

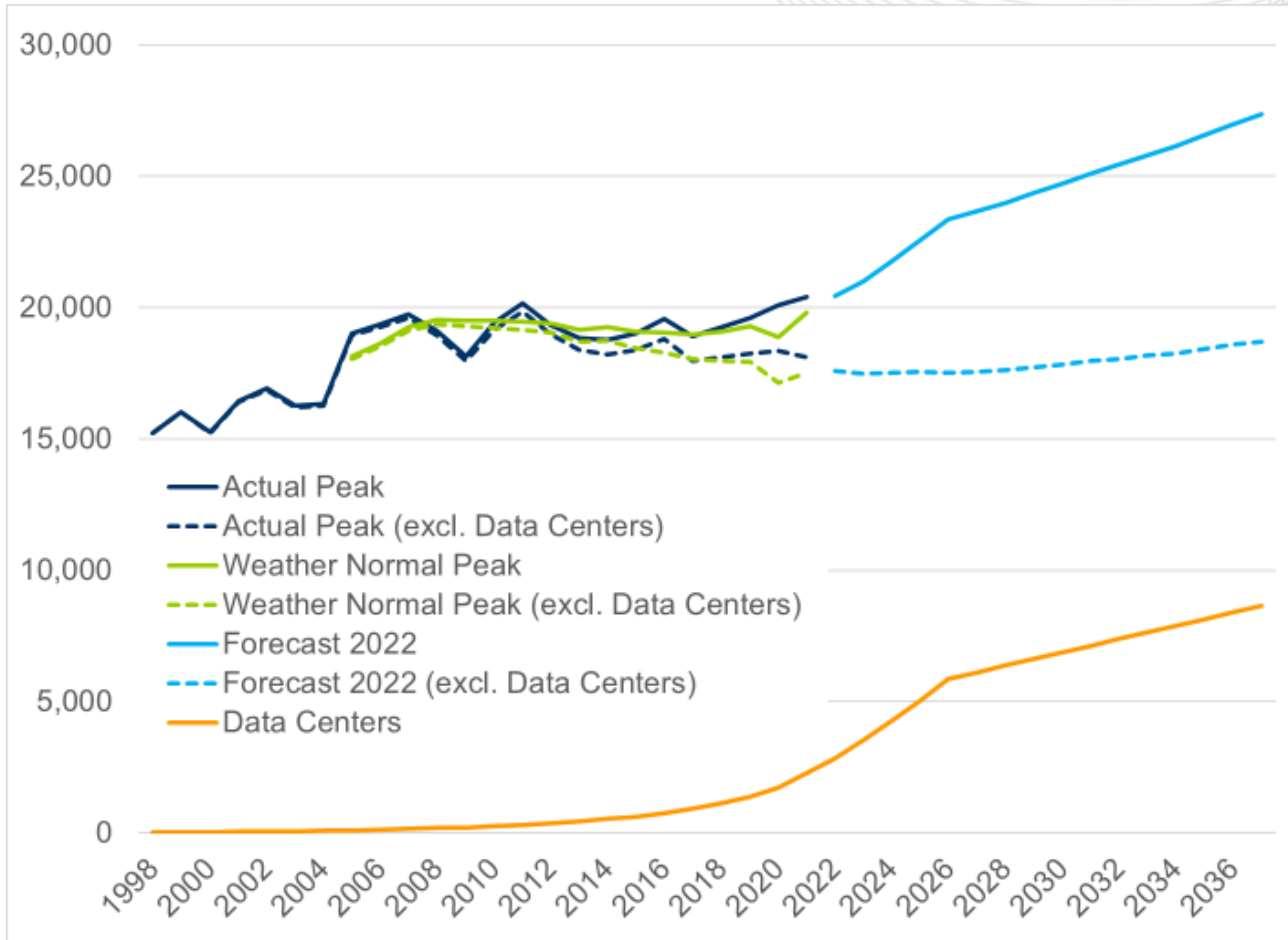


# Dominion Northern Virginia Area Immediate Need

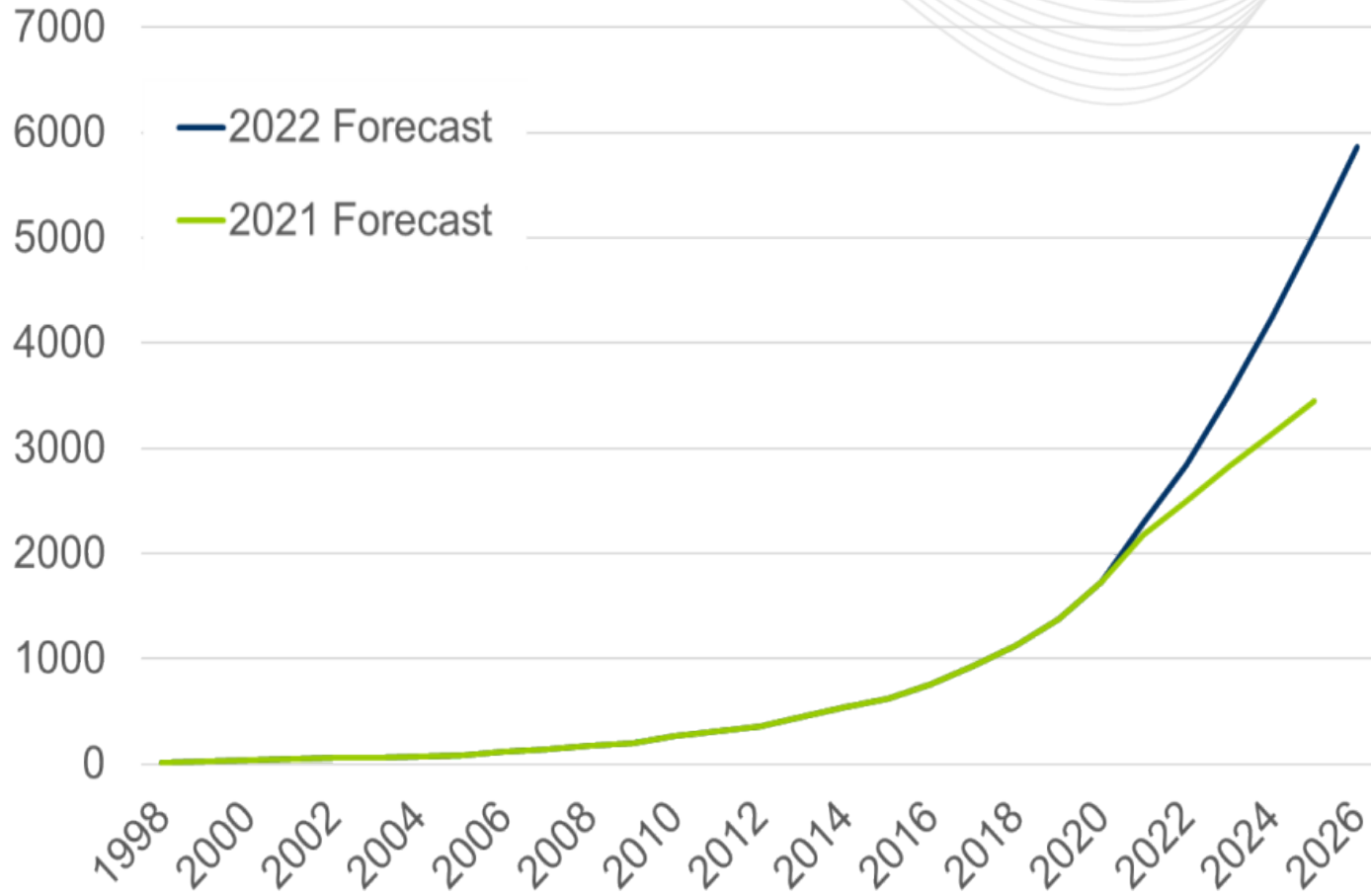
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Transmission Expansion Advisory Committee  
July 12, 2022

- Data Center Alley Area Load Growth and Transmission System
- Need Drivers
- Reliability Violations and Need Assessment Summary:
- Summary of Need, including time sensitive nature of the need
- Alternatives considered
- Why the need was not identified earlier
- Conclusions and Recommendation
- Next Steps



- 2022-2027 Annualized Growth Rate
  - With data centers: 3%
  - Excluding data centers: 0%



• Forecasted data center additions for the 2022 Load Forecast provided by Dominion and NOVEC were noticeably higher than were provided in the prior year.





- Rapid Load Growth (Starting as early as 2018)
  - 2050 MWs from 44 Supplemental Projects (load increases through summer 2025)
  - Some load additions occurred prior to the M3 process
- All load studied and impacting the results presented herein:
  - Reflect existing system load and actual additions via supplemental projects and some organic load growth in the Dominion system/area.

# Summary of Reliability Violations - Summer

	2024	2025 (pre supplemental upgrades)	2025 (post supplemental upgrades)	2027
Gen Deliverability	12	74	10	10
N-1	8	50	3	5
N-1-1	21	144	22	44

• **Notes:**

- Immediate need scope limited to cover 2025 (post supplemental upgrades) performance.
- Remaining needs in 2027 and beyond will be covered part of a competitive window.
- Results reflect the summer peak analysis.
- **2025 pre-supplemental upgrades:** includes all projects with an in-service date of 6/1/2025.
- **2025 post-supplemental upgrades:** includes planned supplemental upgrades to address the majority of the reliability violations. However these projects have a projected in-service date later in 2025 or 2026. These projects may need to be accelerated.
- **2027** includes violations that are also present in 2025.

- The Northern Virginia, Dulles Airport / Data Center area is experiencing very high concentrated load growth
- Reliability violations are observed in 2024, continue in 2025 even with supplemental upgrades and into 2027.
- 11 planned supplemental projects 2 planned baseline upgrades are not sufficient to address the reliability needs in 2025.
- Without further transmission upgrades, in 2024/25:
  - The area will not have sufficient transmission capability under Gen Deliverability, N-1 and N-1-1 outage conditions in 2024 and beyond



- Post the planned supplemental and baseline upgrades planned in the area (2024 and 2025);
  - There are remaining violations that require immediate transmission reinforcement. These needs are driven by the load growth in the Dulles airport load area.
- There is an immediate need to address remaining reliability violations anticipated in 2025.
  - Dominion has an obligation to serve load and there is high risk of load loss without additional immediate transmission reinforcement in the area.

- The area is constrained on all 230 kV inlet transmission segments to serve the size of load.
- Data center load has a flat profile throughout the day.
- Power flow control devices or non-wires solutions are not applicable to solve the identified transmission needs in this area.

- Part of the Attachment M-3 process do-no-harm analysis, PJM identified the need for 11 supplemental transmission reinforcements. In addition to the supplemental projects, PJM identified the need for two baseline reinforcements in the area to support its load growth.
- Because the 2027 RTEP case was not available at the time, the supplemental projects were assessed using the case available at the time (a 2025 RTEP); and at the time, the identified 11 supplemental reinforcement and 2 baseline upgrades were sufficient to serve the load increase using the 2025 RTEP case.

- PJM will proceed with an Immediate need project(s) –without a Window to address Dominion Northern Virginia area needs up to and including 2025 (building on top of already ongoing supplemental upgrades)
- PJM plans to address the 2027 needs via a future competitive window:
  - There is a need for a coordinated and holistically planned solution to address system constraints in the area/region.
  - PJM will work with Dominion, other Transmission Owners and Stakeholders to finalize the need drivers, problem statement and competitive window details taking into account new load service requests submitted in 2022 and longer-term needs.

- PJM welcomes all stakeholders input and comments on its “Immediate Need Assessment”
- PJM will consider all stakeholder feedback.
- Once a proposed transmission solution is identified, PJM and Dominion will bring it forward to the August 2022 TEAC meeting for first read.



Questions?

# Appendix



# Supplemental/Baseline Upgrades (62 Miles+2x500 Sub upgrades) \$230M

#	Project	Re-Conductor ?	Length (mi)	Line #	Upgraded Rating	Description	kV	Cost \$M	Projected ISD
1	b3026	Re-Conductor	6.36	274	1572	Re-conductor the entire 230 kV Line No.274 (Pleasant View – Ashburn – Beaumeade) using a higher capacity conductor with an approximate rating of 1572 MVA.	230	17	7/1/2022
2	b3694.8	Re-Conductor	10.34	249	1047 (SE)	Partial wreck and rebuild 10.34 miles of 230 kV line #249 Carson-Locks to achieve a minimum summer emergency rating of 1047 MVA. Upgrade terminal equipment at Carson and Locks to not limit the new conductor rating.	230	15.37	6/1/2026
3	s2321.4	Re-Conductor	7.54	2011	1574	Re-conductor the 230kV Line 2011 from Clifton to Cannon Branch (7.54 miles) using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1574 MVA.	230	17	12/31/2025
4	s2324.4	Re-Conductor	2.21		1574?	Reconductor 230kV line segment between Loudoun and Takeoff using a standard high-capacity conductor (approx. 2.21 miles)	230	3.31	12/31/2025
5	s2328.4	Re-Conductor	2.16	2152	1574	Re-conductor the 230kV Line 2152 from Beaumeade to Nimbus (2.16 miles) using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1574 MVA.	230	6	12/31/2025
6	s2328.6	Re-Conductor	1	9185	1574	Re-conductor the 230kV Line 9185 from Beaumeade to Paragon Park (1.0 miles) using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1574 MVA.	230	4	12/31/2025
7	s2328.7	Re-Conductor	0.16	2209	1574	Re-conductor the 230kV Line 2209 from Evergreen Mills to Yardley Ridge (0.16 miles) using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1574 MVA.	230	5	12/31/2025
8	s2328.8	Re-Conductor	4.73	2095	2095	Re-conductor the 230kV Line 2095 from Cabin Run to Shellhorn (4.73 miles) using a higher capacity conductor as well as terminal equipment upgrades to achieve an expected rating of 1574 MVA.	230	8	12/31/2025
9	s2340.1	Re-Conductor	23.17	2114	2114	Re-conductor 230kV Line #2114 from Remington CT to Rollins Ford (approx. 23.17 miles)	230	35	12/31/2025
10	s2609.2	Expand 500kV Sub				Install (1) 1440 MVA 500-230 kV transformer at Goose Creek Substation. Extend the existing 500kV ring bus at Goose Creek Substation to be set up for a future six-breaker ring arrangement. One breaker to be installed initially creating a five-breaker ring bus. Install a new 230kV ring bus at Goose Creek Substation to be set up for a future four-breaker ring arrangement. Three 230kV breakers to be installed initially. Cut and extend line #227 Belmont-Beaumeade into Goose Creek Substation.	500/230	40	12/15/2026
11	s2609.3	Re-Conductor	4	202	1574	Reconductor 230kV Line #202 Clark-Idylwood, approximately 4 miles, using a higher capacity conductor and upgrade terminal equipment to achieve an expected rating of 1574MVA.	230	8	12/15/2026
12	s2609.4- s2609.7	New 500 kV Feed				Install (1) 1440 MVA 500-230 kV transformer and associated 230 kV breaker ring at Occoquan Substation to supply the area with a 500 kV source. Install a 500 kV ring bus and associated 230 kV breaker-and-a-half bus configuration at Occoquan Substation. Cut and loop 500 kV line #571 Ox-Possum Point as the 500 kV source into the proposed 500 kV ring bus. Existing terminations for 230 kV line #2001 Occoquan-Possum Point, line #2013 Occoquan-Ox, and line #2042 Odgen Martin-Ox will be rearranged to terminate into the rebuilt Occoquan station Line #215 Hayfield-Possum Point will be rearranged to route over the expanded Occoquan station.	500/230	71	12/15/2026

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1	7/1/2022	<ul style="list-style-type: none"><li>• Original slides posted</li></ul>



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