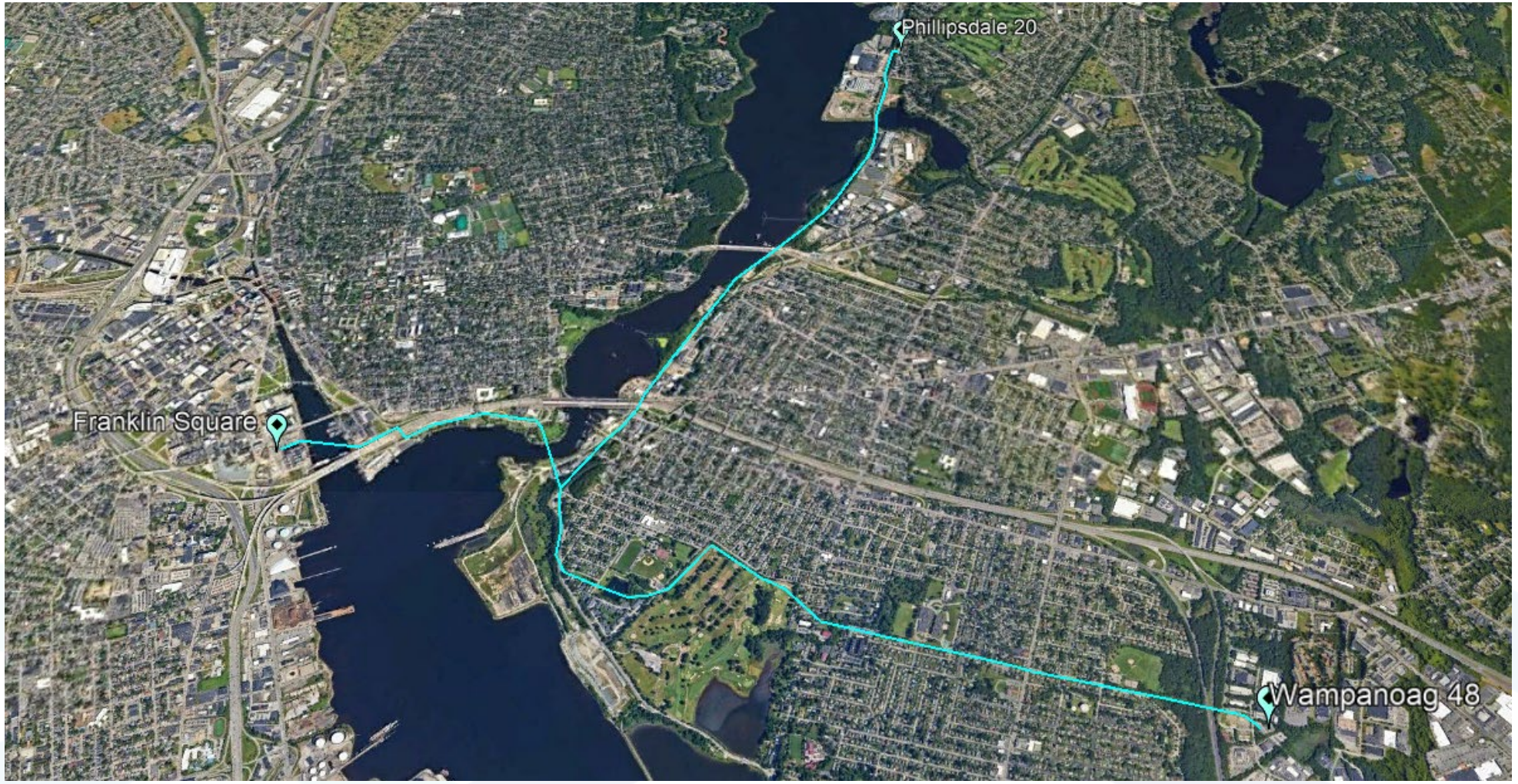
Key Details	
Location	**From:** Wampanoag, East Providence, RI **To:** Franklin Square, Providence, RI **To:** Phillipsdale, East Providence, RI
Existing Mainline length	3.7 miles
Tap length (Non-PTF)	2.5 miles
Operating Voltage	115 kV
Age and upgrade history	• Originally constructed in 1969 • Line relocation in 2005 near I-195
Prior PAC presentations	• October 18, 2023

Existing Structures			
Material	**Configuration**	**Number**	**Avg. age**
E-183W Wampanoag-Franklin Square			
Steel	Monopole Structures	25	56 years
Steel	Single-Circuit Lattice Towers	13	56 years
E-183W Wampanoag-Franklin Square (I-195 Relocation)			
Steel	Single-Circuit Monopoles	6	20 years
E-183W Phillipsdale Tap (Non-PTF)			
Steel	Single-Circuit Davit Arm Structures	33	56 years

Existing Conductor		
Type	**Length**	**Avg. age**
E-183W Wampanoag-Franklin Square		
2-1113 AAC	3.1 miles	56 years
E-183W Wampanoag-Franklin Square (I-195 Relocation)		
2-1113 AAC	0.6 miles	20 years
E-183W Phillipsdale Tap (Non-PTF)		
795 ACSR	2.5 miles	56 years

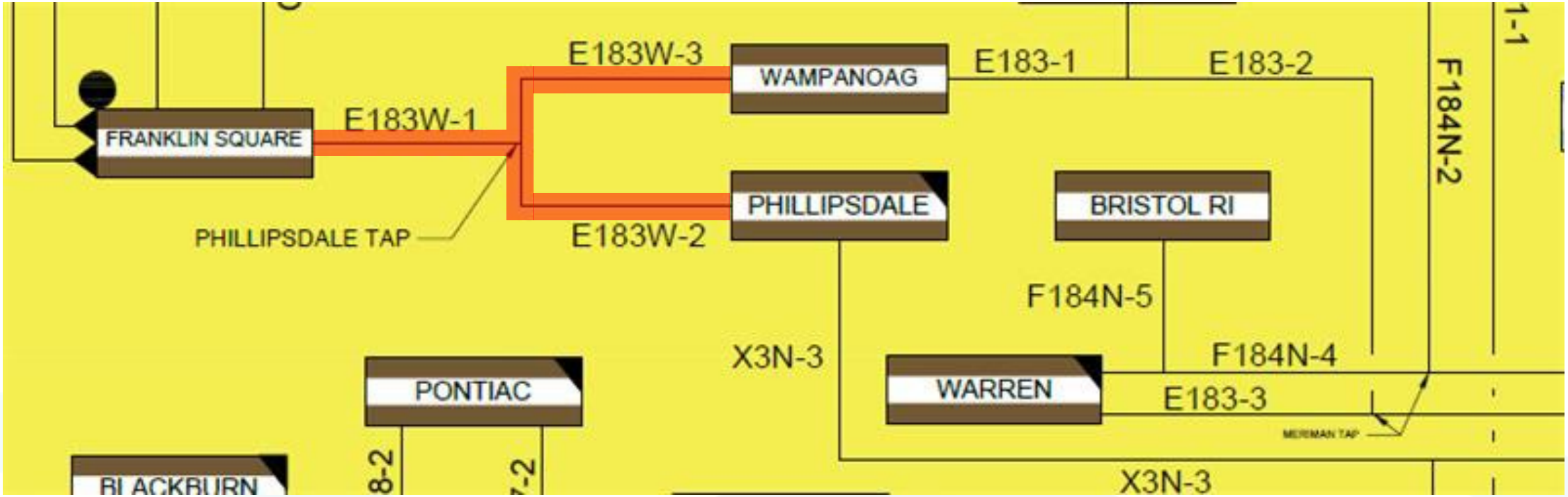
Background Information

Maps and Diagrams



Background Information

Maps and Diagrams



Project Needs and Drivers

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Primary Needs and Drivers	
Primary Concerns	
Structure deterioration	• Physical deterioration such as severe paint chipping, active corrosion, foundation damage, surface rust, and bent lattice tower members
Conductor mechanical strength	• Conductor approaching end of life and susceptible to loss of mechanical strength
Secondary concerns	
Structure construction	• Does not meet current lightning performance design standards • Susceptible to avian interference
Telecommunication needs	• Fiber needed to support protection networks, relaying, improving grid automation, and other device communications
View additional details from Original Presentation	

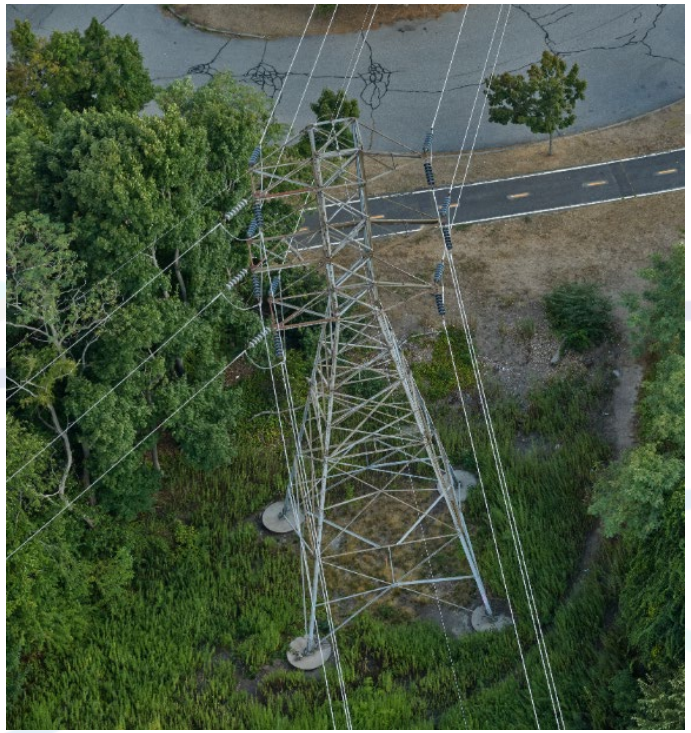
Summary of Current Structure Grades		
Category	**Recommended Action**	**Number of structures**
A	No replacement required due to deterioration	7
B	Consider replacement in conjunction with other structure replacements	15
C	Initiate planned structure replacement project **or** Replace as part of upcoming structure replacement project	22
D	Replace immediately (emergency replacement)	0
Total		44

Project Needs & Drivers

Asset Condition

Foundation Damage on E-183W Str 180

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



Deterioration on on E-183W Str 203

Bridge Alignment South (BAS) Background

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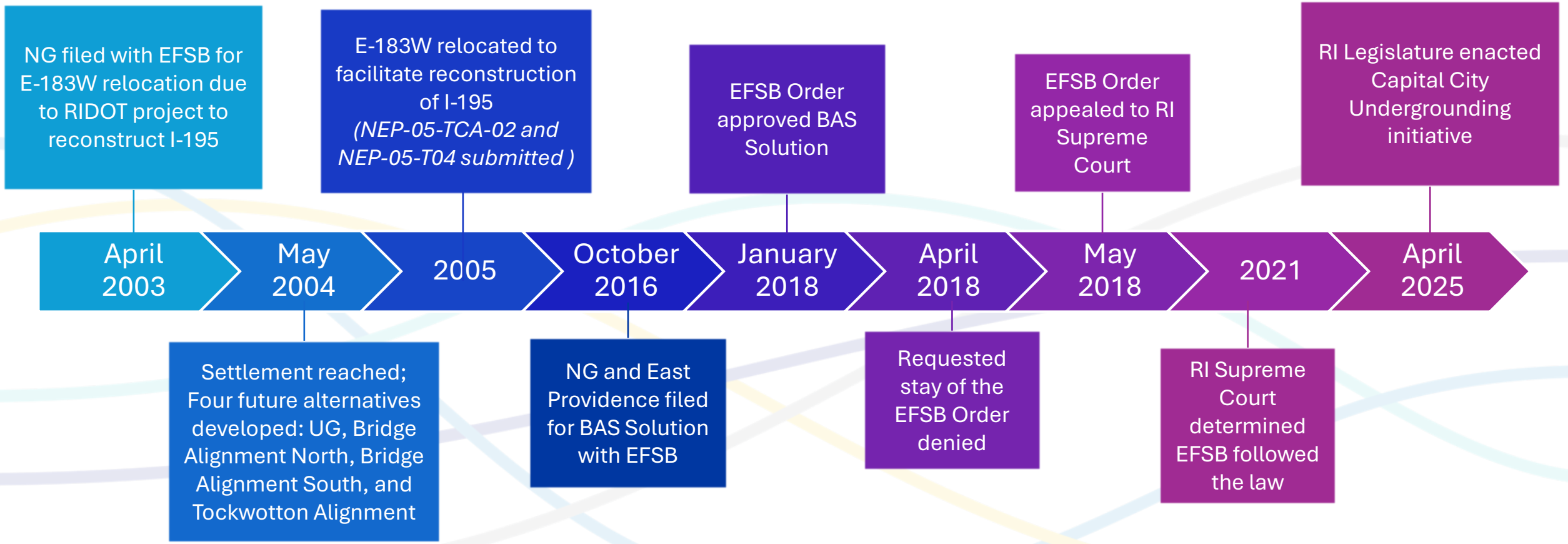

NG: National Grid
RIDOT: Rhode Island Department of Transportation
EFSB: Energy Facility Siting Board

BAS - Capital City Undergrounding Initiative: Impact of State Action

- EFSB Order 123, issued 1/17/2018, approved rebuilding according to BAS Alternative. This Alternative shifts the E-183W river crossing to the south side of the I-195 bridge and the structures out of India Point Park
  - Shifts the start of the Phillipsdale Tap to existing Structure 5
- Energy Facility Siting Act S0981 was enacted 4/16/2025, which approved project designs and cost recovery to advance the undergrounding of approximately 0.6 miles of the E-183W mainline
  - The Act states any incremental cost, over and above the estimated cost of the 2018 BAS Alternative, shall be paid for by customers in the cities of Providence and East Providence

Bridge Alignment South Alternative (2018)

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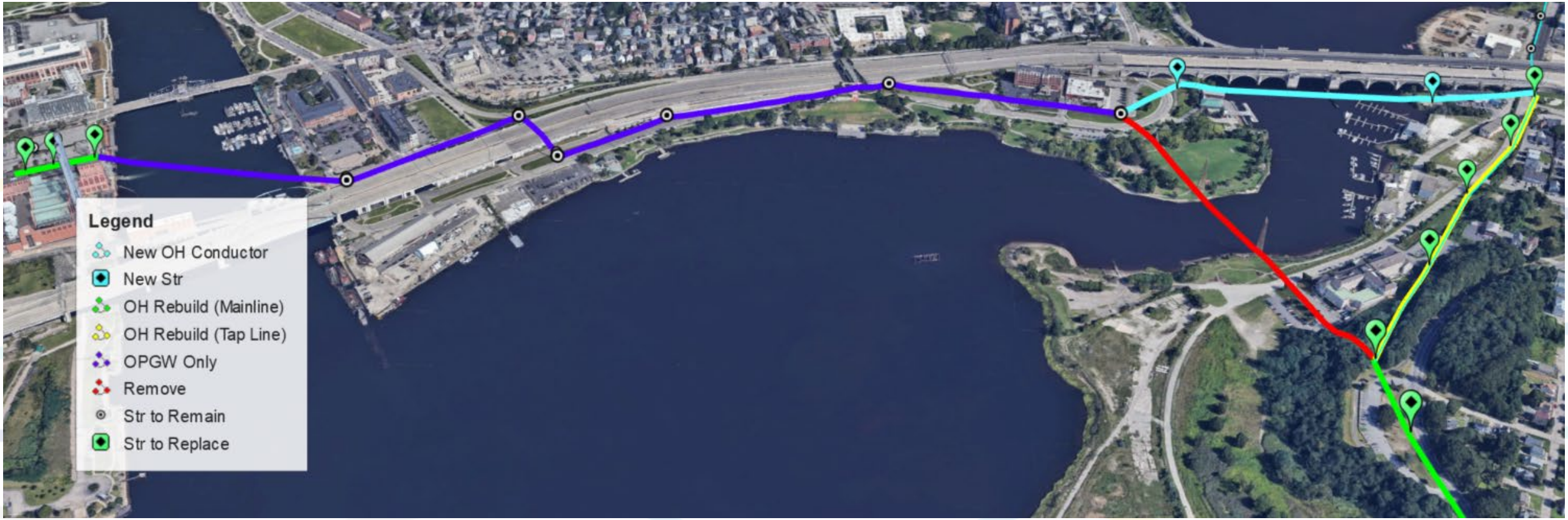

Updated BAS Alternative (2025)

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- Relocate (~0.4 mi north of existing location) and rebuild ~2.9 miles of the E183W mainline overhead from Wampanoag substation to future transition structure
- At the request of cities Providence and East Providence, a hybrid overhead/underground solution will be utilized for ~0.8 mi
  - From the first tap structure, ~0.1 miles of line will be rebuilt underground to another new transition structure
  - The line will span the Seekonk River (~980') overhead and transition underground again via another transition structure
  - The line will be routed underground again for ~0.5 miles before transitioning back to overhead via another transition structure
- 3 lattice structures will be replaced on remaining section to Franklin Square (~0.4 miles)
- **Project Summary:**
  - 45 existing structures will be removed
  - 43 new steel monopole structures will be installed on the E-183W mainline
    - 3 New MOLBAB structures, 2 New Tap Structures, 8 New Terminating Structures, 3 Transition Structures, and 27 New Suspension/Tension Direct embed and Foundation Structures
  - 3.2 Miles of overhead 1590 ACSS conductor and 0.6 miles of equivalent underground conductor will be installed
    - Single 1590 ACSS only. Bundled configuration will be removed with the project.
  - 4.2 Miles of (2) - 48 count OPGW will be installed

Updated Bridge Alignment South Alternative (2025)

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Review of Relevant Transmission Studies

Recent Transmission Studies
Was this line overloaded in recent Attachment K studies (Reliability Needs Assessments, Longer-Term Transmission Studies, etc.) or other recent studies?
Yes – 2050 Transmission Study; E-183W (Phillipsdale Tap – Franklin Square) was overloaded to a maximum of 101.8% LTE (based on 478 MVA LTE rating) in winter 2050 study snapshots
Have modifications or upgrades to this line been identified as potential solutions in any of those studies?
No – overload is marginal and only occurs in 57 GW peak load snapshots; line rating is currently limited by terminal bus equipment at Franklin Square, which is not being addressed by this project

Comparative Analysis of Alternatives

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Comparison			
Key Criteria	**Original Alternative (2005)**	**BAS Alternative (2018)**	**Updated BAS Alternative (2025)**
Routing	Overhead - in place	Overhead – Rerouted	Overhead – Rerouted + Underground 0.6 miles
Structure Scope	Install 37 new steel structures	Install 42 new steel structures	Install 43 new steel structures
Conductor Scope	Install 2.6 miles of new 1590 ACSS conductor	Install 3.6 miles of new 1590 ACSS conductor	Install 3.2 miles of new 1590 ACSS Overhead conductor
Shield Wire Scope	Install 2.6 miles of new OPGW	Install 4.2 miles of new OPGW	Install 4.2 miles of new OPGW
Total Estimated Costs	$10.60M	$15.35M	$34.44M
Total Estimated PTF Costs	$10.60M	$12.82M	$13.79M
Estimated Localized PTF Costs*	$0.00M	$2.53M	$2.50M
Estimated City-Covered Costs	-	-	$18.15M

* Final determination of localized costs will be determined through the ISO-NE's Transmission Cost Allocation process

Scope Summary for Updated BAS Alternative

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Additional Scope Details	
	Total
Miles of ROW Affected	4.2 miles
Miles of shield wire replacement	4.2 miles
Miles of conductor replacement	3.8 miles
Fiber Substation Connections	1 - Wampanoag
Structure Replacements/Mile	10.5 (43 total, primarily steel monopole)

Cost Breakdown Details		
	Total Cost	**Per Unit**
Reconductoring	$2.2 M	$0.579M/mile
Structure Replacements	$8.5 M	$0.198M/structure
Access Costs	$1.6 M	$0.381M/mile
Other Costs (engineering, contingency, etc.)	$1.5 M	$0.367M/mile
Total Estimated PTF Costs	**$13.8 M**	$3.363M/mile
Estimated Localized PTF Costs	**$2.5 M**	$3.205M/Mile
Estimated City-Covered Costs	**$18.2 M**	$23.333M/Mile
Key Factors Affecting Costs	Localized PTF Costs related to 2018 EFSB Order project updates; City-Covered Costs related to 2025 RI legislation project changes, including partial undergrounding	

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Planned Project Ratings

- This project will reconductor 3.8 miles from Wampanoag to Franklin Square with 1590 ACSS and equivalent underground cable
  - Approximately 0.4 miles of 2-1113 AL installed in 2005 will remain between Franklin Square and Phillipsdale Tap
  - The Phillipsdale Tap location will be shifted and a future substation (First Street – listed on RIE's 2025 Local System Plan) will be tapped off between Phillipsdale Tap and Wampanoag
- Pre-project and preliminary post-project ratings are listed below
  - Pre- and post-project line ratings are limited by terminal equipment at both Franklin Square and Wampanoag substations
- Conductor is approaching end of useful life; RIE is planning to replace conductor as part of full rebuild to mitigate need for additional project work in near future

Line Section (Pre-Project)	Voltage (kV)	Summer Ratings (MVA)			Winter Ratings (MVA)		
		Normal	LTE	STE	Normal	LTE	STE
E183W-1 Franklin Square to Phillipsdale Tap	115	342	409	482	426	478	564
E183W-2 Phillipsdale Tap to Phillipsdale	115	288	288	304	329	329	352
E183W-3 Phillipsdale Tap to Wampanoag	115	396	471	500	487	545	581
Line Section (Post-Project)	**Voltage (kV)**	**Summer Ratings (MVA)**			**Winter Ratings (MVA)**		
		Normal	**LTE**	**STE**	**Normal**	**LTE**	**STE**
E183W-1 Franklin Square to Phillipsdale Tap	115	342	409	482	426	478	564
E183W-2 Philipsdale Tap to Phillipsdale	115	288	288	304	329	329	352
E183W-3 Phillipsdale Tap to First St Tap	115	478	549	644	533	586	660
E183W-4 Wampanoag to First St Tap	115	396	468	500	487	545	581

Schedule

Planned Schedule	
Comment Deadline	January 16, 2025
Start of E-183W Major Construction	Q2 2026
Start of E-183W Undergrounding Major Construction	Q4 2026
Project in Service	Q2 2028

Please submit any comments to pacmatters@iso-ne.com and:

Transmission Owner Contact	
Contact Name	Kyra Lagunilla
Contact Email Address	klagunilla@pplweb.com

Conclusions

- To comply with EFSB Order 123 (issued on 1/17/2018) and address asset health concerns identified on the E-183W 115kV line, Rhode Island Energy is planning to rebuild approximately 4.2 miles of the line utilizing the Updated BAS Alternative design
  - Conforms with both 2018 EFSB Order and 2025 Capital City Undergrounding Initiative
- The total estimated PTF cost of the Updated BAS Alternative is $13.79M
  - -25/+50% accuracy, 30.1% increase from Original 2005 Alternative ($10.5M PTF)
- RIE will refund any post-2023 rate impact caused by identified recovery issue to RNS & LNS customers, with interest, in the 2026 FERC formula rate filing in July, consistent with the rate protocols.