



## **CPS – Eastside 345/138-kV Switching Station Project ERCOT Independent Review**

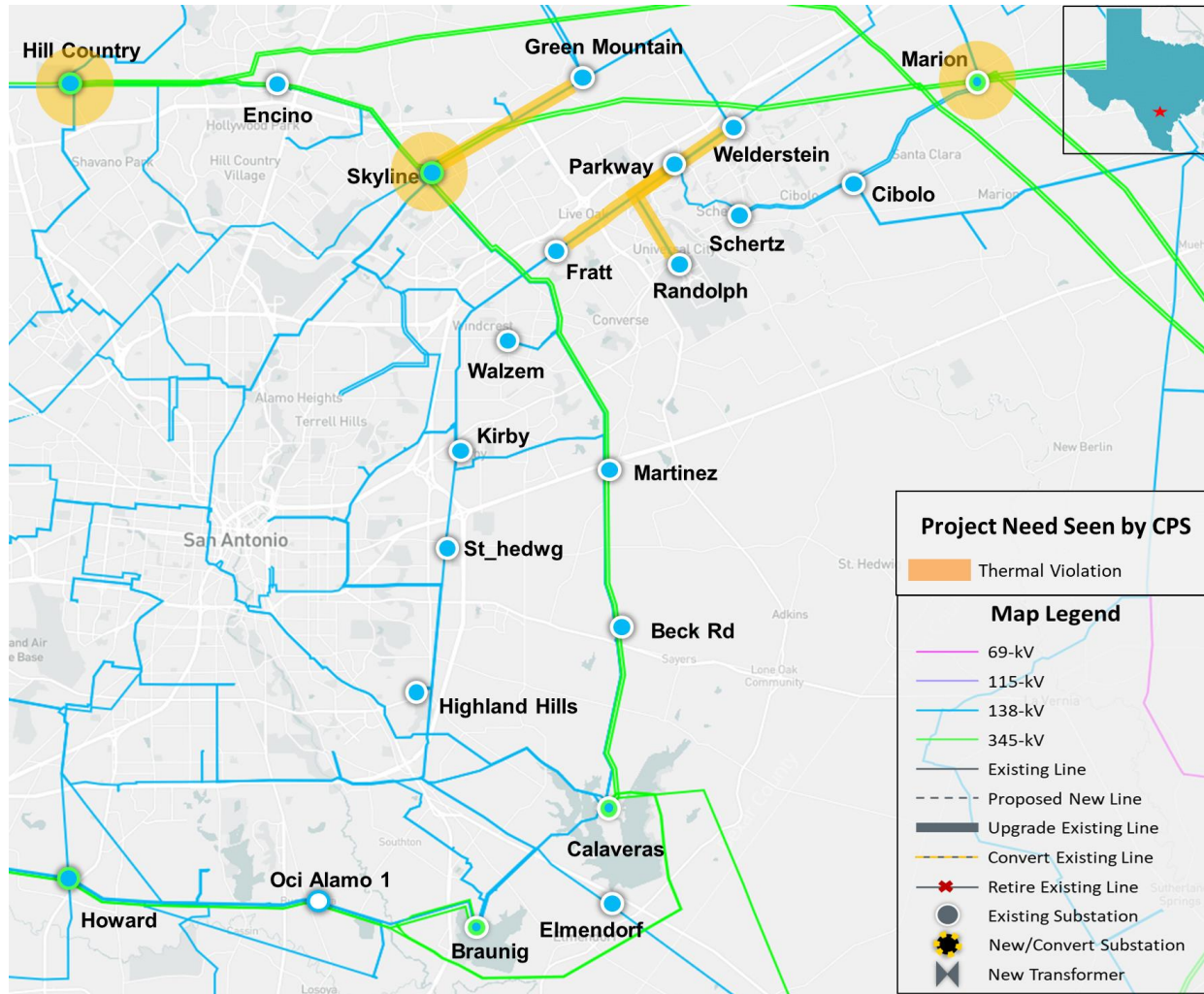
Abishek Penti

RPG Meeting  
June 11, 2024

# Recap

- CPS Energy (CPS) submitted the Eastside 345/138-kV Switching Station Project for Regional Planning Group (RPG) review in February 2024
  - This Tier 1 project is estimated to cost \$158 million and will require a Certificate of Convenience and Necessity (CCN)
  - Estimated in-service date is June 1, 2028
  - Addresses thermal overloads on 345/138-kV autotransformers and 138-kV transmission lines
- CPS provided an overview and ERCOT provided the study scope and status update at the March 2024 and May 2024 RPG Meetings
  - [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>
- This project is currently under ERCOT Independent Review (EIR)

# Recap - Study Area Map with Violations seen by CPS

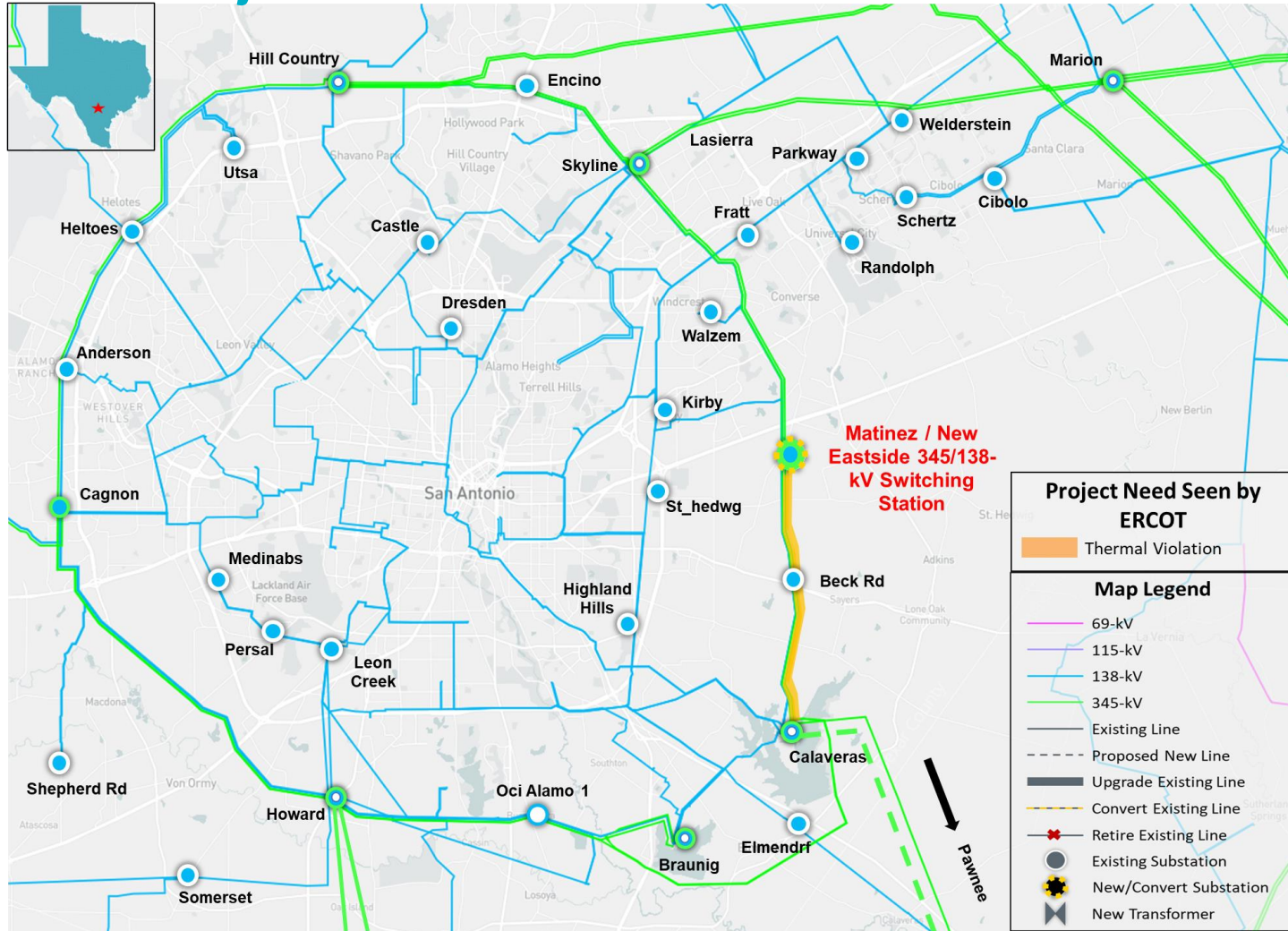


# Recap - Preliminary Results of Reliability Assessment – Base Case + San Antonio South Reliability II Project + 2023-SC10 RTP Placeholder Project

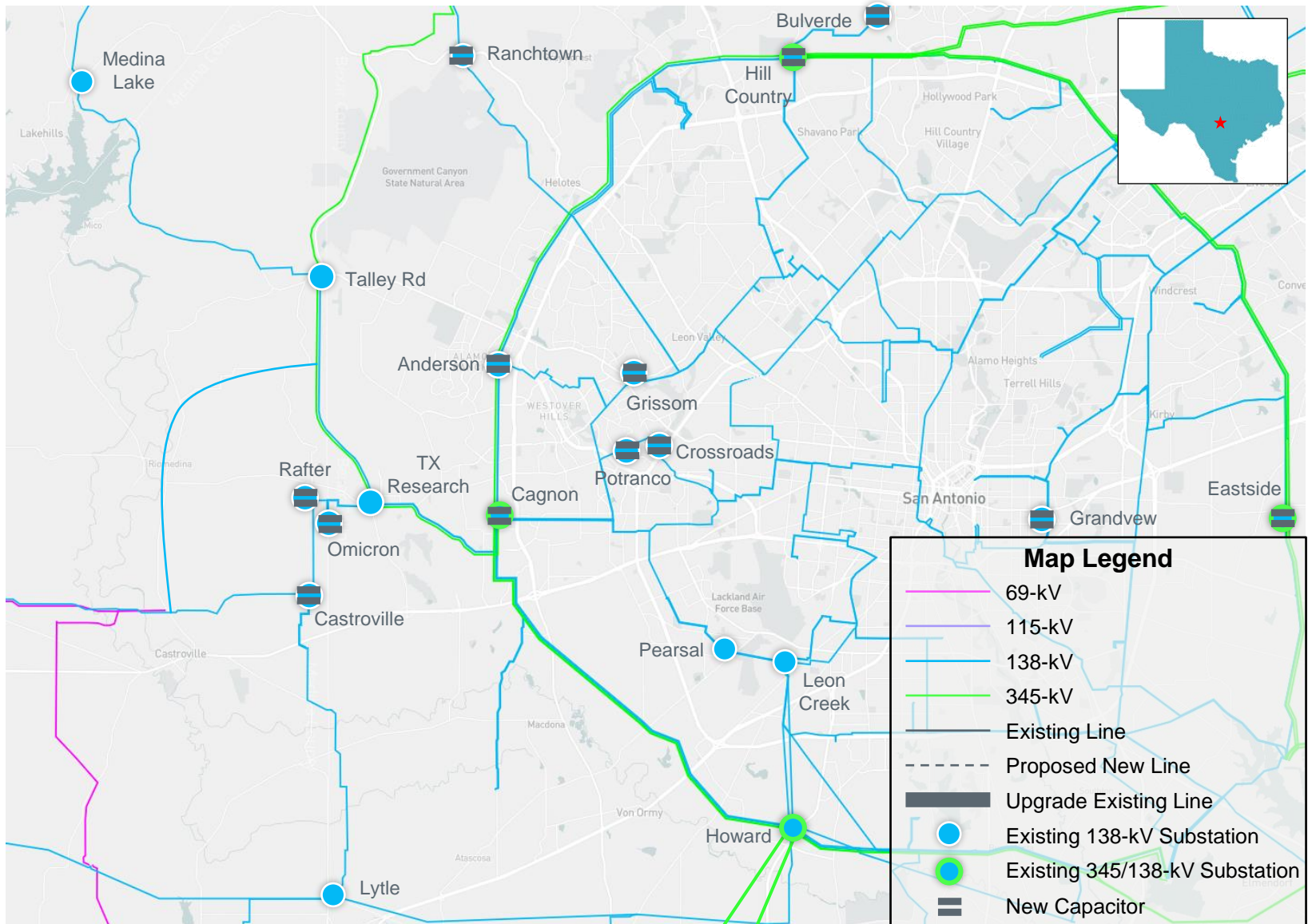
Contingency Category*	Unsolved Power Flow	Voltage Violations	Thermal Overloads
P1	None	None	2
P2, P4, P5	None	None	None
P3 (G-1+N-1)*	None	None	None
P6.2 (X-1+N-1)*	None	None	2
P7	None	None	None

\*See Appendix D for list of G-1 generators and X-1 transformers tested

# Recap - Preliminary Results of Reliability Assessment – Base Case + San Antonio South Reliability II Project + 2023-SC10 RTP Placeholder Project



# Adding Capacitors to Options

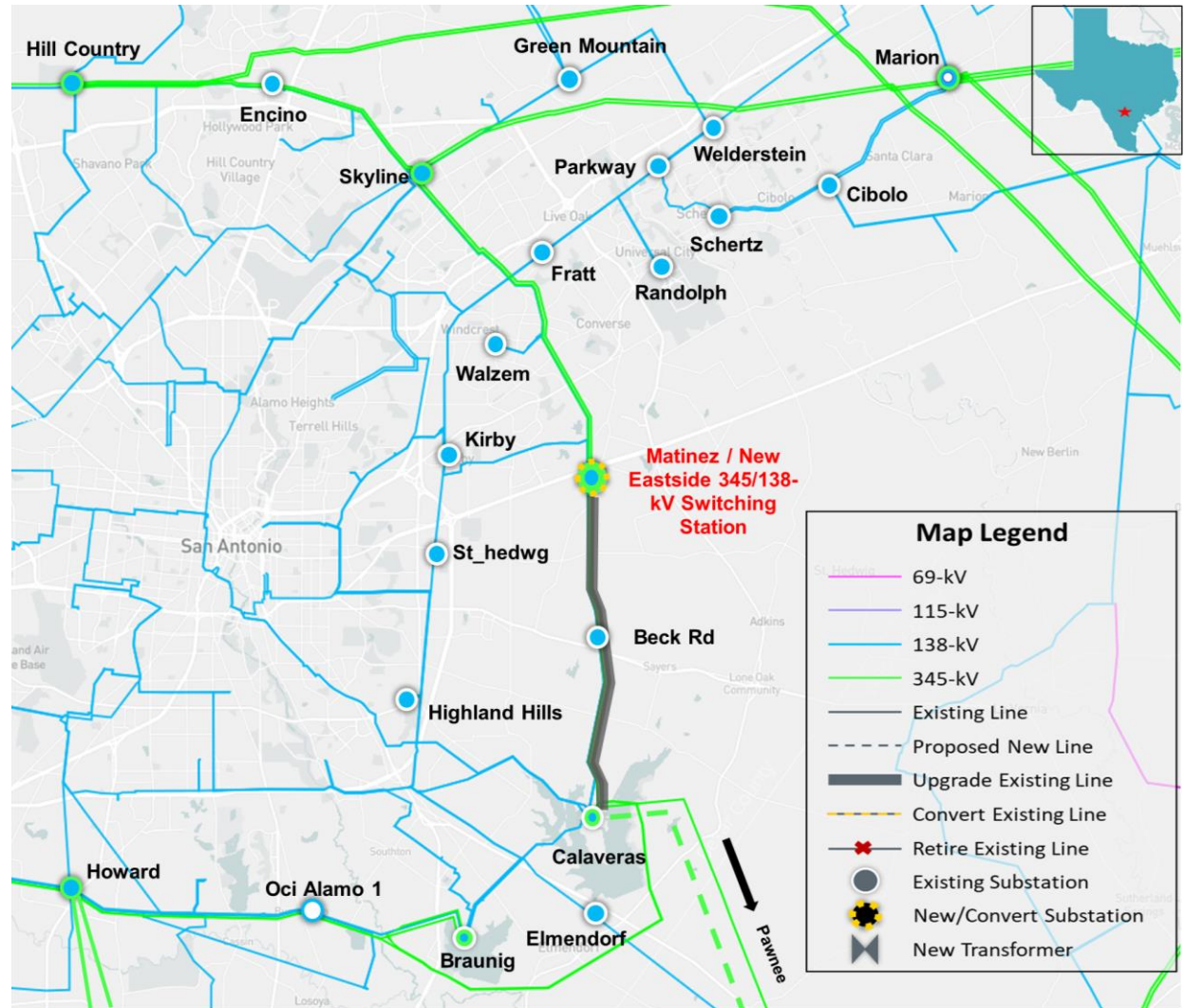


# Adding Capacitance to Options

Substation	MVAR
Rafter	28.57
Cagnon Rd	50.00
Hill Country	50.00
Potranco	28.57
Ranchtown	28.57
Anderson	50.00
Grissom Rd	50.00
Castroville	28.57
Bulverde	14.3
Grandview	28.57
Omicron	42.85
Eastside	50.00
Crossroads	28.57

# Option 1 – Project Proposed by CPS

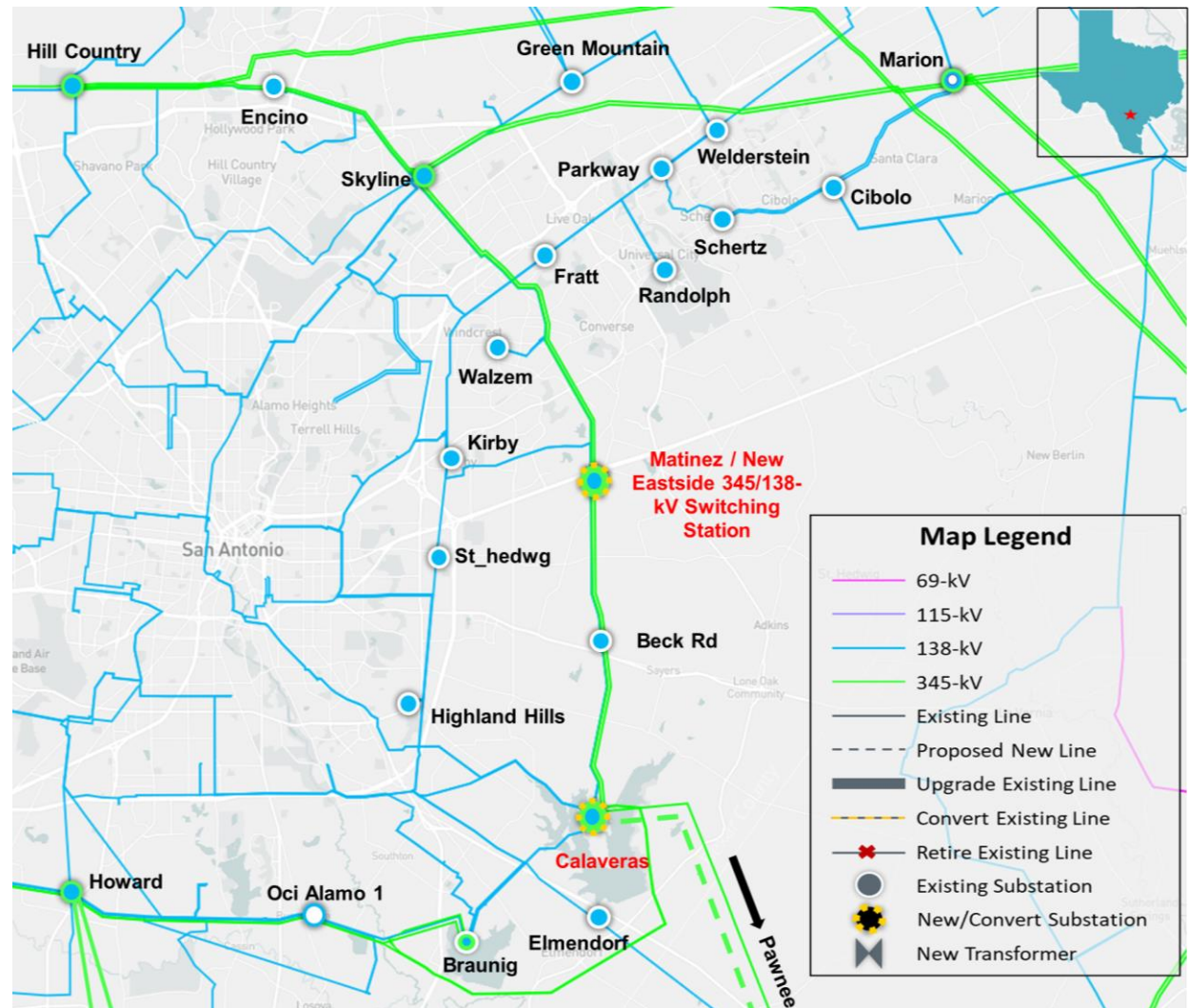
- Construct a new Eastside 345/138-kV switching station North of Beck Road substation
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the new Eastside 345/138-kV switching station
- Loop Spruce to Skyline 345-kV Circuit 1 and Circuit 2 into the new Eastside 345-kV station
- Loop Deely to Martinez, Deely to Walzem, Beck to Kirby and Sommers to Kirby 138-kV transmission lines into the new Eastside 138-kV station
- Rebuild the 345-kV Spruce – new Eastside switching station circuit 1 and circuit 2 in existing easement with a rating of 2347 MVA or greater, approximately 9.8-mile
- Capacitor Additions





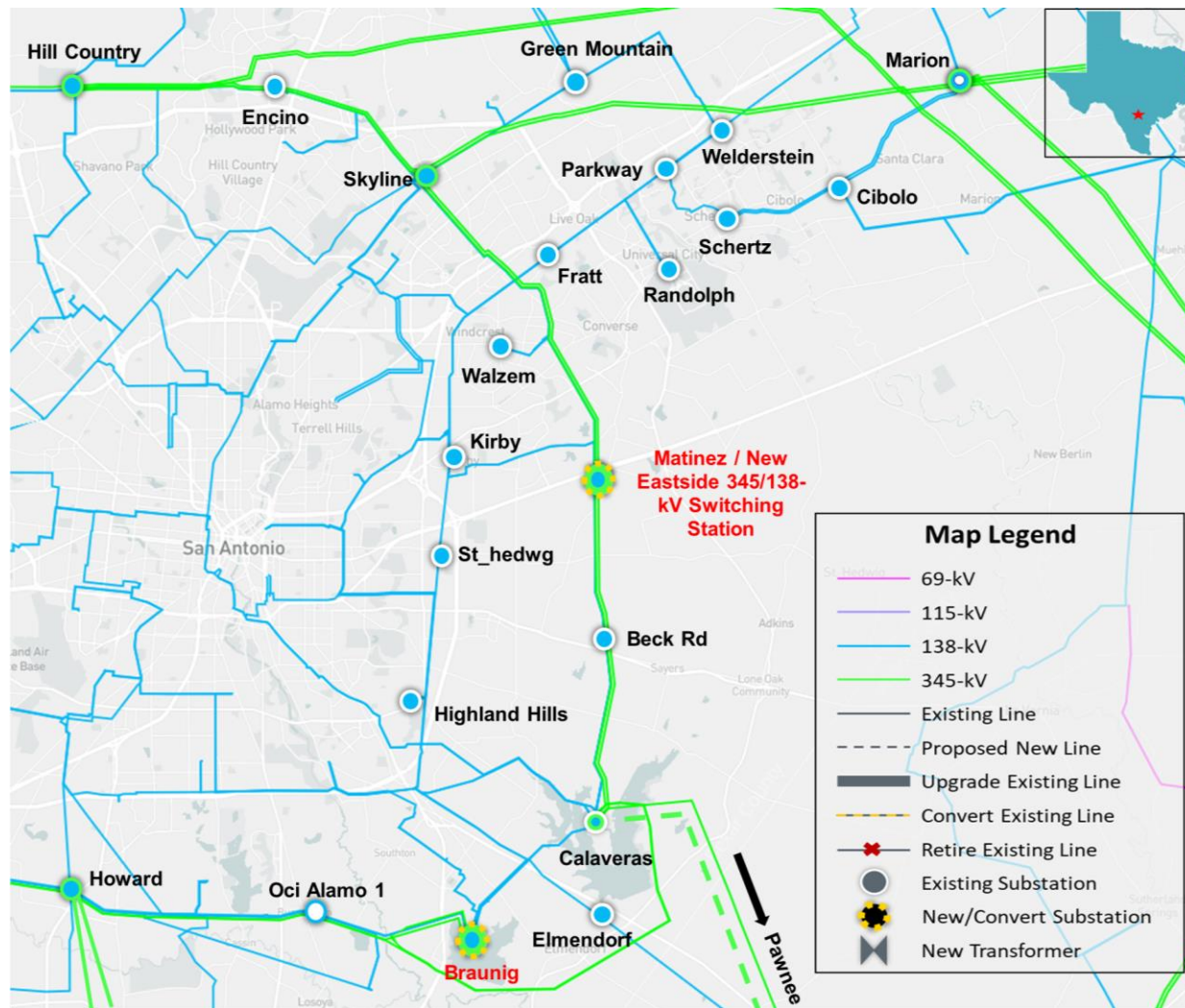
# Option 2 – Addition of Auto Transformers at Spruce

- Construct a new Eastside 345/138-kV switching station North of Beck Road substation
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the new Eastside 345/138-kV switching station
- Loop Spruce to Skyline 345-kV Circuit 1 and Circuit 2 into the new Eastside 345-kV station
- Loop Deely to Martinez, Deely to Walzem, Beck to Kirby and Sommers to Kirby 138-kV transmission lines into the new Eastside 138-kV station
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the Spruce 345-kV Substation to Deely 138-kV Substation
- Capacitor Additions



# Option 3 – Addition of Auto Transformers at Braunig

- Construct a new Eastside 345/138-kV switching station North of Beck Road substation
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the new Eastside 345/138-kV switching station
- Loop Spruce to Skyline 345-kV Circuit 1 and Circuit 2 into the new Eastside 345-kV station
- Loop Deely to Martinez, Deely to Walzem, Beck to Kirby and Sommers to Kirby 138-kV transmission lines into the new Eastside 138-kV station
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the Van Rose 345-kV Substation to Braunig 138-kV Substation
- Capacitor Additions



# 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

- All three options will be further evaluated

# Preliminary Results of Planned Maintenance Outage Analysis

- ERCOT conducted planned maintenance outage analysis on all Three options to compare relative performance of the options
  - Load level in the South Central Weather Zone was scaled down to 83.6% 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 Eastside 345/138-kV Station Project were monitored in the maintenance outage evaluation
- Planned maintenance outage analysis results for all Three options

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

# Cost Estimate and Feasibility Assessment

- Transmission Service Providers (TSPs) performed feasibility assessments and provided cost estimates for the options
  - Based on inputs from CPS, Option 2 and Option 3 are deemed infeasible due to physical space limitations

Option	Cost Estimates (\$M)	CCN Required (Miles)	Feasibility
1	~172	None	Yes
2	N/A*	None	No
3	N/A*	None	No

\* The estimated cost was not provided by CPS due to infeasibility

# ERCOT Preferred Option

- ERCOT preferred Option
  - Option 1 was selected as the preferred option because it
    - Addresses reliability violations
    - Was the only option deemed feasible by the TSP
    - Provides operational flexibility
    - Does not require a CNN

# Next Steps and Tentative Timeline

- ERCOT will continue to evaluate options and provide status updates at future RPG meetings
  - ERCOT may perform the following studies
    - 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
  - Generation and Load Scaling Sensitivity Analyses
    - Planning Guide Section 3.1.3(4)
  - Subsynchronous Resonance (SSR) Assessment
    - Nodal Protocol Section 3.22.1.3(2)
- Tentative timeline
  - Final recommendation – Q3 2024

*Thank you!*



Stakeholder comments also welcomed through:

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# Appendix A – Transmission Projects

- List of transmission projects added to study base case

TPIT No	Project Name	Tier	Project ISD	TSP	County
23RPG028	Rio Medina Project	Tier 2	1/1/2027	STEC	Medina
22RPG026	Wimberley Loop project	Tier 2	5/1/2027	PEC	Blanco, Hays
23RPG003	Eagle Ford Large Load Interconnection Project	Tier 3	12/4/2025	GVEC	DeWitt
23RPG004	Lockhart to Luling 69-kV Transmission Line Overhaul Project	Tier 4	6/30/2025	LCRA	Caldwell
23RPG015	Cuero Substation Upgrade Project	Tier 4	5/15/2024	LCRA	DeWitt
72500	Rio Lago - New 138kV Substation	Tier 4	11/30/2024	BEC	Bandera
72268	CPSE_New Ingram Rd Substation	Tier 4	5/1/2025	CPS	Bexar
73098	Castroville Cut-in 138 kV	Tier 2	5/30/2025	ETT TCC	Medina
71873	CPSE_Hill Country Auto# 2 Impedance Upgrade	Tier 3	6/1/2025	CPS	Bexar
73063	Big Foot to Lytle: Convert to 138 kV	Tier 4	9/20/2025	AEP TCC	Medina, Frio

# Appendix A – Transmission Projects (cont.)

TPIT No	Project Name	Tier	Project ISD	TSP	County
76242	Lytle: Build new 138 kV terminal	Tier 4	9/20/2025	AEP TCC	Medina
76768	Upgrade Pearson -Pearsall	Tier 4	12/1/2025	STEC	Frio, Medina
67992D	CPSE_345KV_Howard_Switching_Station,CPSE_Hamilton_to_MedCtr_Upgrade,CPSE_Medina_to_36th_Street_Upgrade	Tier 3	1/31/2026	CPS	Bexar
76790	Upgrade Pearsall Auto	Tier 4	5/1/2027	STEC	Frio
73417	LCRATSC_Schumansville_SheriffsPosse_StormHardening	Tier 4	15/5/2025	LCRA	Guadalupe , Comal
73793	LCRATSC_McCartyLaneEast_Zorn_TL_Storm_Hardening	Tier 4	15/5/2025	LCRA	Hays, Guadalupe

# Appendix B – Transmission Projects

- List of transmission projects removed from the study base case

TPIT No	Project Name	TSP	County
2023-SC5	Beck Road 345/138-kV Substation Expansion	CPS	Bexar
2023-SC19	South to Central Texas 345-kV Double-Circuit Line Additions	AEN, AEP, LCRA, ONCOR	San Patricio, Bee, Karnes, Wilson, Guadalupe, Comal, Hays, Travis, Williamson
2023-SC10	Wiseman 138-kV Substation Addition and CPS Multiple Cap Bank Additions	CPS	Bexar, Comal
2023-SC16	Hondo to Hondo Creek Switching Station 138-kV Line Upgrade	CPS, STEC	Medina
2023-SC20	Pearson - Natalia - Devine - Moore - Pearsall 69-kV Line Rebuild	STEC	Frio, Medina
2022-S3	Pearsall 138/69-kV Transformer Upgrade	STEC	Frio
2023-S3	Oaks Sub 138/69-kV Transformer Upgrade	STEC	Atascosa
2023-S4	Poteet Sub to Oaks Sub 69-kV Line Upgrade	STEC	Atascosa
2023-S5	Poteet Sub to Pearsall Switching Station 69-kV Line Upgrade	STEC	Atascosa, Frio
2023-S6	Rossville Substation Cap Bank Addition	STEC	Atascosa

# Appendix C – Generation Projects

- List of generation projects added to study base case

GINR	Project Name	Fuel	Project COD	Capacity (MW)	County
22INR0366	LIBRA BESS	OTH	03/30/2024	206.21	Guadalupe
22INR0422	Ferdinand Grid BESS	OTH	05/31/2026	202.65	Bexar
23INR0154	Ebony Energy Storage	OTH	04/30/2024	203.5	Comal
23INR0381	Soportar ESS	OTH	03/15/2025	102.11	Bexar
23INR0483	Rio Nogales CT1 Rotor Replacement	Gas	6/8/2023	3.10	Guadalupe
24INR0427	CPS AvR CT1 Rotor Replacement	GAS	02/15/2024	11.3	Bexar

## Appendix D – G-1 Generators and X-1 Transformers

G-1 Generators	X-1 Transformers
Spruce – CALAVER_JKS2	Hill Country – Ckt 1 345/138-kV
	San Miguel – Ckt 1 345/138-kV
	Skyline – Ckt 1 345/138-kV
	Martinez – Ckt 1 345/138-kV