



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

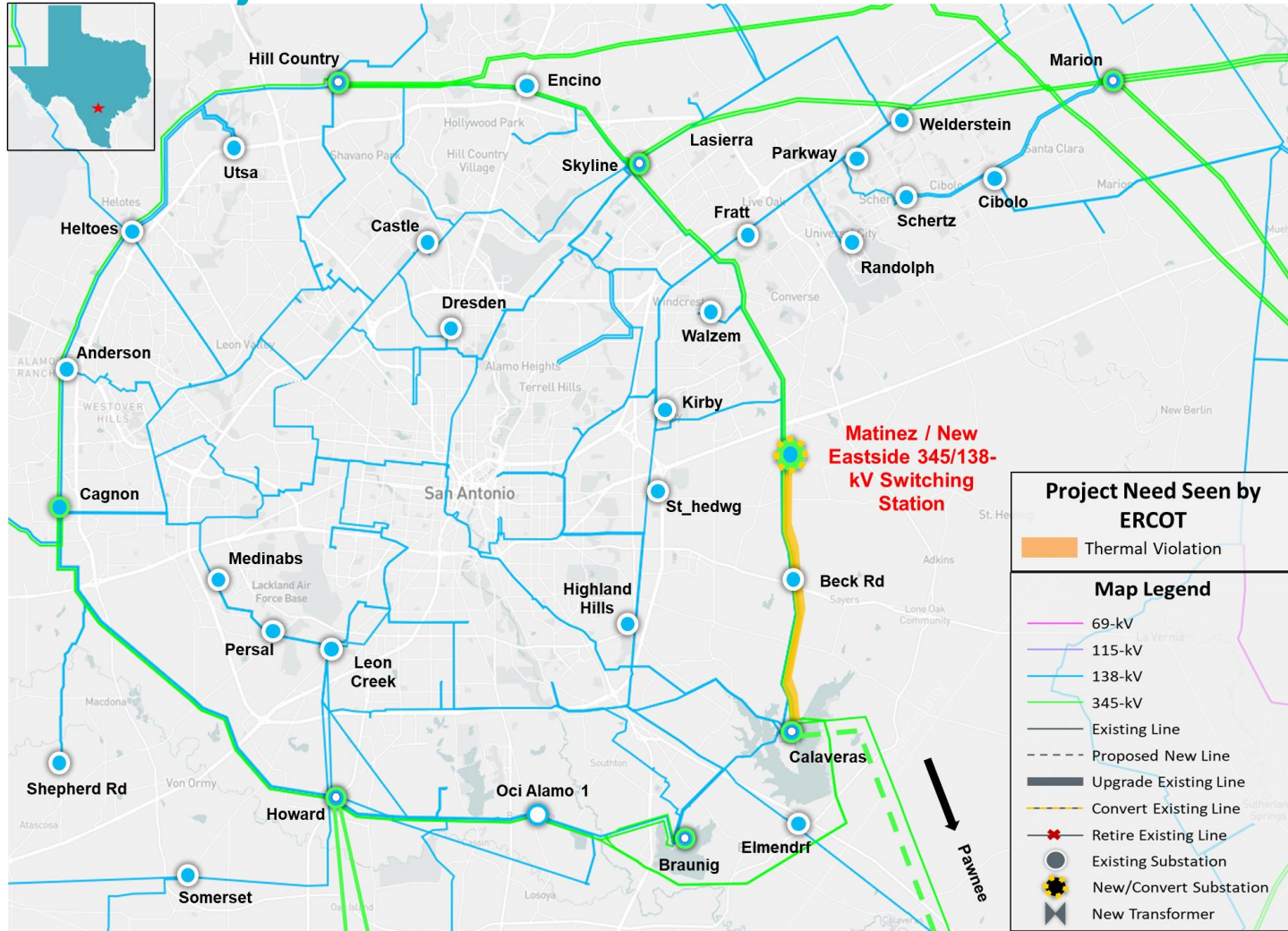
Robert Golen

RPG Meeting  
July 16, 2024

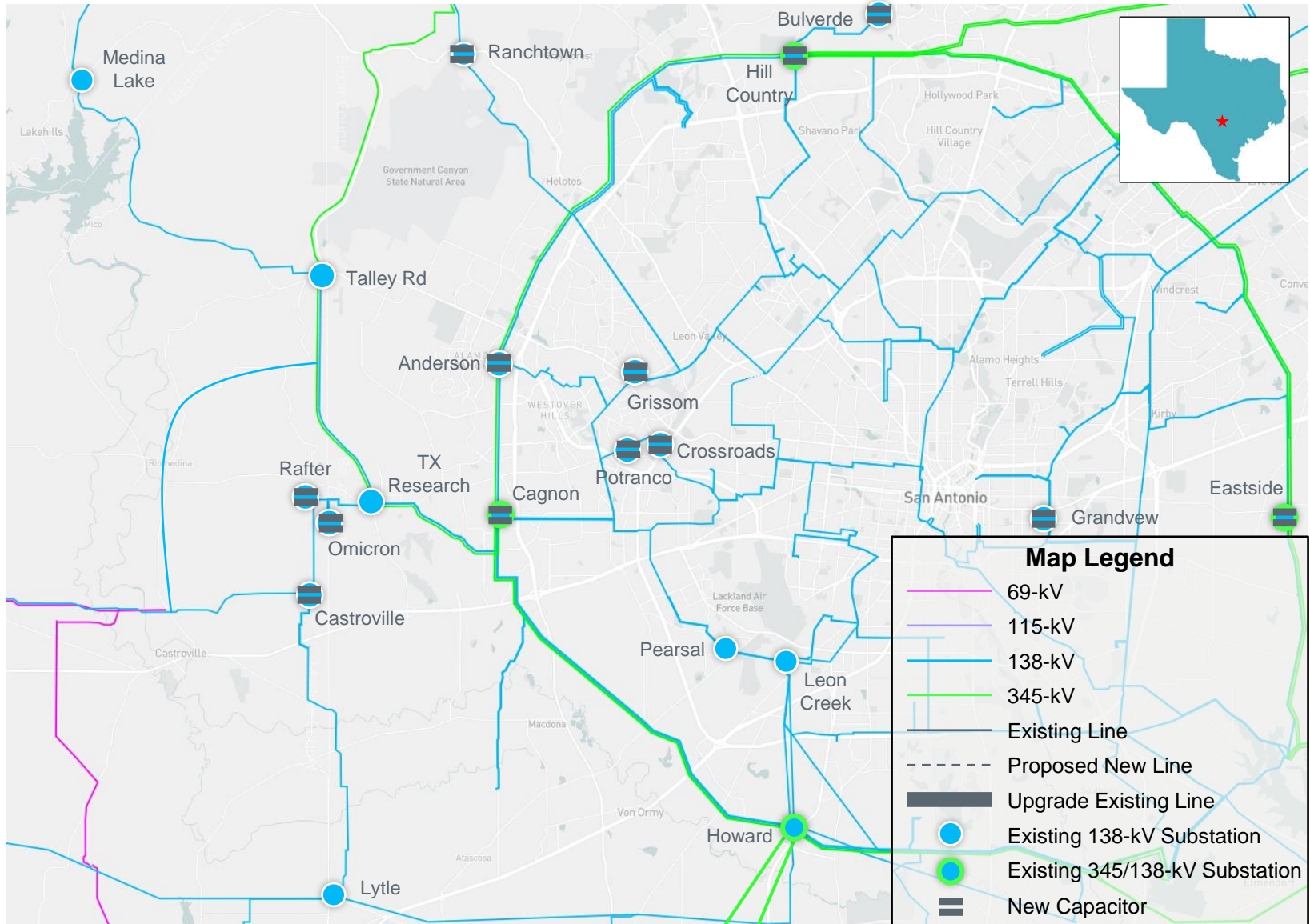
# Recap

- 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, May 2024 and June RPG Meetings
  - <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>
- This project is currently under ERCOT Independent Review (EIR)

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



# Recap - Adding Capacitors to Options

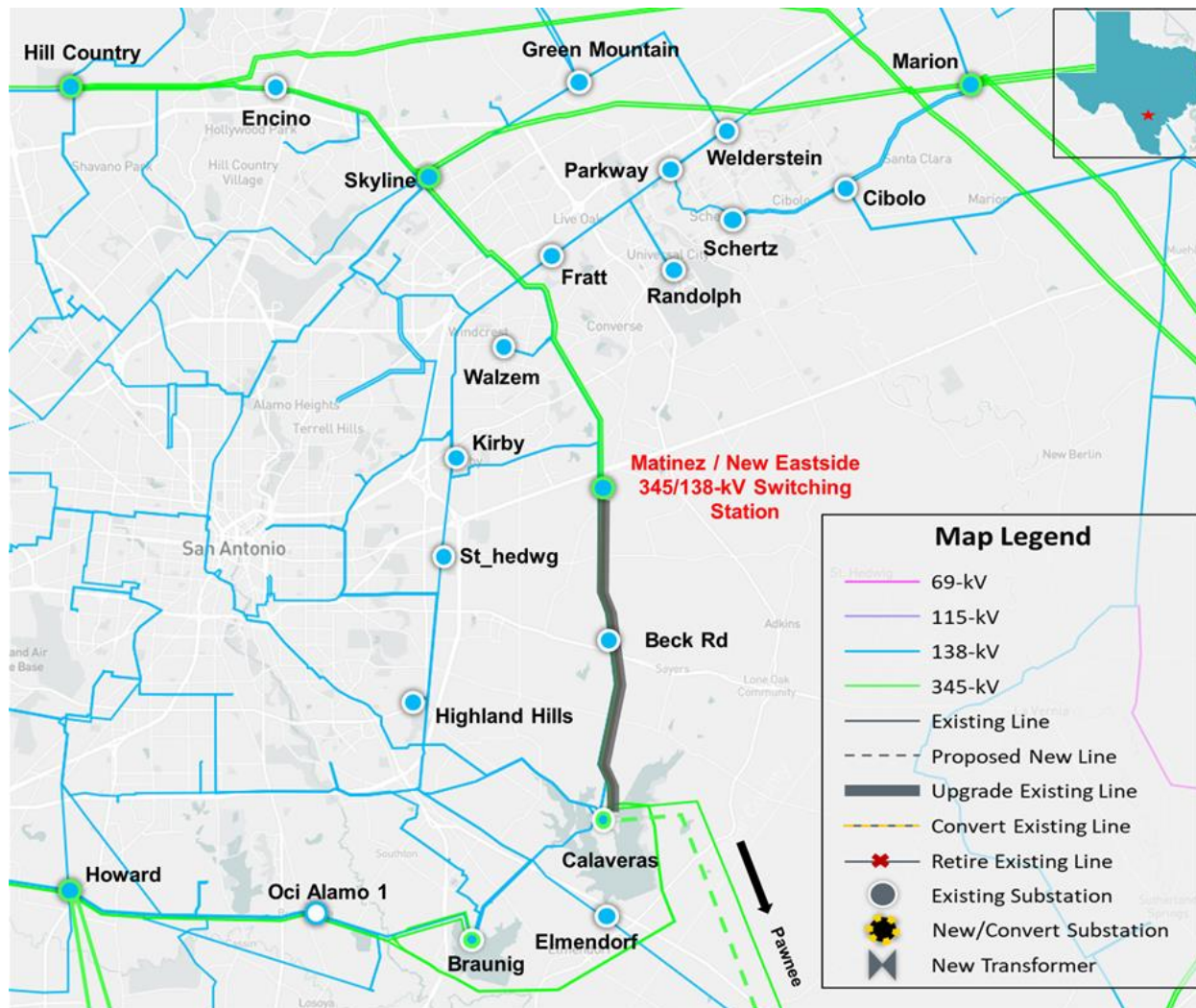


# Recap - Adding Capacitance to Options

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

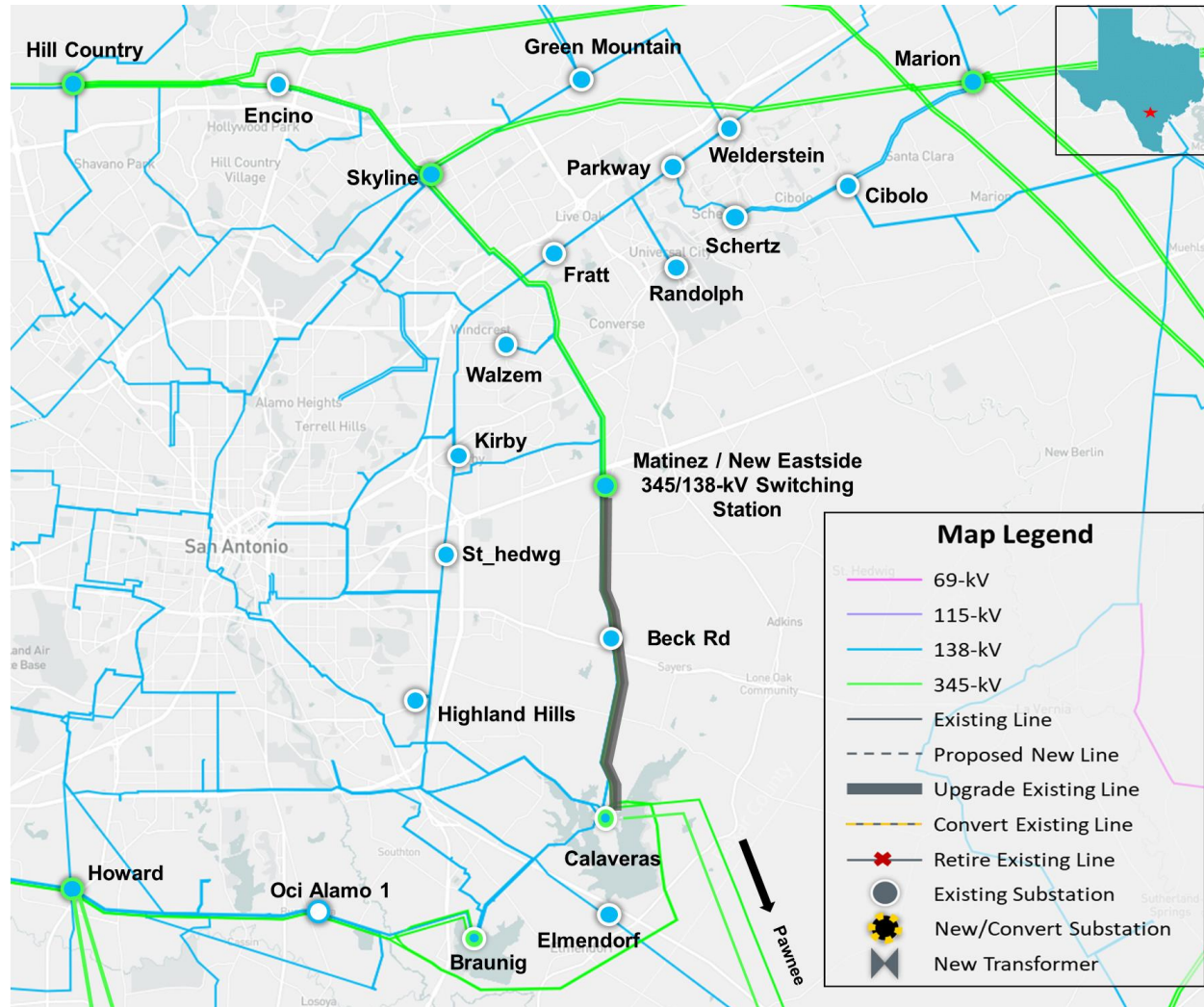
# Modified Option 1 – Project Proposed by CPS

- 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 Spruce to new Eastside switching station 345-kV transmission line circuit 1 and circuit 2 in existing easement with a rating of 2347 MVA or greater, approximately 9.8-mile



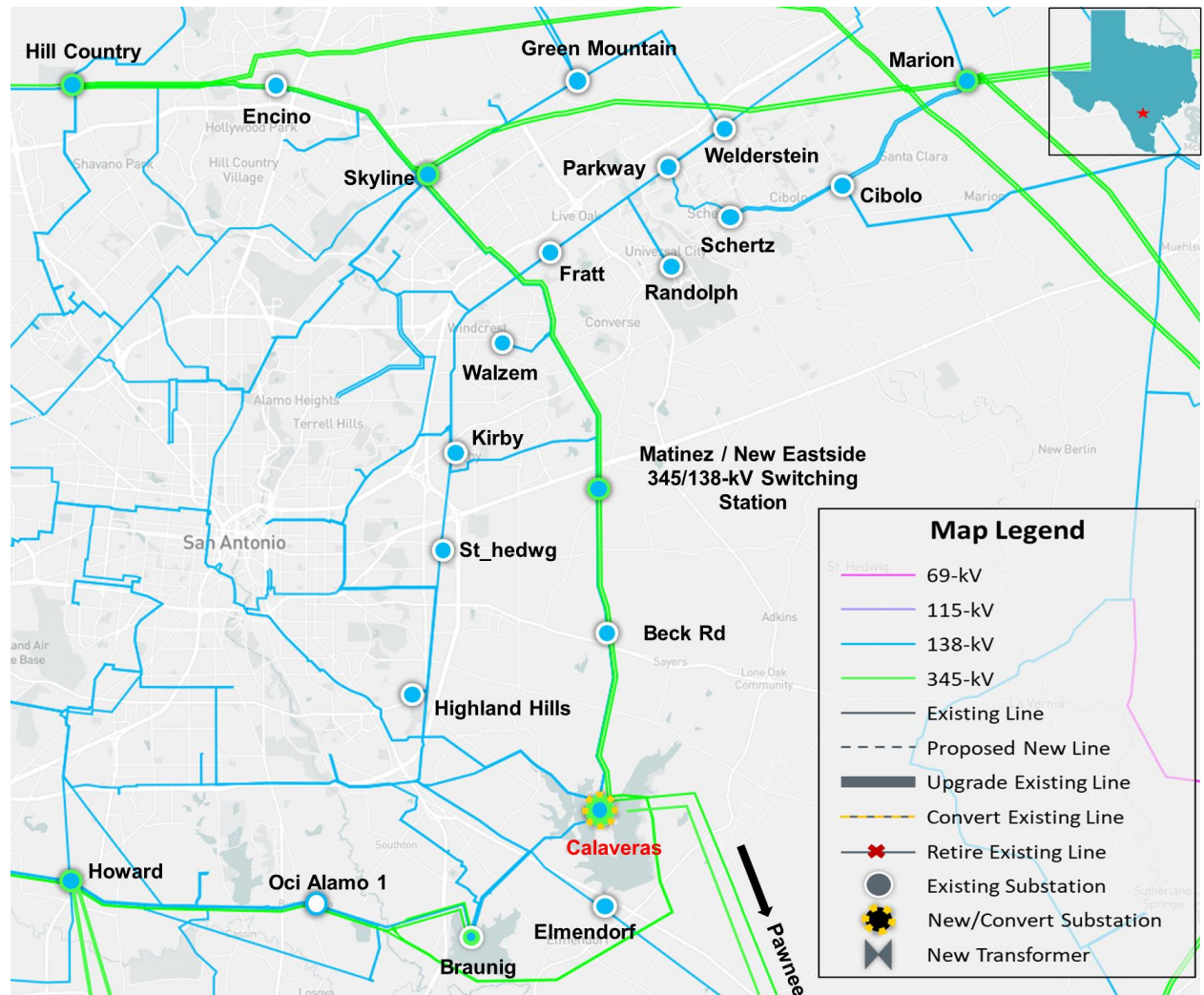
# Option 1A – ERCOT Modified Option

- Rebuild the Spruce to new Eastside switching station 345-kV transmission line circuit 1 and circuit 2 in existing easement with a rating of 2347 MVA or greater, approximately 9.8-mile



# Modified Option 2 – Addition of Auto Transformers at Spruce

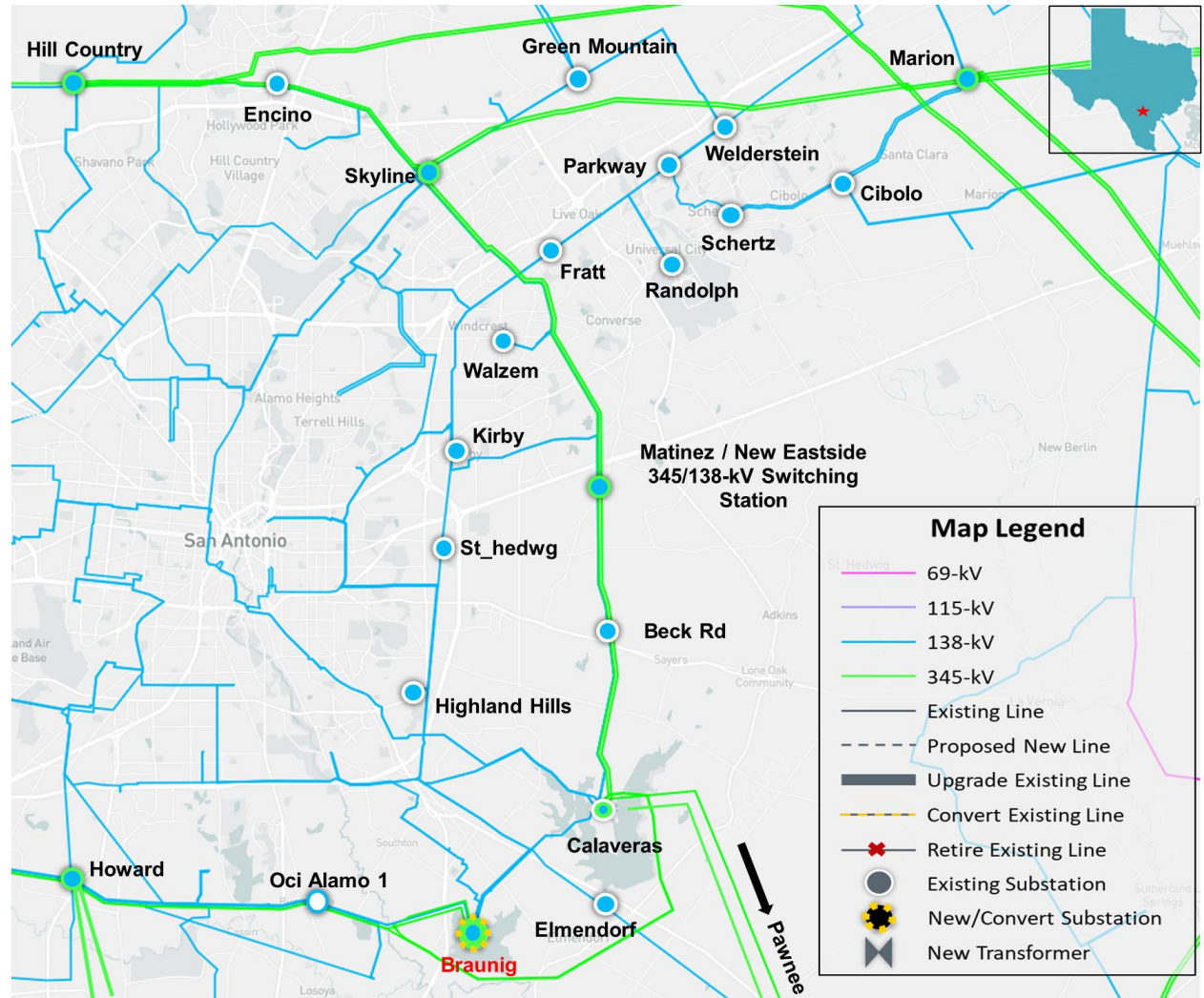
- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the Spruce 345-kV Substation to Deely 138-kV Substation





# Modified Option 3 – Addition of Auto Transformers at Braunig

- Install two 345/138-kV autotransformer with nameplate rating of 600 MVA at the Van Rose 345-kV Substation to Braunig 138-kV Substation



# Preliminary Results of Reliability Assessment – Options

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

- All four options will be further evaluated

# Preliminary Results of Planned Maintenance Outage Analysis

- ERCOT conducted planned maintenance outage analysis on all Four 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 Four options

Option	Unsolved Power Flow	Thermal Overloads	Voltage Violations
1	None	None	None
1A	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	Feasibility
1	~160*	Yes	Yes
1A	~47	No	Yes
2	N/A**	No	No
3	N/A**	No	No

\* Cost Estimate includes the addition of the Eastside Switching Station, which was captured in the San Antonio South Reliability II Project (23RPG032) and endorsed by ERCOT in April 2024

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

# ERCOT Preferred Option

- ERCOT preferred Option
  - Option 1A was selected as the preferred option because it:
    - Least cost option
    - Addresses reliability violations
    - Was deemed feasible by the TSP
    - Does not require a CNN
- Based on ERCOT independent review ERCOT will reclassify this RPG project to a Tier 3 project according to the ERCOT Protocol 3.11.4.3(1)(c)

# Sensitivity Analyses

- Generation Addition Sensitivity Analysis
  - ERCOT performed a generation addition sensitivity by adding new the generation listed below to the preferred option case. The additional resources were modeled following the 2024RTP methodology. ERCOT determined relevant generators do not impact the preferred option

GINR	Unit Name	Fuel Type	Capacity (MW)	County
21INR0391	Grandslam Solar	Solar	121.89	Atascosa
22INR0388	Cachi BESS	Battery	205.46	Guadalupe
23INR0207	El Patrimonio Solar	Solar	152.32	Bexar

- Load Scaling Sensitivity Analysis
  - 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 significant congestion within the study area
- Subsynchronous Resonance (SSR) Assessment
  - Subsynchronous Resonance (SSR) Assessment was conducted for the preferred option
  - ERCOT found no adverse SSR impacts to the existing and planned generation resources at the time of this study

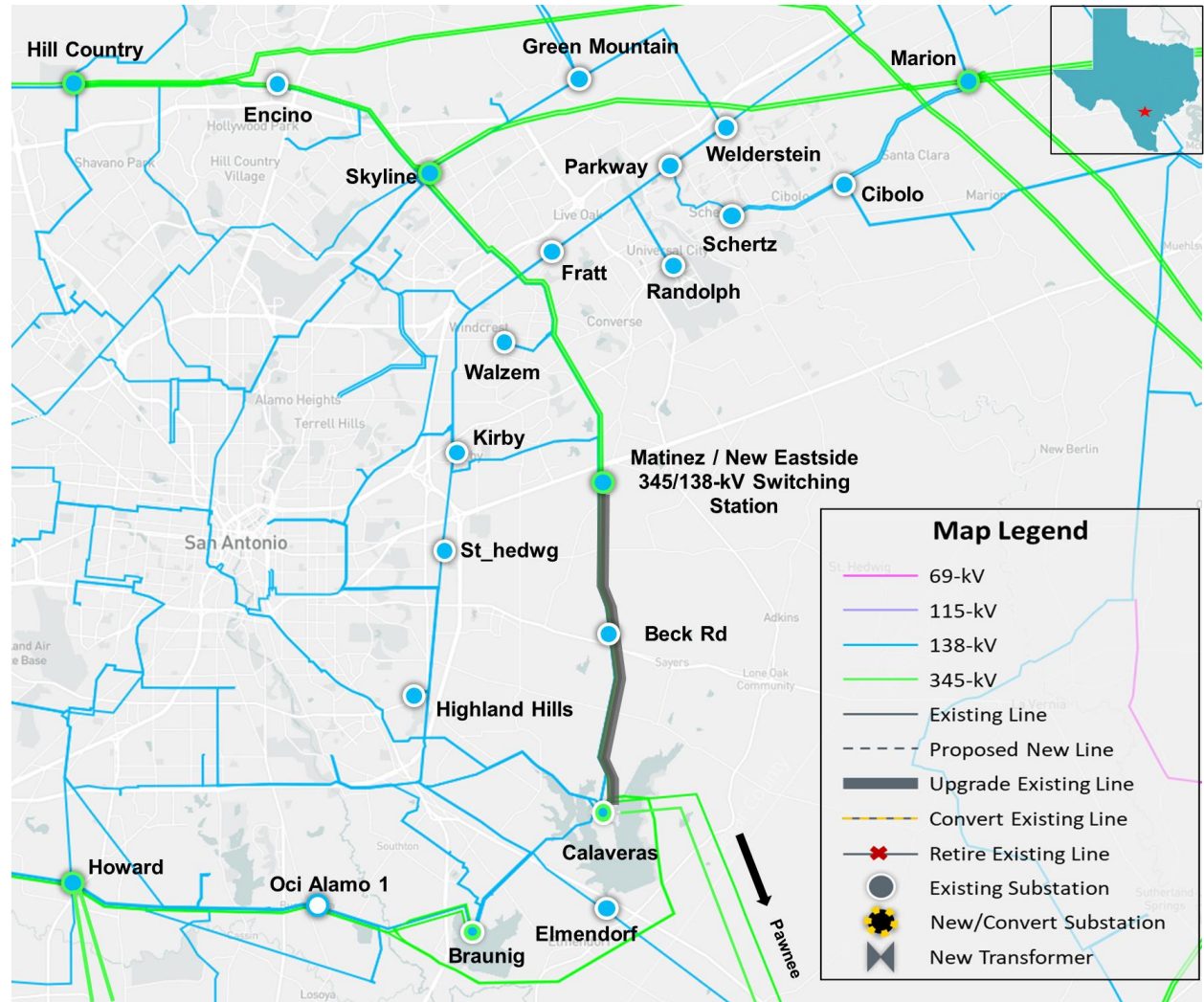
# ERCOT Recommendation

- ERCOT recommends Option 1A
  - Estimated Cost: approximately \$47.0 million
    - Cost estimate for the Eastside 345/138-kV Switching Station, two 345/138-kV autotransformer additions and looped service into the 138-kV network was captured in the San Antonio South Reliability II Project (23RPG032) and endorsed by ERCOT in April 2024
    - Cost estimate for the thirteen (13) capacitor bank additions is being captured in the CPS Omicron Reliability Project (24RPG004)
  - Expected In-Service Date: June 2028
- Based on ERCOT independent review ERCOT will reclassify this RPG project to a Tier 3 project according to the ERCOT Protocol 3.11.4.3(1)(c)



# ERCOT Recommended – Option 1A Map

- Rebuild the Spruce to new Eastside switching station 345-kV transmission line circuit 1 and circuit 2 in existing easement with a rating of 2347 MVA or greater, approximately 9.8-mile



# Next Steps and Tentative Timeline

- Tentative timeline
  - EIR report to be posted in the MIS in July 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 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 – Unit 1	Skyline – Ckt 1 345/138-kV
Guadalupe Gen CC1 (Gas 1, 2, and Steam 5)	Marion – Ckt 1 345/138-kV