AEPSC Childress Area Transmission Improvement Project – ERCOT Independent Review Project Update

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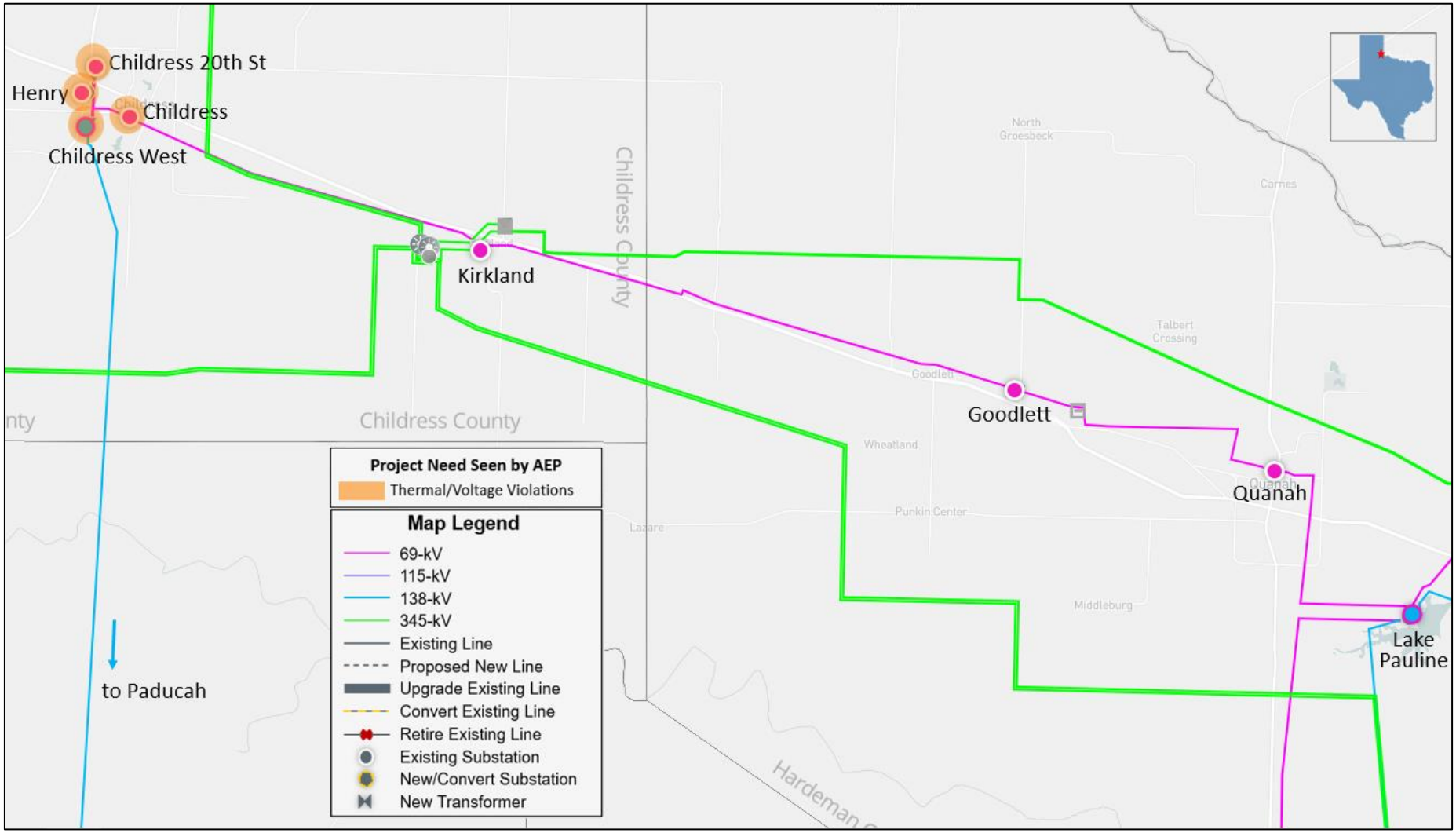
RPG Meeting
August 26, 2025

Introduction

- American Electric Power Service Corporation (AEPSC) submitted the Childress Area Transmission Improvement Project for Regional Planning Group (RPG) review in June 2025
  - This Tier 2 project is estimated to cost $53.0 million and will require a Certificate of Convenience and Necessity (CCN) filing
  - Estimated in-service date (ISD) is November 2031
  - Addresses the voltage violations under planned maintenance outage condition due to projected load increase in the Childress County in the North weather zone
- AEPSC provided an overview presentation and ERCOT provided the study scope at the July RPG Meeting
  - https://www.ercot.com/calendar/07292025-RPG-Meeting
- ERCOT will present the reliability need analysis and project evaluation during this presentation
- This project is currently under ERCOT Independent Review (EIR)

Recap – Study Area Map with Violations Seen by AEPSC



Recap – Study Assumptions

- Study Region
  - North Weather Zone, focusing on the transmission elements in the Childress and surrounding counties
- Steady-State Base Case
  - Final 2024RTP_2030_SUM_12202024
  - Final 2024RTP_2030_MaintenanceOutage_12202024
- Transmission
  - See Appendix A for the list of transmission projects added
  - See Appendix B for the list of placeholder projects that were removed
- Generation
  - See Appendix C for the list of generation projects added
- Load
  - Loads were maintained to be consistent with 2024 RTP

Preliminary Results of Reliability Assessment – Need Analysis

- ERCOT conducted steady-state load flow analysis for the study base case according to the NERC TPL-001-5.1 and ERCOT Planning Criteria

Contingency Category	# of Unsolved Contingencies	# of Thermal Overloads	# of Bus Voltage Violations
N-0 (P0)	None	None	None
N-1 (P1, P2-1, P7)	None	2	1
G-1+N-1 (P3)*	None	None	3
X-1+N-1 (P6-2)**	None	None	None
Total	None	**2**	**4**

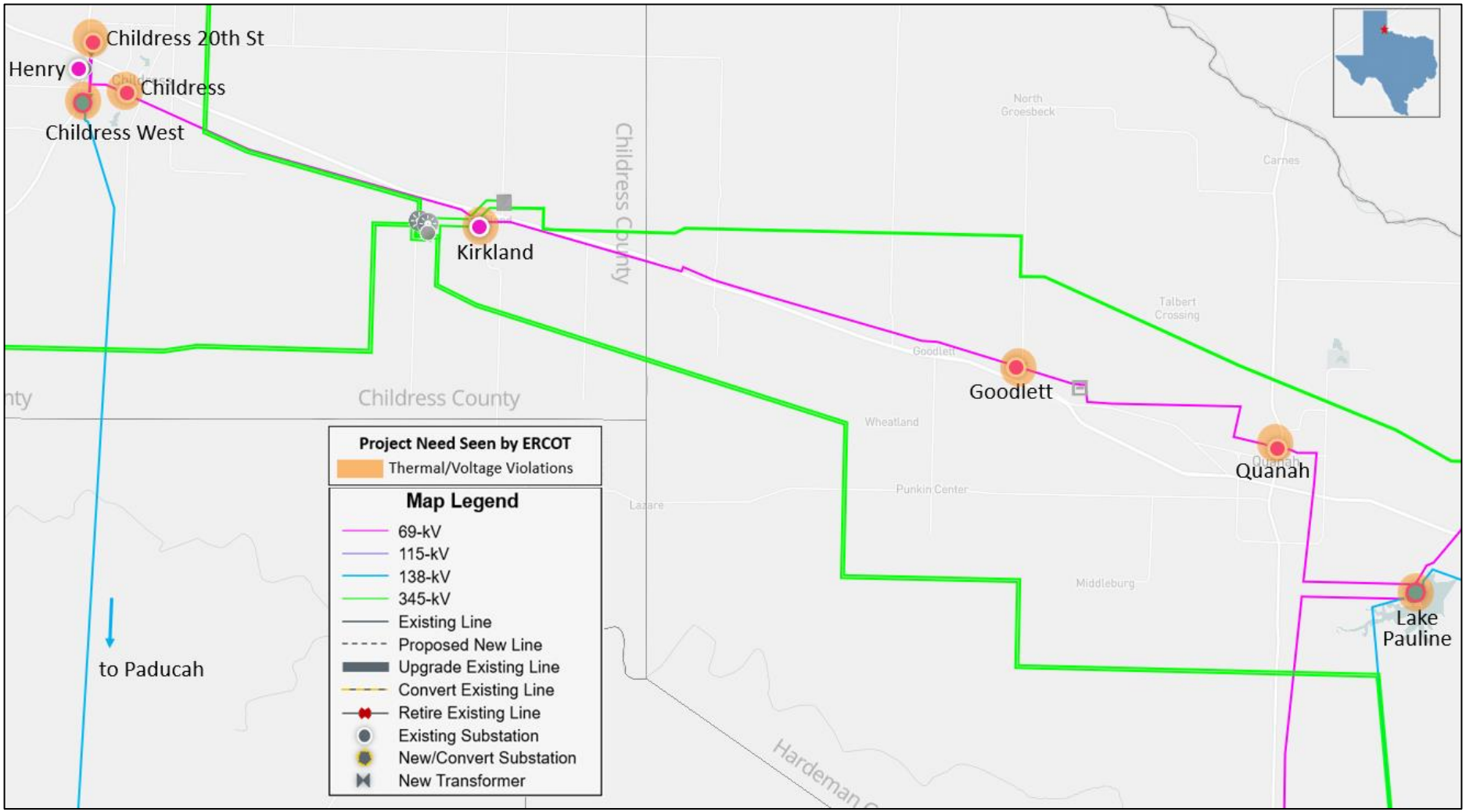
*G-1 Generator tested: Whirlwind
**X-1 Transformers tested: Oklaunion 345/138-kV auto

Preliminary Results of Reliability Assessment – Need Analysis under Planned Maintenance Outage Condition

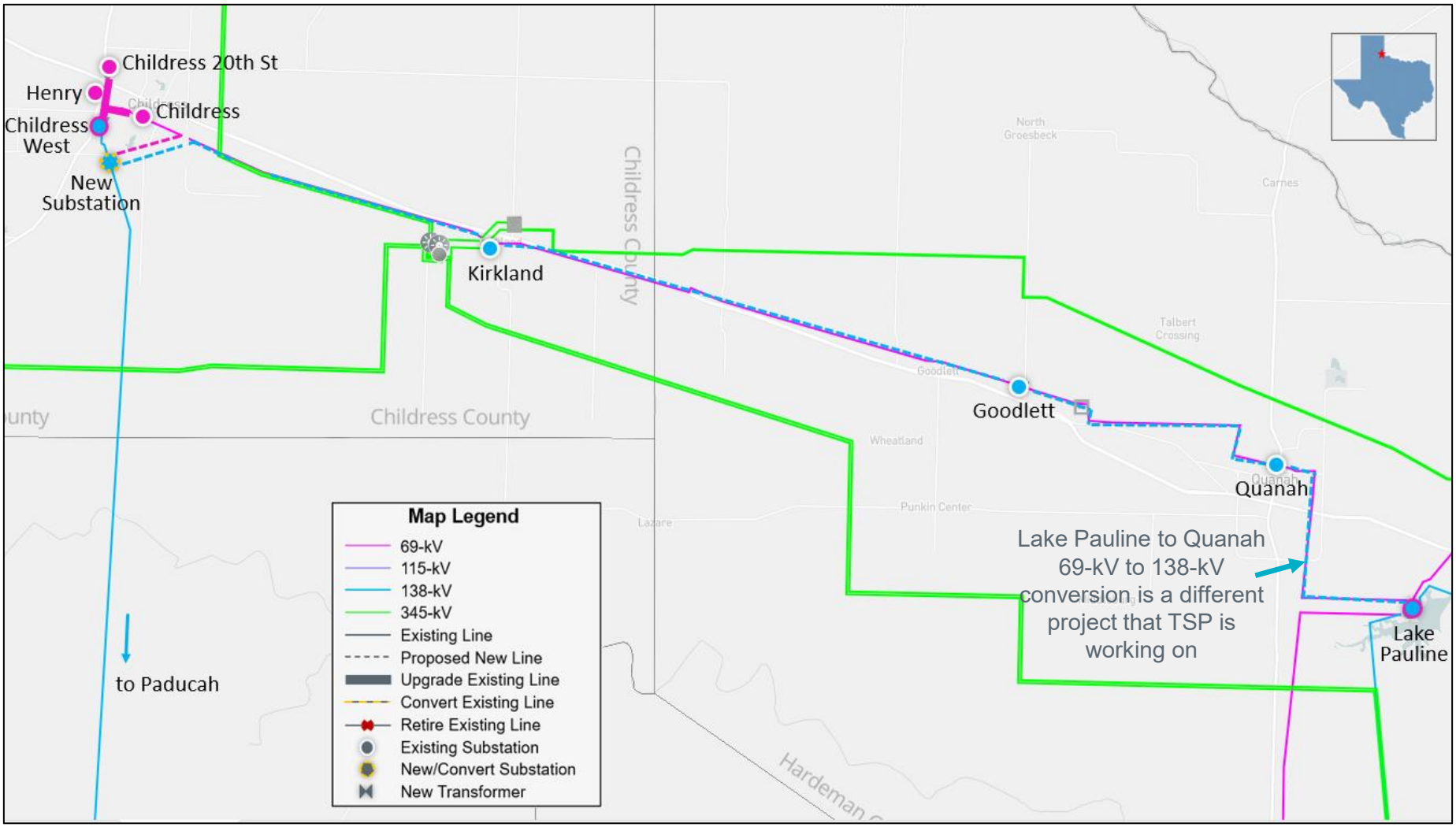
- The project is submitted to address the reliability violations under planned maintenance outage condition, as such, ERCOT also conducted the planned maintenance outage analysis to identify any reliability needs
  - The final 2024 RTP 2030 maintenance outage case was updated reflecting the transmission and generation updates to perform this analysis
  - Based on the review of system topology of the area, ERCOT tested N-2 contingency combinations, and then tested all applicable contingency violations with system adjustments (N-1-1)
- Preliminary need analysis results under planned maintenance outage condition

Contingency Category	# of Unsolved Contingencies	# of Thermal Overloads	# of Bus Voltage Violations
N-1-1 (P6-1, P6-3)	2	None	7

Study Area Map with Project Need Seen by ERCOT



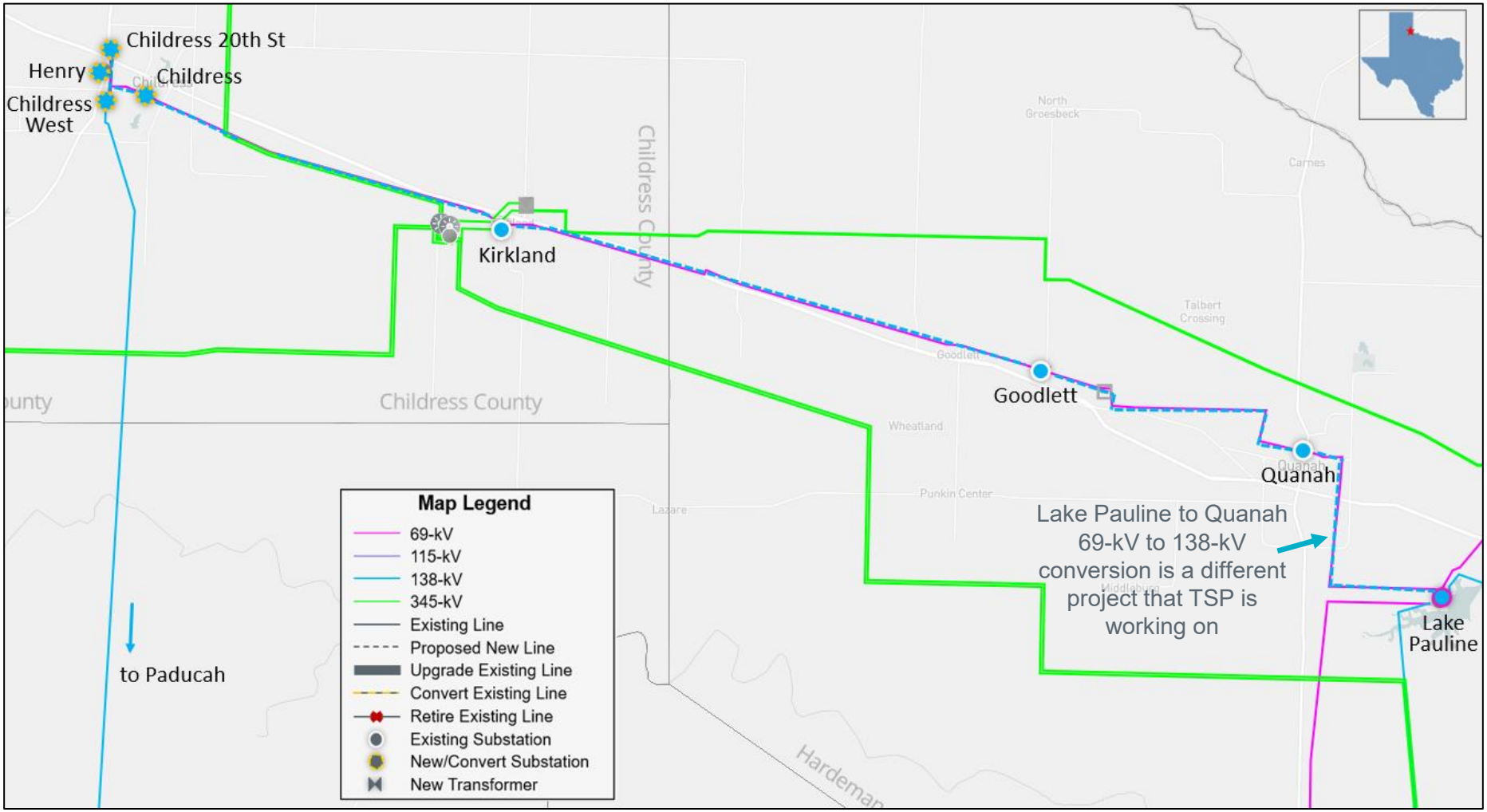
Option 1 (Project Proposed by AEPSC)



Option 1 (Project Proposed by AEPSC)

- Construct a new 138/69-kV substation (New Substation) by cutting into the existing West Childress to Paducah 138-kV transmission line
  - Install one 138/69-kV transformer with normal and emergency ratings of at least 90 MVA
  - The 138-kV substation will have a ring bus design
  - The 69-kV substation will have a single bus design
- Loop the existing Childress to Quanah 69-kV transmission line between the Childress to Kirkland substations into the New Substation
  - Construct two new transmission lines (one 69-kV transmission line with normal and emergency ratings of at least 52 MVA and 67 MVA, respectively, and one 138-kV transmission line with normal and emergency ratings of at least 278 MVA and 408 MVA, respectively) on double-circuit structures from the cut-ins to the New Substation, which will require a new right of way (ROW), approximately 3.5-mile
- Convert the existing 69-kV transmission lines and tap stations between the New Substation and Quanah to 138-kV
  - The converted Quanah to Goodlett to Kirland to New Substation 138-kV transmission lines will have normal and emergency ratings of at least 278 MVA and 408 MVA, respectively, which will require a new ROW for the transmission spans outside of Kirkland substation, approximately 0.8-mile
- Rebuild the existing Childress to West Childress 69-kV transmission lines and tap stations
  - The Childress to Childress 20th St Tap to West Childress 69-kV transmission lines will have normal and emergency ratings of at least 122 MVA and 176 MVA, respectively
  - The Childress 20th St Tap to Childress 20th St 69-kV transmission line will have normal and emergency ratings of at least 122 MVA and 173 MVA, respectively

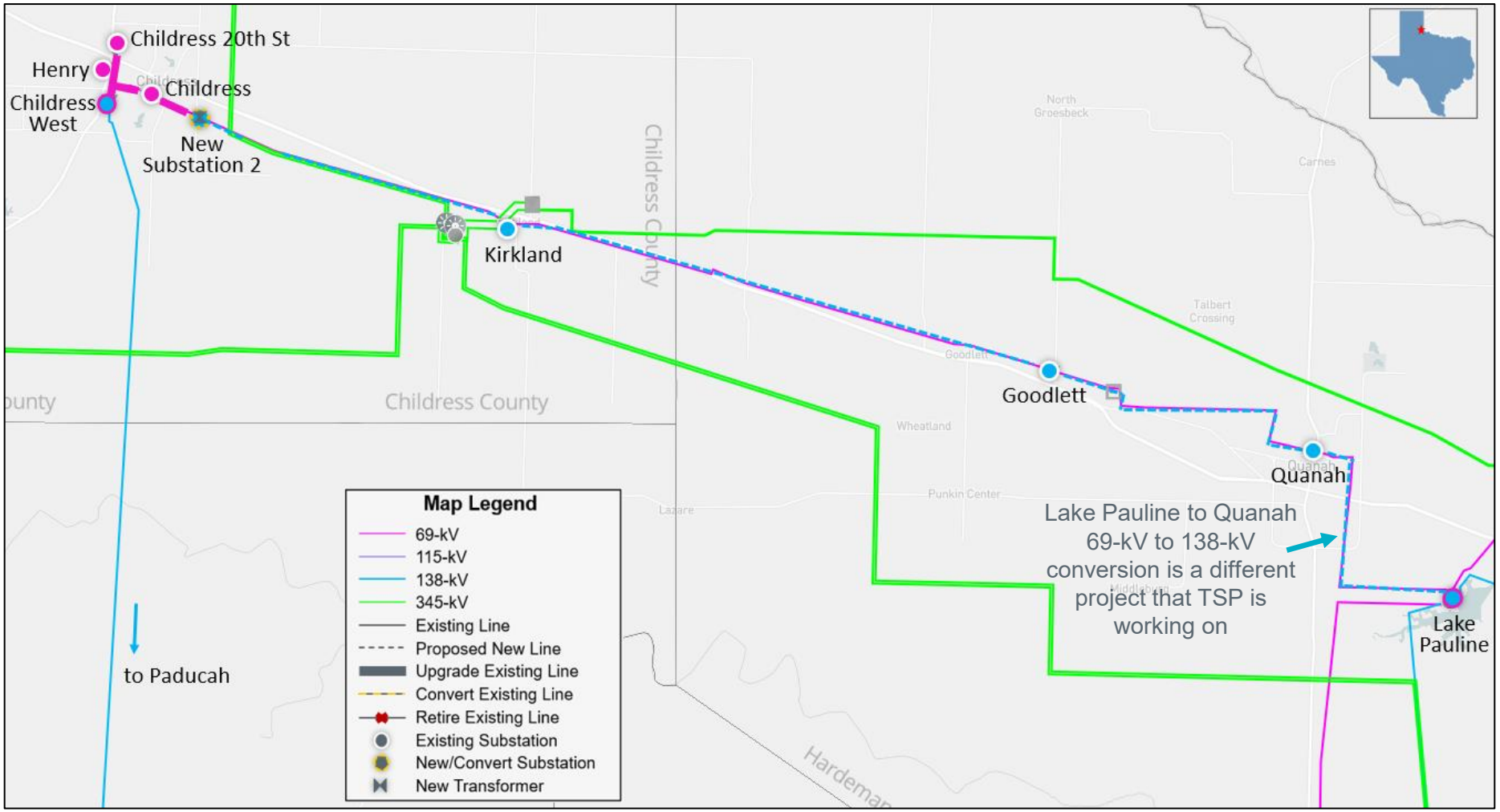
Option 2 – Convert Childress Area 69-kV Transmission Lines to 138-kV



Option 2 – Convert Childress Area 69-kV Transmission Lines to 138-kV

- Convert the existing 69-kV transmission lines and tap stations between Childress and West Childress to 138-kV
  - Rebuild the existing Childress to Childress 20th Street Tap to West Childress 69-kV transmission lines to 138-kV with normal and emergency ratings of at least 483 MVA, which will require a new ROW, approximately 1.27-mile
  - Rebuild the existing Childress 20th Street Tap to Childress 20th Street 69-kV transmission line to 138-kV with normal and emergency ratings of at least 483 MVA, which will require a new ROW, approximately 1.74-mile
  - Rebuild the existing Childress 20th Street to Henry to West Childress 69-kV transmission lines to 138-kV with normal and emergency ratings of at least 483 MVA, which will require a new ROW, approximately 1.40-mile
- Convert the existing 69-kV transmission lines and tap stations between Childress and Quanah to 138-kV
  - The converted Quanah to Goodlett to Kirland to Childress 138-kV transmission lines will have normal and emergency ratings of at least 278 MVA and 408 MVA, respectively
  - New ROW will be required for the transmission line between Childress and structure 4/5, approximately 3.11-mile
  - New ROW will be required for the transmission spans outside of Kirkland substation, approximately 0.8-mile

Option 3 – Rebuild Childress Area 69-kV Transmission Lines



Option 3 – Rebuild Childress Area 69-kV Transmission Lines

- Construct a new 138/69-kV substation (New Substation 2) by cutting into the existing Childress to Kirkland 69-kV transmission line at structure 4/5
  - Install one 138/69-kV transformer with normal and emergency rating of at least 90 MVA
  - The 138-kV substation will have a ring bus design
  - The 69-kV substation will have a single bus design
- Convert the existing 69-kV transmission lines and tap stations between the New Substation 2 and Quanah to 138-kV
  - The converted Quanah to Goodlett to Kirland to New Substation 2 138-kV transmission lines will have normal and emergency ratings of at least 278 MVA and 408 MVA, respectively, which will require a new ROW for the transmission spans outside of Kirkland substation, approximately 0.8-mile
- Rebuild the existing Childress to West Childress 69-kV transmission lines and tap stations
  - The Childress to Childress 20th St Tap to West Childress 69-kV transmission lines will have normal and emergency ratings of at least 122 MVA and 176 MVA, respectively
  - The Childress 20th St Tap to Childress 20th St 69-kV transmission line will have normal and emergency ratings of at least 122 MVA and 173 MVA, respectively
- Upgrade the existing Childress to New Substation 2 69-kV transmission line with normal and emergency ratings of at least 122 MVA and 176 MVA, respectively
- Upgrade the existing West Childress 138/69-kV transformer with normal and emergency ratings of at least 90 MVA
- Add a new capacitor bank (28.8 MVAr) at West Childress 69-kV substation

Preliminary Results of Reliability Assessment – Options

	N-1		G-1*+N-1		X-1**+N-1	
Option	Thermal Violations	Voltage Violations	Thermal Violations	Voltage Violations	Thermal Violations	Voltage Violations
1	None	None	None	None	None	None
2	None	None	None	None	None	None
3	None	None	None	None	None	None

*G-1 Generator tested: Whirlwind
**X-1 Transformers tested: Oklaunion 345/138-kV auto

Planned Maintenance Outage Scenario Analysis

- Preliminary results of planned maintenance outage analysis

Option	Unsolved Power Flow	Thermal Overloads	Voltage Violations
1	None	None	None
2	None	None	None
3	None	None	None

Next Steps and Tentative Timeline

- ERCOT will continue to evaluate options and provide status updates at future RPG meetings
  - Long-Term Load-Serving capability assessment
  - Cost estimates and feasibility assessment
- Congestion Analysis
  - Congestion analysis may be performed based on the recommended transmission upgrades to ensure that the identified transmission upgrades do not result in new congestion within the study area
- Tentative timeline
  - Final recommendation – Q4 2025

Thank you!

Stakeholder comments also welcomed through:

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Appendix A – Transmission Projects

- List of transmission projects to be added to study base case

RPG/TPIT No	Project Name	Tier	Project ISD	From County
81215	Oklaunion: Reconfigure 138 kV Station	Tier 4	May-26	Wilbarger
90002	Salvare: Install New 345 kV Capacitor Bank	Tier 4	May-26	Childress

Appendix B – Transmission Projects

- List of transmission projects to be removed from the study base case

RTP Project ID	Project Name	County
2024-N01	Childress West (6030/6028) 138/69-kV Transformer Upgrade and Cap Bank Addition	Childress
2024-N02	Lake Pauline (6050/6048) 138/69-kV Transformer Upgrade	Hardeman

Appendix C – New Generation Projects to Add

GINR	Project Name	Fuel	Projected COD	Max Capacity (~MW)	County
25INR0672	Fagus Solar Park 2 SLF	SOL	10/03/2025	166.6	Childress
26INR0524	Fagus Solar Park 3 SLF	SOL	04/01/2026	186.8	Childress