



CPS Energy – San Antonio South Reliability Project – ERCOT Independent Review (EIR) Status Update

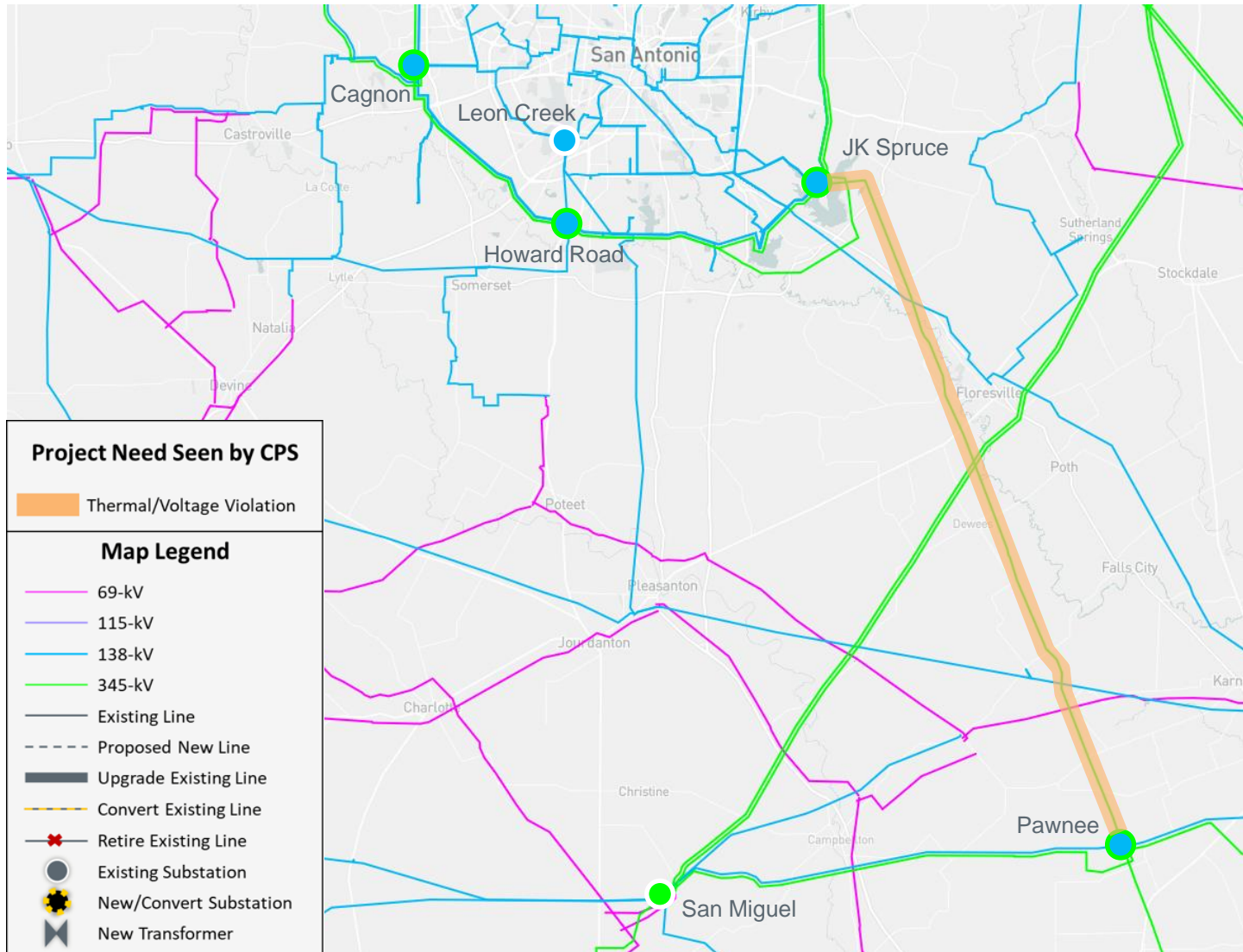
Caleb Holland

March 22, 2023

Recap

- CPS Energy (CPS) submitted the San Antonio South Reliability Project for Regional Planning Group (RPG) review in December 2022
 - This Tier 1 project is estimated to cost \$281 million and will require a Certificate of Convenience and Necessity (CCN)
 - Estimated in-service date
 - June 2027
 - Addresses thermal overloads in the San Antonio South area
 - CPS has expressed need for “critical status designation”
- CPS Provided an overview presentation and ERCOT provided the study scope at the January and February RPG Meetings
 - <https://www.ercot.com/calendar/01252023-RPG-Meeting>
 - <https://www.ercot.com/calendar/02142023-RPG-Meeting>
- This project is currently under ERCOT Independent Review (EIR)

Recap: Study Area Map with Project Need

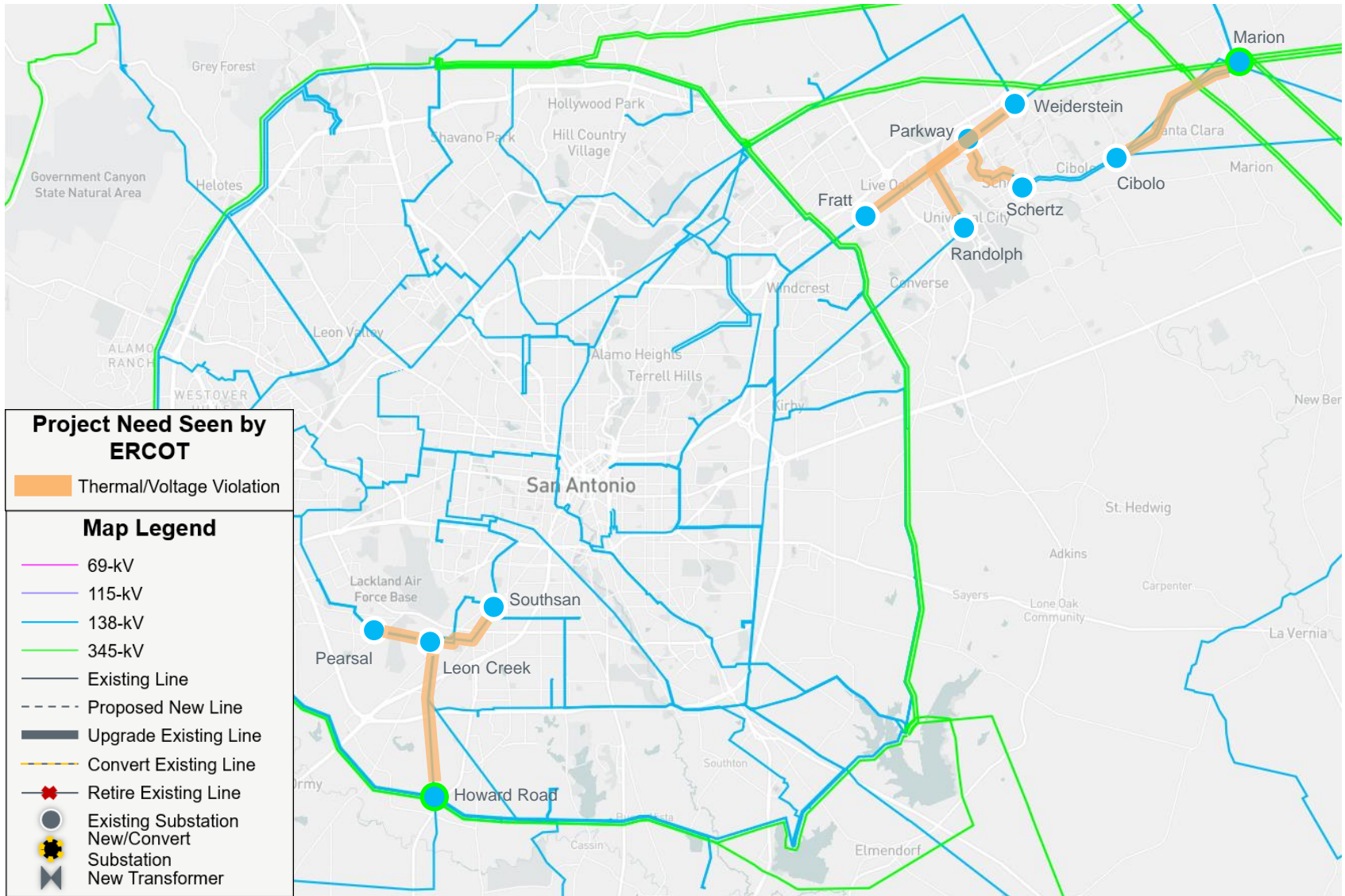


Preliminary Results of Reliability Assessment – Base Case

| Contingency Category* | Unsolved Power Flow | Voltage Violations | Thermal Overloads |
|-----------------------|---------------------|--------------------|-------------------|
| P1 | None | None | None |
| P2.1 | None | None | None |
| P3 (G-1+N-1)* | None | None | 6 |
| P6.2 (X-1+N-1)* | None | None | None |
| P7 | None | None | None |

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

Project Need as Seen by ERCOT – Base Case



Project Need Seen by ERCOT

Thermal/Voltage Violation

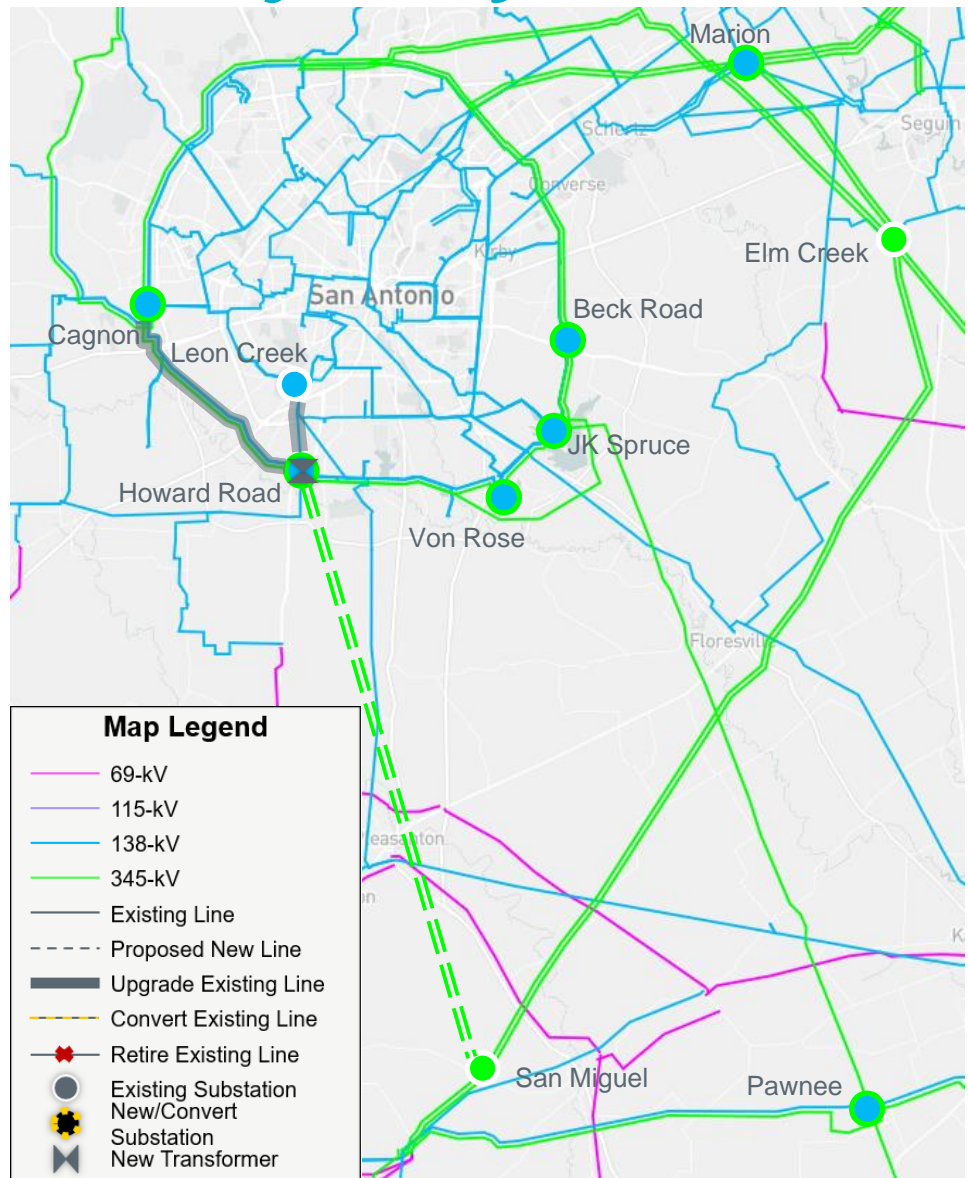
Map Legend

- 69-kV
- 115-kV
- 138-kV
- 345-kV
- Existing Line
- Proposed New Line
- Upgrade Existing Line
- Convert Existing Line
- Retire Existing Line
- Existing Substation
- New/Convert Substation
- New Transformer



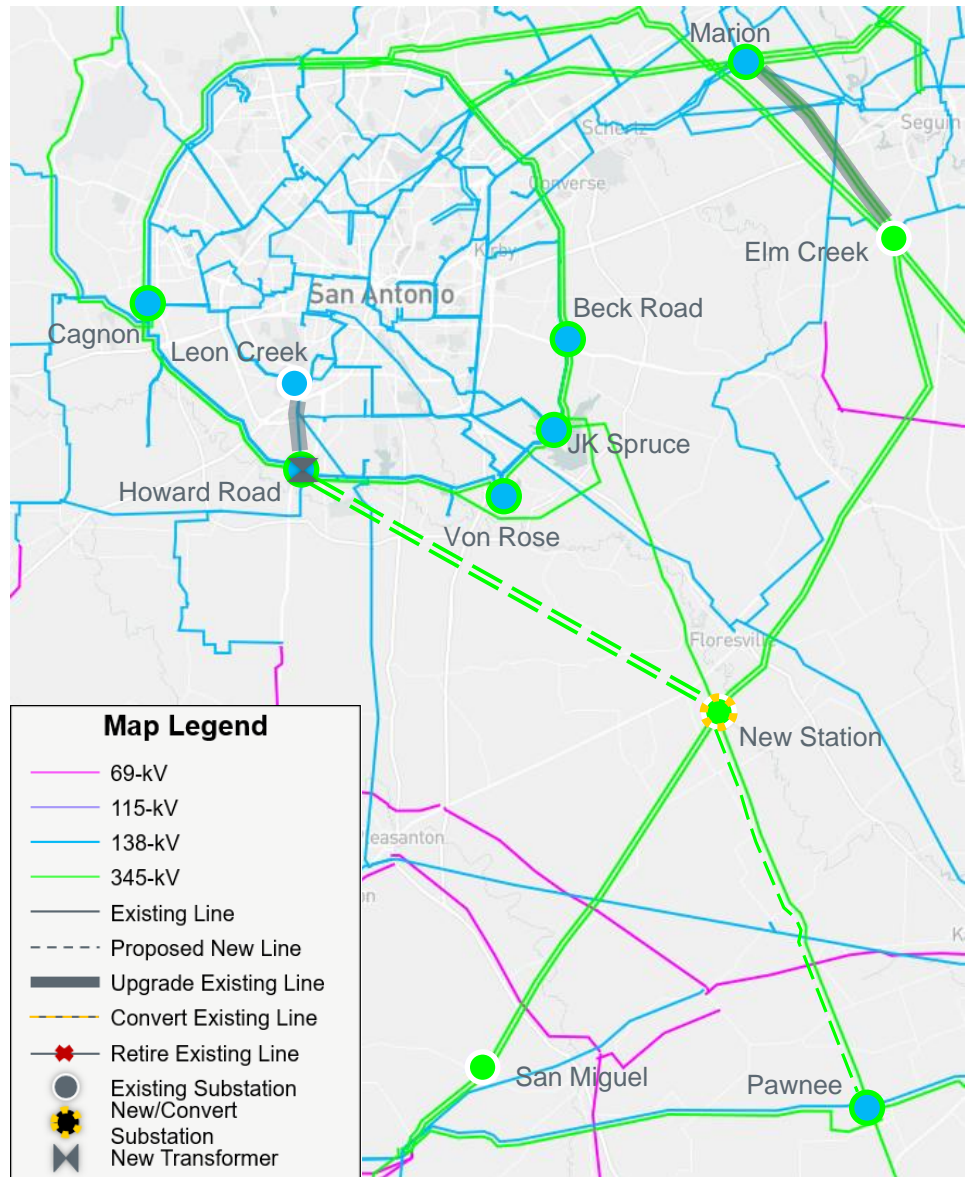
Option 1 - Proposed Project by CPS

- Construct new 50-mile Howard Road – San Miguel 345-kV double circuit transmission line
- Rebuild 14.9-mile Cagnon to Howard Road 345-kV double circuit transmission line
- Rebuild 4.9-mile Howard Road to Leon Creek 138-kV transmission line
- Add a third 600-MVA 345/138-kV autotransformer at Howard Road substation



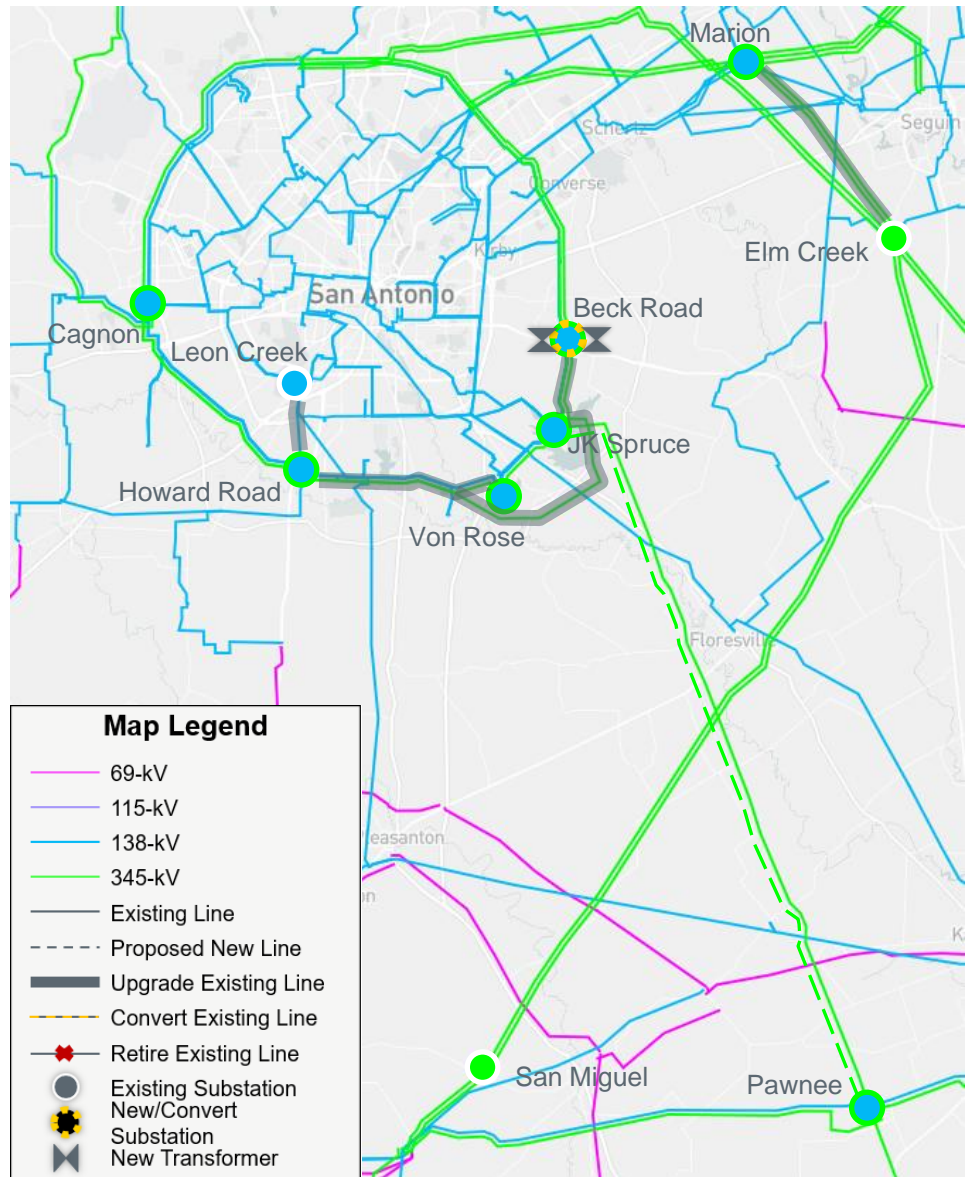
Option 2 – Alternative from CPS

- Construct new 345-kV station (New Station) between Spruce to Pawnee and San Miguel to Elm Creek circuits
- Construct new 38-mile Howard Rd to (New Station) double circuit 345-kV transmission line
- Rebuild 26-mile (New Station) to Pawnee 345-kV line to a double circuit transmission line
- Rebuild 13.9-mile Elm Creek to Marion 345-kV double circuit transmission line
- Rebuild 4.9-mile Howard Road to Leon Creek 138-kV transmission line
- Add a third 600-MVA 345/138-kV autotransformer at Howard Road substation



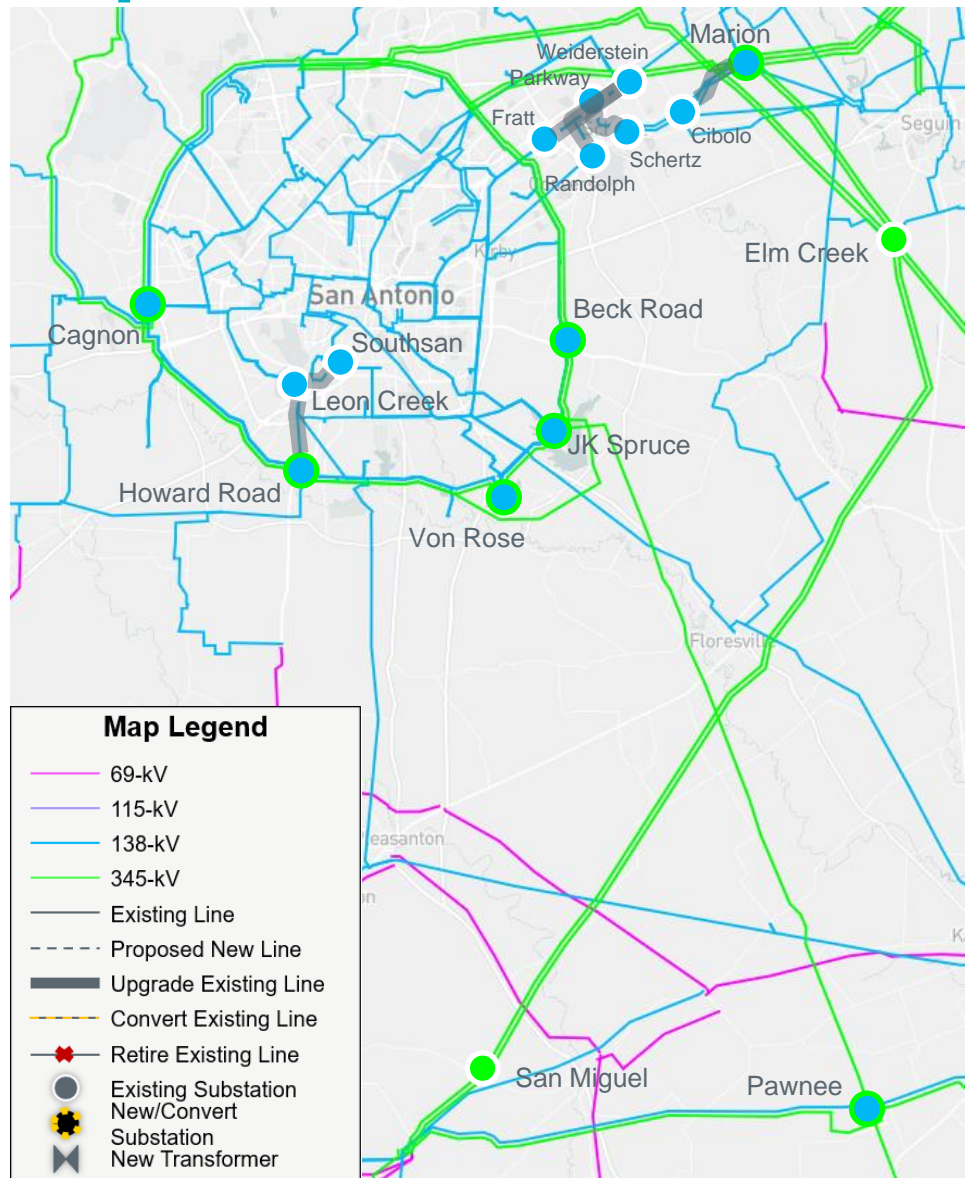
Option 3 – Alternative from CPS

- Rebuild 45.8-mile Spruce to Pawnee 345-kV line to a double circuit transmission line
- Rebuild 35-mile Howard Rd to Spruce and Howard Rd to Von Rose 345-kV transmission lines
- Rebuild 13.9-mile Elm Creek to Marion 345-kV double circuit transmission line
- Rebuild 5.2-mile Beck to Spruce 345-kV double circuit transmission line
- Build Beck Road 345/138-kV switchyard and install two 600-MVA autotransformers



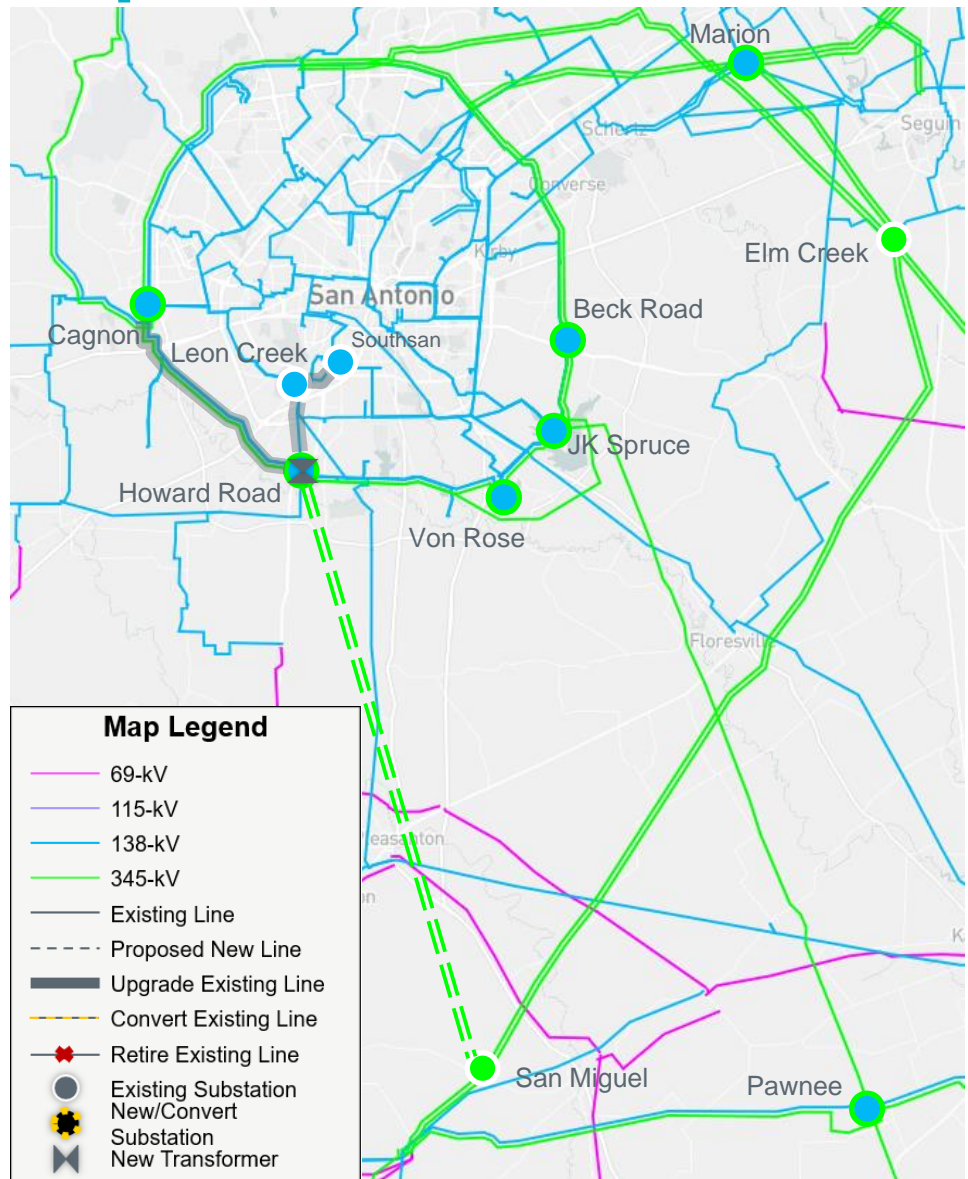
Option 4 – ERCOT Option

- Rebuild 4.9-mile Howard Rd to Leon Creek 138-kV transmission line
- Rebuild 2.9-mile Leon Creek to Southsan 138-kV transmission line
- Rebuild 4.1-mile Fratt to Parkway 138-kV transmission line
- Rebuild 5.5-mile Randolph to Weiderstein 138-kV transmission line
- Rebuild 4.8-mile Marion to Cibolo Double Circuit 138-kV transmission line
- Rebuild 2.8-mile Schertz to Parkway 138-kV transmission line



Option 5 – ERCOT Option

- Construct new 50-mile Howard Road – San Miguel 345-kV double circuit transmission line
- Rebuild 14.9-mile Cagnon to Howard Road 345-kV double circuit transmission line
- Rebuild 4.9-mile Howard Road to Leon Creek 138-kV transmission line with a minimum Rate A of 698 MVA
- Add a third 600-MVA 345/138-kV autotransformer at Howard Road substation
- Rebuild 2.9-mile Leon Creek to Southsan 138-kV transmission line



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 | 1 | None | None | None |
| Option 2 | None | None | 1 | 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 |

- Options 3, 4, and 5 are short-listed

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
 - Planned maintenance outage analysis
 - Long-term load serving capability assessment
 - 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 addition sensitivity analysis (Planning Guide (PG) section 3.1.3 (4) (a))
 - Load scaling sensitivity analysis (PG 3.1.3 (4) (b))
 - Cost estimates and feasibility assessments will be requested from CPS
- Tentative timeline
 - Final recommendation – Q2 2023

Thank you!



Stakeholder comments also welcomed through:

Caleb.Holland2@ercot.com

Robert.Golen@ercot.com

Tanzila.Ahmed@ercot.com

Appendix – Transmission Projects Added to Study Case

| TPIT No | Project Name | Tier | Project ISD | TSP | County |
|------------|--|--------|-------------|-----|--------|
| 45084B | Braunig to Highland Rebuild | Tier 4 | Jul-23 | CPS | Bexar |
| 70536 | New 138 kV Verde Circle Substation | Tier 4 | Oct-24 | CPS | Bexar |
| 45029 | Grandview Highland Hills Rebuild | Tier 4 | Jun-25 | CPS | Bexar |
| 45084A | Braunig to Highland Rebuild | Tier 4 | Jun-25 | CPS | Bexar |
| 67992B | CPSE_345KV_Howard_Switching_Station,CPSE_Hamilton_to_MedCtr_Upgrade,CPSE_Medina_to_36th_Street_Upgrade | Tier 3 | Jun-25 | CPS | Bexar |
| 67992C | CPSE_345KV_Howard_Switching_Station,CPSE_Hamilton_to_MedCtr_Upgrade,CPSE_Medina_to_36th_Street_Upgrade | Tier 3 | Jun-25 | CPS | Bexar |
| 67992A | CPSE_345KV_Howard_Switching_Station,CPSE_Hamilton_to_MedCtr_Upgrade,CPSE_Medina_to_36th_Street_Upgrade | Tier 3 | Jun-25 | CPS | Bexar |
| 15TPIT0031 | Chavaneaux_Chavaneaux Tap Rebuild (Brooks to Chavaneaux ckt) | Tier 4 | Jun-26 | CPS | Bexar |
| 4320 | CPSE_Brooks to Chavaneaux MLSE | Tier 4 | Dec-26 | CPS | Bexar |
| 4323 | CPSE_Braunig to Brooks MLSE | Tier 4 | Jun-27 | CPS | Bexar |

Appendix – Generation Added to Study Case

| GINR | Project Name | Fuel | Project COD | Capacity (MW) | County |
|-----------|-----------------|------|-------------|---------------|--------|
| 22INR0368 | Padua Grid BESS | OTH | Mar-24 | 202.6 | Bexar |

Appendix – G-1 Generators and X-1 Transformers

| G-1 Generators | X-1 Transformers |
|--|--|
| Sommers – CALAVER_OWS2 | Howard_5 to Howard ckt 1 (345/138-kV) |
| San Miguel – SAN_SANMIGG1 | Miguel 5 to Miguel 8 ckt 1 (345/138-kV) |
| Spruce – CALAVER_JKS2 | Pawnee Switch 5 to Pawnee Sub 8 ckt 1 (345/138-kV) |
| Leon Creek – LEON_LCPCT1, LEON_LCPCT2, LEON_LCPCT3, LEON_LCPCT4, | |