



ERCOT Independent Review: Leander – Parmer Lane – Round Rock 138 kV Project

RPG Meeting
May 20, 2014

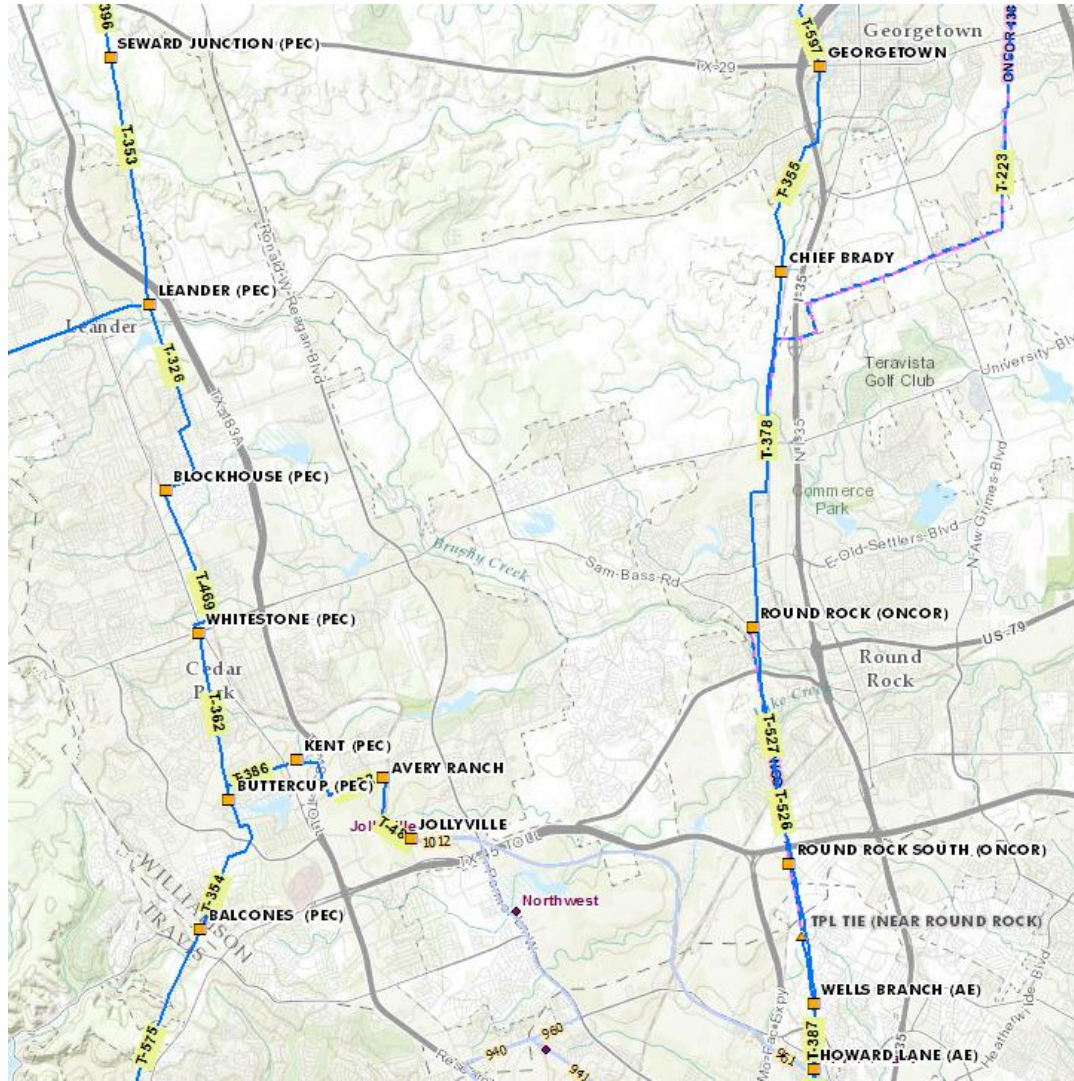
Project Need

- Load in western Williamson County (including the cities of Leander and Cedar Park areas) served in part by the Pedernales Electric Cooperative (PEC) -owned Avery Ranch, Balcones, Blockhouse, Buttercup, Kent Street, Leander, Seward Junction, and Whitestone substations have experienced significant growth
 - From 2002 to 2012 the summer peak load served by these substations has grown from 183.8 MW to 360.1 MW
 - PEC has forecasted these substations to serve 575 MW in 2022

- PEC has identified the need for two new substation to serve the load growth
 - One substation near the intersection of Parmer Lane and Highway 1431 (needed by 2018)
 - Second substation near the intersection of East Crystal Falls Parkway and Ronald Reagan Boulevard (needed by 2020)

- In addition to the PEC need for new substation, LCRA has identified reliability criteria violations in the area

Area Map of PEC and LCRA TSC System in Western Williamson County



Study Model and Criteria

- Study Base Case
 - 2018 SE Final Case (from 2013 RTP)
 - 2020 South & South Central (SSC) Start Case from the 2014 RTP
- The 2019 study case was created by updating the 2018 SE base case with the LCRA/PEC 2019 loads forecast for the study area
- The 2022 study case was created by updating the 2020 SSC start case with the LCRA/PEC 2022 loads forecast for the study area
- Study Criteria
 - Pre-contingency – 100% of normal rating and 0.95 p.u for low-voltage
 - Post-contingency – 100% of emergency rating and 0.90 p.u for low-voltage

Study Model and Criteria

- The 2019 and 2022 load forecast used for the study area, provided by LCRA & PEC

Bus Number	Substation	2019 Load with Parmer in-service	2022 Load with Parmer in-service
7524	Seward Junction	28.8	33.1
7525	Leander	61.8	58
7527	Blockhouse	54.9	62.4
7529	Whitestone	67	77
7530	Kent street	35.3	40.5
7531	Buttercup	66.3	75.4
7533	Balcones	90.7	102.4
7534	Avery Ranch	69	80.1
7367	Parmer	28.4	45.8
	Total Load	502 (MW)	575 (MW)

Reliability Issues

- No reliability issues were identified in 2019 base case
- Both thermal overloads and low voltages were observed in 2022 (With G-1 condition: Loss of Ferguson Unit)

Branch	Contingency	Loading in 2022
Lago Vista – Nameless 138 kV	Whitestone – Buttercup 138 kV	106.7%
Hutto – Round Rock NE 138 kV ckt 2	Techridge – Howard Lane 138 kV	103.4%

Bus Name	Contingency	Bus Voltage
Whitestone 138 kV	Whitestone – Buttercup 138 kV	0.89 pu
Blockhouse 138 kV	Whitestone – Buttercup 138 kV	0.89 pu
Leander 138 kV	Whitestone – Buttercup 138 kV	0.89 pu
Seward Junction 138 kV	Whitestone – Buttercup 138 kV	0.89 pu
Round Rock NE 138 kV	Hutto – Round Rock NE 138kV ckt1	0.89 pu

Study Options

- Parmer Lane Substation is needed by 2019
- Thirteen options were evaluated, all the options connect via the new Parmer Lane Substation.

Option	From	To	Estimated Cost (\$million)
1	Chief Brady	Whitestone	62.30
2	Chief Brady	Avery Ranch	60.90
3	Chief Brady	Jollyville	63.60
4	Avery Ranch	Seward Junction	54.00
5	Jollyville	Seward Junction	56.80
6	Round Rock	Seward Junction	61.90
7	Avery Ranch	Leander	43.10
8	Jollyville	Leander	46.20
9	Chandler	Leander	54.40
10	Round Rock S	Leander	77.50
11	Round Rock	Leander	51.00
12	Chief Brady	Leander	63.70
13	Westinghouse South	Leander	52.40

2019 Study Results

Option	Hutto - RRNE 138 kV under contingency of Techridge - Howard Lane	Lago Vista - Nameless 138 kV under contingency of Butter - White
Base	< 92%	92.66%
1 (Chief Brady - Whitestone)	< 92%	< 92%
2 (Chief Brady - Avery Ranch)	< 92%	< 92%
3 (Chief Brady - Jollyville)	93.29%	< 92%
4 (Seward Junction - Avery Ranch)	< 92%	< 92%
4d (Seward Junction - Avery Ranch) with new double circuit contingency	< 92%	95.33%
5 (Jollyville - Seward Junction)	< 92%	< 92%
5d (Jollyville - Seward Junction) with new double circuit contingency	< 92%	95.34%
6 (Seward Junction - Round Rock)	96.84%	< 92%
7 (Leander - Avery Ranch)	< 92%	< 92%
7d (Leander - Avery Ranch) with new double circuit contingency	< 92%	96.35%
8 (Jollyville - Leander)	< 92%	< 92%
8d (Jollyville - Leander) with new double circuit contingency	< 92%	96.36%
9 (Chandler - Leander)	96.88%	< 92%
10 (Round Rock S - Leander)	93.92%	< 92%
11 (Round Rock - Leander)	98.95%	< 92%
12 (Chief Brady - Leander)	95.02%	< 92%
13 (Westinghouse S - Leander)	94.22%	< 92%

2022 Study Results

Option	Hutto - RRNE 138 kV under contingency of Techridge - Howard Lane	Lago Vista - Nameless 138 kV under contingency of Butter - White	Howard Lane - Jollyville 138 kV under contingency of Williamson - Northwest	Marshall Ford - Bullick Hollow 138 kV under contingency of Avery Ranch - Jollyville
Base	103.42%	106.72%	88.72%	96.01%
1 (Chief Brady - Whitestone)	108.49%	< 92%	< 92%	< 92%
2 (Chief Brady - Avery Ranch)	108.61%	95.13%	< 92%	< 92%
3 (Chief Brady - Jollyville)	105.36%	94.68%	< 92%	< 92%
4 (Seward Junction - Avery Ranch)	105.20%	< 92%	92.95%	92.80%
4d (Seward Junction - Avery Ranch) with new double circuit contingency	105.20%	108.81%	92.95%	92.80%
5 (Jollyville - Seward Junction)	103.09%	< 92%	92.99%	< 92%
5d (Jollyville - Seward Junction) with new double circuit contingency	103.09%	109.00%	92.99%	< 92%
6 (Seward Junction - Round Rock)	111.42%	< 92%	< 92%	< 92%
7 (Leander - Avery Ranch)	103.81%	< 92%	92.13%	93.22%
7d (Leander - Avery Ranch) with new double circuit contingency	103.81%	110.48%	92.13%	93.22%
8 (Jollyville - Leander)	103.07%	< 92%	93.76%	< 92%
8d (Jollyville - Leander) with new double circuit contingency	103.07%	110.68%	93.76%	< 92%
9 (Chandler - Leander)	110.49%	< 92%	< 92%	< 92%
10 (Round Rock S - Leander)	107.88%	< 92%	< 92%	< 92%
11 (Round Rock - Leander)	113.70%	< 92%	< 92%	< 92%
12 (Chief Brady - Leander)	108.20%	< 92%	< 92%	< 92%
13 (Westinghouse S - Leander)	101.20%	< 92%	< 92%	< 92%

Additional considerations

- Based on the analysis, both Leander – Parmer Lane –Jollyville 138 kV (Option #8) and Leander – Parmer Lane – Round Rock 138 kV (Option 11) address all the reliability need and load growth in both 2019 and 2022
- Option #8 new ROW is estimated to be 11.4 mile* compared to Option # 11 which is 12.6 mile*, resulting in Option # 8 having a lower planning cost estimate than Option # 11 (by ~ \$ 4.8 million)
- ERCOT considers Option # 11 to be the best project alternative for the following reasons:
 - Provides a 138-kV transmission source into an area of Williamson County which has no transmission service and is forecasted to experience high load growth
 - Provides the transmission infrastructure needed to reliably serve the second substations PEC identified for the area north of Highway 620 between Highway 183 and Interstate 35
 - Will reduce the east-to-west flows in the Austin Energy area as it is a direct parallel path for the Howard Lane-Jollyville 138 kV path



* The estimated ROW will change depending on the final routing

ERCOT Preferred Option

Study Option 11

- Construct a new Parmer 138 kV Substation
- Construct a new 138-kV single circuit line on a double-circuit capable transmission structure (approximately 13 miles) that connects the existing Leander and Round Rock substations to the new Parmer Substation with an emergency rating of at least 446 MVA
- Add terminal equipment at the existing Leander and Round Rock substations for the new transmission line
- Upgrade the 138-kV bus at the Leander Substation

- The cost estimate is \$50.96 million

