



## STEC – Rio Medina Project ERCOT Independent Review Status Update

Abishek Penti

RPG Meeting  
January 17, 2024

# Recap

- STEC submitted the Rio Medina Project for Regional Planning Group (RPG) review in September 2023
  - This Tier 2 project is estimated to cost \$38.0 million and will require Certificate of Convenience and Necessity (CCN) filings
  - Estimated in-service date is January 2027
  - The project serves a new 129 MW load at the new Rio Medina substation
- STEC provided a project overview at the October RPG meeting
  - <https://www.ercot.com/calendar/10182023-RPG-Meeting>
- ERCOT provided Scope at the November RPG Meeting
  - <https://www.ercot.com/calendar/11142023-RPG-Meeting>



# Recap: Study Assumption

- Final 2022 Regional Transmission Planning (RTP) 2027 summer peak case for South and South Central (SSC) weather zones was used as the start case
- Transmission updates
  - Recently approved Tier 1 CPS San Antonio South Reliability Project was added
  - Recently approved Tier 2 Hondo Creek to Pearson 69-kV Transmission Line Rebuild Project was added
  - Recently approved Tier 4 Big Foot to Dilley Switch 138-kV Conversion Project was added
- Generation updates
  - None
- Load updates
  - Added the following Confirmed loads to the base case

Bus No	Substation Name	Load (MW)
5809	Dunlay	129.5
5355	Rafter	38.4

# Analysis Performed

- Reliability Assessment – Need Analysis
  - N-1, G-1+N-1, and X-1+N-1
  - Planned maintenance outage analysis (N-2 as a proxy for N-1-1)
- Initial Options Identified
- Options Evaluation
  - Reliability Analysis (N-1)
  - Planned Maintenance Outage Analysis
  - Long-Term Load Serving Capability Assessment
- Short-listed Options Identified

# 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	Voltage Violations	Thermal Overloads	Unsolved Power Flow
N-0 (P0)	None	None	None
N-1 (P1, P2-1, P7)	None	None	None
G-1+N-1 (P3)*	None	None	None
X-1+N-1 (P6-2)**	None	None	None
Total	None	None	None

\* G-1: JK Spruce generator

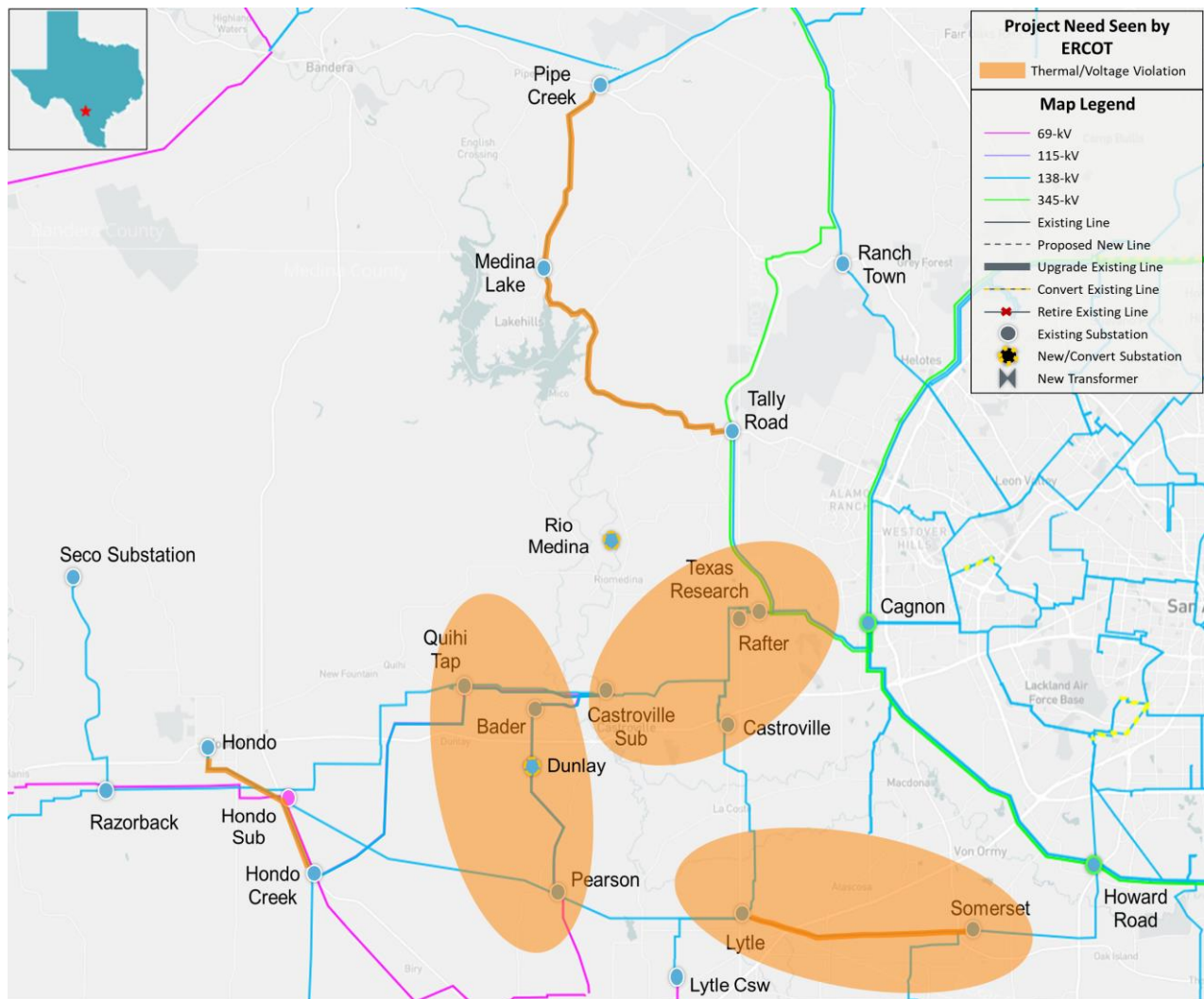
\*\* X-1: Cagnon 345/138-kV transformer

## Preliminary Results of Planned Maintenance Outage Analysis – Need Analysis

- ERCOT conducted planned maintenance outage analysis on base case with confirmed loads added to identify the project need
  - Load level in the South-South Central weather zone was scaled down to 83.7% of the summer peak load in the study base case based on ERCOT load forecast, historical load, and ratio of residential/commercial load from TSP, in order to mimic the non-summer peak load condition
  - N-2 contingencies were tested as a proxy for N-1-1
  - The transmission elements in the area of Rio Medina Project were monitored in the maintenance outage evaluation
- Planned maintenance outage analysis results

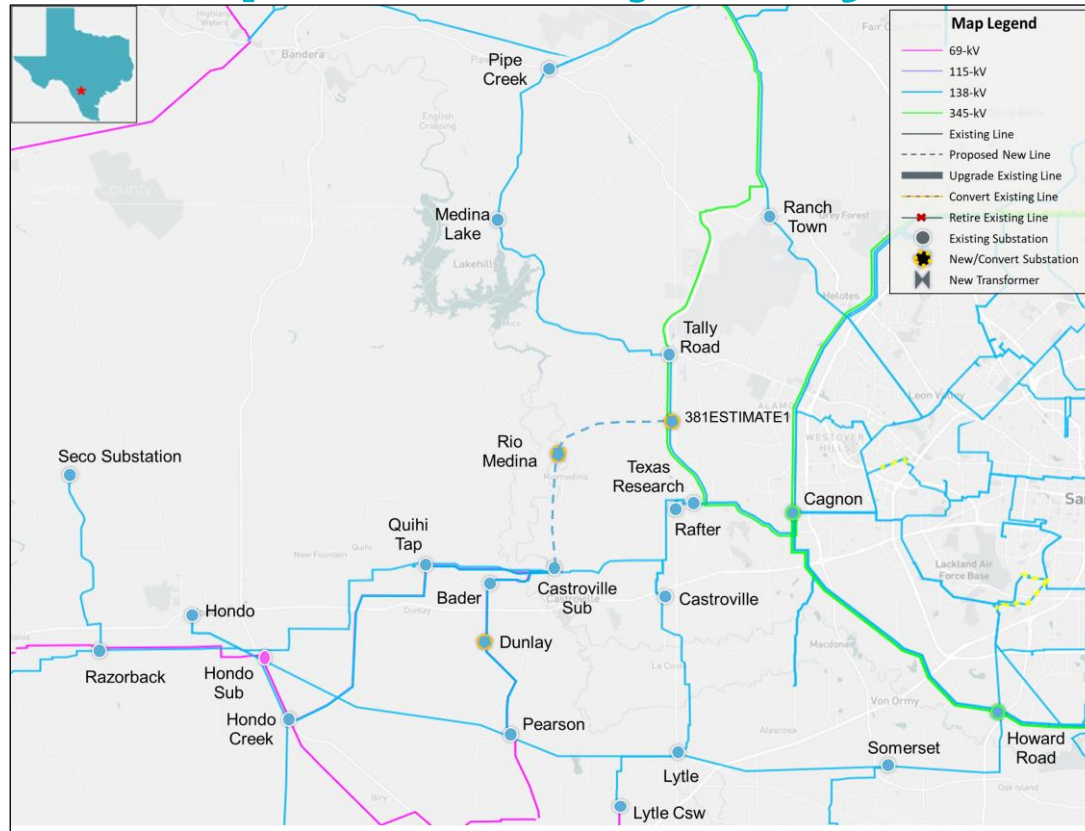
Thermal Overloads	Voltage Violations	Unsolved Power Flow
39.3 miles of 138-kV line	12	2

# Study Area Map with Project Need as Seen by ERCOT under Planned Maintenance Outage Scenarios



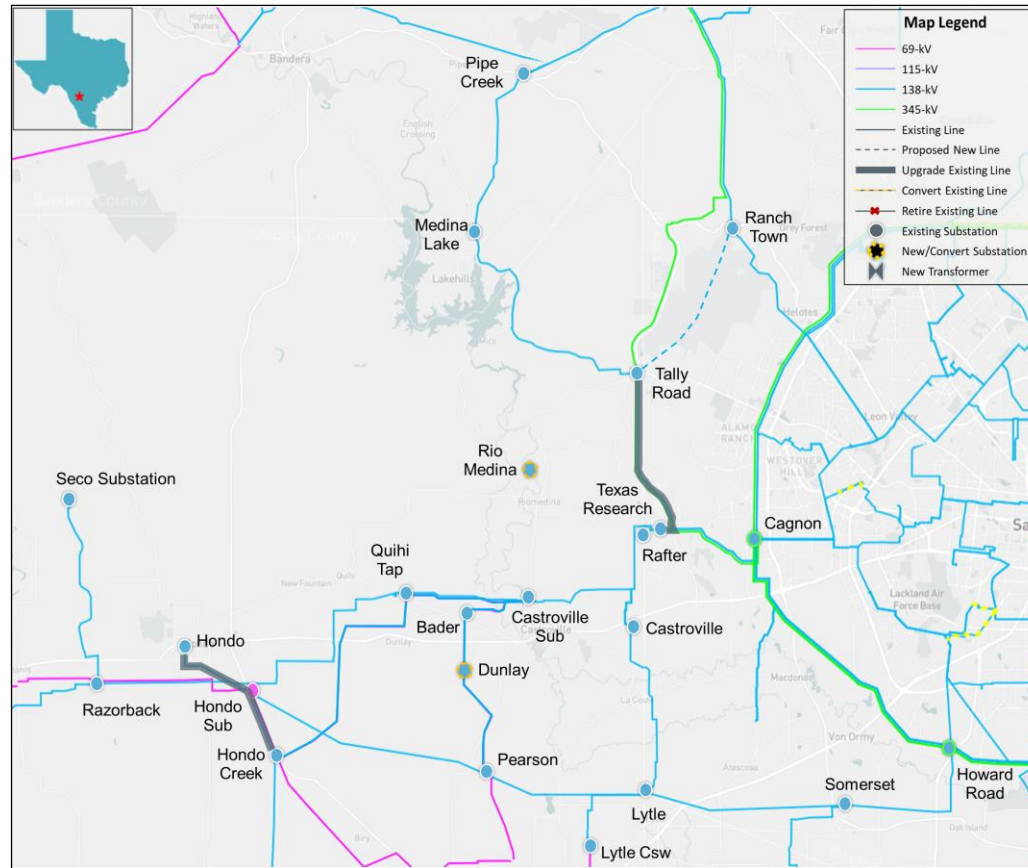


# Option 1 - Proposed Project by STEC



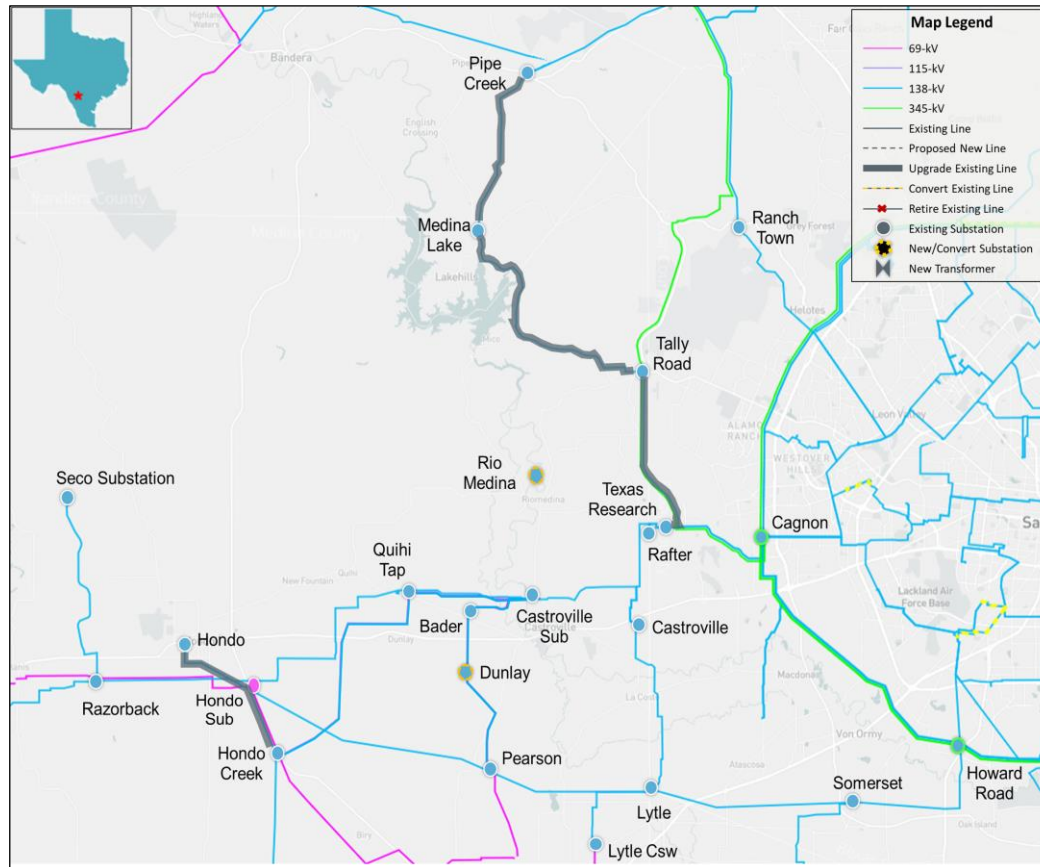
- Construct a new Rio Medina 138-kV substation
- Construct a new 4.5 miles Rio Media – Castroville Sub 138-kV single-circuit line on a double-circuit structure with at least 427 MVA normal rating and 474 MVA emergency rating
- Construct a new 381Estimate1 138-kV substation which cuts into the existing Texas Research and Tally Road 138-kV line
- Construct a new 8.8 miles Rio Media - 381Estimate1 138-kV single-circuit line on a double-circuit structure with at least 427 MVA normal rating and 474 MVA emergency rating

# Option 2



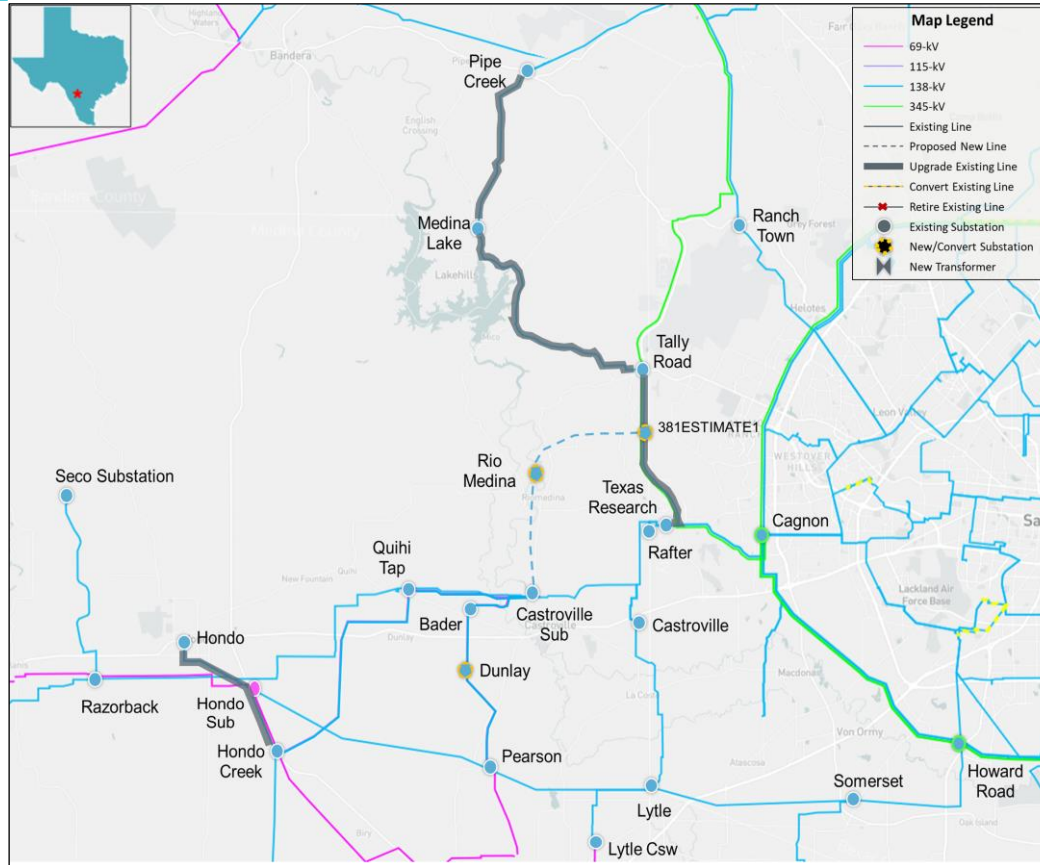
- Upgrade Hondo to Hondo Creek 138-kV line with at least 285 MVA normal rating and emergency rating
- Upgrade approximately 8 miles Tally Road to Texas Research 138-kV line with at least 469 MVA normal rating and emergency rating
- Construct a new approximately 9.5 miles Tally Road - Ranch Town 138-kV line with at least 469 MVA normal rating and emergency rating
- Add a Capacitor bank at Dunlay substation

# Option 3



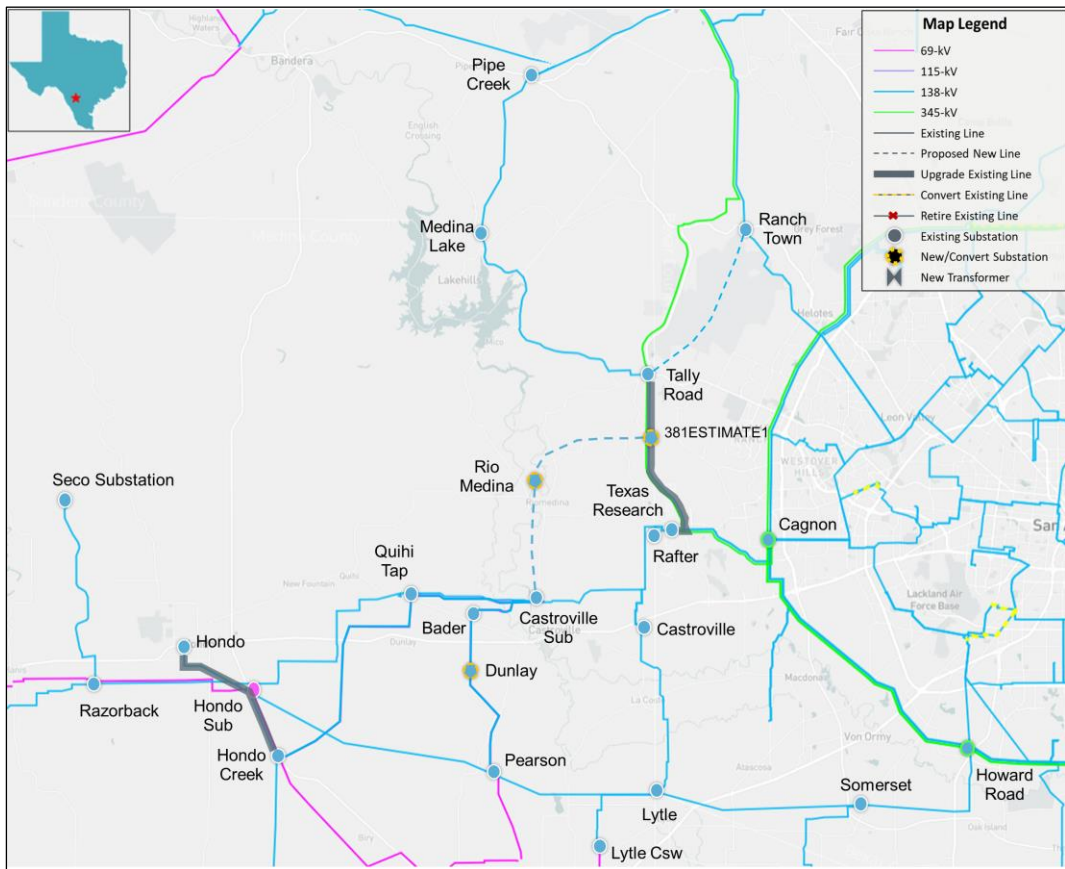
- Upgrade Hondo to Hondo Creek 138-kV line with at least 285 MVA normal rating and emergency rating
- Upgrade approximately 8 miles Tally Road to Texas Research 138-kV line with at least 469 MVA normal rating and emergency rating
- Upgrade approximately 8 miles Pipe Creek- Medina Lake and approximately 12.4 miles Medina Lake - Tally Road 138-kV line with at least 469 MVA normal rating and emergency rating
- Add a Capacitor bank at Dunlay substation

# Option 4



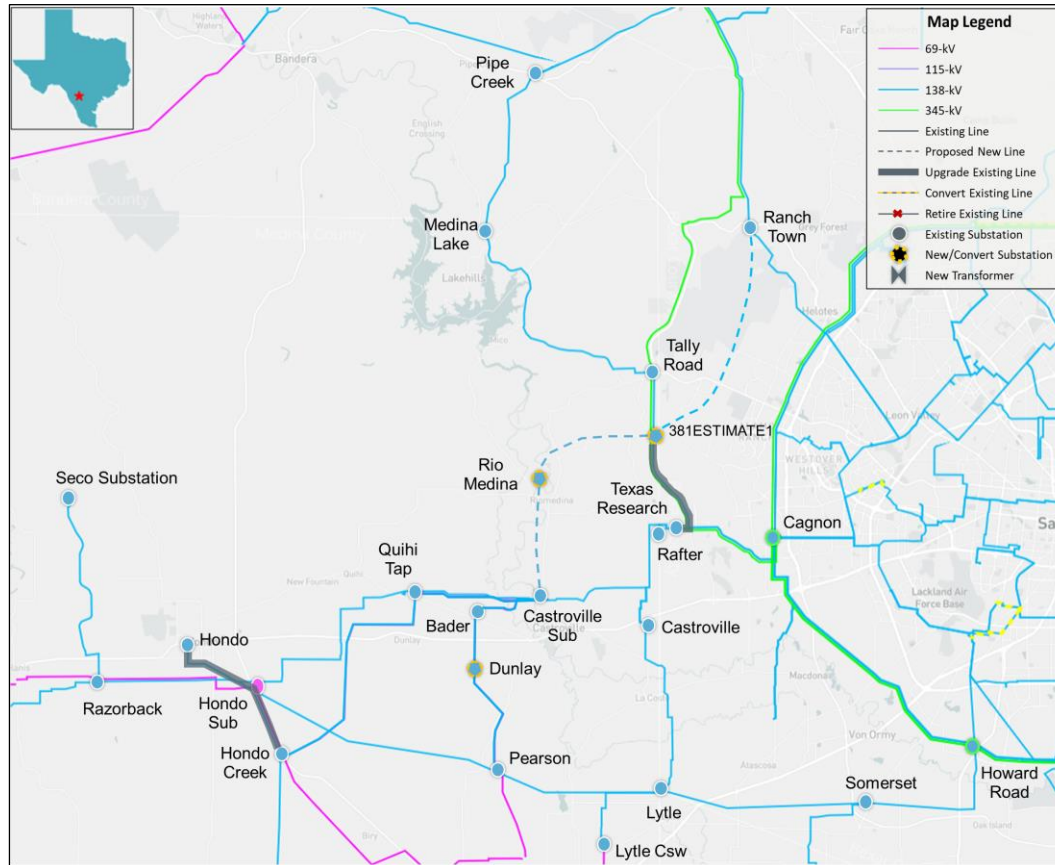
- Construct Rio Medina and 381Estimate1 138-kV substations. Construct Castroville Sub – Rio Medina 138-kV line and Rio Medina – 381Estimate1 138-kV lines with at least 427 MVA normal rating and 474 MVA emergency rating
- Upgrade Hondo to Hondo Creek 138-kV line with at least 285 MVA normal rating and emergency rating
- Upgrade approximately 3 miles Tally Road to 381Estimate1 and approximately 5 miles 381Estimate1 to Texas Research 138-kV lines with at least 469 MVA normal rating and emergency rating
- Upgrade approximately 8 miles Pipe Creek- Medina Lake and approximately 12.4 miles Medina Lake - Tally Road 138-kV line with at least 469 MVA normal rating and emergency rating
- Add a Capacitor bank at Dunlay substation and Rio Medina substation

# Option 5



- Construct Rio Medina and 381Estimate1 138-kV substations. Construct Castroville Sub – Rio Medina 138-kV line and Rio Medina – 381Estimate1 138-kV lines with at least 427 MVA normal rating and 474 MVA emergency rating
- Upgrade Hondo to Hondo Creek 138-kV line with at least 285 MVA normal rating and emergency rating
- Upgrade approximately 3 miles Tally Road to 381Estimate1 and approximately 5 miles 381Estimate1 to Texas Research 138-kV lines with at least 469 MVA normal rating and emergency rating
- Construct a new approximately 11 miles Tally Road - Ranch Town 138-kV line with at least 469 MVA normal rating and emergency rating
- Add a Capacitor bank at Dunlay substation

# Option 6



- Construct Rio Medina and 381Estimate1 138-kV substations. Construct Castroville Sub – Rio Medina 138-kV line and Rio Medina – 381Estimate1 138-kV lines with at least 427 MVA normal rating and 474 MVA emergency rating
- Upgrade Hondo to Hondo Creek 138-kV line with at least 285 MVA normal rating and emergency rating
- Upgrade approximately 5 miles 381Estimate1 to Texas Research 138-kV line with at least 469 MVA normal rating and emergency rating
- Construct a new approximately 13 miles 381Estimate1 - Ranch Town 138-kV line with at least 469 MVA normal rating and emergency rating
- Add a Capacitor bank at Dunlay substation

# Preliminary Results of Reliability Assessment - Options

	N-1		X-1 & N-1*		G-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
Option 4	None	None	None	None	None	None
Option 5	None	None	None	None	None	None
Option 6	None	None	None	None	None	None

\* G-1: JK Spruce generator

\*\* X-1: Cagnon 345/138-kV transformer

# Preliminary Results of Planned Maintenance Outage Analysis - Options

- ERCOT conducted planned maintenance outage analysis on the six options to determine relative performance between the options

	Thermal Violations	Voltage Violations	Unsolvable Contingencies
Option 1	6	6	0
Option 2	4	14	0
Option 3	2	6	2
Option 4	1	0	0
Option 5	0	0	0
Option 6	0	0	0

- Based on the results in the above table Option 5 and Option 6 were selected for further evaluation



# Preliminary Results of Long-Term Load Serving Capability Assessment

- Assumptions
  - Adjusted load up in the study area, excluding flexible loads in the area
  - Adjusted conforming load down outside of study area to balance power
  - Based on N-1 contingency
- Preliminary Findings
  - Option 6 provides more load serving capability than option 5

Option	Incremental Load Serving Capability (MW)
5	419 MW
6	447 MW

# Next Steps and Tentative Timeline

- Short-listed Options
  - Cost estimates and feasibility assessment
- Congestion Analysis
  - Congestion analysis will 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
  - Status update at the February RPG meeting
  - Final recommendation – Q1 2024

*Thank you!*



Stakeholder comments also welcomed through:

[Abishek.Penti@ercot.com](mailto:Abishek.Penti@ercot.com)

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

# Appendix – New Transmission Projects Added

TPIT No	Project Name	Tier	Project ISD	TSP	From County
22RPG048	San Antonio South Reliability Project	Tier 1	Jun-27	CPS	Bexar, Atascosa
22RPG022	Hondo Creek to Pearson 69 kV Transmission Line Rebuild Project	Tier 2	Dec-23, Jun-24	STEC	Medina
23RPG024	Big Foot to Dilley Switch 138 kV Conversion	Tier 4	Aug-26	AEPSC	Frio
67992	CPSE_345KV_Howard_Switching_Station	Tier 3	Feb-24	CPS	Bexar
68266	Dry Frio: Build new 138 kV station	Tier 4	May-24	AEP TNC	Uvalde
70536	New 138 kV Verde Circle Substation	Tier 4	Oct-24	CPS	Bexar
72500	Rio Lago - New 138kV Substation	Tier 4	Nov-24	BEC	Bandera
72268	CPSE_New Ingram Rd Substation	Tier 4	May-25	CPS	Bexar
76576	Asherton to Uvalde: Convert to 138 kV	Tier 3	May-25	AEP TCC	Dimmit
76580	Poblano: Build new 138 kV station	Tier 3	May-25	AEP TCC	Uvalde
71873	CPSE_Hill Country Auto# 2 Impedance Upgrade	Tier 4	Sep-25	AEP	Medina
73063	Big Foot to Lytle: Convert to 138 kV	Tier 4	Sep-25	AEP	Medina
67915	Asherton to West Basteville 138 kV line Rebuild	Tier 3	Dec-26	BEC	Dimmit
71871	CPSE_Cagnon to Shepherd Rd Rebuild Phase A	Tier 4	May-23	CPS	Bexar

# Appendix – New Generation Projects Added

GINR	Project Name	Fuel	Projected COD	Capacity (MW)	County
21INR0395	SunRay	Solar	05/23/2024	200	Uvalde
22INR0368	Padua Grid BESS	Battery	12/31/2024	51.39	Bexar
22INR0422	Ferdinand Grid BESS	Battery	05/31/2026	202.65	Bexar
23INR0381	Soportar ESS	Battery	03/15/2025	102.11	Bexar