



## Oncor – Temple Area Project ERCOT Independent Review Status Update

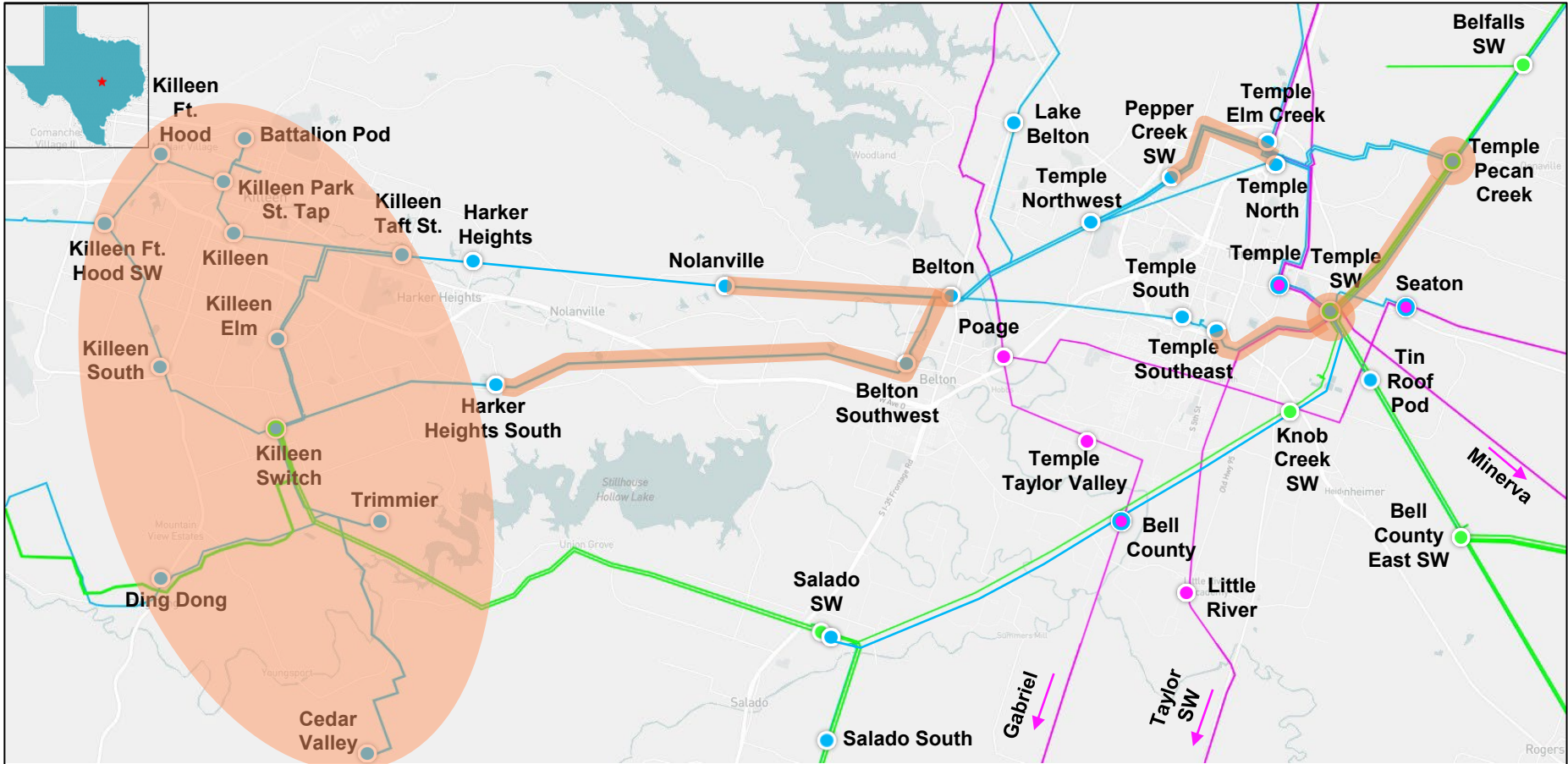
Tanzila Ahmed

RPG Meeting  
July 16, 2024

# Recap – Introduction

- Oncor submitted the Temple Area Project for Regional Planning Group (RPG) review in January 2024
  - This Tier 1 project is estimated to cost \$120.7 million, and filing of Certificate of Convenience and Necessity (CCN) is not required
  - Estimated In-Service Date (ISD) is May 2026
  - This project addresses identified thermal violations seen in the Temple area in Bell County due to load grown in the area
- Oncor presented project overview and ERCOT presented study scope for this ERCOT Independent Review (EIR) at the February RPG meeting
  - <https://www.ercot.com/calendar/02122024-RPG-Meeting>
- ERCOT provided status update at the March and April RPG meeting
  - [https://www.ercot.com/calendar/03182024-RPG-Meeting- -Webex](https://www.ercot.com/calendar/03182024-RPG-Meeting--Webex)
  - <https://www.ercot.com/calendar/05142024-RPG-Meeting>
  - <https://www.ercot.com/calendar/06112024-RPG-Meeting>

# Recap - Study Area Map with Violations Seen by ERCOT



Project Need Seen by ERCOT	
<span style="display:inline-block; width:15px; height:10px; background-color:orange; border:1px solid black;"></span>	Thermal/Voltage Violation
<span style="display:inline-block; width:15px; height:10px; background-color:gray; border:1px solid black;"></span>	Aging Infrastructures
<span style="display:inline-block; width:15px; height:10px; background-color:yellow; border:1px solid black;"></span>	TSP Criteria Violation

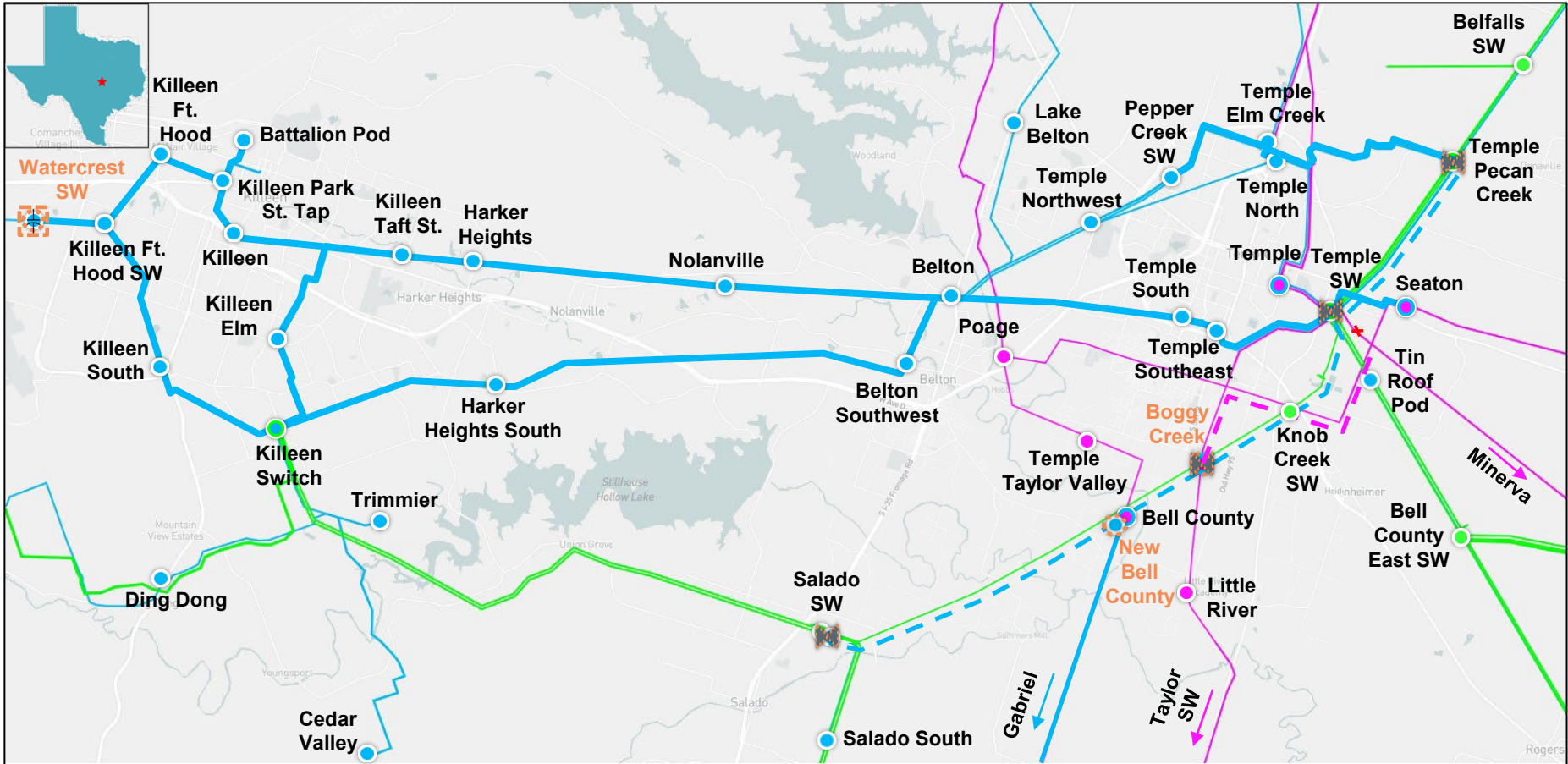
Voltage Legend	
<span style="display:inline-block; width:20px; border-bottom:2px solid magenta;"></span>	69-kV
<span style="display:inline-block; width:20px; border-bottom:2px solid blue;"></span>	115-kV
<span style="display:inline-block; width:20px; border-bottom:2px solid cyan;"></span>	138-kV
<span style="display:inline-block; width:20px; border-bottom:2px solid green;"></span>	345-kV

Line Legend	
<span style="display:inline-block; width:20px; border-bottom:1px solid black;"></span>	Existing Line
<span style="display:inline-block; width:20px; border-bottom:1px dashed black;"></span>	Proposed New Line
<span style="display:inline-block; width:20px; border-bottom:3px solid black;"></span>	Upgrade Existing Line
<span style="display:inline-block; width:20px; border-bottom:1px dashed black; border-top:1px dashed black;"></span>	Convert Existing Line
<span style="display:inline-block; width:20px; border-bottom:1px solid black; border-top:1px solid black;"></span>	Retire Existing Line

Substation Legend	
<span style="display:inline-block; width:10px; height:10px; border:1px solid black; border-radius:50%;"></span>	Existing Substation
<span style="display:inline-block; width:10px; height:10px; border:2px solid black; border-radius:50%;"></span>	New/Convert Substation
<span style="display:inline-block; width:10px; height:10px; border:1px solid black; border-radius:50%;"></span>	New Transformer



# Recap - Option 4A Map



Project Need Seen by ERCOT	
	Thermal/Voltage Violation
	Aging Infrastructures
	TSP Criteria Violation

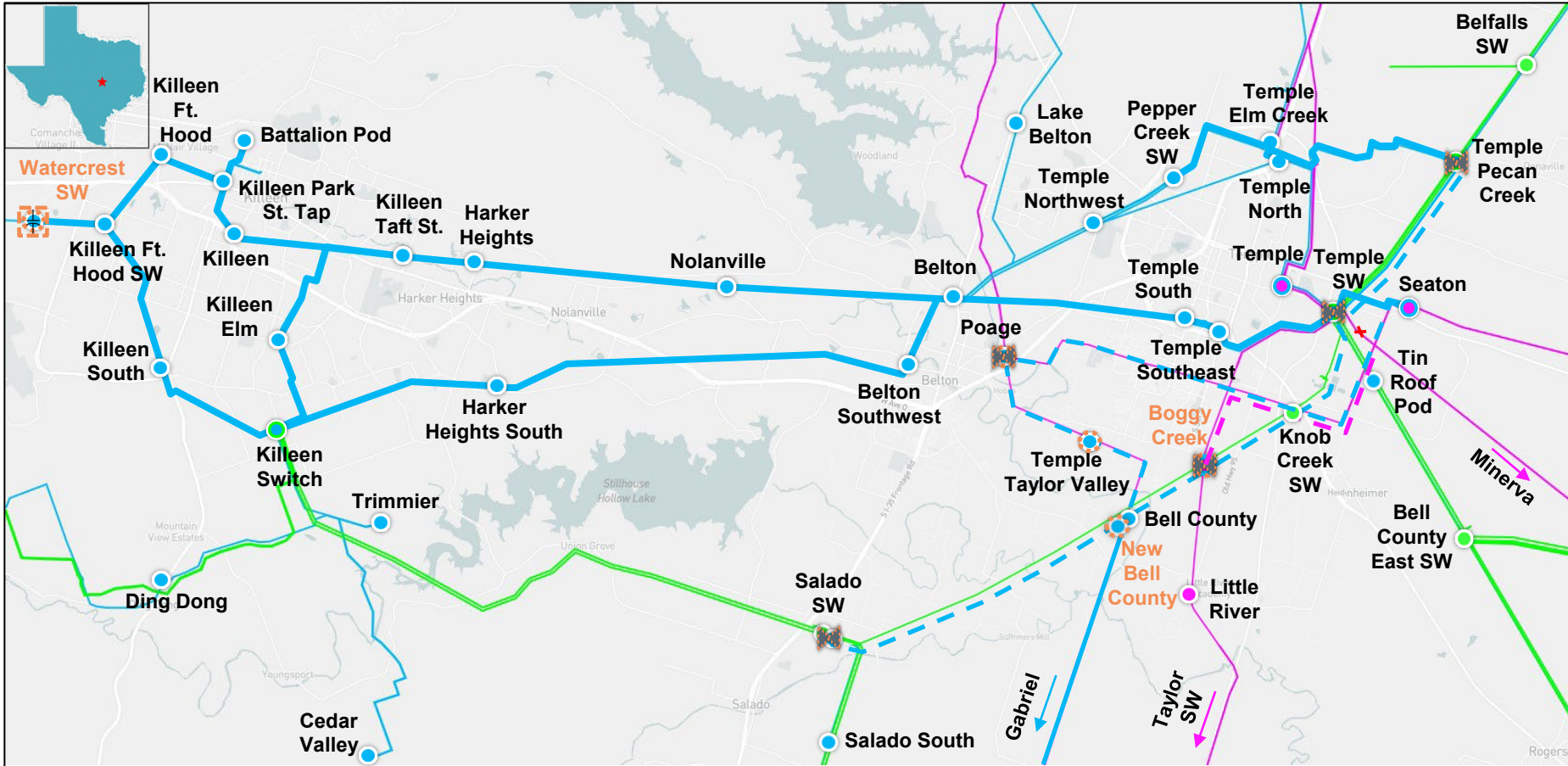
Voltage Legend	
	69-kV
	115-kV
	138-kV
	345-kV

Line Legend	
	Existing Line
	Proposed New Line
	Upgrade Existing Line
	Convert Existing Line
	Retire Existing Line

Substation Legend	
	Existing Substation
	New/Convert Substation
	New Transformer



# Recap - Option 5A Map



Project Need Seen by ERCOT	
	Thermal/Voltage Violation
	Aging Infrastructures
	TSP Criteria Violation

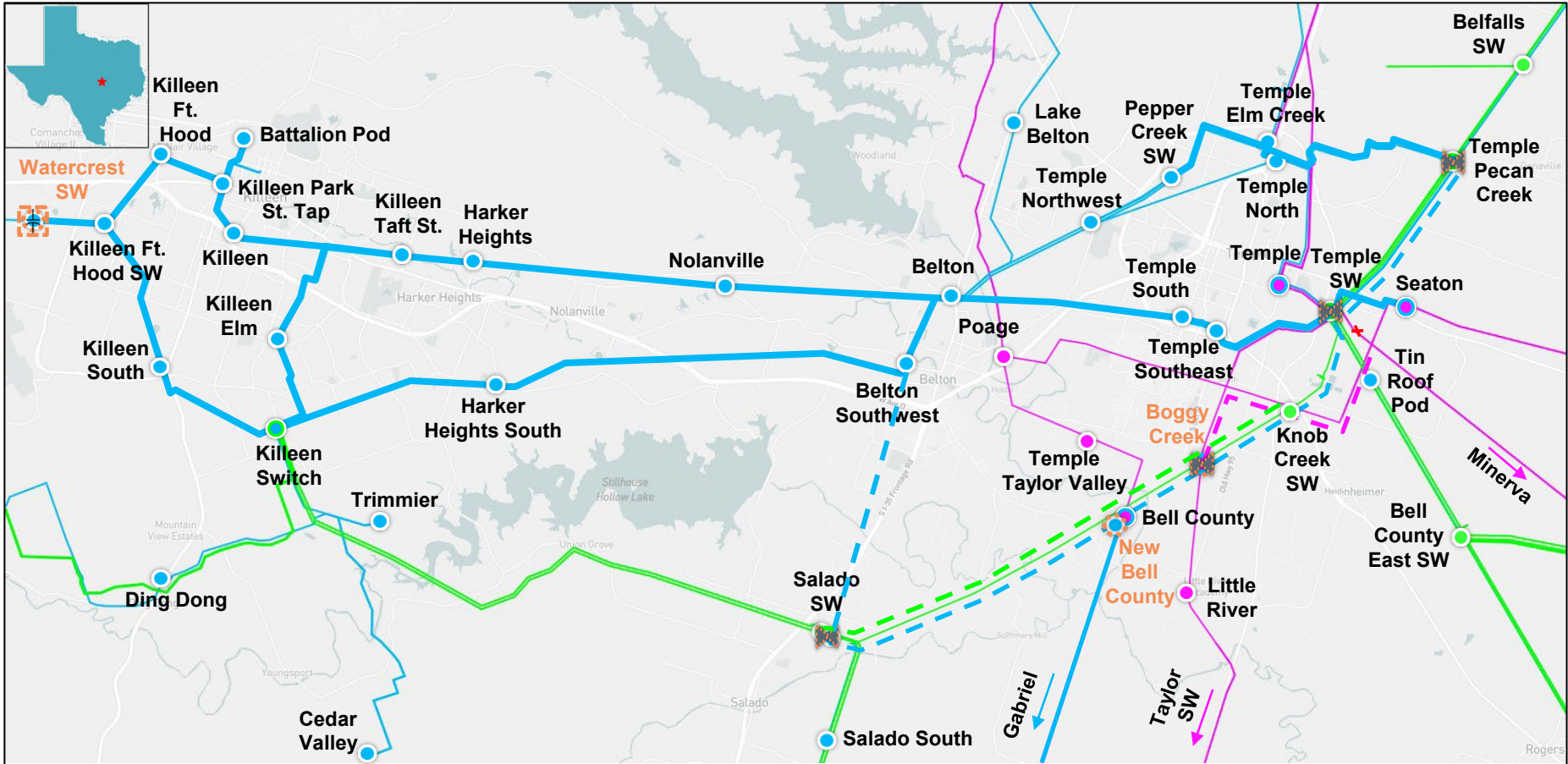
Voltage Legend	
	69-kV
	115-kV
	138-kV
	345-kV

Line Legend	
	Existing Line
	Proposed New Line
	Upgrade Existing Line
	Convert Existing Line
	Retire Existing Line

Substation Legend	
	Existing Substation
	New/Convert Substation
	New Transformer



# Recap - Option 7A Map



Project Need Seen by ERCOT	
	Thermal/Voltage Violation
	Aging Infrastructures
	TSP Criteria Violation

Voltage Legend	
	69-kV
	115-kV
	138-kV
	345-kV

Line Legend	
	Existing Line
	Proposed New Line
	Upgrade Existing Line
	Convert Existing Line
	Retire Existing Line

Substation Legend	
	Existing Substation
	New/Convert Substation
	New Transformer



# Cost Estimate and Feasibility Assessment – Updated Short-listed Options

- Transmission Service Providers (TSPs) performed feasibility assessments and provided final cost estimates for the three short-listed options

Option	Cost Estimates (\$M)	CCN Required (Miles)	Feasibility	Expected ISD* (Month Year)
4A	~257.6	Yes (15.4)	Feasible	December 2028
5A	~272.6	Yes (15.4)	Feasible	December 2028
7A	~329.3*	Yes (~23.4)	Not Feasible	N/A

\* The estimated cost does not include new CCN or land acquisition related cost

\*\* The expected ISD is tentative and are subject to change based on requirements for various approvals, ROW acquisition and construction progress

- Based on feedback from Oncor, Option 7A was deemed as not feasible as time. New CCN line and new 345-kV circuit will require additional land acquisitions and time to complete

# Comparison of Short-listed Options

	Option		
	4A	5A	7A
Address the project needs	Yes	Yes	Yes
Meets ERCOT and NERC Reliability Criteria	No	Yes	Yes
Improves Long-term Load Serving Capability	Yes	Yes	Best
Require CCN (miles)	Yes (15.4)	Yes (15.4)	Yes (~23.4)
Expected ISD*** (Month Year)	December 2028	December 2028	N/A
Cost Estimate* (\$M)	~257.6	~272.6	~329.3**
Feasible	Yes	Yes	No

\* The cost estimates were provided by the TSPs

\*\* The estimated cost does not include cost related to new CCN or land acquisition

\*\*\* The expected ISD is tentative and are subject to change based on requirements for various approvals, ROW acquisition, and/or construction progress

- Option 4A observed reliability violation under N-1 condition
- Based on feedback from Oncor, Option 7A was deemed as not feasible as time



# ERCOT Preferred Option

- Option 5A was selected as the ERCOT preferred option because it
  - Addresses project need in the Bell County
  - Improves long-term load serving capability for future load growth in the area
  - Is the least cost solution and requires least amount of CCN mileages among the options that meet all of the ERCOT and NERC Reliability Criteria

# Sensitivity Analyses

- Generation Addition Sensitivity Analysis
  - Per Planning Guide Section 3.1.3(4)(a), ERCOT performed a generation addition sensitivity by adding new the generation listed in Appendix A to the preferred option case. The additional resources were modeled following the 2024RTP methodology. ERCOT determined relevant generators do not impact the preferred option
- Load Scaling Sensitivity Analysis
  - Per Planning Guide Section 3.1.3(4)(b), ERCOT performed a load scaling sensitivity and concluded that the load scaling did not have a material impact on project need

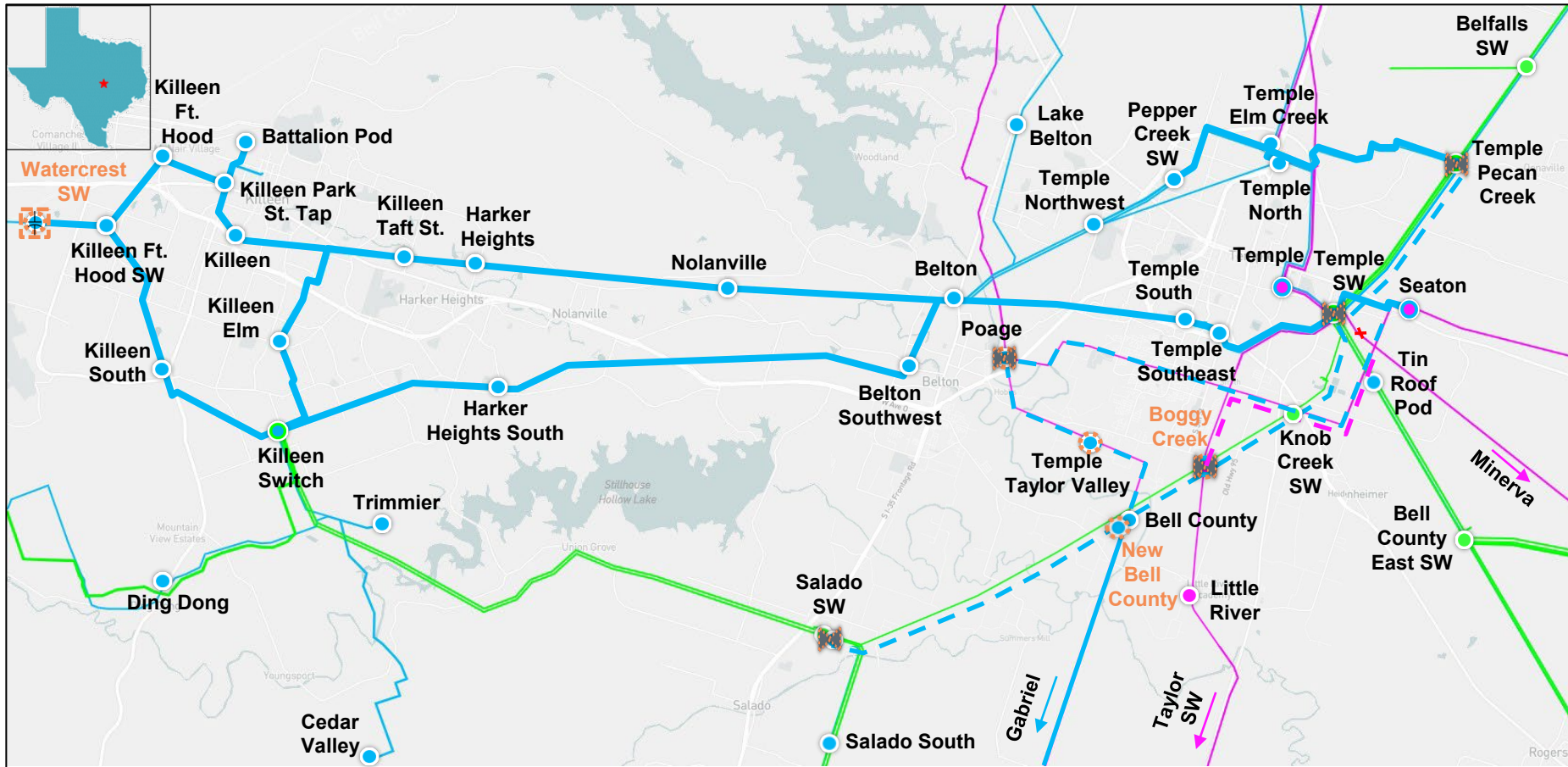
# Additional Analyses




- Congestion Analysis
  - Congestion analysis was performed for the preferred option using the 2023 RTP 2028 economic case
  - The preferred option did not result in any new congestion within the study area
- Subsynchronous Resonance (SSR) Assessment
  - Subsynchronous Resonance (SSR) Assessment was conducted for the preferred option per Nodal Protocol Section 3.22.1.3
  - ERCOT found no adverse SSR impacts to the existing and planned generation resources at the time of this study





# ERCOT Recommendation






- ERCOT recommends Option 5A
  - Estimated Cost: approximately \$272.6 million
  - Expected ISD: December 2028
    - The expected ISD is tentative and are subject to change based on requirements for various approvals, ROW acquisition, and/or construction progress
  - CCN filling will be required to
    - Construct a new Temple Switch – Boggy Creek Switch – Bell County Switch – Salado Switch 138-kV transmission lines on new double-circuit structure with one circuit in place, utilizing the existing ROW, 15.4-mile
  - Recommended option components are detailed in the Appendix B

# ERCOT Recommended - Option 5A Map



Project Need Seen by ERCOT	
	Thermal/Voltage Violation
	Aging Infrastructures
	TSP Criteria Violation

Voltage Legend	
	69-kV
	115-kV
	138-kV
	345-kV

Line Legend	
	Existing Line
	Proposed New Line
	Upgrade Existing Line
	Convert Existing Line
	Retire Existing Line

Substation Legend	
	Existing Substation
	New/Convert Substation
	New Transformer



# Next Steps and Tentative Timeline

- Tentative timeline
  - EIR report to be posted in the MIS in July 2024
  - EIR recommendation to TAC in July 2024
  - EIR recommendation to R&M in August 2024
  - Seek ERCOT Board of Directors endorsement in August 2024

*Thank you!*



Stakeholder comments also welcomed through:

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[Robert.Golen@ercot.com](mailto:Robert.Golen@ercot.com)

# Appendix A: List of Units for Generation Addition Sensitivity Analysis

GINR	Unit Name	Fuel Type	Capacity (MW)	County
24INR0031	Stoneridge Solar	Solar	201.6	Milam
25INR0389	Stoneridge BESS	Battery	101.9	Milam
23INR0118	Blevins Solar	Solar	271.6	Falls
23INR0119	Blevins Storage	Battery	181.3	Falls
23INR0070	Chillingham Solar	Solar	352.4	Bell
23INR0079	Chillingham Storage	Battery	153.9	Bell
23INR0344	XE Hermes Solar	Solar	100.4	Bell
24INR0365	XE Hermes Storage	Battery	100.4	Bell
24INR0166	Stillhouse Solar	Solar	212.5	Bell
24INR0042	Yaupon Solar SLF	Solar	204.1	Milam
24INR0169	Yaupon Storage SLF	Battery	0.0	Milam
24INR0208	Eastbell Milam Solar II	Solar	150.6	Milam
23INR0469	Big Elm Storage	Battery	100.8	Bell
23INR0249	Limewood Solar	Solar	204.6	Bell
22INR0511	Gransolar Texas One	Solar	50.0	Milam
22INR0356	Jungmann Solar	Solar	40.2	Milam
23INR0235	Hoyte Solar	Solar	206.8	Milam



## Appendix B: Option 5A Components

- Install a second 345/138-kV autotransformer with nameplate rating of 600 MVA at Temple Pecan Creek Switch and loop the existing Bellfalls Switch – Temple Switch 345-kV transmission line into the Temple Pecan Creek 345-kV Switch by installing three new 345-kV circuit breakers in the existing 345-kV ring bus arrangement and three new 138-kV circuit breakers in the existing 138-kV breaker-and-a-half arrangement. Replace all existing 40 kA, 138-kV circuit breakers at Temple Pecan Creek Switch with 63 kA circuit breakers
- Install a second 345/138-kV autotransformer with nameplate rating of 600 MVA at Temple Switch and rebuild the Temple 345/138-kV Switch with eleven 345-kV circuit breakers in a breaker-and-a-half arrangement and sixteen 138-kV circuit breakers in a breaker-and-a-half arrangement
- Replace nine of the existing 40 kA, 138-kV circuit breakers at Temple Elm Creek Switch with 63 kA circuit breakers
- Upgrade the existing Temple Pecan Creek Switch – Temple Elm Creek Switch 138-kV double-circuit transmission line with normal and emergency ratings of 493 MVA or greater, approximately 5.0-mile
- Install a second circuit on the vacant position of the existing Temple Switch – Temple Pecan Creek Switch 138-kV double-circuit capable line with normal and emergency ratings of 486 MVA or greater, approximately 4.4-mile

## Appendix B: Option 5A Components (Continued)

- Construct a new Boggy Creek 138/69-kV Switch approximately 3.58 miles south of the existing Temple 138-kV Substation. Install seven 138-kV breakers in breaker-and-a-half arrangement and two 69-kV breakers in single bus arrangement. Relocate the existing 138/69-kV autotransformer from Temple Switch to the new Boggy Creek Switch
- Boggy Creek 138-kV Switch to be interconnected as follows:
  - Install a new 69-kV transmission line on the vacant sides of the existing double-circuit capable structures of Taylor Switch – Temple Switch and Bob Poage – Seaton 69-kV transmission lines and connect the new 69-kV line to Minerva Switch at STR 3/5 to establish the Boggy Creek Switch – Minerva Switch 69-kV transmission line
  - Establish the new Boggy Creek Switch – Temple Switch 138-kV transmission line by converting the 69-kV line between Boggy Creek Switch and Temple Switch to 138-kV operation
  - Establish a normally open disconnect switch at Temple on the newly established Boggy Creek Switch – Temple Switch 138-kV transmission line with normal and emergency ratings of 197 MVA or greater, approximately 5.0-mile
  - Disconnect the existing Temple Switch – Minerva Switch 69-kV at STR 3/5
- Construct an Oncor-owned New Bell County 138-kV Switch with four 138-kV breakers in a ring bus arrangement near the existing Bell County Switch and establish a tie to the existing Bell County Switch substation
- Convert the existing Seaton – Bob Poage – Temple Taylor Valley – Bell County Switch 69-kV transmission lines to 138-kV operational with normal and emergency ratings of 214 MVA or greater, approximately 17.7-mile

## Appendix B: Option 5A Components (Continued)

- Upgrade the existing Temple North – Pepper Creek Switch 138-kV double-circuit transmission line with a normal and emergency ratings of 486 MVA or greater, 2.2-mile per-circuit.
- Install two new 600 MVA 345/138-kV Autotransformers at the existing Salado Switch and connect the 138-kV and 345-kV at Salado Switch.
- Oncor-owned New Bell County 138-kV Switch to be interconnected as follows:
  - Keep the existing 345-kV double-circuit and the existing 345-kV line from Salado Switch – Knob Creek – Temple Switch but remove the existing 138-kV circuits from the existing 345-kV structures.
  - Construct a new Bell County Switch – Boggy Creek Switch – Temple Switch 138-kV transmission lines on new double-circuit structure with one circuit in place, utilizing the existing ROW with a normal and emergency ratings of 614 MVA or greater, approximately 7.7-mile.
  - Construct a new Bell County Switch – Salado Switch 138-kV transmission line on new double-circuit structure with one circuit in place, utilizing the existing ROW, with normal and emergency ratings of 614 MVA or greater, approximately 7.8-mile
- Upgrade the existing Temple Switch – Temple Southeast – Scott & White – Temple South – Belton 138-kV transmission lines with normal and emergency ratings of 486 MVA or greater, approximately 9.6-mile
- Upgrade the existing Belton – Belton Southwest – Harker Heights South – Killeen Switch 138-kV transmission lines with normal and emergency ratings of 486 MVA or greater, approximately 17.2-mile

## Appendix B: Option 5A Components (Continued)

- Upgrade the existing Belton – Nolanville – Harker Heights – Killeen Taft – Killeen Elms Rd – Killeen Switch 138-kV transmission lines with a normal and emergency ratings of 486 MVA or greater, approximately 19.8-mile.
- Upgrade the existing Temple Elm Creek Switch – Temple North 138-kV double-circuit transmission line with a normal and emergency ratings of 486 MVA or greater, approximately 0.6-mile per-circuit.
- Construct the new Watercrest 138-kV Switch substation near Killeen Ft. Hood Switch in a 4-breaker ring bus arrangement and install one capacitor bank consisting of 110.4 Mvar in three 36.8 Mvar stages.
- Close the normally open Killeen Ft. Hood – Killen Park Tap Street 138-kV transmission line.
- Upgrade the existing Watercrest Switch – Killeen Taft 138-kV transmission lines with a normal and emergency ratings of 614 MVA or greater, approximately 7.9-mile.
- Upgrade the existing Watercrest Switch – Killeen Switch 138-kV transmission lines with a normal and emergency ratings of 493 MVA or greater, approximately 7.5-mile.
- Upgrade the existing Temple Switch – Seaton 138-kV transmission line with a normal and emergency ratings of 486 MVA or greater, approximately 2.7-mile.
- Expand and convert the existing Bob Poage 69-kV substation to 138/69-kV Switch substation and install a new 100 MVA 138/69-kV Autotransformer.
- Convert the existing Temple Taylor Valley 69-kV substation to 138-kV substation.