



Oncor Venus Switch to Sam Switch 345- kV Line – ERCOT Independent Review Project Update

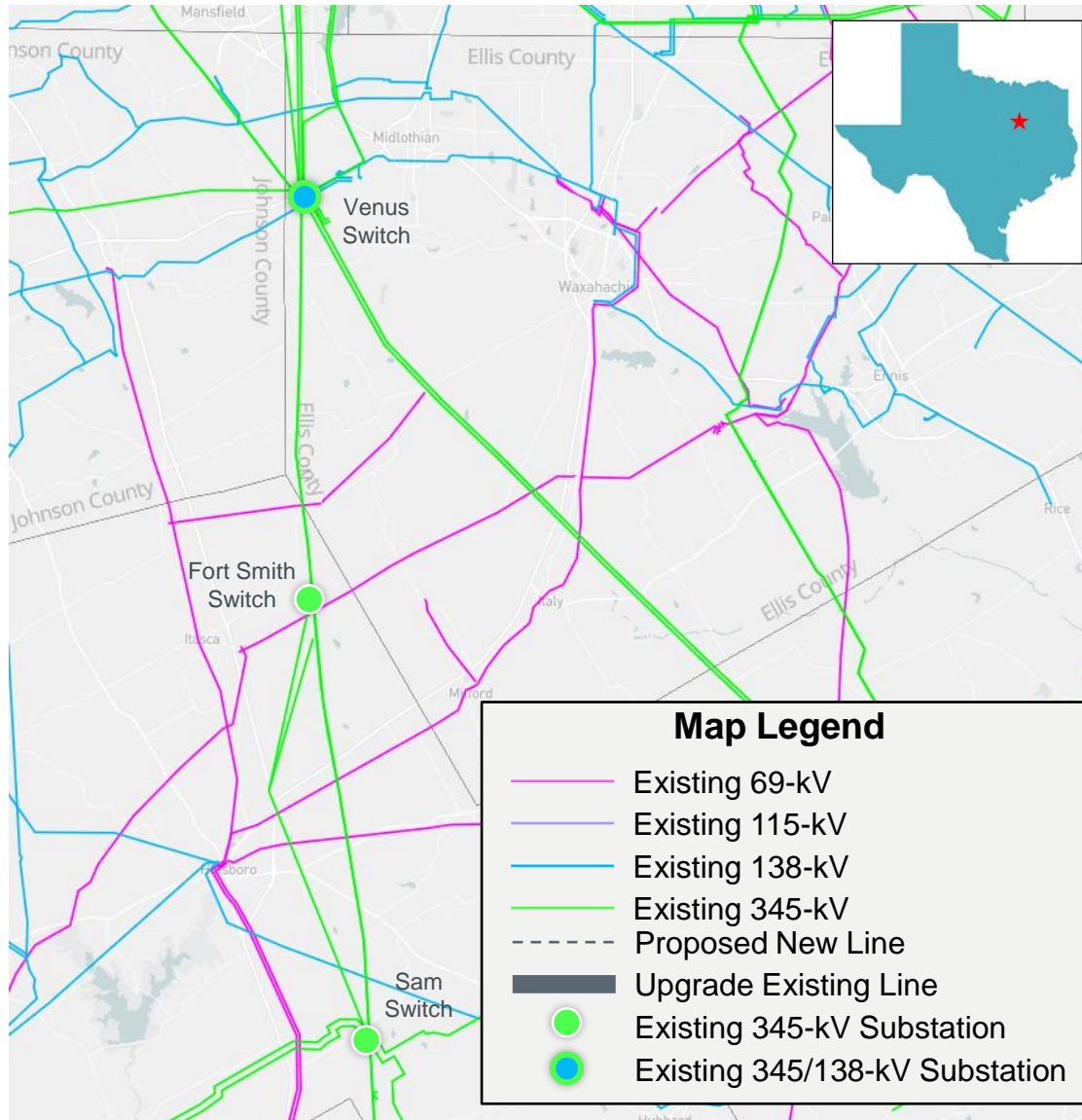
Sarah Gunasekera

RPG Meeting
October 16, 2024

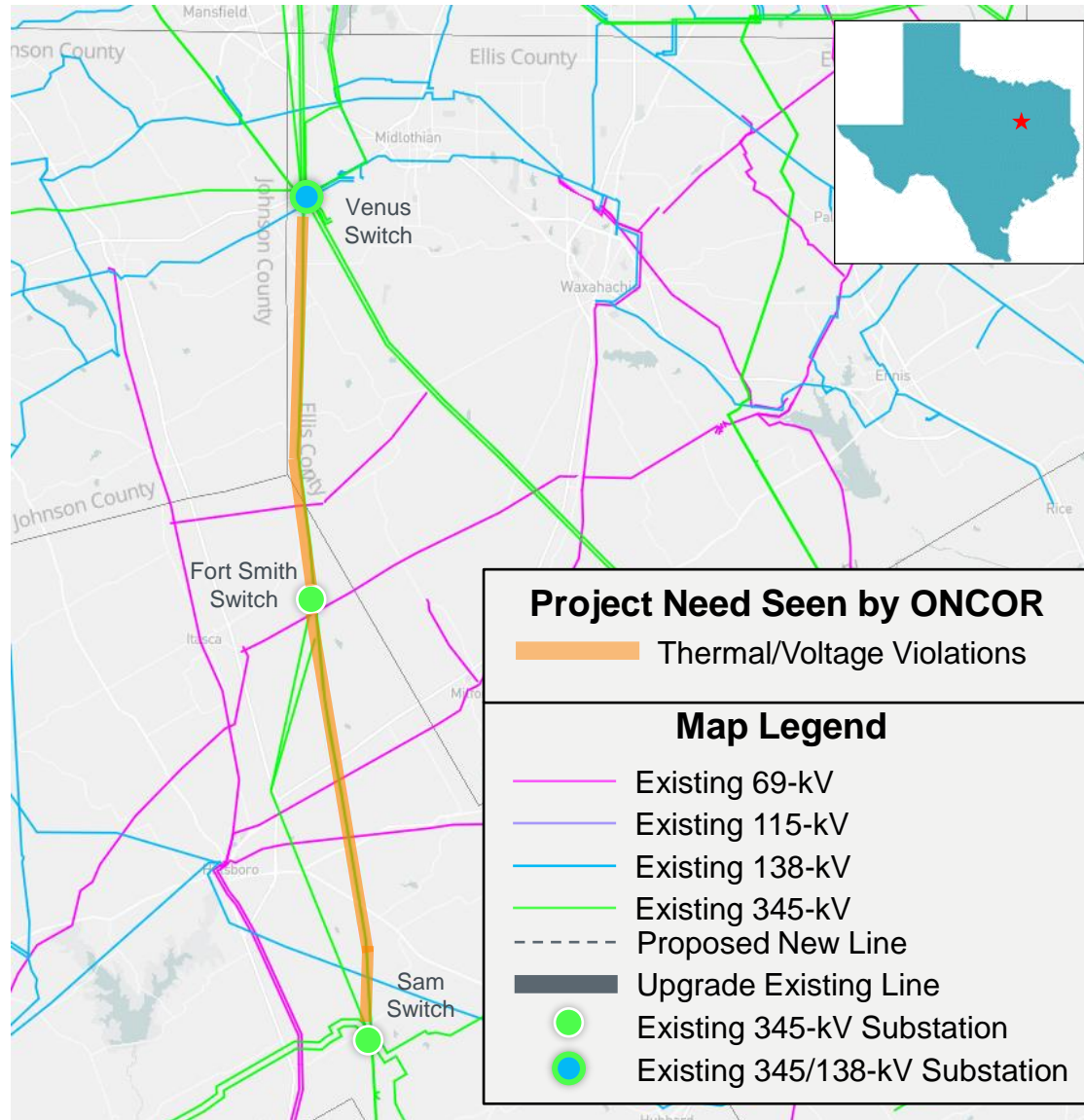
Introduction

- Oncor submitted the Venus Switch to Sam Switch 345-kV Line Project for Regional Planning Group (RPG) review in June 2024
 - This Tier 1 project is estimated at \$118.9 million and will not require a Convenience and Necessity (CCN)
 - Estimated completion date is May 2026
 - Addresses post-contingency thermal overloads on the Venus Switch – Sam Switch double circuit 345-kV line
- Oncor presented a project overview and ERCOT provided a project scope at the August 2024 RPG Meeting
 - <https://www.ercot.com/calendar/08132024-RPG-Meeting>
- ERCOT provided a project update at the September RPG Meeting
 - <https://www.ercot.com/calendar/09252024-RPG-Meeting>
- This project is currently under ERCOT Independent Review (EIR)

Study Area Map



Study Area Map with Project Need seen by Oncor



Study Assumptions and Methodology Update

- Transmission Updates
 - RPG Projects in the area that have been approved or are being studied with in-service dates prior to May 2026 were added to the study base case if not already modeled in the case
 - See Appendix A for the updated list of transmission projects added
 - Transmission projects identified in the 2023 RTP in the study area that have not been approved by RPG were removed
 - See Appendix B for the updated list of transmission projects added
- Generation update
 - Additional 6.9(1) generation was added to based on the July 2024 GIS report
 - See Appendix B for updated list of generation projects added
 - All generation were dispatched consistent with the 2024 RTP methodology
- Loads update
 - Approximately 1500 MW of confirmed loads in North North Central Weather Zones were updated to create the study base case

Preliminary Results of Reliability Assessment – Updated Base Case

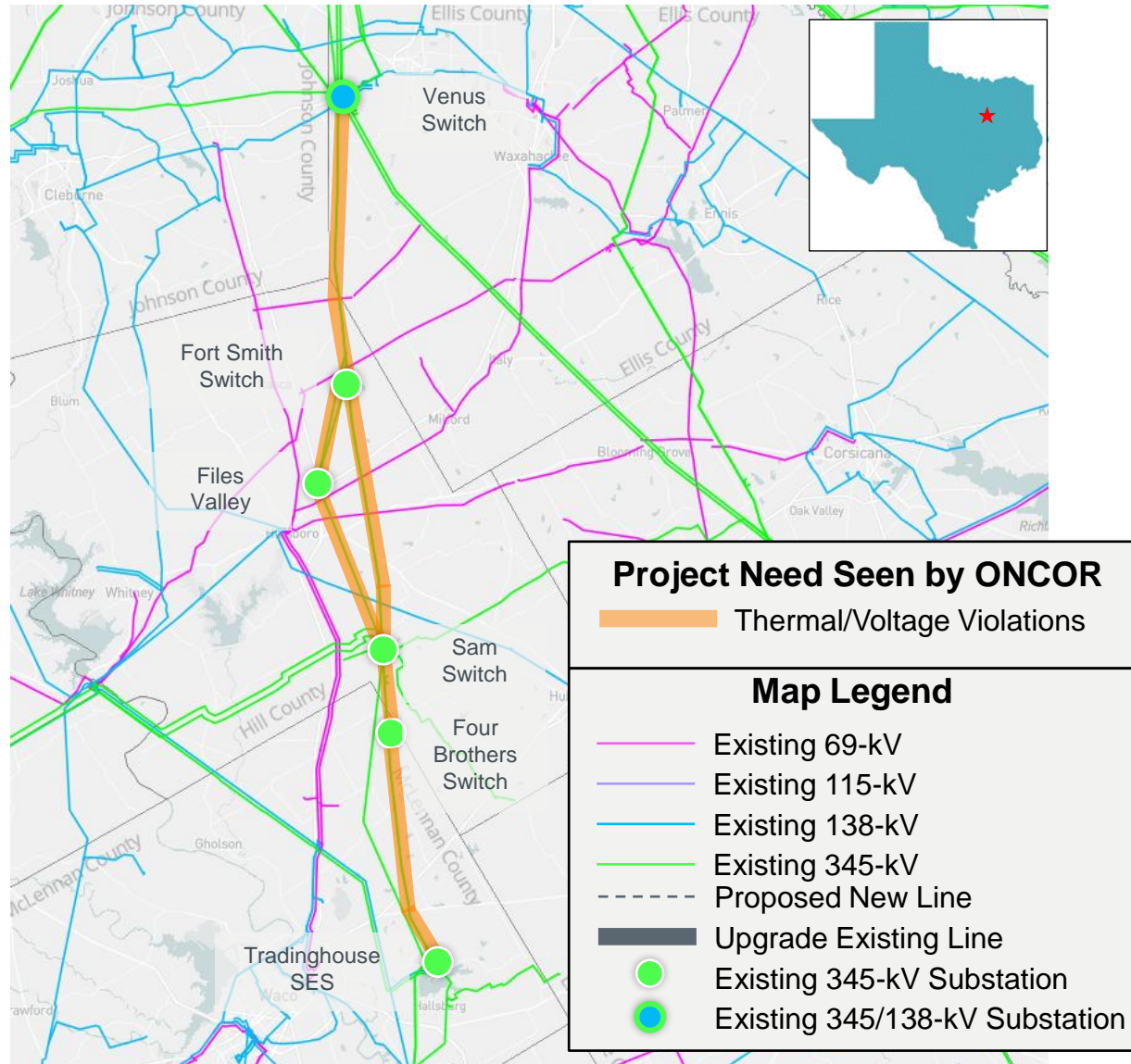
Contingency Category*	Unsolved Power Flow	Voltage Violations	Thermal Overloads
P1	None	None	4
P2, P4, P5	None	None	None
P3 (G-1+N-1)*	None	None	1**
P6.2 (X-1+N-1)*	None	None	None**
P7	None	None	None

*G-1 Generators tested: Comanche Peak SES U1, Midlothian N1, Compadre S1, Sunvalley S1

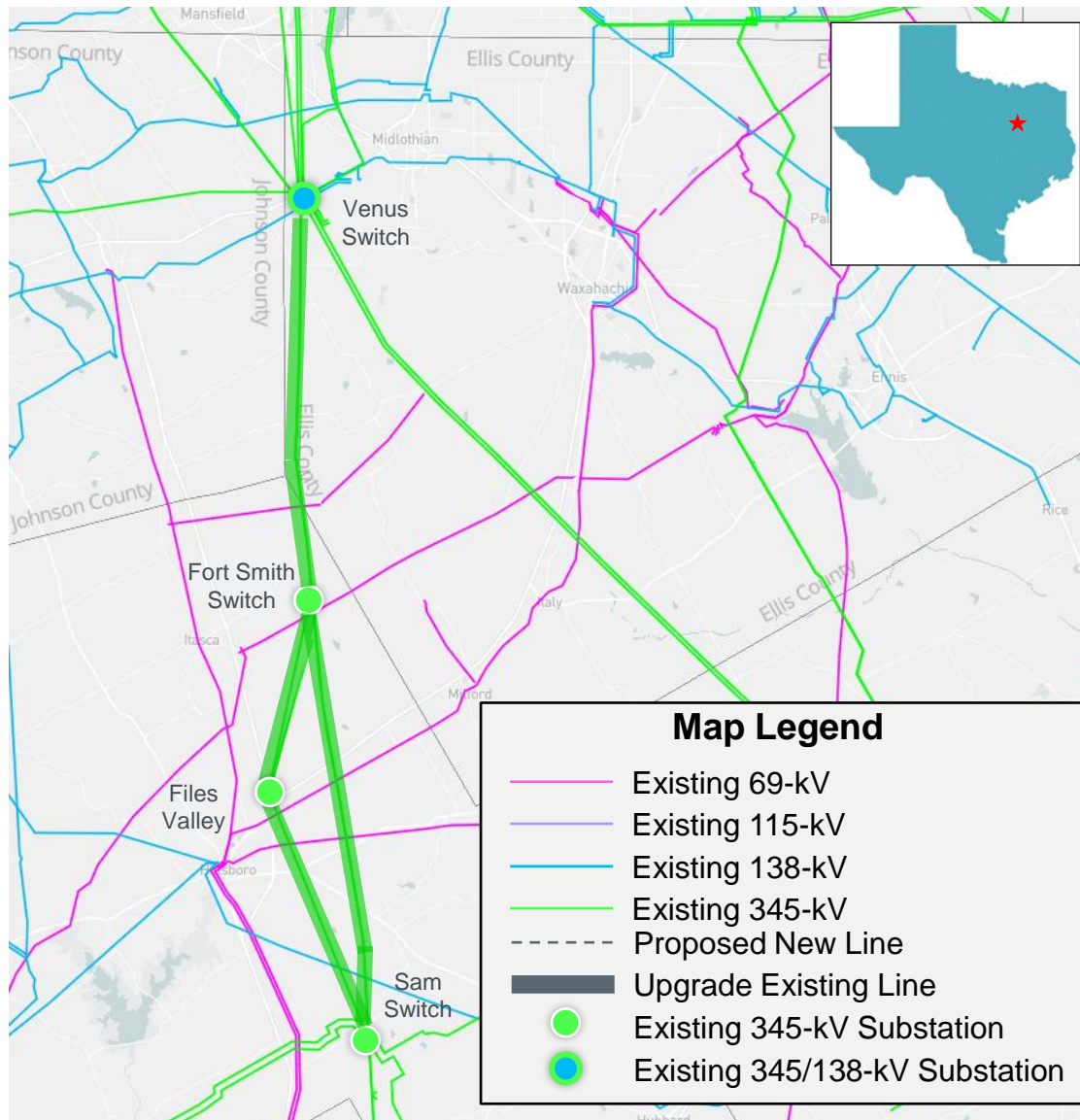
*X-1 Transformers tested: Sherry Switch X1, Everman Switch X1, Lake Creek SES X1

**Violations seen in the basecase under P1 events were also seen under G-1 and X-1 events

Study Area Map with Updated Project Need seen by ERCOT



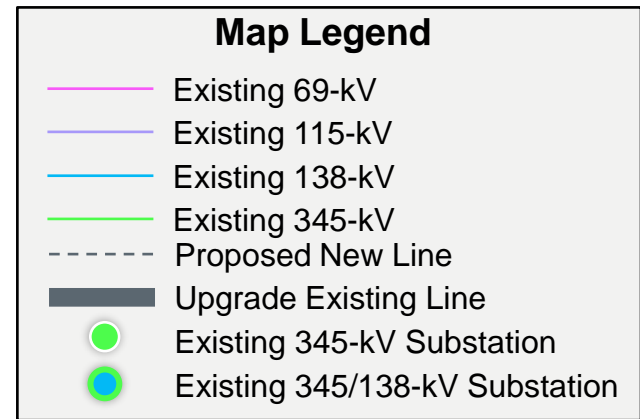
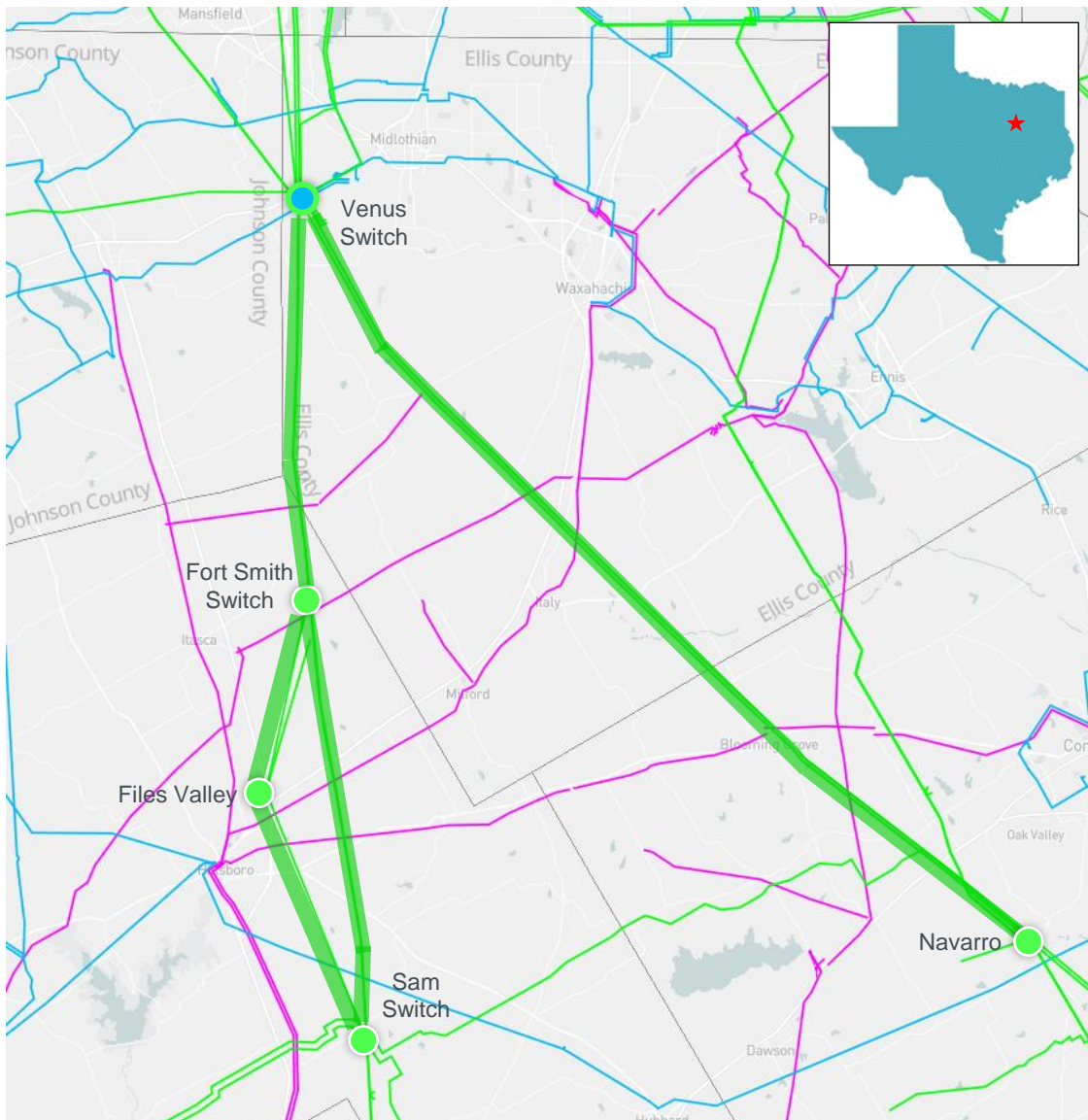
Option 1 – Oncor Proposed Project



Option 1 – Oncor Proposed Project

- Rebuild existing Venus Switch – Fort Smith Switch 345-kV transmission line with normal and emergency ratings of 1912 MVA or greater, approximately 17.80-mile
- Rebuild existing Venus Switch – Sam Switch 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 38.0-mile
- Rebuild existing Fort Smith Switch – Files Valley 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 3.30-mile
- Rebuild existing Sam Switch – Files Valley 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 16.90-mile

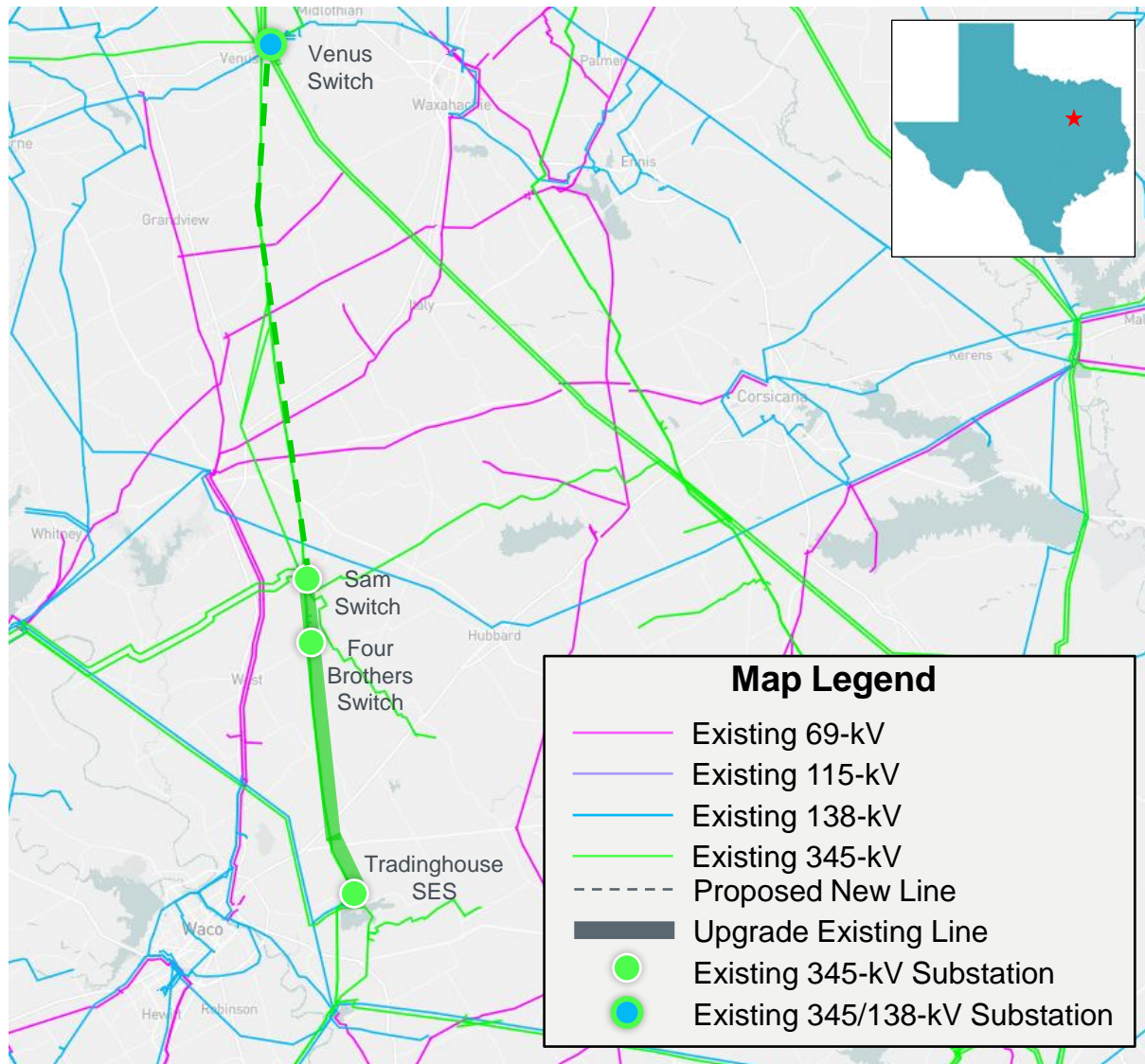
Option 2 – ERCOT Option



Option 2 – ERCOT Option

- Rebuild existing Venus Switch – Fort Smith Switch 345-kV transmission line with normal and emergency ratings of 1912 MVA or greater, approximately 17.80-mile
- Rebuild existing Venus Switch – Sam Switch 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 38.0-mile
- Rebuild existing Fort Smith Switch – Files Valley 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 3.30-mile
- Rebuild existing Sam Switch – Files Valley 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 16.90-mile
- Rebuild existing Venus Switch – Navarro 345-kV double circuit transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 33.20-mile

Option 3 – ERCOT Option



Option 3 – ERCOT Option

- Build a new Venus Switch – Sam Switch 345-kV transmission line (circuit 2) with normal and emergency ratings of 1792 MVA or greater, approximately 38.0-mile
- Rebuild existing Sam Switch – Four Brothers Switch 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 2.50-mile
- Rebuild existing Four Brothers Switch – Tradinghouse SES 345-kV transmission line with normal and emergency ratings of 1792 MVA or greater, approximately 20.20-mile

Preliminary Results of Reliability Assessment – Options

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

*G-1 Generators tested: Comanche Peak SES U1, Midlothian N1, Compadre S1, Sunvalley S1

*X-1 Transformers tested: Sherry Switch X1, Everman Switch X1, Lake Creek SES X1

Maintenance Outage Scenario Analysis

- ERCOT conducted planned maintenance outage analysis on all short-listed options to compare relative performance of the options
 - Load levels the North Central Weather zone were scaled down based on the historical non-summer peak data to 81.3%, in order to mimic the non-summer peak load condition
 - 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)
- The following thermal or voltage constraints were observed in the N-1-1 analysis

	Thermal Violation	Voltage Violation
Option 1	None	None
Option 2	None	None
Option 3	None	None

Study Procedure

- Project Evaluation
 - Additional project alternatives will be tested to satisfy the NERC and ERCOT reliability requirements
 - ERCOT may also perform the following studies
 - Long-Term Load-Serving Capability Assessment
 - The TSP will provide the Cost Estimate and Feasibility Assessment
- Generation Addition and Load Scaling Sensitivity Analyses
 - Planning Guide Section 3.1.3(4)
- Subsynchronous Resonance (SSR) Assessment
 - Nodal Protocol Section 3.22.1.3(2)
- 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

Deliverables

- Tentative Timelines
 - Status updates at the future RPG meetings
 - Final Recommendation – Q4 2024

Thank you!



Stakeholder comments also welcomed through:

sarah.gunasekera@ercot.com

robert.golen@ercot.com

Appendix A – Transmission Projects Added

TPIT	Project Name	Tier	Project ISD	County(s)
60094	Convert Waco East - Elm Mott 69 kV Line to 138 kV	Tier 4	5/15/2024	McLennan
62666	Upgrade and convert McGregor - Waco West Line	Tier 4	12/15/2024	McLennan
66216	Upgrade and convert Waco West - Temple 69 kV Line to 138 kV	Tier 4	6/15/2024	McLennan, Bell
66218A	Hillsboro - Italy 69 kV Line	Tier 4	10/15/2023	Ellis
66218B	Hillsboro - Italy 69 kV Line	Tier 4	12/15/2025	Ellis
71136	Waxahachie-Waxahachie OCF 69 kV Line Rebuild	Tier 4	5/15/2025	Dallas, Ellis
71903	Establish Launch Pad 138 kV Switch	Tier 4	12/15/2025	McLennan
72916	Oncor_N_NoTPIT_Geller 138 kV Substation	No TPIT	12/15/2025	Dallas
73443	Utilize Melton POI via Navarro 345 kV Switch for Project Lefty	Tier 4	5/15/2024	Navarro
78167	Add 2nd autotransformer at Trumbull	Tier 4	11/15/2025	Ellis
78367	Montfort Switch-Shankle Switch 138 kV Line	Tier 3	12/15/2025	Navarro, Ellis
80550	Central Park 138 kV Switch	Tier 4	12/15/2024	McLennan
82304	PMCR for adding Blackjack new station	Tier 4	12/31/2024	Bosque
82810	Olympus 138 kV Switch	Tier 4	5/15/2025	Navarro
82826	Sunflower 138 kV Switch	Tier 4	5/15/2025	McLennan

Appendix A – Transmission Projects Added cont'd

RPG No	Project Name	Tier	Project ISD	County(s)
24RPG025	Gunter 345/138-kV Switch Project	Tier 3	12/1/2025	Collin
24RPG022	Wilmer 345/138-kV Switch Project	Tier 1	5/1/2026	Dallas
24RPG021	Forney 345/138-kV Switch Rebuild Project	Tier 1	12/1/2025	Kaufman
24RPG019	Vineyard Switch to Cypress Waters 138-kV Circuit Addition Project	Tier 2	5/1/2026	Dallas, Tarrant
24RPG018	Salado Switch to Hutto Switch 138-kV Line Project	Tier 3	5/1/2027	Bell, Williamson
24RPG001	Temple Area Project	Tier 1	5/1/2026	Bell
23RPG033	Watermill to Seagoville 138 kV Line Project	Tier 3	12/1/2025	Dallas
23RPG020	Hackberry Switch to DFW D East 2 138-kV Double-Circuit Line Section Project	Tier 3	12/1/2025	Dallas
23RPG018	Arlington Reliability Enhancement Project	Tier 2	5/1/2026	Tarrant, Dallas
23RPG006	North Lake 138 kV Switch Rebuild	Tier 4	5/1/2023	Dallas

Appendix B – Transmission Backed Out

RTP Project ID	Project Name	County(s)
2023-NC6	Telico Area Upgrades	Ellis
2023-NC7	Four Brothers Switch -Tradinghouse - Outlaw - Lake Hall Switch - Sam Switch Area Improvements	Mclennan, Ellis
2023-NC13	Hillboro 138-kV Area Upgrades	Hill
2023-NC16	Sardis Area 138-kV Line Upgrades	Ellis
2023-NC19	Venus - Fort Smith - Sam Switch Double Circuit 345-kV Line Upgrades and Venus Kemp Ranch 345/138-kV Transformer Addition	Ellis
2023-NC23	Venus - Navarro - Jewett Area 345-kV Line Upgrades	Ellis
2023-NC35	Navarro (3478) - Haney (213) - Hubbard (3515) 138-kV Line Upgrade	Navarro
2023-NC37	Hillboro 138/69-kV Transformer Upgrade	Hill
2023-NC45	Cleburne Switch (2279) to Keene (2294) to Alvarado (2297) to Griffith (1905) to Railport (442) to Venus (1908) 138-kV Line Upgrades	Johnson
2023-NC62	Whitney 345/138-kV Transformer Upgrade	Hill

Appendix C – Generation Added

GINR	Project Name	Fuel	Project COD	Capacity (~MW)	County
21INR0379	Ash Creek Solar	SOL	01/31/2025	417.7	Hill
23INR0030	Langer Solar	SOL	03/01/2027	249.8	Bosque
23INR0195	Desert Willow BESS	OTH	02/03/2025	154.4	Ellis
23INR0349	Tokio Solar	SOL	08/25/2025	175.7	McLennan
24INR0023	Compadre Solar	SOL	12/25/2024	406.1	Hill
24INR0038	SP Jaguar Solar	SOL	06/01/2026	300.0	McLennan
24INR0039	SP Jaguar BESS	OTH	06/30/2025	300.0	McLennan
24INR0138	Midpoint Storage	OTH	08/30/2025	51.3	Hill
24INR0139	Midpoint Solar	SOL	08/30/2025	99.8	Hill
24INR0140	Gaia Storage	OTH	07/31/2025	76.8	Navarro
24INR0141	Gaia Solar	SOL	07/31/2025	152.7	Navarro
19INR0110	Azalea Springs Solar	SOL	05/31/2025	181.0	Angelina
20INR0203	Pine Forest Solar	SOL	12/01/2025	301.5	Hopkins
20INR0208	Signal Solar	SOL	03/15/2025	51.8	Hunt
20INR0222	Tyson Nick Solar	SOL	08/01/2025	90.5	Lamar
21INR0240	La Casa Wind	WIN	03/22/2025	148.4	Stephens
21INR0368	Eliza Solar	SOL	12/20/2024	151.7	Kaufman
21INR0511	Wolf Ridge Repower	WIN	08/31/2024	9.0	Cooke
21INR0515	Roadrunner Crossing Wind II SLF	WIN	10/31/2024	126.7	Eastland
22INR0260	Eliza Storage	OTH	02/17/2025	100.4	Kaufman
22INR0526	Pine Forest BESS	OTH	10/29/2025	210.1	Hopkins

Appendix C – Generation Added

GINR	Project Name	Fuel	Project COD	Capacity (~MW)	County
22INR0554	Platinum Storage	OTH	03/03/2025	309.5	Fannin
22INR0555	TE Smith Storage	OTH	07/15/2025	125.4	Rockwall
23INR0026	Baker Branch Solar	SOL	09/30/2024	469.4	Lamar
23INR0070	Chillingham Solar	SOL	10/18/2024	352.4	Bell
23INR0114	True North Solar	SOL	12/05/2024	238.8	Falls
23INR0118	Blevins Solar	SOL	07/01/2025	271.6	Falls
23INR0119	Blevins Storage	OTH	07/01/2025	181.3	Falls
23INR0296	Trojan Solar SLF	SOL	02/28/2026	151.3	Cooke
23INR0367	Fewell Solar	SOL	09/09/2025	203.5	Limestone
23INR0403	Connolly Storage	OTH	09/06/2024	125.4	Wise
23INR0469	Big Elm Storage	OTH	11/10/2025	100.8	Bell
24INR0010	Pinnington Solar	SOL	10/15/2025	666.1	Jack
24INR0015	Five Wells Solar	SOL	09/15/2024	322.8	Bell
24INR0140	Gaia Storage	OTH	07/31/2025	76.8	Navarro
24INR0141	Gaia Solar	SOL	07/31/2025	152.7	Navarro
24INR0198	Two Forks BESS	OTH	07/01/2027	309.0	Cooke
24INR0295	Lucky Bluff BESS SLF	OTH	10/15/2025	100.8	Erath
24INR0312	Wigeon Whistle BESS	OTH	09/23/2024	122.9	Collin
24INR0315	Black Springs BESS SLF	OTH	10/15/2025	120.7	Palo Pinto
24INR0631	Radian Storage SLF	OTH	12/31/2024	160.0	Brown
25INR0231	Apache Hill BESS	OTH	11/15/2026	201.2	Hood