Item 4.1.2: Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project

Prabhu Gnanam
Director Grid Planning

Board of Directors Meeting

ERCOT Public
June 23-24, 2025

Board of Directors Request

- **Purpose**
  - Provide an overview of the $119.03 million Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Tier 1 Reliability Project.

- **Voting Items / Requests**
  - ERCOT staff requests and recommends that the Board of Directors (Board) endorse the Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Regional Planning Group (RPG) Project (Option 1) based on North American Electric Reliability Corporation (NERC) and Electric Reliability Council of Texas, Inc (ERCOT) reliability planning criteria.

Key Takeaways:

- The Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project is a Tier 1 project requiring Board consideration for endorsement.
- The Project has completed RPG review and received an independent assessment from ERCOT staff and unanimous endorsement by the Technical Advisory Committee (TAC).
- ERCOT studied several options and recommends Option 1 as it addressed the reliability violations, improves long-term load-serving capability in the study area without requiring a Certificate of Convenience and Necessity (CCN) and ensures ERCOT and NERC Reliability under the maintenance sensitivity.

Tier 1 Project Requirement

- ERCOT Protocol Section 3.11.4, Regional Planning Group Project Review Process, defines the level of transmission projects that require Board consideration
  - Projects with an estimated capital cost of $100 Million or greater are Tier 1 projects (3.11.4.3)
  - Tier 1 projects require Board endorsement (3.11.4.7)
  - ERCOT shall present Tier 1 projects to TAC for review and comment; and comments from TAC shall be included in the presentation to the Board (3.11.4.9)

Key Takeaway: The Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project is a Tier 1 project requiring Board consideration for endorsement.

Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project

- Oncor submitted Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project for RPG review in September 2024
- The purpose of the project is to address the reliability needs in Borden, Howard, and Martin Counties in the Far West Weather Zone
- ERCOT performed an independent review of the project and identified thermal overloads and voltage violations in Borden, Howard, and Martin Counties
- ERCOT's endorsement of the project is based on the reliability need to relieve thermal overloads on 29.2 miles of 138-kV transmission lines and 6 voltage violations in Borden, Howard, and Martin Counties to meet NERC and ERCOT reliability planning criteria
- ERCOT presented the project to TAC on April 23, 2025
  - TAC voted unanimously to endorse the project

Key Takeaway: The Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project has completed RPG review and received unanimous endorsement by TAC.

Basis for ERCOT Board Endorsement

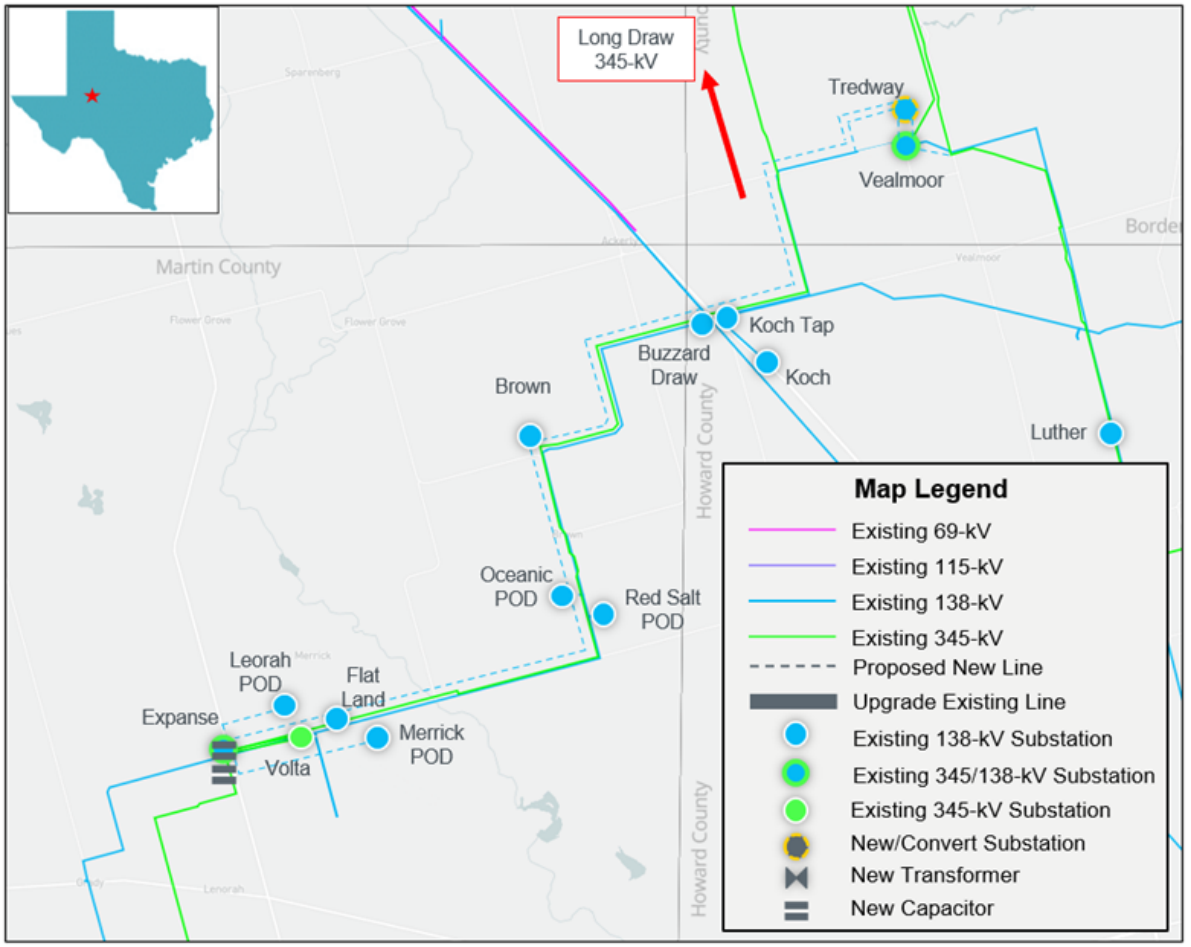
- ERCOT's independent review identified a reliability need for the Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project to satisfy:
  - NERC TPL-001-5.1 Table 1 Reliability Criteria for category:
    - P1 contingency, loss of a single transmission element
    - P3 contingency, loss of generating unit followed by a single transmission element
  - ERCOT Planning Guide Section Reliability Performance Criteria contingency:
    - 4.1.1.2(1)(c): The contingency is a loss of a single generating unit followed by a single transmission element or common tower outage

Key Takeaway: The Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project is needed to meet reliability under NERC and ERCOT Planning Guide criteria.

Request for Board Vote

ERCOT staff requests and recommends that the Board:

- Endorse the need for the Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project (Option 1) based on NERC and ERCOT reliability planning criteria



Appendix

ERCOT Recommendation

ERCOT recommends Option 1 from the ERCOT review of the Oncor project to:

- Establish new Oncor Tredway 138-kV Switch, approximately 0.5-miles north of Oncor's existing Vealmoor 345/138-kV Switch;
- Construct a new Tredway to Structure 10/7 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile;
  - Disconnect the existing Luther to Vealmoor 138-kV transmission line at Vealmoor 138-kV Switch, and terminate into new Oncor Tredway 138-kV Switch;
- Construct two new Tredway to Vealmoor 138-kV tie lines with normal and emergency ratings of 828 MVA or greater, approximately 0.4-mile;
- Construct a new Tredway to Structure 1/3 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile;
  - Disconnect the existing Buzzard Draw to Koch Tap to Vealmoor transmission line at Vealmoor 138-kV Switch, and terminate into Tredway 138-kV Switch;
- Rebuild the existing Expanse to Buzzard Draw to Structure 1/3 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 28.8-mile, creating the Expanse to Treadway North and South 138-kV transmission lines;
- Remove the circuit breakers at the existing Brown 138-kV Substation and connect Brown 138-kV to the north Expanse to Tredway 138-kV transmission line;

ERCOT Recommendation (Continued)

ERCOT recommends Option 1 from the ERCOT review of the Oncor project to:

- Remove the circuit breakers at the existing Oceanic Point of Delivery (POD) 138-kV and connect Oceanic POD 138-kV to the new north Expanse to Tredway 138-kV transmission line;
- Reconfigure the existing Flat Land 138-kV substation from a single-tap configuration to a double-tap configuration so the substation is served from both of the Expanse to Tredway 138-kV circuits;
- Construct a new Expanse to Lenorah POD 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile;
  - Disconnect the existing Lenorah POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch;
- Construct a new Expanse to Merrick POD 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 1.0-mile;
  - Disconnect the existing Merrick POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch;
- Install five 138-kV, 3200 A circuit breakers at Expanse 345/138 kV Switch; and
- Install two 55.2 MVAr capacitor banks at Expanse 345/138-kV Switch.

Key Takeaway: ERCOT studied several options and recommends Option 1 to address the reliability violations and improves long-term load-serving capability.

Date: June 16, 2025
To: Board of Directors
From: Prabhu Gnanam, Director Grid Planning (ERCOT)
Subject: Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project

Issue for the ERCOT Board of Directors

ERCOT Board of Directors Meeting Date: June 23-24, 2025
Item No.: 4.1.2

Issue:
Whether the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) should accept the recommendation of ERCOT staff to endorse the need for the Tier 1 Oncor Electric Delivery Company LLC (Oncor) Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Regional Planning Group (RPG) Project in order to meet the reliability requirements for the ERCOT System and address thermal overloads and voltage violations in Borden, Howard, and Martin Counties in the Far West Weather Zone, which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted unanimously to endorse.

Background/History:
Oncor proposed the Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project in September 2024, a $119.03 million, Tier 1 project with the expected in-service date (ISD) of December 2025, to meet reliability planning criteria in Borden, Howard, and Martin Counties in the Far West Weather Zone. Protocol Section 3.11.4.7, Processing of Tier 1 Projects, requires ERCOT to independently review submitted projects. ERCOT performed an independent review of the Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project and identified thermal overloads and voltage violations in Borden, Howard, and Martin Counties. The ERCOT project recommendation (Option 1), a $119.03 million, Tier 1 project with the expected ISD of December 2025 addresses the need for a project under North American Electric Reliability Corporation (NERC) and ERCOT Planning Criteria to address thermal overloads on 29.2 miles of 138-kV transmission lines and 6 voltage violations in Borden, Howard, and Martin Counties with the following ERCOT System improvements:

- Establish new Oncor Tredway 138-kV Switch, approximately 0.5-miles north of Oncor's existing Vealmoor 345/138-kV Switch;
- Construct a new Tredway to Structure 10/7 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile;
    - Disconnect the existing Luther to Vealmoor 138-kV transmission line at Vealmoor 138-kV Switch, and terminate into new Oncor Tredway 138-kV Switch;

- Construct two new Tredway to Vealmoor 138-kV tie lines with normal and emergency ratings of 828 MVA or greater, approximately 0.4-mile;
- Construct a new Tredway to Structure 1/3 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile;
    - Construct a new Tredway to Structure 1/3 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile;
- Rebuild the existing Expanse to Buzzard Draw to Structure 1/3 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 28.8-mile, creating the Expanse to Treadway North and South 138-kV transmission lines;
- Remove the circuit breakers at the existing Brown 138-kV Substation and connect Brown 138-kV to the north Expanse to Tredway 138-kV transmission line;
- Remove the circuit breakers at the existing Oceanic Point of Delivery (POD) 138-kV and connect Oceanic POD 138-kV to the new north Expanse to Tredway 138-kV transmission line;
- Reconfigure the existing Flat Land 138-kV substation from a single-tap configuration to a double-tap configuration so the substation is served from both of the Expanse to Tredway 138-kV circuits;
- Construct a new Expanse to Lenorah POD 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile;
    - Disconnect the existing Lenorah POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch;
- Construct a new Expanse to Merrick POD 138-kV double-circuit transmission line with normal and emergency ratings of 614 MVA or greater, approximately 1.0-mile;
    - Disconnect the existing Merrick POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch;
- Install five 138-kV, 3200 A circuit breakers at Expanse 345/138 kV Switch; and
- Install two 55.2 MVAr capacitor banks at Expanse 345/138-kV Switch.

ERCOT's independent review verified the reliability need for the Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project to satisfy ERCOT Planning Guide Section 4.1.1.2(1)(b), Reliability Performance Criteria, contingencies are for the loss of a single generating unit followed by a single transmission element or common tower outage.

RPG considered project overviews during meetings in October 2024 and March 2025. Between October 2024 and March 2025, ERCOT staff presented scope and status

updates at RPG meetings in October, January, and March. Pursuant to paragraph (2) of Protocol Section 3.11.4.9, Regional Planning Group Acceptance and ERCOT Endorsement, ERCOT presented the Tier 1 project to the Technical Advisory Committee (TAC) for review and comment, and on April 23, 2025, TAC unanimously endorsed the project as recommended by ERCOT. Pursuant to paragraph (1)(a) of Protocol Section 3.11.4.3, Categorization of Proposed Transmission Projects, projects with an estimated capital cost of $100 million or greater are Tier 1 projects, for which Protocol Section 3.11.4.7(2) requires endorsement by the Board. Pursuant to Section 3.11.4.9, ERCOT's endorsement of a Tier 1 project is obtained upon affirmative vote of the Board.

ERCOT's assessment of the Sub-Synchronous Resonance (SSR) of existing facilities in Borden, Howard, and Martin Counties in the Far West Weather Zone, conducted pursuant to Protocol Section 3.22.1.3, Transmission Project Assessment, yielded no adverse SSR impacts to the existing and planned generation resources at the time of the study. Results of the congestion analysis ERCOT conducted pursuant to Planning Guide Section 3.1.3, Project Evaluation, indicated an increase on existing congestion in the area with the addition of the Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project (Option 1). Upgrading the congested line did not yield sufficient economic benefit and therefore was not recommended for upgrade as part of this project.

The project completion date is subject to change based on requirements for environmental assessment, licensing requests and construction progress. Oncor will work with ERCOT as necessary to develop and implement Constraint Management Plans (CMPs) based on summer operational conditions in 2025. If needed, Oncor will utilize line sectionalizing or mobile equipment/capacitor installation to mitigate risks under contingency conditions.

The report describing the ERCOT Independent Review of the Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit (Option 1), including ERCOT staff's recommendation, is attached as ***Attachment A***.

Key Factors Influencing Issue:

1. ERCOT System improvements are needed to meet reliability planning criteria in Borden, Howard, and Martin Counties in the Far West Weather Zone.
2. ERCOT staff found the recommended set of improvements to be the most efficient solution for meeting the planning reliability criteria and addressing thermal overloads and voltage violations.
3. Protocol Section 3.11.4.7 requires Board endorsement of a Tier 1 project, which is a project with an estimated capital cost of $100 million or greater pursuant to Protocol Section 3.11.4.3(1)(a).

4. TAC voted unanimously to endorse the Tier 1 Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Regional Planning Group (RPG) Project (Option 1), as recommended by ERCOT, on April 23, 2025.

Conclusion/Recommendation:

ERCOT staff recommends that the Board endorse the need for the Tier 1 Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit RPG Project (Option 1), which ERCOT staff has independently reviewed, and which TAC has voted unanimously to endorse based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria.

ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.
BOARD OF DIRECTORS RESOLUTION

WHEREAS, pursuant to Section 3.11.4.3(1)(a) of the Electric Reliability Council of Texas, Inc. (ERCOT) Protocols, projects with an estimated capital cost of $100 million or greater are Tier 1 projects, for which Section 3.11.4.7 requires endorsement by the ERCOT Board of Directors (Board); and

WHEREAS, after due consideration of the alternatives, the Board deems it desirable and in the best interest of ERCOT to accept ERCOT staff's recommendation to endorse the need for the Tier 1 Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Regional Planning Group Project (Option 1), which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted to endorse based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria;

THEREFORE, BE IT RESOLVED, that the Board hereby endorses the need for the Tier 1 Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Regional Planning Group Project (Option 1), which ERCOT staff has independently reviewed, and which TAC has voted to endorse based on NERC and ERCOT reliability planning criteria.

CORPORATE SECRETARY'S CERTIFICATE

I, Brandon Gleason, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its June 23-24, 2025, meeting, the Board passed a motion approving the above Resolution by _____.

IN WITNESS WHEREOF, I have hereunto set my hand this ___ day of June, 2025.

_____
Brandon Gleason
Assistant Corporate Secretary

ERCOT Independent Review of the Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project

Document Revisions

Date	Version	Description	Author(s)
04/18/2025	1.0	Final	Sarah Gunasekera
		Reviewed by	Robert Golen, Prabhu Gnanam

© 2025 ERCOT
All rights reserved.

Executive Summary

Oncor Electric Delivery Company LLC (Oncor) submitted the Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project to the Regional Planning Group (RPG) in September 2024. Oncor proposed this project to address North American Electric Reliability Corporation (NERC) Reliability Standard TPL-001-5.1 and ERCOT Planning Guide criteria post-contingency thermal overloads and voltage violations on the Vealmoor to Buzzard Draw to Expanse 138-kV transmission line located in Borden, Howard, and Martin Counties in the Far West (FW) Weather Zone.

The Oncor proposed project was estimated to cost approximately $119.03 million, was classified as a Tier 1 project per ERCOT Protocol Section 3.11.4.3, and the project will not require a Certificate of Convenience and Necessity (CCN) application.

ERCOT performed an Independent Review, identified reliability issues (thermal overloads and voltage violations identified in Oncor's project submission in Borden, Howard, and Martin Counties) and evaluated five different transmission project options.

The ERCOT Independent Review (EIR) evaluated five different transmission projects options. Based on the study results described in the Section 5 and 6 of this report, ERCOT recommends the following option (Option 1) to address the reliability issues mentioned. Option 1 consists of the following:

- Establish a new Oncor Tredway 138-kV Switch, approximately 0.5 miles north of Oncor's existing Vealmoor 345/138-kV Switch;
- Construct a new Tredway to Structure 10/7 138-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile;
    - Disconnect the existing Luther to Vealmoor 138-kV transmission line at Vealmoor 138-kV Switch, and terminate into the new Oncor Tredway 138-kV Switch;
- Construct a new Tredway to Vealmoor Autotransformer #1 138-kV tie line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 828 MVA or greater, approximately 0.4-mile;
- Construct a new Tredway to Vealmoor Autotransformer #2 138-kV tie line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 828 MVA or greater, approximately 0.4-mile;
- Construct a new Tredway to Structure 1/3 138-kV transmission line on double-circuit capable structures with both circuits in place, with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile. The existing Structure 1/3 is located on the existing Buzzard Draw to Koch Tap to Vealmoor 138-kV transmission line;
    - Disconnect the existing Buzzard Draw to Koch Tap to Vealmoor transmission line at Vealmoor 138-kV Switch, and terminate into the new Oncor Tredway 138-kV Switch;
- Rebuild the existing Expanse to Buzzard Draw to Structure 1/3 138-kV transmission line on double-circuit capable structures with both circuits in place, with normal and emergency

© 2025 ERCOT
All rights reserved.

ratings of 614 MVA or greater, approximately 28.8-mile, creating the Expanse to Tredway North and South 138-kV transmission lines. The new north circuit flies by Buzzard Draw 138-kV Switch, establishing the new Tredway to Expanse 138-kV double-circuit transmission line;

- Remove the circuit breakers at the existing Brown 138-kV Substation and connect Brown 138-kV to the north Expanse to Tredway 138-kV transmission line;
- Reconnect the existing Oceanic Point of Delivery (POD) 138-kV to the new north Expanse to Tredway 138-kV transmission line;
- Reconfigure the existing Flat Land 138-kV substation from a single-tap configuration to a double-tap configuration so the substation is served from both of the Expanse to Tredway 138-kV circuits;
- Construct a new Expanse to Lenorah POD 138-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile;
    - Disconnect the existing Lenorah POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch;
- Construct a new Expanse to Merrick POD 138-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 614 MVA or greater, approximately 1.0-mile;
    - Disconnect the existing Merrick POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch;
- Install five 138-kV, 3200 A circuit breakers at Expanse 345/138 kV Switch; and
- Install two 55.2 MVAr capacitor banks at Expanse 345/138-kV Switch.

The cost estimate for Option 1 is approximately $119.03 million. A CCN application will not be required. The expected in-service date (ISD) of this project is December 2025. However, Oncor has advised that the completion date may change based on requirements for environmental assessment, licensing requests and construction progress.

Oncor will work with ERCOT as necessary to develop and implement Constraint Management Plans (CMPs) based on summer operational conditions in 2025. If needed, Oncor will utilize line sectionalizing or mobile equipment/capacitor installation to mitigate risks under contingency conditions.

© 2025 ERCOT
All rights reserved.

Table of Contents

© 2025 ERCOT
All rights reserved.

© 2025 ERCOT
All rights reserved.

1 Introduction

In September 2024, Oncor Electric Delivery Company LLC (Oncor) submitted the Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project to the Regional Planning Group (RPG) to address North American Electric Reliability Corporation (NERC) Reliability Standard TPL-001-5.1 and ERCOT Planning Guide criteria post-contingency thermal overloads and voltage violations on the Vealmoor to Buzzard Draw to Expanse 138-kV transmission line. This project is in the Far West (FW) Weather Zone in the Borden, Howard, and Martin Counties.

The Oncor proposed project was classified as a Tier 1 project pursuant to ERCOT Protocol Section 3.11.4.3, with an estimated to cost of $119.03 million. A Certificate of Convenience and Necessity (CCN) application will not be required for this project and the expected in-service date (ISD) of the project is December 2025.

ERCOT conducted an Independent Review for this RPG project to identify any reliability needs in the area and evaluate various transmission upgrade options. This report describes the study assumptions, methodology, and the results of the ERCOT Independent Review (EIR) of the project.

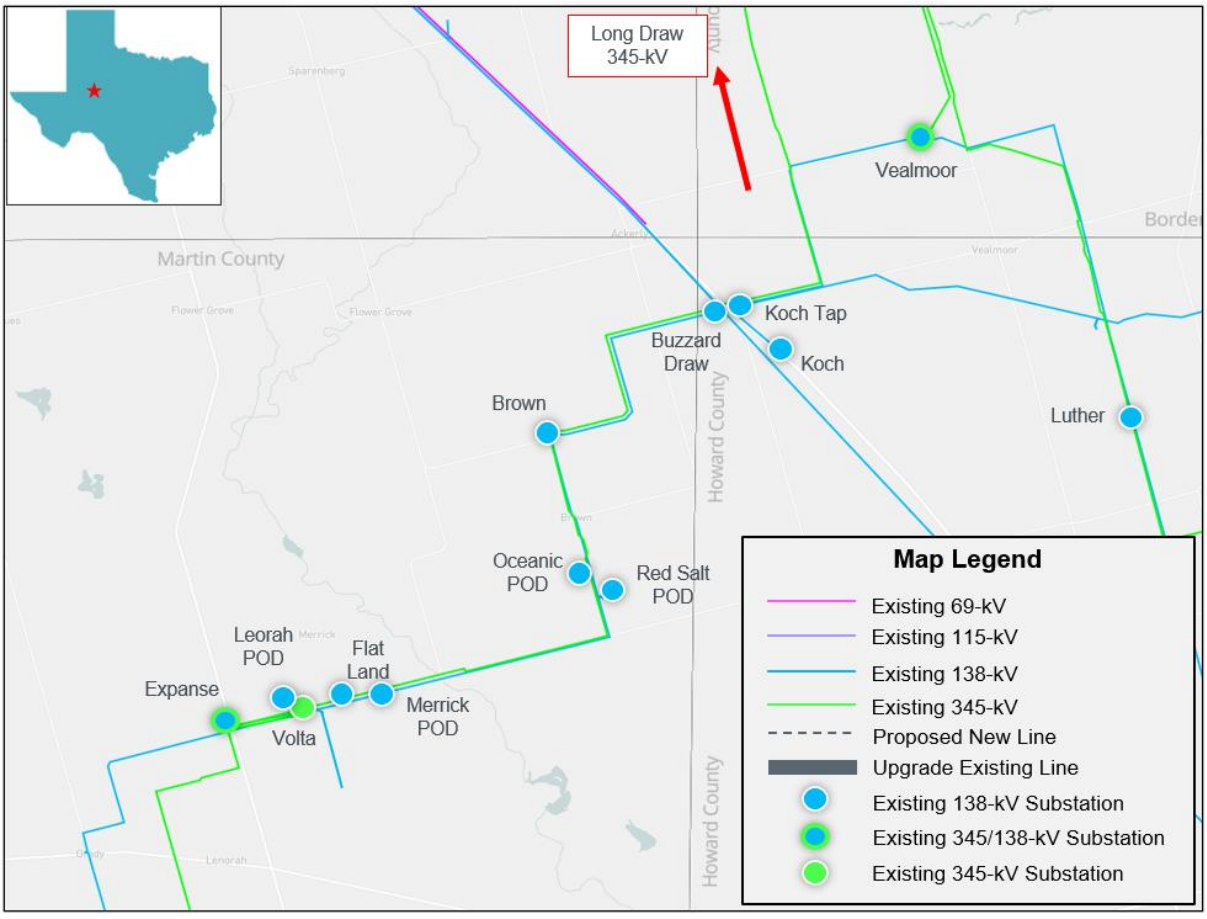


Figure 1.1.1: Map of Transmission System in Project Study Area

© 2025 ERCOT
All rights reserved.

2 Study Assumptions and Methodology

ERCOT performed studies under various system conditions to identify any reliability issue and to determine transmission upgrades to support the proposed Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project if an upgrade is deemed necessary. This section describes the study assumptions and criteria used to conduct the independent study.

2.1 Study Assumptions for Reliability Analysis

This project is in the FW Weather Zone in Borden, Howard, and Martin Counties. Midland, Glasscock, Sterling, and Mitchell Counties were also included in the study because of their electrical proximity to the proposed project.

2.1.1 Steady-State Study Base Case

The Final 2023 Regional Transmission Plan (RTP) cases, published on the Market Information System (MIS) on December 22, 2023, were used as reference cases in this study. Year 2026 Summer Peak was selected for the long-term outlook. The steady-state study base case was constructed by updating transmission, generation, and loads of the following 2026 Summer Peak Load case for the West-Far West (WFW) Weather Zones:

- Case: 2023RTP_2026_SUM_WFW_12222023[1].

2.1.2 Transmission Topology

Transmission projects within the study area with ISD by December 2025 were added to the study base case. The ERCOT Transmission Project Information and Tracking (TPIT)[2] report posted in October 2024 was used as reference. The added TPIT projects are listed in Table 2.1.

Table 2.1: List of Transmission Projects Added to the Study Base Case

TPIT No	Project Name	Tier	Project ISD	County
5436	Morgan Creek - McDonald 138 kV Line	Tier 3	15-Dec	Mitchell
66532	Grey Well Draw - Pronghorn 138 kV Line Rebuild	Tier 4	24-Jan	Midland
70964	WETT 345 kV Volta witch	Tier 3	24-Mar	Howard
71960	Upgrade Grady - Expanse 138 kV Line	Tier 4	15-Dec	Martin
72007	Ranger Camp 345-138-69 kV Switch	Tier 1	21-Feb	Howard, Mitchell
73043	Peck - Driver 138 kV Line	Tier 2	24-Dec	Glasscock
73210	Little Luther Substation	NOTPIT	9-Jun	Howard
73216	Mustang Springs Substation	NOTPIT	15-Jun	Martin, Midland
73368	Grey Well Draw - Buffalo 138 kV Second Circuit	Tier 3	24-Dec	Midland
73434	Shaw 138 kV POD	Tier 4	24-May	Reagan
76686	Add Hog Mountain 138 kV POD	Tier 4	24-Dec	Glasscock

[1] 2023 Regional Transmission Plan Postings: https://mis.ercot.com/secure/data-products/grid/regional-planning
[2] TPIT Report: https://www.ercot.com/gridinfo/planning

© 2025 ERCOT
All rights reserved.

TPIT No	Project Name	Tier	Project ISD	County
76705	Prairieland 345/138 kV Switch and 138 kV Line	Tier 2	25-May	Glasscock
76719	Blue Mountain Switch	Tier 4	17-Jan	Loving, Winkler
76724	Bull Moose POD	NOTPIT	22-Jan	Winkler
78374	Rockhound 345/138 kV Switch	Tier 3	24-Dec	Midland
78376	Rainwater 138 kV POD	NOTPIT	1-Aug	Reeves, Culberson
78379	Taray 138 kV POD	NOTPIT	4-Aug	Loving
78380	White Dune 138 kV POD	NOTPIT	5-Aug	Ward, Winkler
79951	Calcite POD	NOTPIT	23-Nov	Ector
80858	Sterling City: Upgrade 69 kV Relays	Tier 4	25-Apr	Sterling
80913	Sloan 138 kV Switch	Tier 4	25-May	Midland
81270	Construct the new Prong Moss 345 kV switch	Tier 1	30-Dec	Howard
81274	Ranger Camp - Cattleman 345-kV	Tier 1	8-Jul	Howard, Mitchell
87861	Ranger Rider - Ranger Camp	Tier 1	20-Jul	Howard, Mitchell

Transmission projects, listed in Table 2.2, identified in the 2023 RTP as placeholder projects in the study area and were not approved by RPG were removed from the study base case.

Table 2.2: List of Transmission Projects Removed from the Study Base Case

RTP Project Index	Project Name	County
2021-FW19	Morgan Creek SES - Longshore Switch 345-kV Line Upgrade	Mitchell, Howard
2021-FW20	Lamesa - Key Sub - Gail Sub - Willow Valley Switch 138-kV Line Upgrade	Dawson, Borden
2022-FW24	Faraday - Lamesa - Clearfork - Riverton 345-kV Double Circuit Line Addition	Borden, Dawson, Andrews, Winkler, Loving and Reeves
2023-FW4	Buzzard Draw Switch - Koch Tap - Vealmoor 138-kV Line Upgrade	Howard
2023-FW13	Bulldog - Elbow - Eiland - Einstein - Carterville 138-kV Line Upgrade	Howard, Midland
2022-WFW2	Midessa South SW - Consavvy - Longshore Switch - Morgan Creek SES 345-kV Line Upgrades	Midland, Howard, Mitchell
2023-WFW1	Exxon Sharon Ridge to Willow Valley Switch 138-kV Line Upgrade	Scurry, Borden
2023-WFW2	Morgan Creek SES - Falcon Seaboard - Midland East 345-kV Line Upgrade	Midland, Howard, Mitchell
2023-W12	Morgan Creek SES - Tonkawa 345-kV Line Rebuild	Mitchell

2.1.3 Generation

Based on the August 2024 Generator Interconnection Status (GIS)[3] report posted on the ERCOT website on September 3, 2024, generators in the study area that met Planning Guide Section 6.9(1) conditions with Commercial Operations Date (COD) prior to December 2025 were added to the study base case. These generation additions are listed in Table 2.3. All generation dispatches were consistent with the 2024 RTP methodology.

[3] GIS Report: https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER

© 2025 ERCOT
All rights reserved.

Table 2.3: List of Generation Added to the Study Base Case Based on the August 2024 GIS Report

GINR	Project Name	Fuel	Project COD	Capacity (MW)	County
19INR0203	Angelo Solar	SOL	08/01/2024	195.4	Tom Green
22INR0502	Shamrock Wind SLF	WIN	09/15/2024	223.9	Crockett
23INR0372	Cross Trails Storage	OTH	04/25/2025	58.3	Scurry
23INR0387	Pioneer DJ Wind	WIN	09/15/2024	140.3	Midland
23INR0418	Angelo Storage	OTH	08/10/2024	103.0	Tom Green
24INR0273	Al Pastor BESS	OTH	09/10/2024	103.1	Dawson
24INR0421	Swift Air Solar	SOL	03/31/2025	146.5	Ector
24INR0568	Shamrock Energy Storage (SLF)	OTH	07/01/2025	99.3	Crockett
24INR0578	Panther Creek 1 Repower	WIN	12/31/2024	11.0	Glasscock
24INR0582	Panther Creek 2 Repower	WIN	12/31/2024	8.0	Glasscock
24INR0629	Jade Storage SLF	OTH	09/30/2024	160.0	Scurry

The status of each unit that was projected to be either indefinitely mothballed or retired at the time of the study were reviewed. The units listed in Table 2.4 were opened (turned off) in the study base case to reflect their mothballed/retired status.

Table 2.4: List of Generation Opened to Reflect Mothballed/Retired/Forced Outage Status

Bus No	Unit Name	Capacity (MW)	Weather Zone
110941	SL_SL_G1	65.0	Coast
110942	SL_SL_G2	65.0	Coast
110943	SL_SL_G3	30.0	Coast
110944	SL_SL_G4	30.0	Coast
140042	WFCOGEN_UNIT2	17.0	North
130121	SGMTN_SIGNALM2	6.6	Far West
132931	TOSBATT_UNIT1	2.0	Far West

Generation listed in Table 2.5 were closed (turned on) in the study base case to reflect the change in their Generation Resource as these resources are returning to year-round service.

Table 2.5: List of Generation Closed to Reflect Returning to Service Status

Bus No	Unit Name	Capacity (MW)	Weather Zone
110020	WAP_GT2	71.0	Coast
150023	MCSES_UNIT8	568.0	North Central
110261	TGF_TGFGT_1	78.0	Coast

2.1.4 Loads

Loads in the WFW Weather Zones were updated based on the new confirmed loads in the WFW Weather Zones. Loads outside the WFW Weather Zones were adjusted to meet the minimum reserve requirements consistent with the 2023 RTP.

© 2025 ERCOT
All rights reserved.

2.2 Long-Term Load-Serving Capability Assessment

ERCOT performed long-term load-serving capability assessment under base case and higher load conditions to compare the performance of the study options.

In the higher load condition evaluation, loads in the study area were increased (however customers with flexible loads remained at the same level as in the base case), and conforming loads outside of FW Weather Zone were decreased to balance power.

2.3 Maintenance Outage Scenario

ERCOT developed an off-peak maintenance season scenario to further evaluate the study options.

The load level in the FW Weather Zone was reduced to 96.0% of its summer peak load level in the study base case. This scaling is meant to reflect assumed off-peak season loads based on ERCOT load forecast for future years as well as historical load in the FW Weather Zone.

2.4 Study Assumptions for Congestion Analysis

Congestion analysis was conducted to identify any new congestion in the study area with the addition of the preferred transmission upgrade option.

The 2024 RTP 2026 economic case was updated based on the August 2024 GIS[4] report for generation updates and the October 2024 TPIT[5] reports for transmission updates to conduct congestion analysis. New confirmed loads in the FW Weather Zone were also added to the study base case. The 2026 study year was selected based on the proposed ISD of the project.

All transmission projects listed in Table 2.1 were added and the RTP projects shown in Table 2.2 that were used as placeholders for the Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project were removed from the economic base case.

New generation additions listed in Table 2.3 were added to the economic base case and all generation listed in Table 2.4 were opened in the study base case to reflect their mothballed/retired status. Furthermore, generation listed in Table 2.5 were removed from seasonal settings in the study base case as these resources are returned to year-round service.

2.5 Methodology

This section lists the Contingencies and Criteria used for project review along with tool used to perform the various analyses.

2.5.1 Contingencies and Criteria

The reliability assessments were performed based on NERC Reliability Standard TPL-001-5.1, ERCOT Protocol, and ERCOT Planning Criteria[6].

[4] GIS Report: https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER
[5] TPIT Report: https://www.ercot.com/gridinfo/planning
[6] ERCOT Planning Criteria: http://www.ercot.com/mktrules/guides/planning/current

© 2025 ERCOT
All rights reserved.

Contingencies[7] were updated based on the changes made to the topology as described in Section 2.1 of this document. The following steady-state contingencies were simulated for the study region:

- P0 (System Intact)
- P1, P2-1, P7 (N-1 conditions);
- P2-2, P2-3, P4, and P5 (345-kV only);
- P3: G-1+N-1 (G-1: generation outages) {Odessa U1, Morgan Creek SES U1, Long Draw Solar S2}; and
- P6-2: X-1+N-1 (X-1: 345/138-kV transformers only) {Long Draw X1, Expanse X2, Odessa X1, Morgan Creek X1}.

All 69-kV and above buses, transmission lines, and transformers in the study region were monitored (excluding generator step-up transformers) and the following thermal and voltage limits were enforced:

- Thermal
  - Rate A (normal rating) for pre-contingency conditions; and
  - Rate B (emergency rating) for post-contingency conditions.
- Voltages
  - Voltages exceeding pre-contingency and post-contingency limits; and
  - Voltage deviations exceeding 8% on non-radial load buses.

2.5.2 Study Tool

ERCOT utilized the following software tools to perform this independent study:

- PowerWorld Simulator version 23 for Security Constrained Optimal Power Flow (SCOPF) and steady-state contingency analysis; and
- UPLAN version 12.3.0.29978 to perform congestion analysis.

3 Project Need

Steady-state reliability analysis was performed in accordance with NERC TPL-001-5.1 and ERCOT Planning Criteria described in Section 2.5 of this document. This analysis indicated thermal overloads and voltage violations in the Borden, Howard, and Martin Counties as seen in the Oncor project submission under NERC P1 (N-1), P3 (G-1+N-1), and P6-2 (X-1+N-1) conditions in the study area. These issues are summarized in Table 3.1 and illustrated in Figure 3.1. Detailed thermal overloads are listed in Table 3.2. Detailed voltage violations are listed in Table 3.3. No unsolved power flow was observed.

Table 3.1: Violations Observed Under NERC TPL-001-5.1 and ERCOT Planning Criteria in the Study Area

NERC Contingency Category	Voltage Violations	Thermal Overloads	Unsolved Power Flow
P0: N-0	None	None	None

[7] Details of each event and contingency category is defined in the NERC reliability standard TPL-001-5.1

© 2025 ERCOT
All rights reserved.

NERC Contingency Category	Voltage Violations	Thermal Overloads	Unsolved Power Flow
P1, P2-1, P7: N-1	5	5	None
P3: G-1+N-1	6*	5*	None
P6-2: X-1+N-1	6*	5*	None

**Violations under P1 (N-1) events were also observed under P3 (G-1+N-1) and P6-2 (X-1+N-1) events*

Table 3.2: Thermal Overloads in the Study Area

NERC Contingency Category	Overloaded Element	Voltage Level (kV)	Length (~Miles)	Max Loading %
P3: G-1+N-1	Brown to Oceanic POD	138	3.6	101.43
P3: G-1+N-1	Buzzard Draw to Brown	138	15.3	113.37
P3: G-1+N-1	Expanse to Lenorah POD	138	1.4	103.64
P3: G-1+N-1	Koch Tap to Buzzard Draw	138	0.3	126.21
P3: G-1+N-1	Vealmoor to Koch Tap	138	8.6	127.98

Table 3.3: Voltage Violations in the Study Area

NERC Contingency Category	Violated Bus	Voltage Level (kV)	Voltage (pu)
P1: N-1	FLATLAND_8	138	0.87
P1: N-1	LENORAH_8	138	0.87
P1: N-1	Other_129	138	0.87
P1: N-1	REDLAKEGP_P8	138	0.86
P1: N-1	REDLAKEGP_T8	138	0.87
P1: N-1	REDSALT_8	138	0.89

© 2025 ERCOT
All rights reserved.

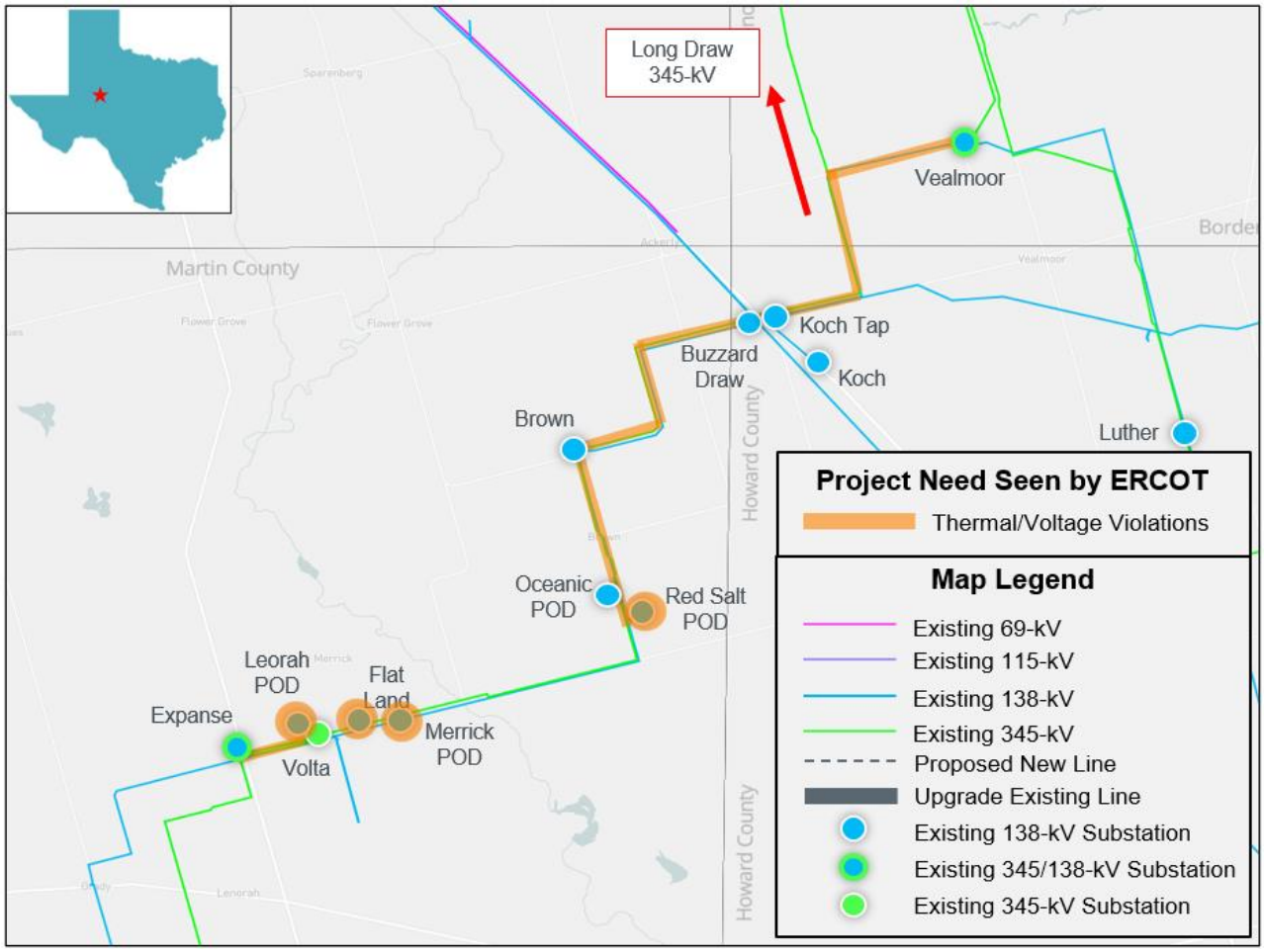


Figure 3.1: Study Area Map Showing Project Need Seen by ERCOT

© 2025 ERCOT
All rights reserved.

4 Description of Project Options

ERCOT initially evaluated five system improvement options to address the thermal overloads and voltage violations that were observed in the study base case.

Option 1 (Oncor Proposed Solution) consists of the following:

- Establish a new Oncor Tredway 138-kV Switch, approximately 0.5 miles north of Oncor's existing Vealmoor 345/138-kV Switch;
- Construct a new Tredway to Structure 10/7 138-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile;
    - Disconnect the existing Luther to Vealmoor 138-kV transmission line at Vealmoor 138-kV Switch, and terminate into the new Oncor Tredway 138-kV Switch;
- Construct a new Tredway to Vealmoor Autotransformer #1 138-kV tie line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 828 MVA or greater, approximately 0.4-mile;
- Construct a new Tredway to Vealmoor Autotransformer #2 138-kV tie line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 828 MVA or greater, approximately 0.4-mile;
- Construct a new Tredway to Structure 1/3 138-kV transmission line on double-circuit capable structures with both circuits in place, with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile. The existing Structure 1/3 is located on the existing Buzzard Draw to Koch Tap to Vealmoor 138-kV transmission line;
    - Disconnect the existing Buzzard Draw to Koch Tap to Vealmoor transmission line at Vealmoor 138-kV Switch, and terminate into the new Oncor Tredway 138-kV Switch;
- Rebuild the existing Expanse to Buzzard Draw to Structure 1/3 138-kV transmission line on double-circuit capable structures with both circuits in place, with normal and emergency ratings of 614 MVA or greater, approximately 28.8-mile, creating the Expanse to Tredway North and South 138-kV transmission lines. The new north circuit flies by Buzzard Draw 138-kV Switch, establishing the new Tredway to Expanse 138-kV double-circuit transmission line;
- Remove the circuit breakers at the existing Brown 138-kV Substation and connect Brown 138-kV to the north Expanse to Tredway 138-kV transmission line;
- Reconnect the existing Oceanic Point of Delivery (POD) 138-kV to the new north Expanse to Tredway 138-kV transmission line;
- Reconfigure the existing Flat Land 138-kV substation from a single-tap configuration to a double-tap configuration so the substation is served from both of the Expanse to Tredway 138-kV circuits;

© 2025 ERCOT
All rights reserved.

- Construct a new Expanse to Lenorah POD 138-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile;
    - Disconnect the existing Lenorah POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch;
- Construct a new Expanse to Merrick POD 138-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 614 MVA or greater, approximately 1.0-mile;
    - Disconnect the existing Merrick POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch;
- Install five 138-kV, 3200 A circuit breakers at Expanse 345/138 kV Switch; and
- Install two 55.2 MVAr capacitor banks at Expanse 345/138-kV Switch.

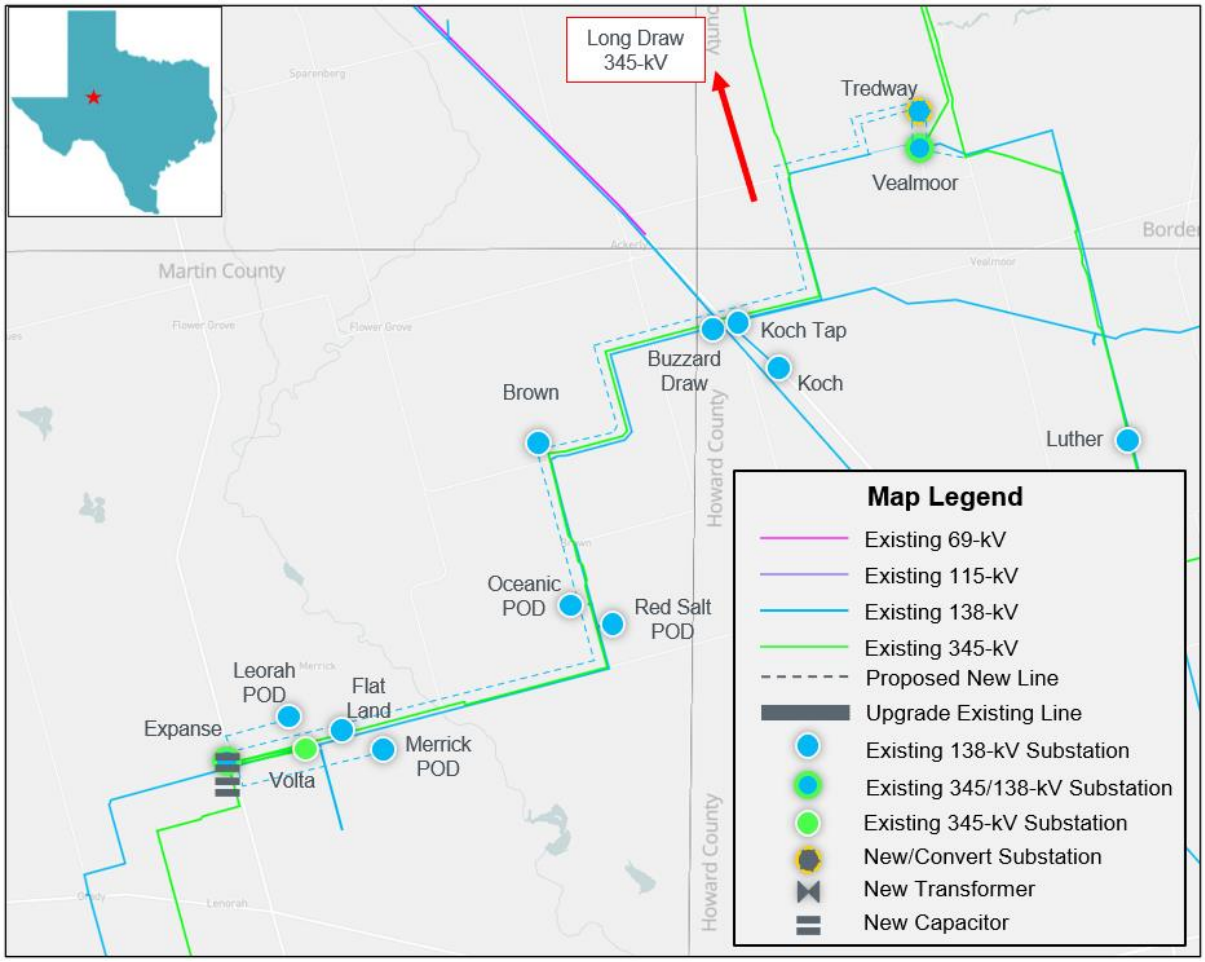


Figure 4.1: Map of Study Area with Option 1

© 2025 ERCOT
All rights reserved.

Option 2 consists of the following:

- Create a new Red Salt 345-kV substation near the existing Red Salt 138-kV substation;
- Install two new 345/138-kV transformers at the existing Red Salt 138-kV substation with normal and emergency ratings of 708 MVA or greater; and
- Tap the Long Draw to Volta 345-kV transmission line at the new Red Salt 345/138-kV substation creating the Long Draw to Red Salt 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 32.0-mile, and the Red Salt to Volta 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 9.0-mile.

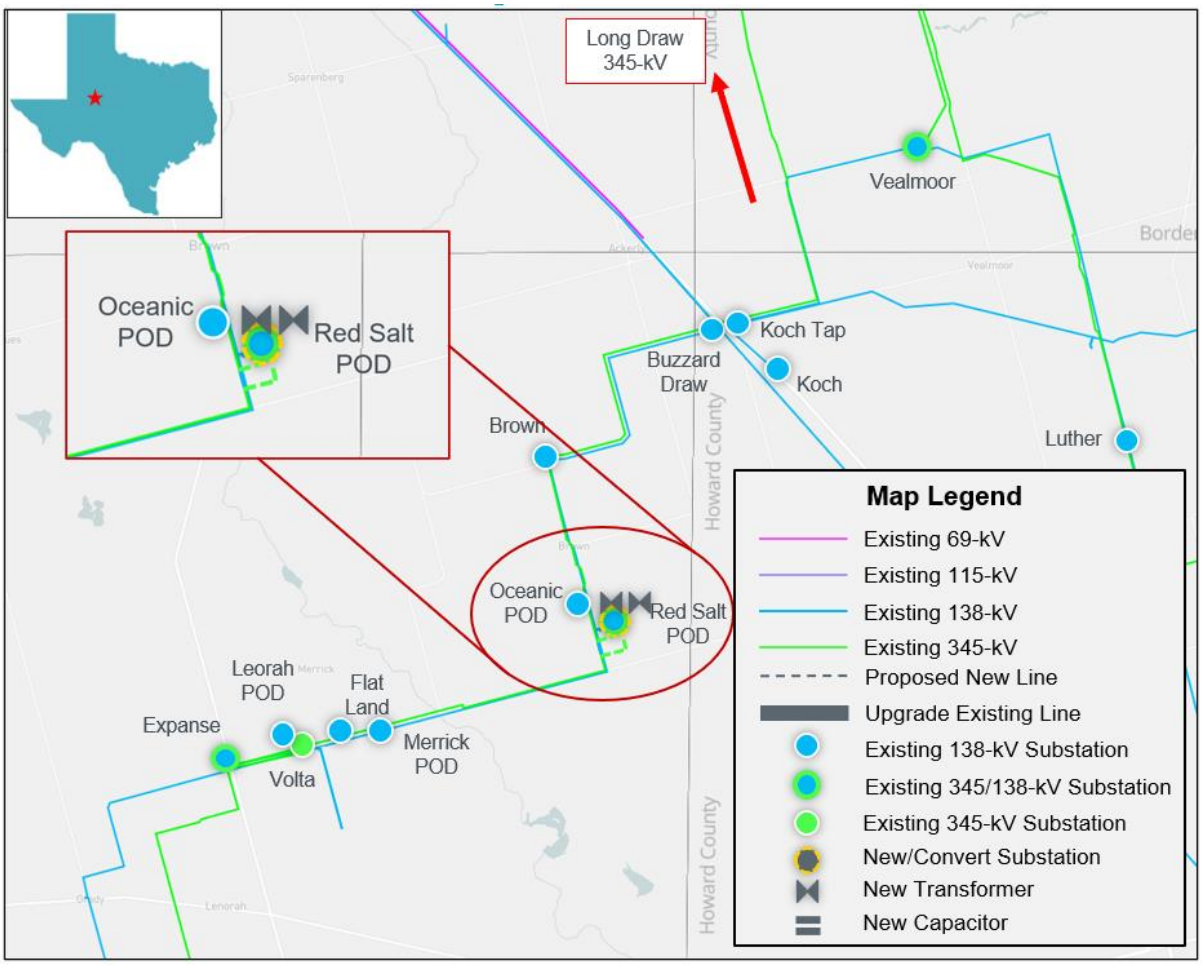


Figure 4.2: Map of Study Area with Option 2

© 2025 ERCOT
All rights reserved.

Option 3 consists of the following:

- Create a new Red Salt 345-kV substation near the existing Red Salt 138-kV substation;
- Install two new 345/138-kV transformers at the existing Red Salt 138-kV Substation with normal and emergency ratings of 708 MVA or greater;
- Construct a new Vealmoor to Red Salt 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 19.0-mile;
- Construct a new Red Salt to Volta 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 9.0-mile; and
- Rebuild the existing Vealmoor to Long Draw 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 11.4-mile.

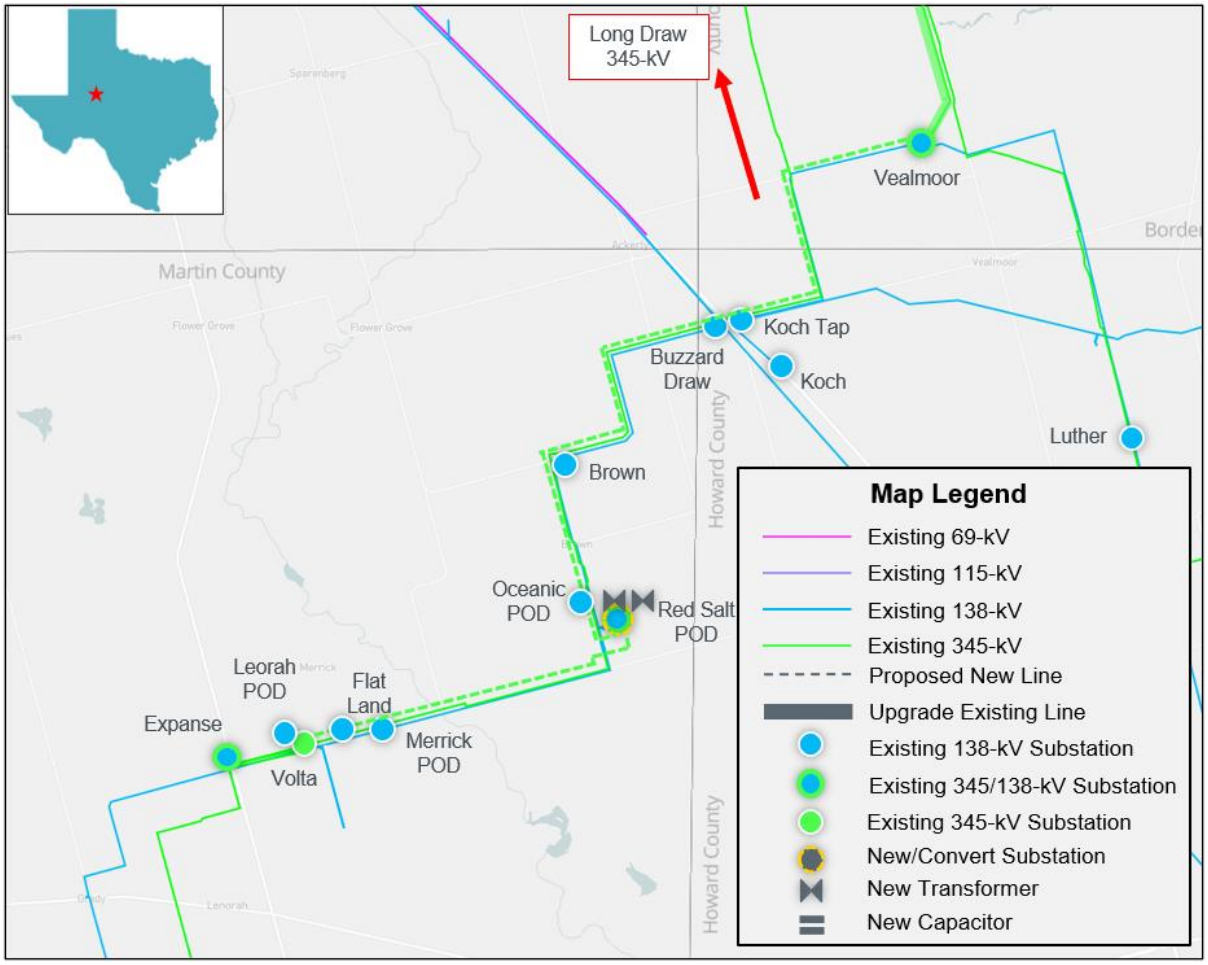


Figure 4.3: Map of Study Area with Option 3

© 2025 ERCOT
All rights reserved.

Option 4 consists of the following:

- Rebuild the existing Vealmoor to Koch Tap 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 8.6-mile;
- Rebuild the existing Koch Tap to Buzzard Draw 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile;
- Create a new Brown 345-kV substation near the existing Brown 138-kV substation;
- Install two new 345/138-kV transformers at the existing Brown 138-kV Substation with normal and emergency ratings of 708 MVA or greater;
- Create a new Red Salt 345-kV substation near the existing Red Salt 138-kV substation;
- Install two new 345/138-kV transformers at the existing Red Salt 138-kV Substation with normal and emergency ratings of 708 MVA or greater;
- Tap the Long Draw to Volta 345-kV transmission line at the new Brown 345/138-kV substation and at the new Red Salt 345/138-kV substation creating the Long Draw to Brown 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 28.0-mile, the Brown to Red Salt 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 4.0-mile, and the Red Salt to Volta 345-kV transmission line with normal and emergency ratings of 1723 MVA or greater, approximately 9.0-mile;
- Construct a new Buzzard Draw to Oceanic 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 19.3-mile;
- Construct a new Oceanic to Merrick 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 9.0-mile; and
- Install two 55.2 MVAr capacitor banks at Expanse 345/138-kV Switch.

© 2025 ERCOT
All rights reserved.

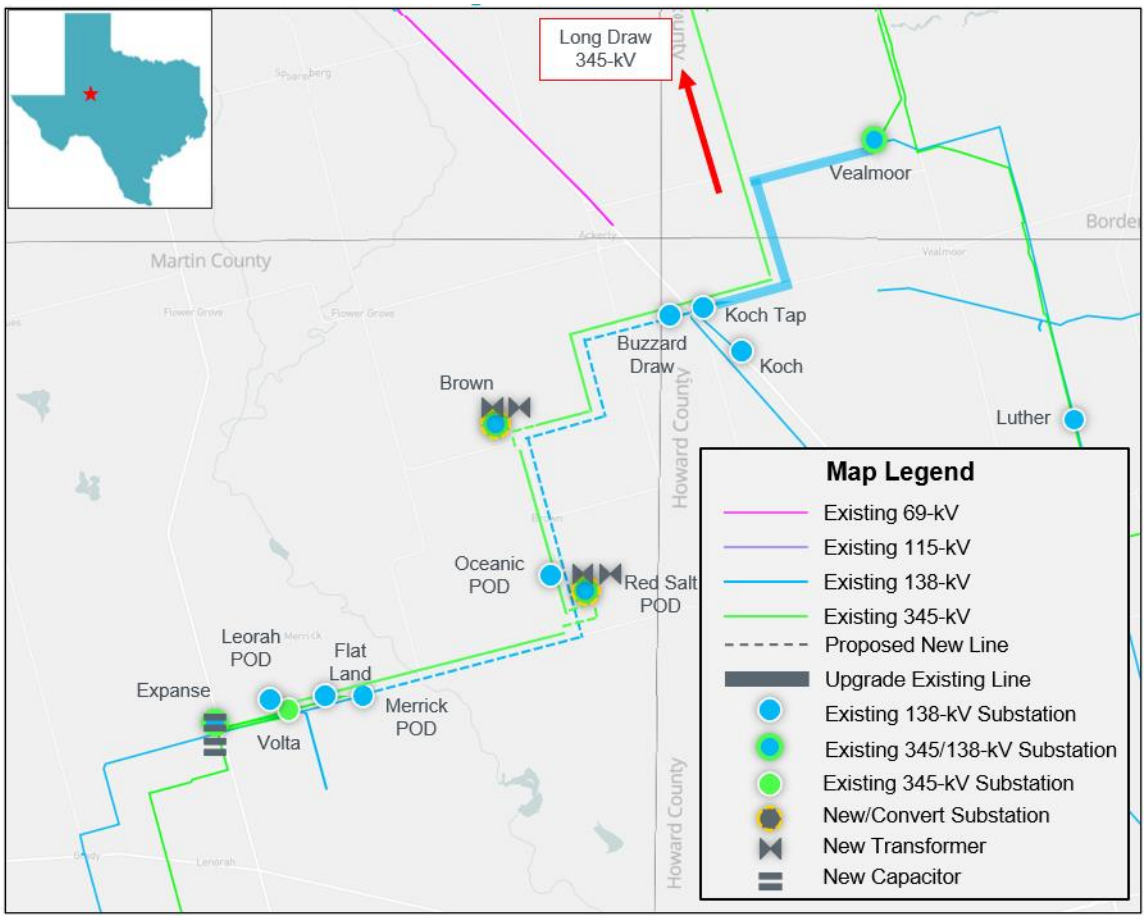


Figure 4.4: Map of Study Area with Option 4

© 2025 ERCOT
All rights reserved.

Option 5 consists of the following:

- Rebuild the existing Vealmoor to Koch Tap 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 8.6-mile;
- Rebuild the existing Koch Tap to Buzzard Draw 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile;
- Rebuild the existing Buzzard Draw to Brown 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 15.3-mile;
- Rebuild the existing Brown to Oceanic POD 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 3.6-mile;
- Rebuild the existing Oceanic POD to Red Salt 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 0.8-mile;
- Rebuild the existing Lenorah to Expanse 138-kV transmission line with normal and emergency ratings of 614 MVA or greater, approximately 1.4-mile;
- Install two 55.2 MVAr capacitor banks at Expanse 345/138-kV Switch;
- Install two 55.2 MVAr capacitor banks at Flatland 138-kV substation; and
- Install two 55.2 MVAr capacitor banks at Red Salt 138-kV substation.

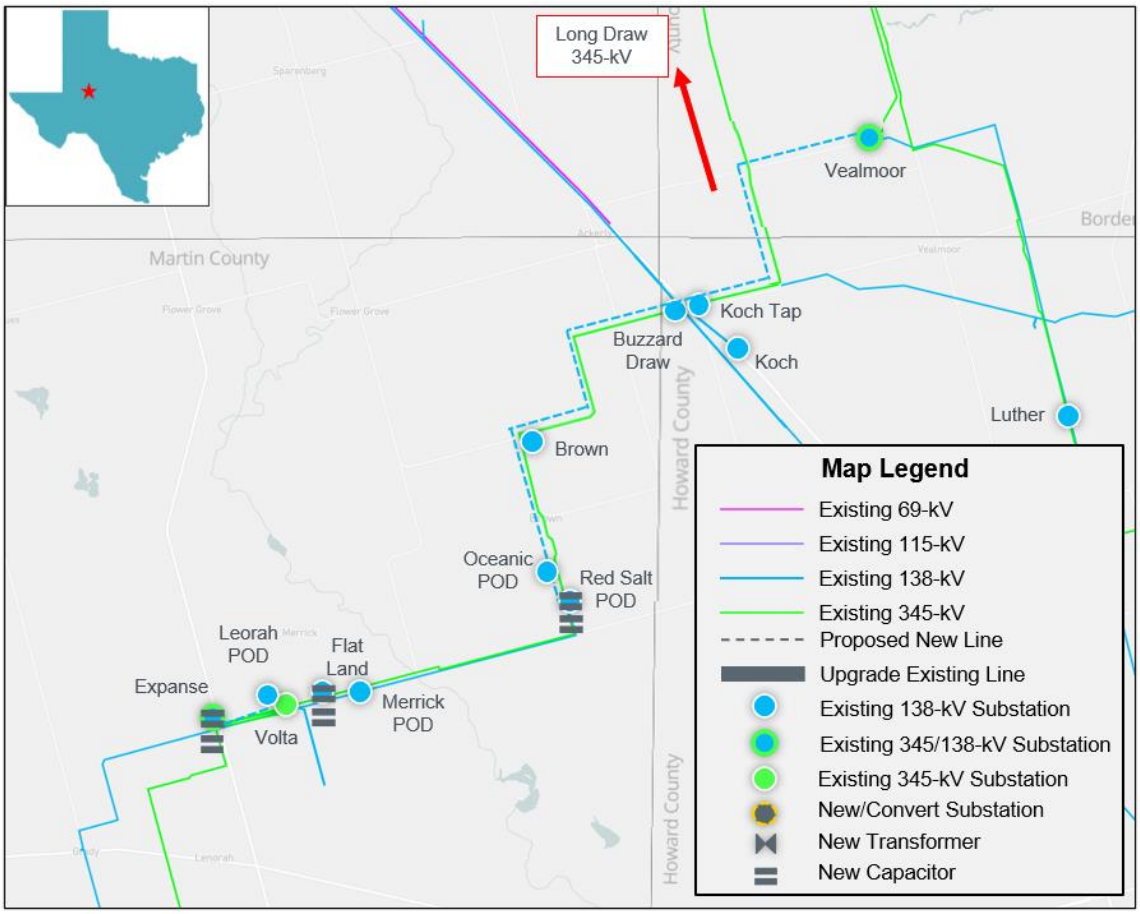


Figure 4.5: Map of Study Area with Option 5

© 2025 ERCOT
All rights reserved.

5 Option Evaluations

ERCOT performed a reliability analysis to evaluate all five initial options and to identify any reliability impact of the options in the study area. Based on the results of these analyses, short-listed options were selected for further evaluations. This section details these studies and their results and compares the short-listed options.

5.1 Results of Reliability Analysis

All five initial options were evaluated based on the contingencies described in the methodology section of the report. Option 2 and Option 4 observed thermal overloads and/or voltage violations under N-1, G-1+N-1 and X-1+N-1. No reliability criteria violations were identified for Option 1, Option 3, and Option 5 as shown in Table 5.1. Option 2 and Option 4 were dropped from further evaluation.

Table 5.1: Results of Initial Reliability Assessment of All Five Options

Option	N-1		G-1+N-1		X-1+N-1	
	Unsolved Power Flow	Thermal Overload	Voltage Violation	Thermal Overload	Voltage Violation	Thermal Overload	Voltage Violation
1	None	None	None	None	None	None	None
2	None	2	None	3	1	2	None
3	None	None	None	None	None	None	None
4	None	None	5	None	5	None	5
5	None	None	None	None	None	None	None

5.2 Short-Listed Options

Based on the results shown in Section 5.1, Option 1, Option 3, and Option 5 were selected as short-listed options for further evaluations. These three options are illustrated in Figures 5.1, 5.2, and 5.3.

© 2025 ERCOT
All rights reserved.

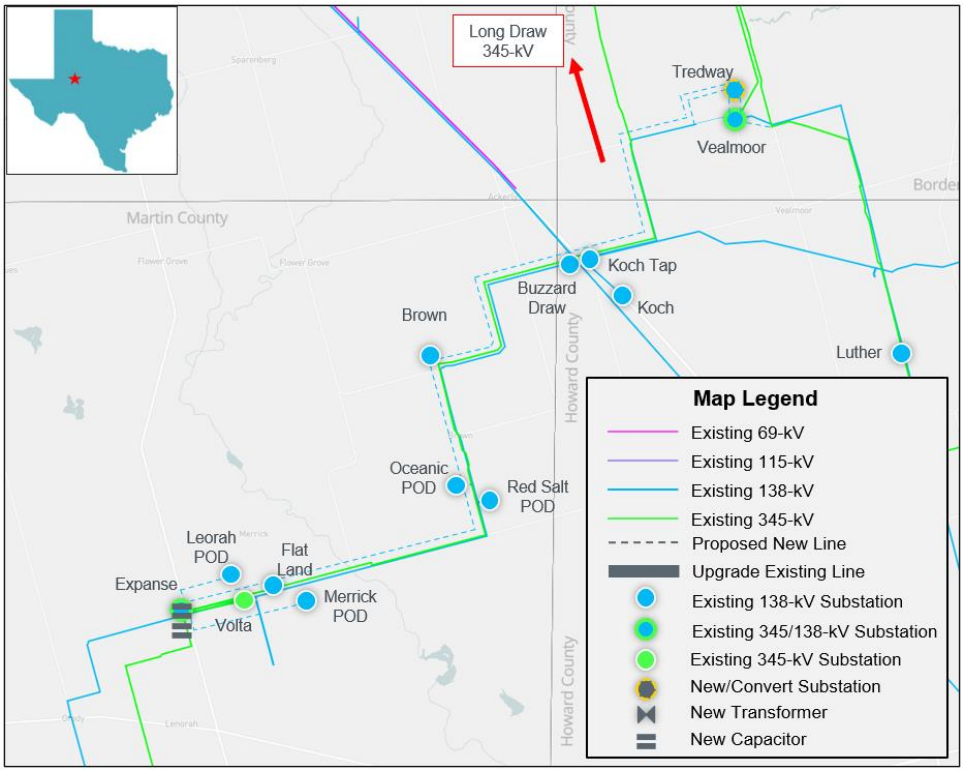


Figure 5.1: Map of Study Area with Option 1

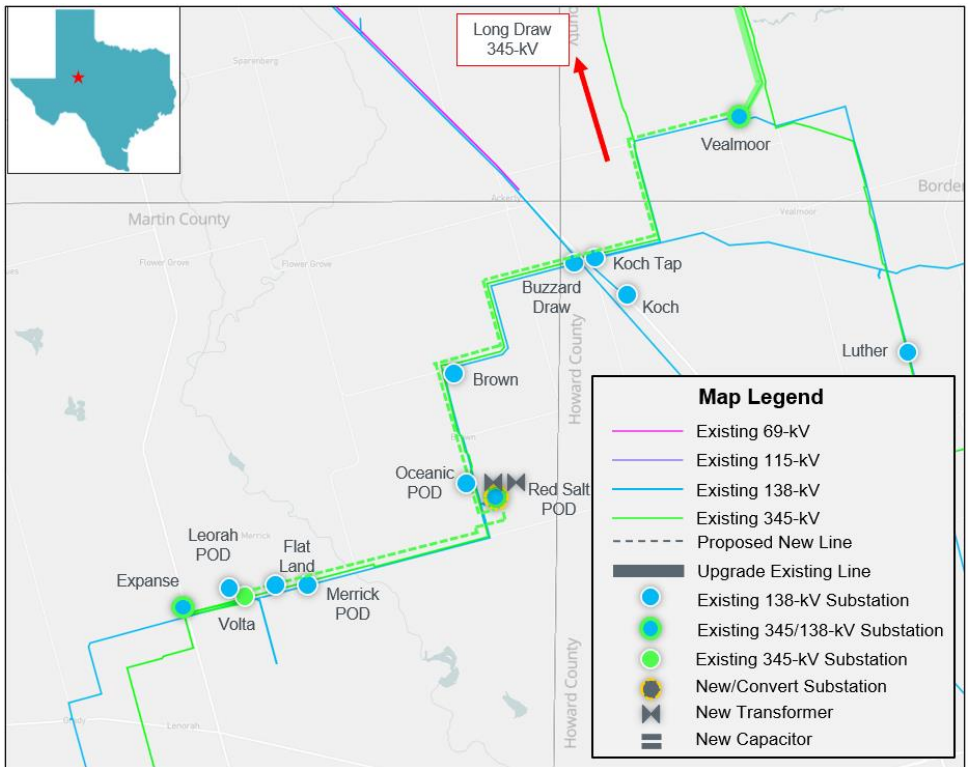


Figure 5.2: Map of Study Area with Option 3

© 2025 ERCOT
All rights reserved.

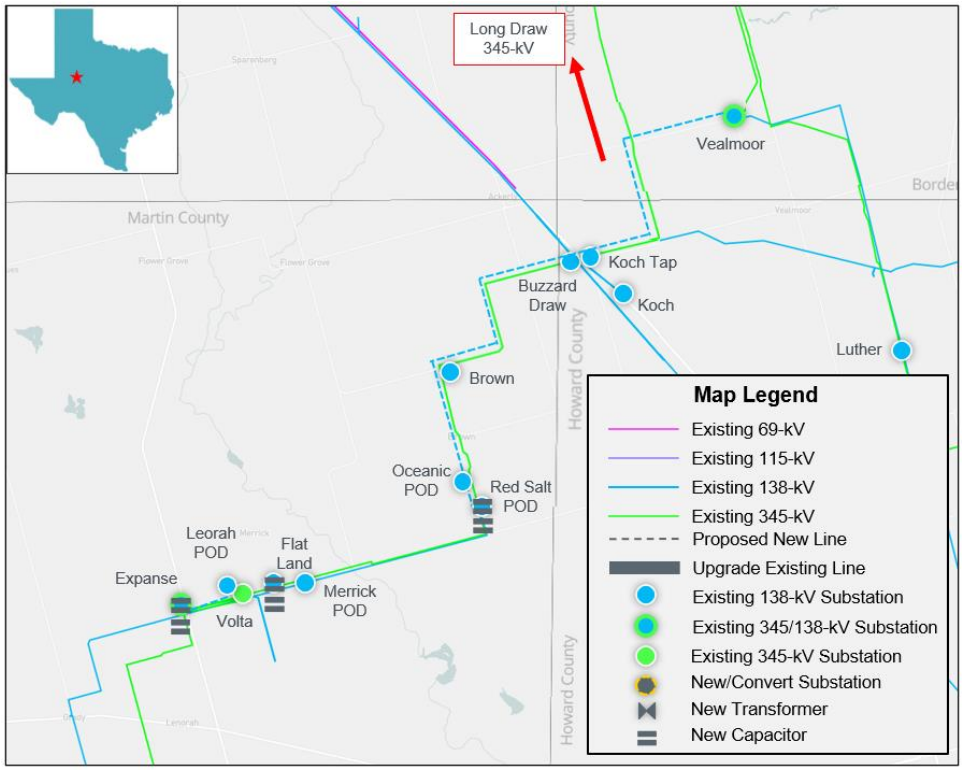


Figure 5.3: Map of Study Area with Option 5

© 2025 ERCOT
All rights reserved.

5.3 Planned Maintenance Outage Evaluation

Using the P1, P2.1, and P7 contingencies based on the review of the system topology of the area, ERCOT conducted an N-2 contingency analysis for each short-listed option to represent system element outage(s) under planned maintenance condition (N-1-1) in the area. Then, each N-2 violation was run as an N-1-1 contingency scenario, with system adjustments between the contingencies. The transmission elements in the local area of the Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project were monitored in the maintenance outage evaluation.

As shown in Table 5.2, the results of this maintenance assessment indicate that all three short-listed options did not result in any reliability violations.

Table 5.2: Results of Planned Maintenance Outage Evaluation for the Three Short-Listed Options

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

ERCOT conducted a planned maintenance sensitivity evaluation incorporating approximately 1,200 MW of additional officer letter load in the FW as provided by Oncor. ERCOT conducted an N-2 contingency analysis for each short-listed option to represent system element outage(s) under planned maintenance condition (N-1-1) in the area. Then, each N-2 violation was run as an N-1-1 contingency scenario, with system adjustments between the contingencies. The transmission elements in the local area of the Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project were monitored in the maintenance outage evaluation.

As shown in Table 5.3, the results of this planned maintenance sensitivity evaluation indicates that Option 1 did not result in any reliability violations, while Option 3 and Option 5 have reliability violations.

Table 5.3: Results of Planned Maintenance Outage Sensitivity for the Three Short-Listed Options

Option	Voltage Violations	Thermal Overloads	Unsolved Power Flow
1	None	None	None
3	2	6	None
5	7	7	None

5.4 Long-Term Load-Serving Capability Analysis

ERCOT performed a long-term load-serving capability assessment on the three short-listed options to compare their relative performance.

The results show that the three short-listed options provided additional long-term load-serving capability with Option 1 providing the greatest and Option 5 providing the least. These results are shown in Table 5.4.

© 2025 ERCOT
All rights reserved.

Table 5.4: Results of Long-Term Load-Serving Capability Assessment of Three Short-Listed Options

Option	Incremental Load-Serving Capability (~MW)
1	1,344
3	915
5	728

5.5 Cost Estimate and Feasibility Assessment

Oncor performed feasibility assessments and provided cost estimates for the three short-listed options. Table 5.5 summarizes the cost estimate, estimated mileage of CCN required, and option feasibility for the three short-listed options.

Table 5.5: Cost Estimates and Feasibility for the Three Short-Listed Options

Option	Cost Estimates (~$M)	CCN Required (~Miles)	Feasible
1	119.3	0.0	Feasible
3	241.7	24.4	Feasible
5	86.0	0.0	Feasible

6 Comparison of Short-Listed Options

Based on the results from Option Evaluations in Section 5, the short-listed Option 1, Option 3 and Option 5 are summarized in Table 6.1.

Table 6.1: Comparison of the Three Short-Listed Options

	Option 1	Option 3	Option 5
Addresses Project Needs	Yes	Yes	Yes
Met ERCOT and NERC Reliability Criteria	Yes	Yes	Yes
Secured Under Maintenance Sensitivity	Yes	No	No
Improves Long-Term Load-Serving Capability	Yes (Best)	Yes	Yes
CCN Needed (~Miles)	No	Yes (24.4)	No
Capital Cost Estimates (~$M)	119.03	241.7	86.0
Feasible	Yes	Yes	Yes

ERCOT recommends Option 1 as the preferred option to address the reliability need in the study area based on the following considerations:

- Option 1 addresses the project need in the study area and meets ERCOT and NERC Reliability Criteria;
- Option 1 improves long-term load-serving capability for future load growth in the area and does not require a CCN;
- Option 1 ensures ERCOT and NERC Reliability under the identified maintenance sensitivity.

© 2025 ERCOT
All rights reserved.

7 Additional Analysis and Assessment

The preferred option (Option 1, approximately $119.03 million) is categorized as a Tier 1 project, pursuant to ERCOT Protocol 3.11.4.3(1)(a). As required by Planning Guide Section 3.1.3(4), ERCOT performed generation and load sensitivity studies to identify the preferred option performance, as required under Planning Guide Section 3.1.3(4). Additionally, a Sub-synchronous Resonance (SSR) Assessment was performed.

7.1 Generation Addition Sensitivity Analysis

ERCOT performed a generation addition sensitivity analysis based on Planning Guide Section 3.1.3(4)(a). Based on a review of the January 2025 GIS report, there were no units within the Study Area which could have an impact on the identified reliability issues.

7.2 Load Scaling Sensitivity Analysis

Planning Guide Section 3.1.3(4)(b) requires an evaluation of the potential impact of load scaling on the criteria violations seen in this EIR. As stated in Section 3.1, ERCOT used the 2026 WFW summer peak case from the 2023 RTP and adjusted the load to create the 2026 WFW summer peak case to study the Borden, Howard, and Martin Counties. This study base case, which was created in accordance with the 2023 RTP Study Scope and Process document and Section 2.1 of this document, included load scaled down from the respective non-coincident peaks in the Coast, East, North, North Central, South, and South Central Weather Zones.

The Outage Transfer Distribution Factors (OTDFs) of overloaded elements with respect to the load transfer for each Weather Zone (excluding NNC) were calculated using PowerWorld Simulator. The OTDFs were less than 2.5% for each of the overloaded elements, i.e., they were not significant enough to have an impact on the overloaded elements. ERCOT concluded that the load scaling used to develop the base case in this study did not have a material impact on the project need, which was primarily driven by thermal overloads and aging infrastructure issues in the study area.

7.3 Sub-synchronous Resonance (SSR) Assessment

Pursuant to Nodal Protocol Section 3.22.1.3(2), ERCOT conducted a sub-synchronous-resonance (SSR) screening for the preferred option (Option 1) and found no adverse SSR impacts to the existing and planned generation resources in the study area.

8 Congestion Analysis

ERCOT conducted a congestion analysis to identify any potential impact on system congestion related to the addition of the recommend project, Option 1, using the 2024 RTP 2026 economic study case.

The results of congestion analysis indicated no additional congestion in the area due to the addition of the recommended transmission upgrades of Option 1.

© 2025 ERCOT
All rights reserved.

9 Conclusion

ERCOT evaluated the five transmission upgrade options to resolve thermal overloads and voltage violations on the Vealmoor to Buzzard Draw to Expanse 138-kV transmission line. Based on the results of the independent review, ERCOT recommends Option 1 as the preferred solution because it addresses the thermal and voltage violations with no reliability issues, improves long-term load-serving capability for future load growth in the area without requiring a CCN, and ensures ERCOT and NERC reliability under the identified maintenance sensitivity compared to all short-listed options.

Option 1 (Oncor proposed solution) consists of the following upgrades:

- Establish a new Oncor Tredway 138-kV Switch, approximately 0.5 miles north of Oncor's existing Vealmoor 345/138-kV Switch;
- Construct a new Tredway to Structure 10/7 138-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile;
    - Disconnect the existing Luther to Vealmoor 138-kV transmission line at Vealmoor 138-kV Switch, and terminate into the new Oncor Tredway 138-kV Switch;
- Construct a new Tredway to Vealmoor Autotransformer #1 138-kV tie line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 828 MVA or greater, approximately 0.4-mile;
- Construct a new Tredway to Vealmoor Autotransformer #2 138-kV tie line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 828 MVA or greater, approximately 0.4-mile;
- Construct a new Tredway to Structure 1/3 138-kV transmission line on double-circuit capable structures with both circuits in place, with normal and emergency ratings of 614 MVA or greater, approximately 0.3-mile. The existing Structure 1/3 is located on the existing Buzzard Draw to Koch Tap to Vealmoor 138-kV transmission line;
    - Disconnect the existing Buzzard Draw to Koch Tap to Vealmoor transmission line at Vealmoor 138-kV Switch, and terminate into the new Oncor Tredway 138-kV Switch;
- Rebuild the existing Expanse to Buzzard Draw to Structure 1/3 138-kV transmission line on double-circuit capable structures with both circuits in place, with normal and emergency ratings of 614 MVA or greater, approximately 28.8-mile, creating the Expanse to Tredway North and South 138-kV transmission lines. The new north circuit flies by Buzzard Draw 138-kV Switch, establishing the new Tredway to Expanse 138-kV double-circuit transmission line;
- Remove the circuit breakers at the existing Brown 138-kV Substation and connect Brown 138-kV to the north Expanse to Tredway 138-kV transmission line;
- Reconnect the existing Oceanic Point of Delivery (POD) 138-kV to the new north Expanse to Tredway 138-kV transmission line;

© 2025 ERCOT
All rights reserved.

- Reconfigure the existing Flat Land 138-kV substation from a single-tap configuration to a double-tap configuration so the substation is served from both of the Expanse to Tredway 138-kV circuits;
- Construct a new Expanse to Lenorah POD 138-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 614 MVA or greater, approximately 0.6-mile;
    - Disconnect the existing Lenorah POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch;
- Construct a new Expanse to Merrick POD 138-kV transmission line on double-circuit capable structures with one circuit in place, with normal and emergency ratings of 614 MVA or greater, approximately 1.0-mile;
    - Disconnect the existing Merrick POD from the existing Expanse to Buzzard Draw 138-kV transmission line so it is served radially from Expanse Switch;
- Install five 138-kV, 3200 A circuit breakers at Expanse 345/138 kV Switch; and
- Install two 55.2 MVAr capacitor banks at Expanse 345/138-kV Switch.

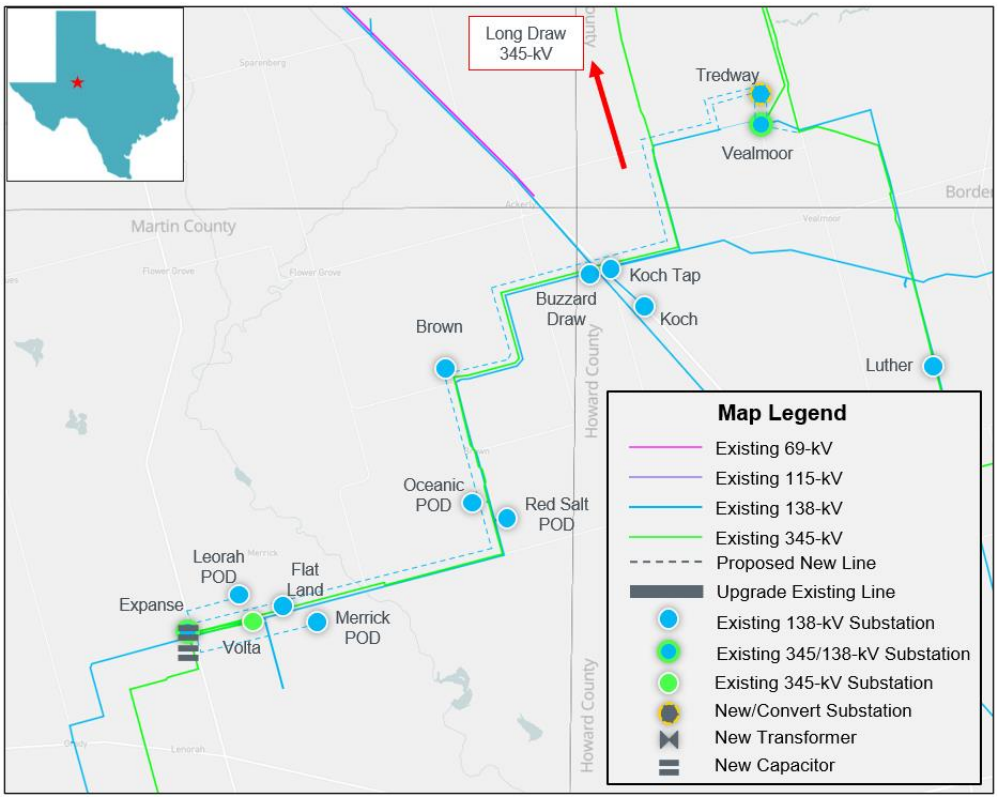


Figure 10.1: Map of Option 1

The cost estimate for the project is approximately $119.03 million and the project is classified as a Tier 1 project per ERCOT Protocol Section 3.11.4.3(1)(a). The project is recommended for construction to meet a December 2025 ISD. However, Oncor has advised that the completion date may change based on requirements for environmental assessment, licensing requests and construction progress.

© 2025 ERCOT
All rights reserved.

A CCN application will not be required for the project. Oncor will work with ERCOT as necessary to develop and implement Constraint Management Plans (CMPs) based on summer operational conditions in 2025. If needed, Oncor will utilize line sectionalizing or mobile equipment/capacitor installation to mitigate risks under contingency conditions.

© 2025 ERCOT
All rights reserved.

Appendix

A: Attachments

Table A.1: Project Related Document

No	Document Name	Attachment
1	Oncor Tredway 138-kV Switch and Expanse to Tredway 138-kV 2nd Circuit Project	RPG_Oncor Tredway 138 kV Swi

© 2025 ERCOT
All rights reserved.