



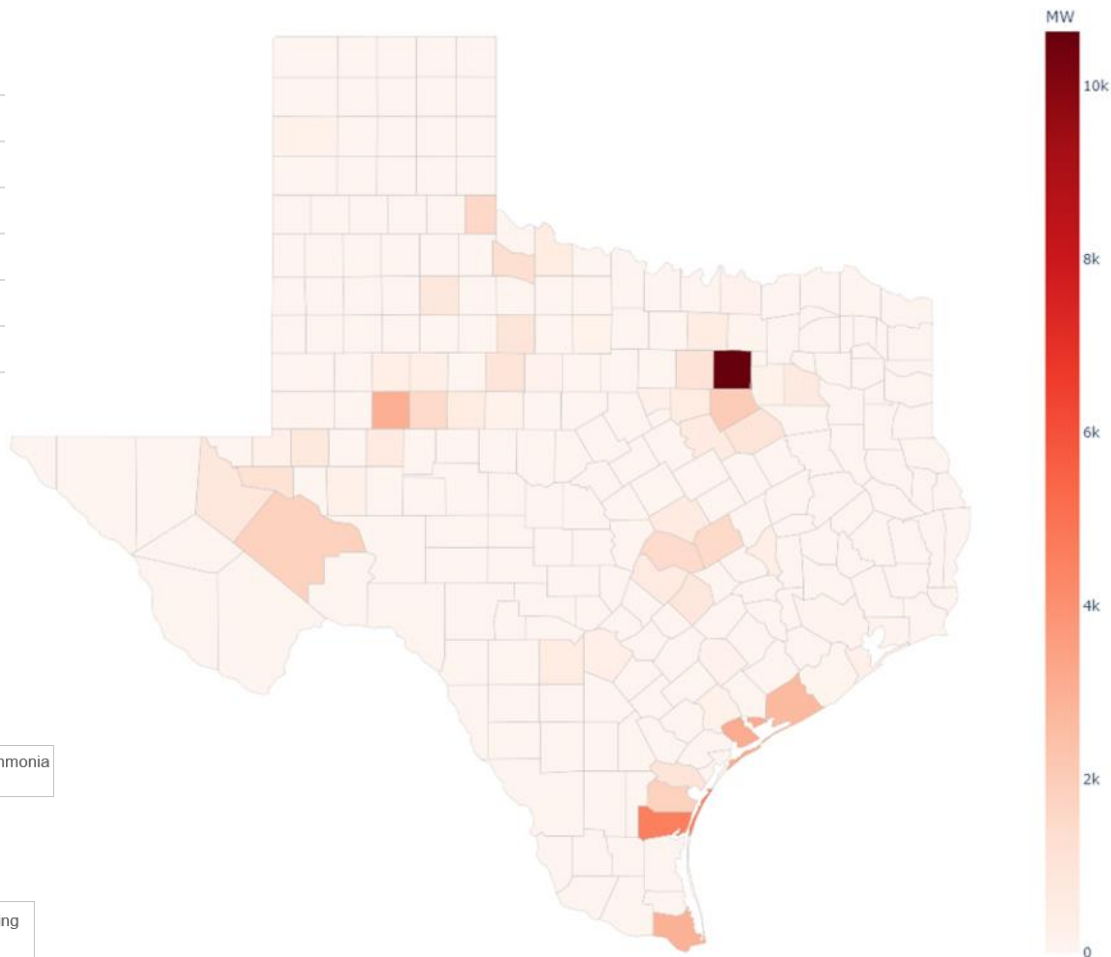
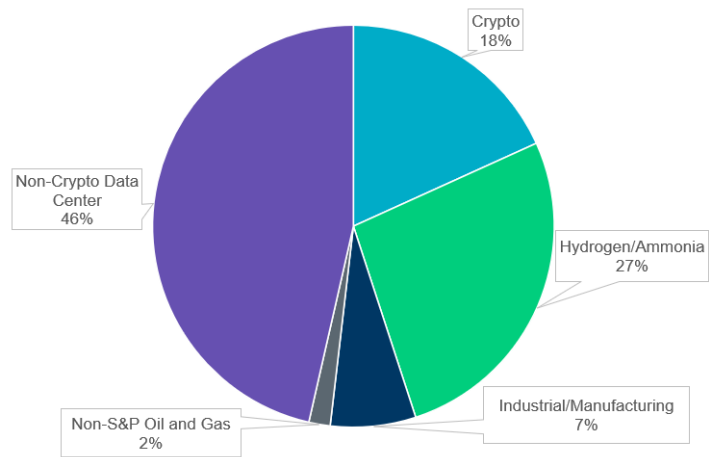
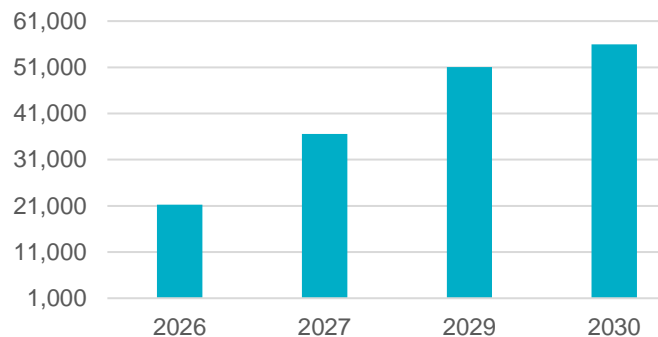
2024 RTP – Final Update

ERCOT
Regional Transmission Planning

January 2025

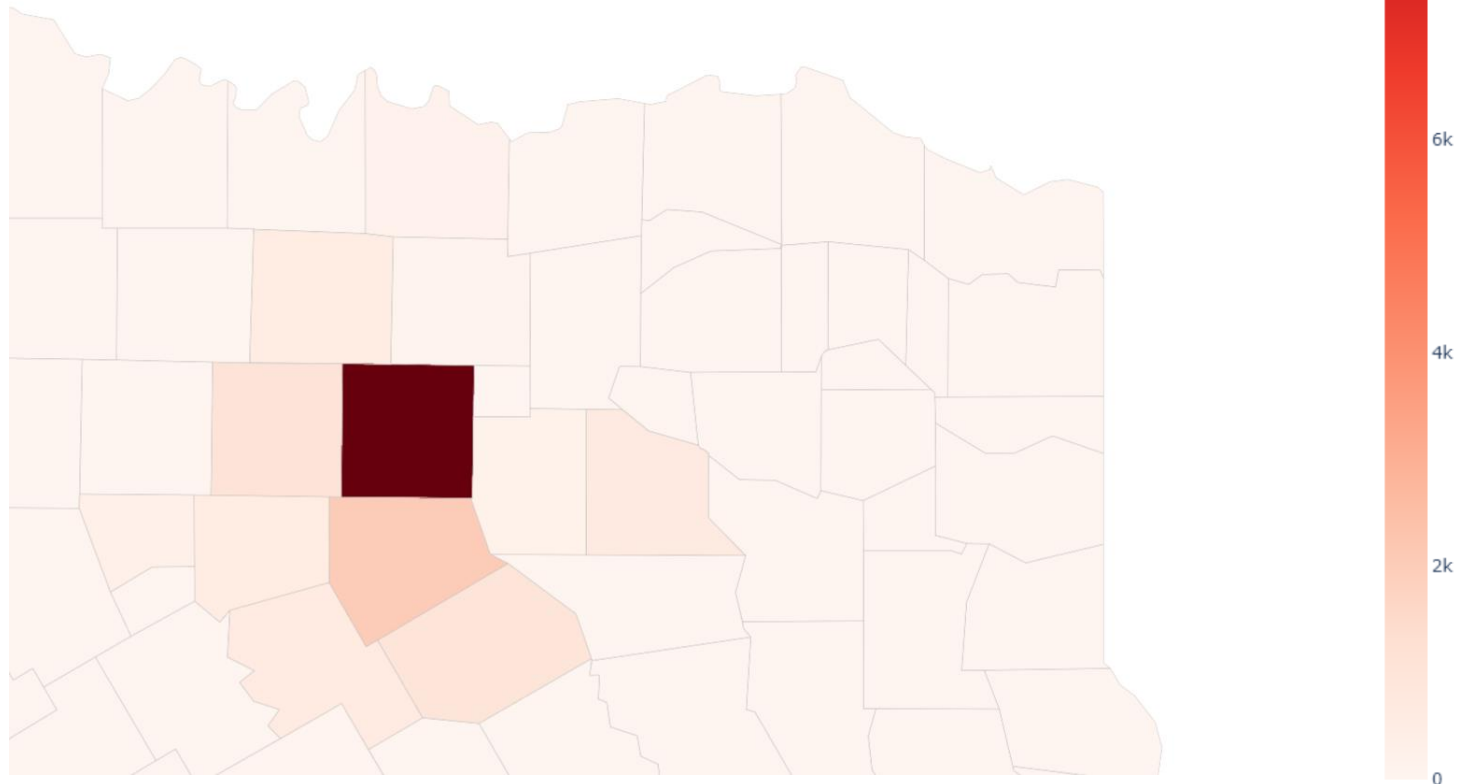
2024 RTP Large Load Summary

Large Load Addition (MW)



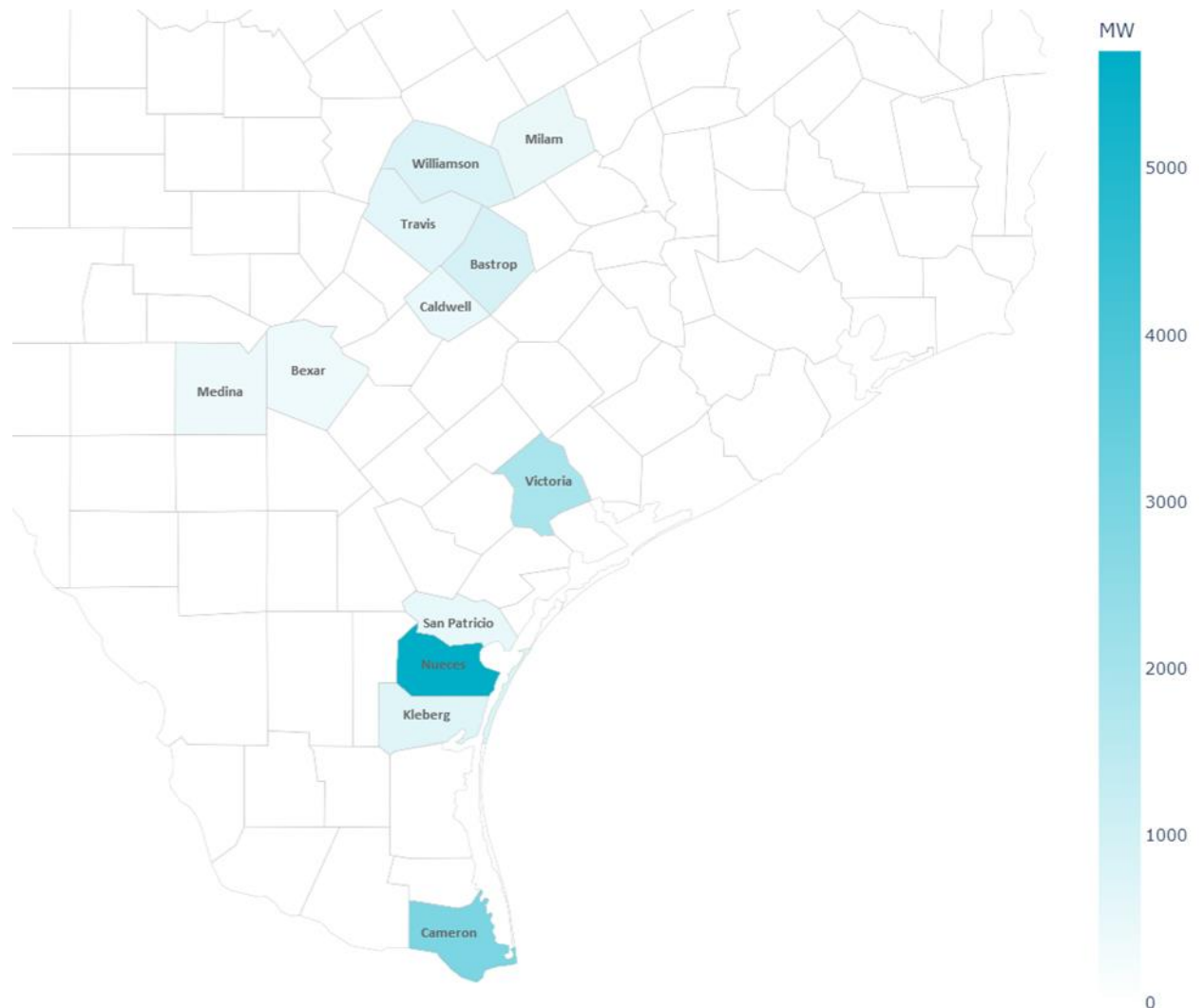
2024 RTP Regional Observations

- There are approximately 15 GW of large loads in the North Central weather zone by study year 2030, with approximately 10 GW in Dallas county alone.
- Within three buses of the Watermill 345-kV bus in south Dallas, there will be more than 12 GW.



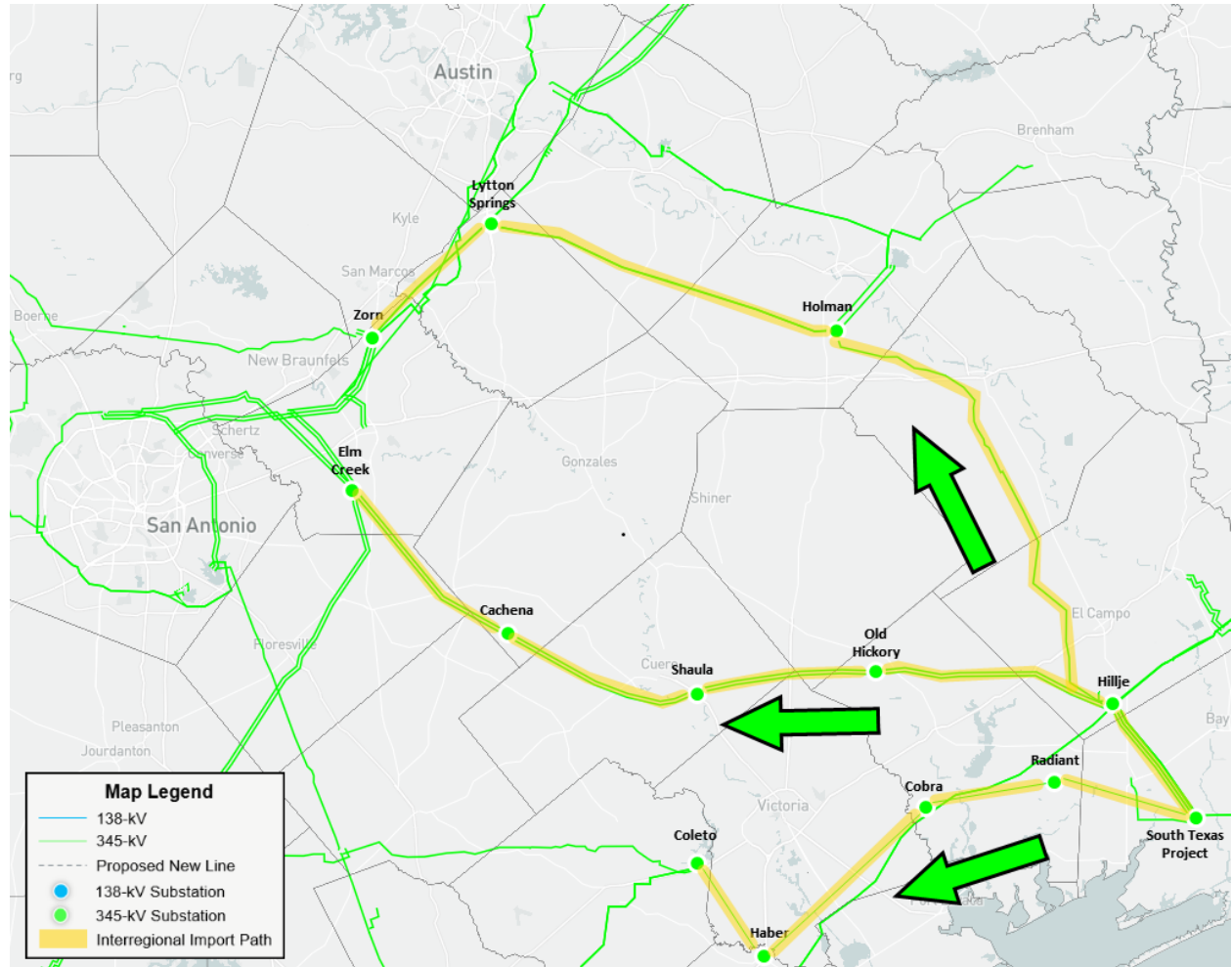
2024 RTP Regional Observations

- There are also approximately 15 GW of large loads in the South and South Central weather zones by the study year 2030.
- Approximately 7 GW of those large loads are located in the Corpus Christi area.



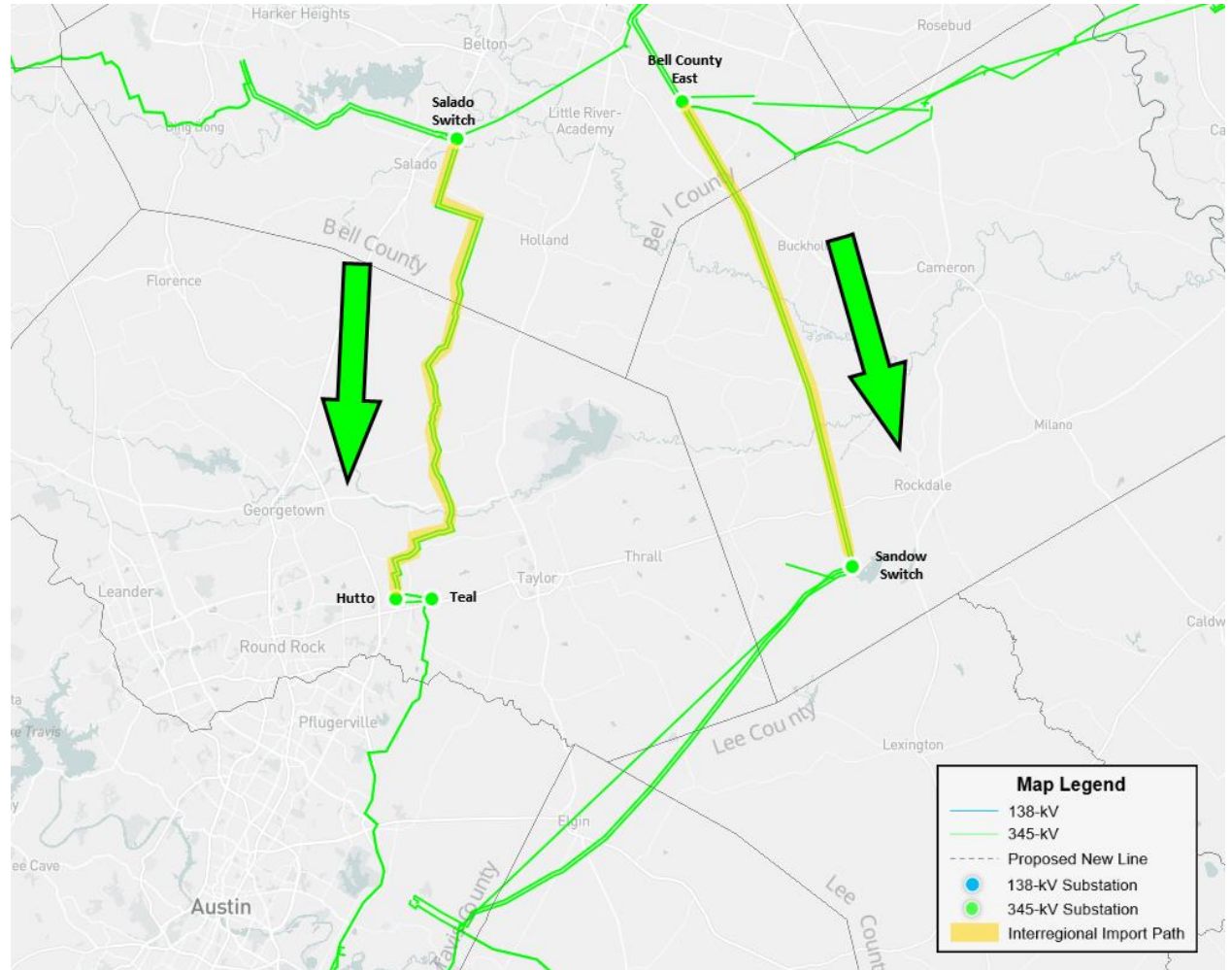
2024 RTP Regional Observations

- Due to heavy solar growth in the Coast, the weather zone is a net exporter of power by study year 2030.
- Much of the power in the STP and Hillje area flows south toward the Corpus Christi area and west toward central Texas.



2024 RTP Regional Observations

- In addition to flow moving from the Coast westward to the central area, there are additional heavy flows into the area from north of Austin.



2024 RTP Analysis Comparison

- This unprecedented load growth and the regional challenges it presented, along with the growing amount of congestion already present in today's system, prompted discussions about introducing 765-kV infrastructure to the ERCOT Transmission Grid.
- 765-kV transmission addition would enable power to flow more efficiently through long-distance transmission from resource-rich regions to load centers.
- The 2024 RTP continued to build on the Permian Basin Reliability Plan to address statewide reliability needs.
- Developed two transmission plans, to address the 2030 projected demand of ~150 GWs: 345-kV plan and the Texas 765-kV Strategic Transmission Expansion Plan (TX 765-kV STEP).

2024 RTP Analysis – Scope

- Two RTP assessments were performed under base scenario conditions
 - 345-kV Plan (without 765-kV Core plan)
 - Corrective Action Plans (CAPs) were developed for
 - N-1, G-1+N-1, X-1+N-1 under summer peak conditions
 - » Included 69-kV, 138-kV, and 345-kV violations
 - N-1-1 fall peak maintenance outage scenario
 - » Included contingencies with 69-kV, 138-kV, and 345-kV elements*
 - » Violations were resolved for 69-kV, 138-kV, and 345-kV elements
 - TX 765-kV STEP (with 765-kV Core plan)
 - CAPs were developed for
 - N-1, G-1+N-1, X-1+N-1 under summer peak conditions
 - » Included 69-kV, 138-kV, 345-kV, and 765-kV violations
 - N-1-1 fall peak maintenance outage scenario
 - » Included contingencies with at least one 345-kV or 765-kV element
 - » Violations were resolved for 69-kV, 138-kV, 345-kV, and 765-kV elements

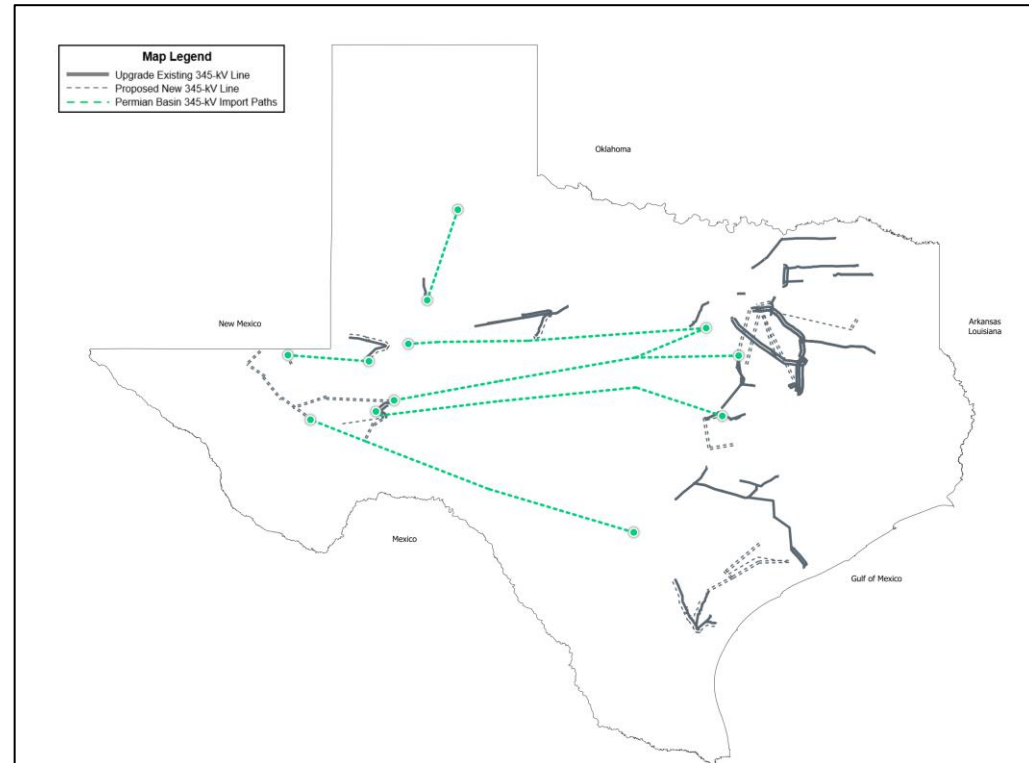
[*] Only CAPs resulting from a contingency with at least one 345-kV element were included in the comparison to the Core plan

345-kV Plan

- No changes to 345-kV option in Permian Basin study
- New ROW Line Miles*
 - 3,007
- Existing Line Upgrade Miles*
 - 4,274

345-kV Plan

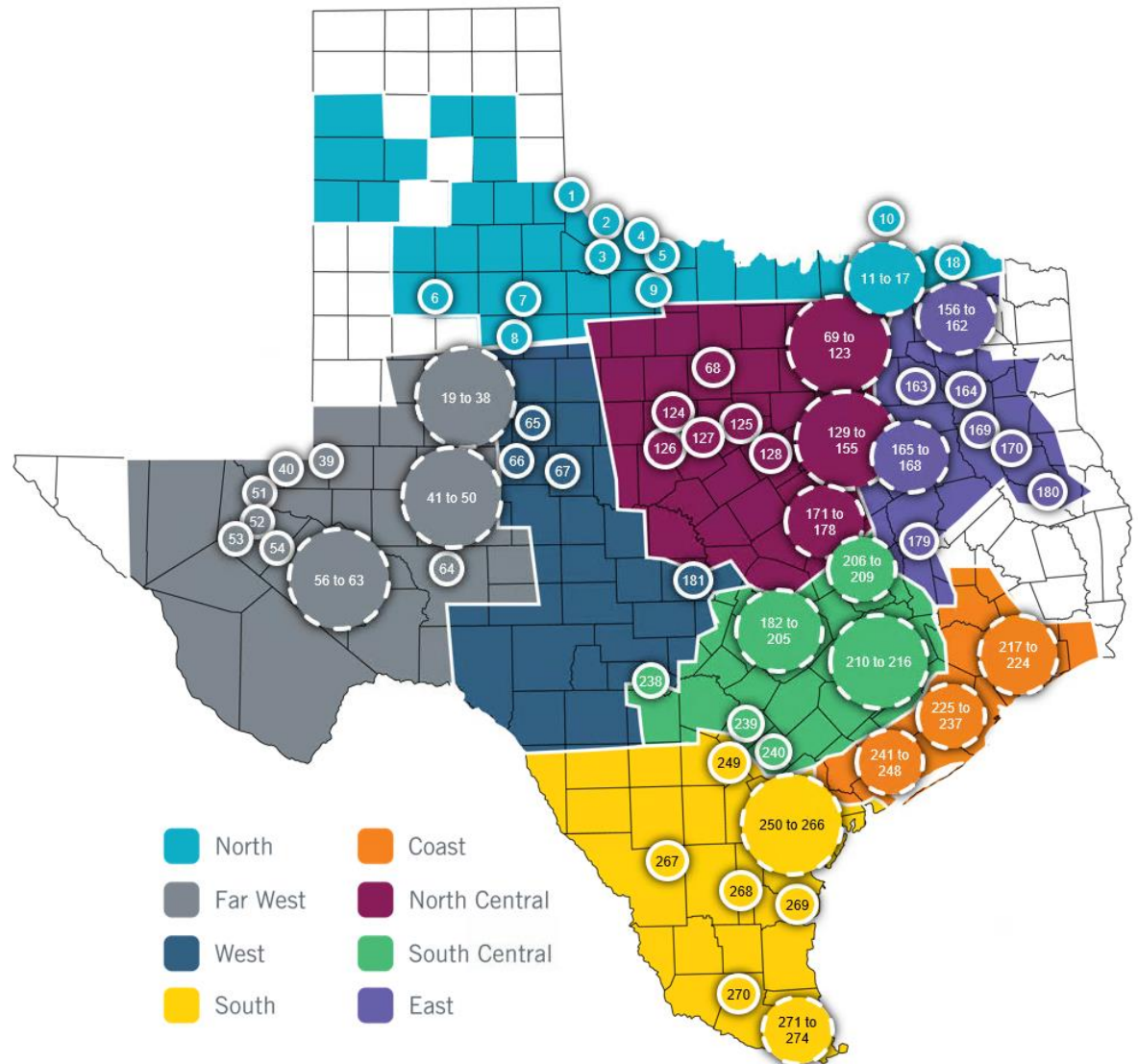
Critical components needed by 2030



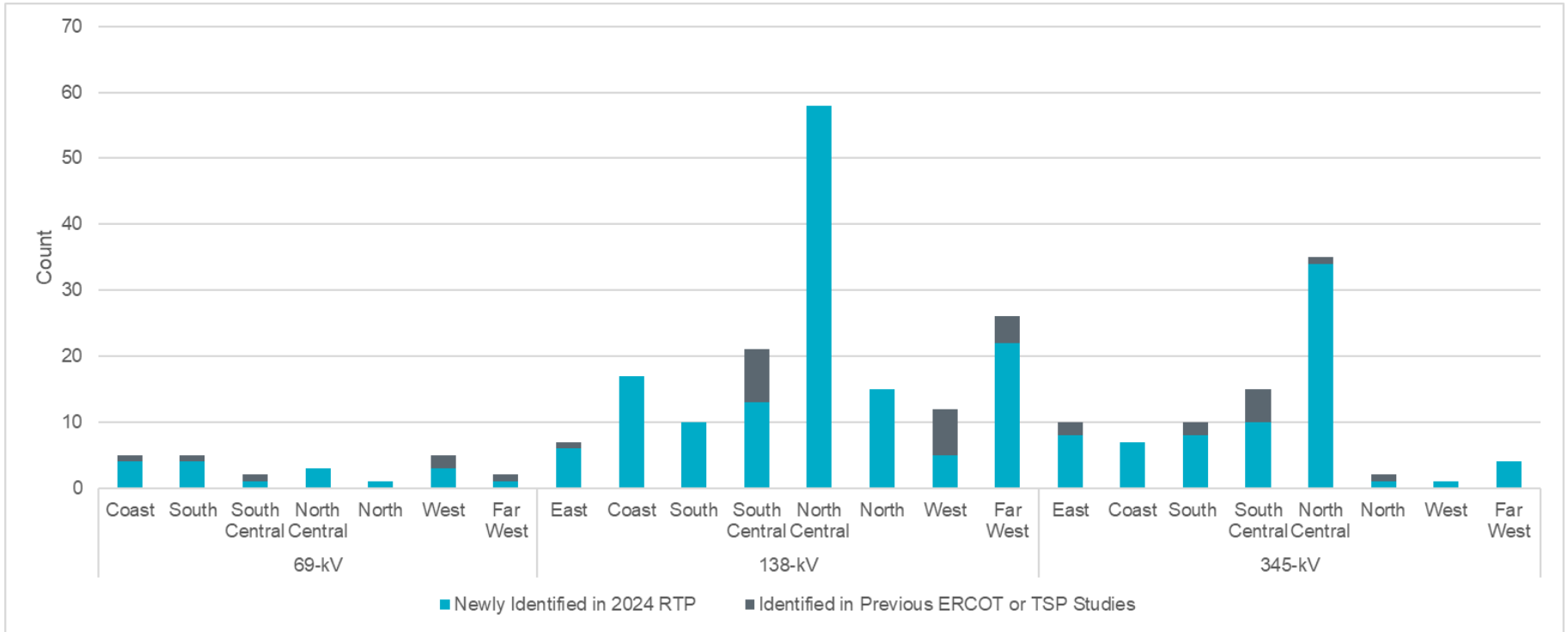
[*] All mileage numbers include 20% routing adder on top of point-to-point distance.
NOTE: Geographic locations for proposed new lines are meant to demonstrate general electrical point-to-point connections. Specific routing of any new transmission infrastructure is determined by the Public Utility Commission as part of the CCN process with Transmission Service Providers.

2024 RTP Reliability Projects – 345-kV Plan

RTP Year	Total Reliability Projects
2016	40
2017	60
2018	38
2019	56
2020	50
2021	67
2022	89
2023	173
2024	274



Previous vs. New Projects – 345-kV Plan

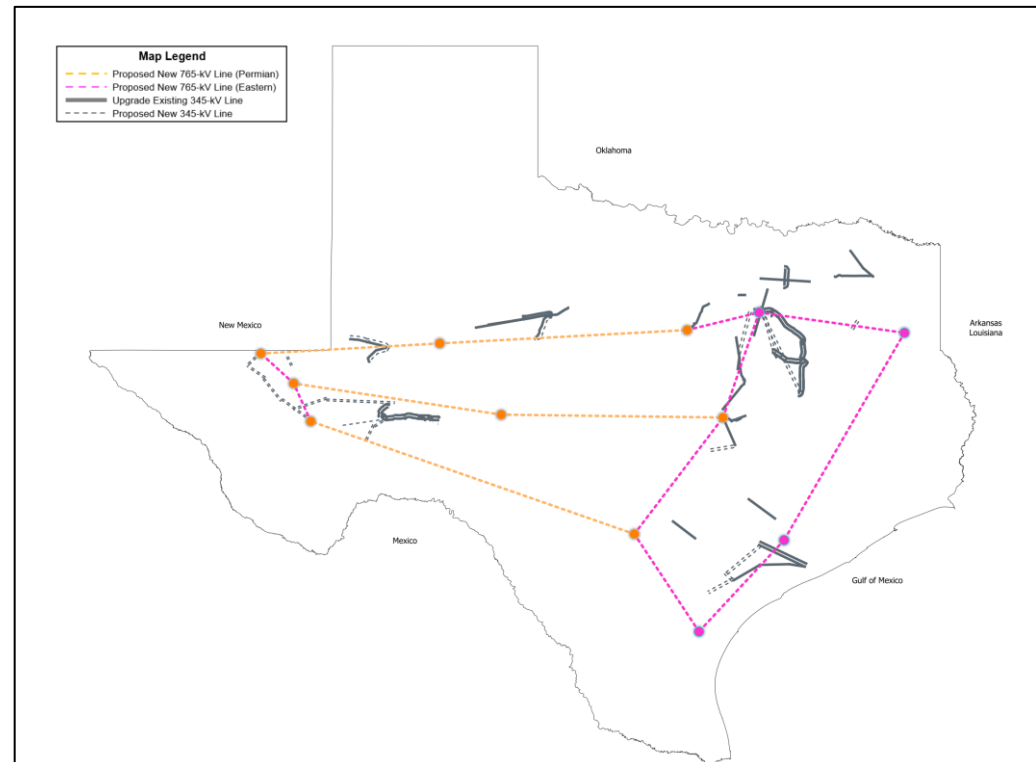


TX 765-kV STEP

- No changes to 765-kV option in Permian Basin study
- # of 765-kV Substations
 - Permian Basin = 8
 - Eastern = 4
- New 765-kV ROW Line Miles*
 - Permian Basin = 1,255
 - Eastern = 1,213
- # of 765/345-kV Transformers
 - Watermill, Hillje, Blu Lacy = 3
 - All others = 2
- Existing Line Upgrade Miles*
 - 2,831

Texas 765-kV Strategic Transmission Expansion Plan (TX 765-kV STEP)

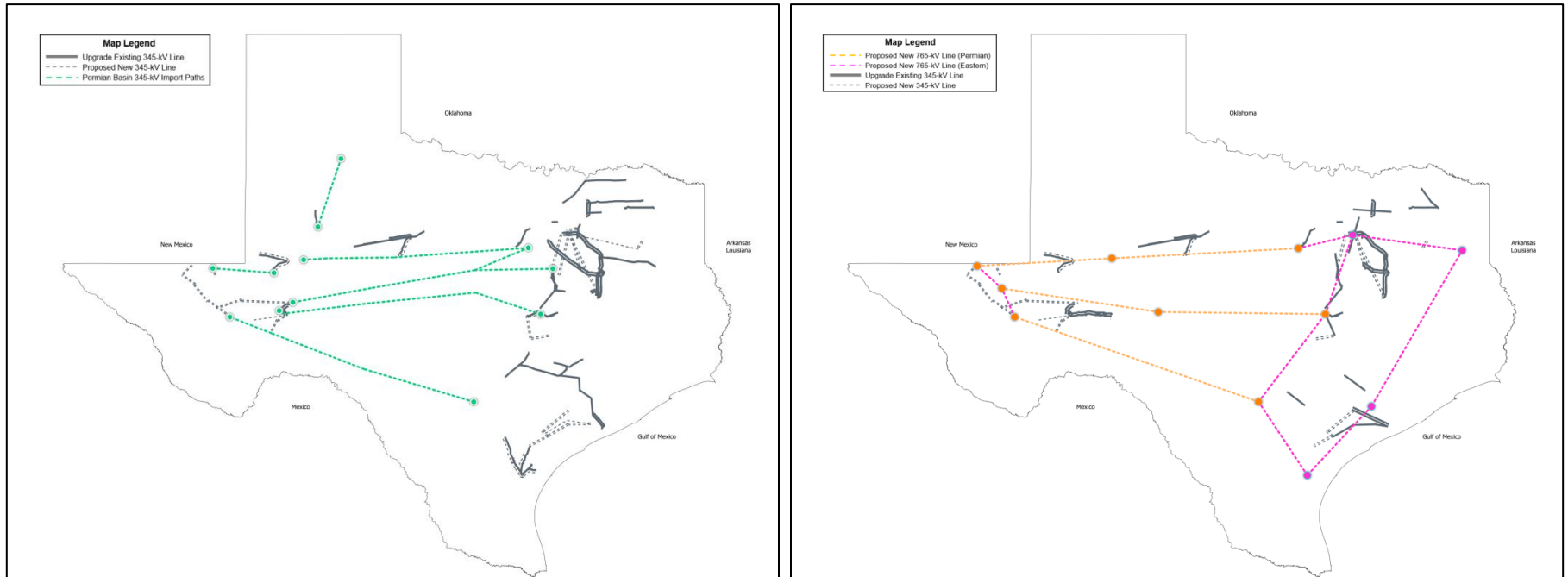
Critical components needed by 2030



[*] All mileage numbers include 20% routing adder on top of point-to-point distance.

NOTE: Geographic locations for proposed new lines are meant to demonstrate general electrical point-to-point connections. Specific routing of any new transmission infrastructure is determined by the Public Utility Commission as part of the CCN process with Transmission Service Providers.

2024 RTP Analysis – Comparison

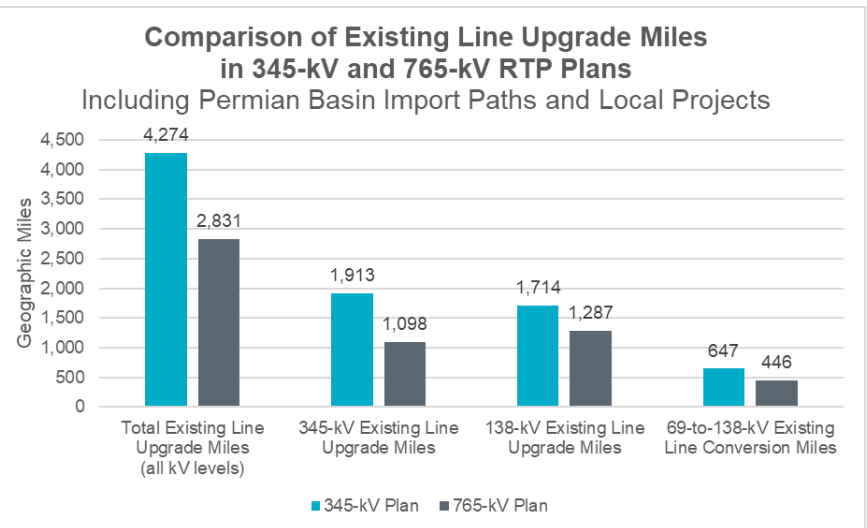
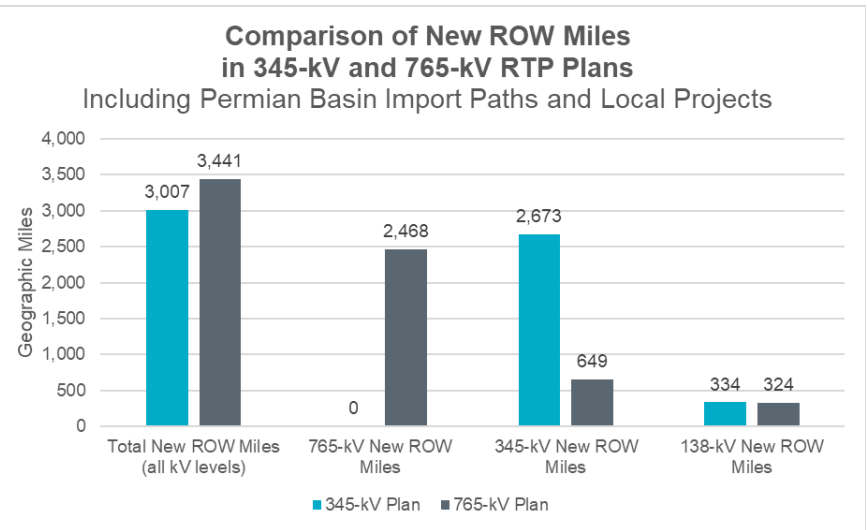


345-kV New Lines and Upgrades Needed
with the 345-kV Plan (Left) and TX 765-kV STEP (Right)
Including Permian Basin Import Paths and Local Projects

2024 RTP Analysis – Comparison

345-kV Plan adds 434 fewer miles of new ROW miles

TX 765-kV STEP upgrades 1,443 fewer miles of existing lines



NOTE: All miles are geographic miles

Ex: 100 miles of single-circuit line = 100 miles, and 100 miles of double-circuit lines = 100 miles

2024 RTP Analysis – Comparison

Summary of the Construction Cost Estimates (\$Billion)

	345-kV Plan (\$B)	TX 765-kV STEP (\$B)
Permian Basin Reliability Plan Projects	12.95	13.77
2024 RTP Projects (beyond Permian Projects)	17.80	19.22
Total	30.75	32.99
		+2.24

Summary of the Construction Cost Estimates – with Live Reconductoring (\$Billion)

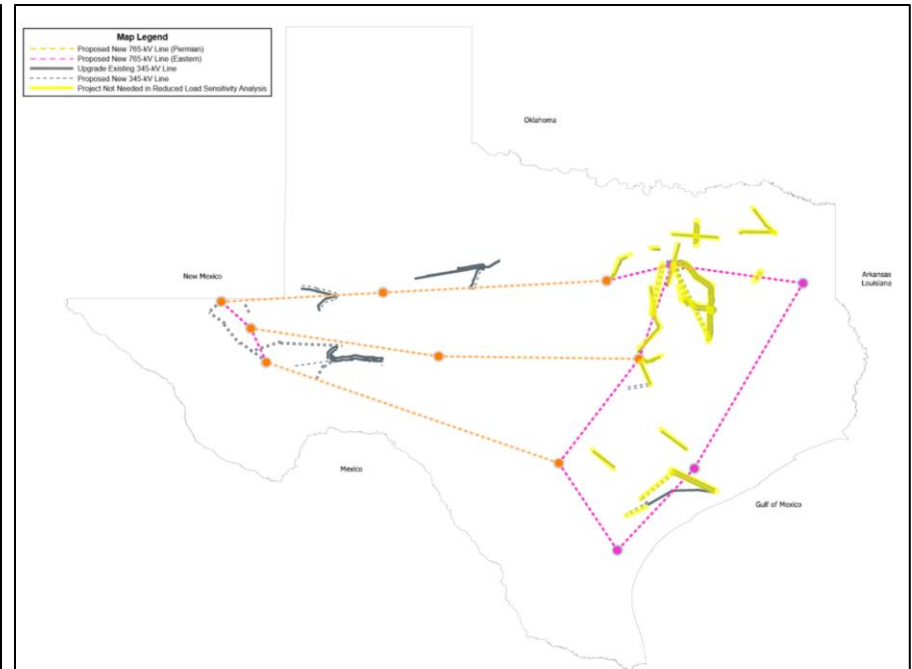
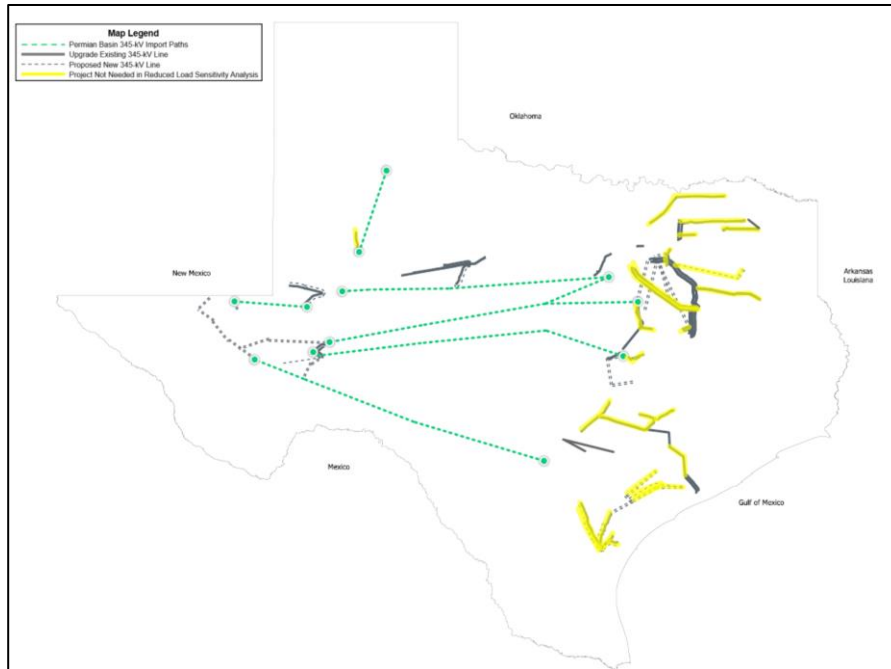
	345-kV Plan (\$B)	TX 765-kV STEP (\$B)
Permian Basin Reliability Plan Projects	12.95	13.77
2024 RTP Projects (beyond Permian Projects) (with Live Reconductoring)	19.60	20.13
Total	32.55	33.90
		+1.35

Factoring in cost increases from likely-needed live reconductoring, the cost difference between the two plans under base scenario conditions decreases \$890M to \$1.35B.

2024 RTP Sensitivity Analysis – Reduced Load

- Two RTP assessments were performed under reduced load scenario conditions (~ 20 GW less overall load)
 - 345-kV Plan (without 765-kV Core plan)
 - Corrective Action Plans (CAPs) were developed for
 - N-1, G-1+N-1, X-1+N-1 under summer peak conditions
 - » Included 69-kV, 138-kV, and 345-kV violations
 - No N-1-1 fall peak maintenance outage analysis was performed
 - TX 765-kV STEP (with 765-kV Core plan)
 - CAPs were developed for
 - N-1, G-1+N-1, X-1+N-1 under summer peak conditions
 - » Included 69-kV, 138-kV, 345-kV, and 765-kV violations
 - No N-1-1 fall peak maintenance outage analysis was performed

2024 RTP Sensitivity Analysis Comparison – Reduced Load

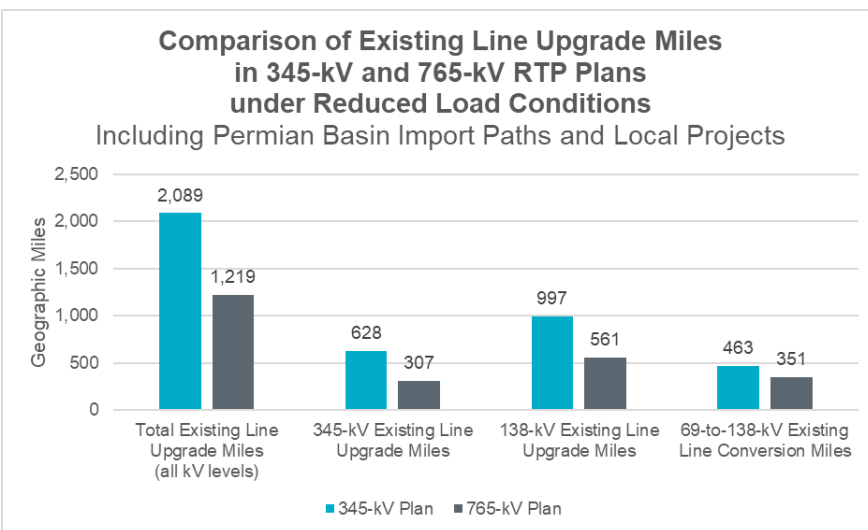
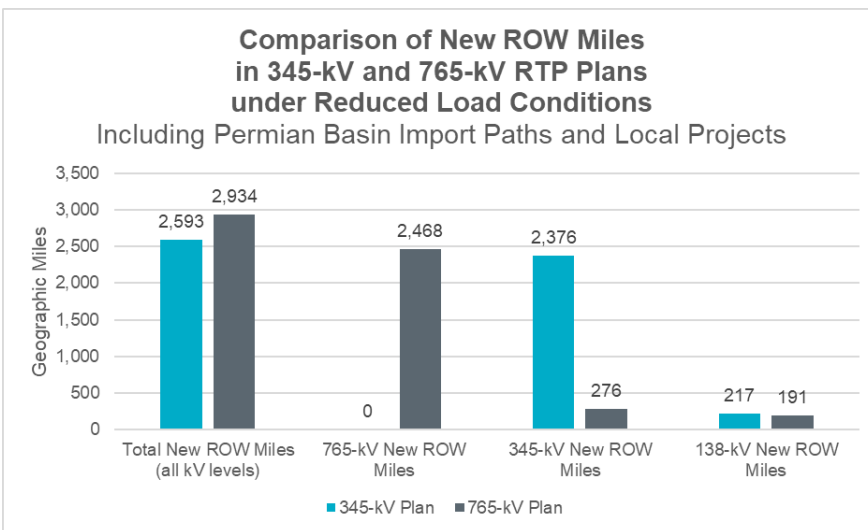


345-kV New Lines and Upgrades Needed
with the 345-kV Plan (Left) and TX 765-kV STEP (Right)
under Reduced Load Scenario Conditions
Including Permian Basin Import Paths and Local Projects
Highlighted projects not needed under reduced load conditions

2024 RTP Sensitivity Analysis Comparison – Reduced Load

345-kV Plan adds 341 fewer miles of new ROW miles

TX 765-kV STEP upgrades 870 fewer miles of existing lines



NOTE: All miles are geographic miles

Ex: 100 miles of single-circuit line = 100 miles, and 100 miles of double-circuit lines = 100 miles

2024 RTP Sensitivity Analysis Comparison – Reduced Load

Summary of the Construction Cost Estimates (\$Billion)

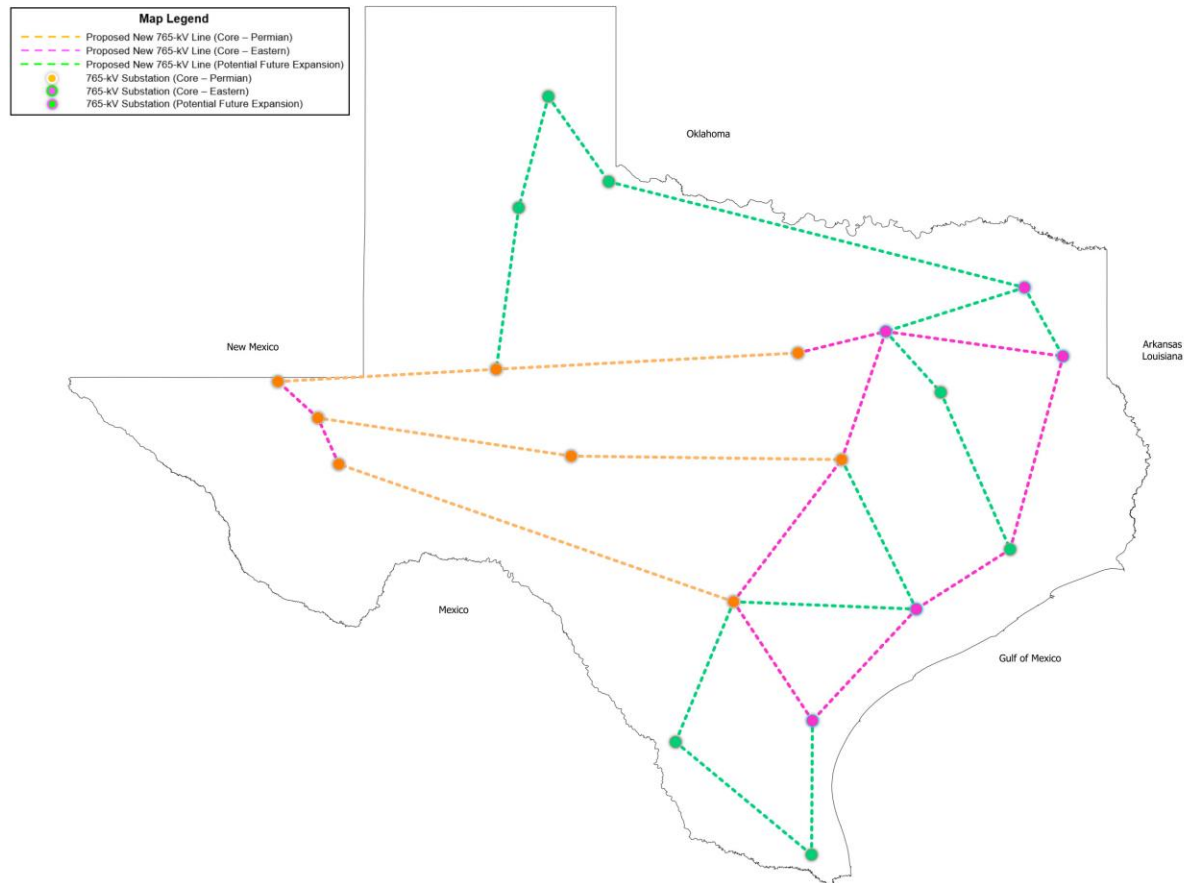
	345-kV Plan (\$B)	TX 765-kV STEP (\$B)
Permian Basin Reliability Plan Projects	12.95	13.77
2024 RTP Projects (beyond Permian Projects)	8.03	10.14
Total	20.98	23.91
		+2.93

Summary of the Construction Cost Estimates – with Live Reconductoring (\$Billion)

	345-kV Plan (\$B)	TX 765-kV STEP (\$B)
Permian Basin Reliability Plan Projects	12.95	13.77
2024 RTP Projects (beyond Permian Projects) <i>(with Live Reconductoring)</i>	8.48	10.22
Total	21.43	23.99
		+2.56

***Factoring in cost increases from likely-needed live
reconductoring, the cost difference between the two plans
under reduced load conditions decreases \$370M to \$2.56B.***

TX 765-kV STEP Potential Future Expansion



Potential future expansion could include lines into the Panhandle and Valley along with additional east-to-central pathways to serve more of the ERCOT system as need materializes.

2024 RTP Report Posting

- 2024 RTP report and final reliability cases were posted on December 20, 2024.
- Public version of the report¹ is also available.

Questions/Comments

- Please send questions to:
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 - Ping.Yan@ercot.com