



Transmission Expansion Advisory Committee (TEAC) Recommendations to the PJM Board

PJM Staff White Paper

PJM Interconnection
August 2024

For Public Use

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Contents

I.	Executive Summary	1
II.	Baseline Project Recommendations	1
III.	Baseline Reliability Projects Summary	1
	A. AEP Transmission Zones	1
	B. ComEd Transmission Zone	2
	C. Dominion Transmission Zone	2
	D. PSEG Transmission Zone	2
	E. Baseline Reliability Project Details	3
IV.	Transmission Owner Criteria Projects	10
V.	Changes to Previously Approved Projects	10
	Scope/Cost Changes	10
	New Jersey State Agreement Approach Project:	10
	2022 RTEP Window 3 Project:	10
	Cancellations	12
VI.	Review by the Transmission Expansion Advisory Committee (TEAC)	13
VII.	Cost Allocation	13
VIII.	Board Approval	13
	Attachment A – Reliability Project Single-Zone Allocations	14
	Attachment B – Reliability Project Multi-Zone Allocations	15

I. Executive Summary

On February 28, 2024, the PJM Board of Managers approved changes to the Regional Transmission Expansion Plan (RTEP), totaling a net increase of \$1,194.2 million for baseline and network projects, to resolve reliability criteria violations and to address changes to existing projects and project cancellations.

Since then, PJM has identified new baseline reliability criteria violations, and the transmission system enhancements needed to resolve them, at an estimated cost of \$447.51 million. Scope changes to an existing project will result in a net increase of \$194 million, and cancellation to existing projects will result in a net decrease of \$23.45 million. This yields an overall RTEP net increase of approximately \$618.06 million to resolve baseline criteria violations, for which PJM is recommending Board approval. With these changes, RTEP projects will total approximately \$50,071.06 million since the first Board approvals in year 2000.

PJM sought Reliability and Security Committee consideration and full Board approval of the RTEP baseline projects summarized in this white paper. On August 7th, 2024 the Board approved the addition of RTEP baseline projects as well as other changes to the RTEP as summarized in this paper.

II. Baseline Project Recommendations

A key dimension of PJM's RTEP process is baseline reliability evaluation, which is necessary before subsequent interconnection requests can be analyzed. Baseline analysis identifies violations of reliability criteria and standards, determines the potential to improve the market efficiency and operational performance of the system, and incorporates any public policy requirements. PJM then develops transmission system enhancements to resolve identified violations and reviews them with stakeholders through the Transmission Expansion Advisory Committee (TEAC) and Subregional RTEP committees prior to submitting its recommendation to the Board. Baseline transmission enhancement costs are allocated to PJM responsible customers.

III. Baseline Reliability Projects Summary

A summary of baseline projects with estimated costs equal to or greater than \$10 million is provided below. Projects with estimated costs less than \$10 million typically include, by way of example, transformer replacements, line reconductoring, breaker replacements and upgrades to terminal equipment, including relay and wave trap replacements. A complete listing of all recommended projects and their associated cost allocations is included in Attachment A (allocations to a single zone) and Attachment B (allocations to multiple zones).

A. AEP Transmission Zones

- Baseline project b3847.1-2 – Baker, Broadford and Jefferson 765 kV breakers: \$60.95 million
- Baseline project b3851.1-2 – Allen-R.P. Mone and Mone-Maddox Creek 345 kV line rebuilds and breaker replacements: \$92.47 million
- Baseline project b3852.1-2 – Vassell and Maliszewski 765 kV transformer bank and breaker: \$33.73 million

B. ComEd Transmission Zone

- Baseline project b3811.1-3 – Haumesser Road 138 kV: \$28.11 million
- Baseline project b3812.1-4 – Elwood-Goodings Grove 345 kV upgrade: \$61.84 million

C. Dominion Transmission Zone

- Baseline project b3850.1-3 – Yadkin-Fentress 500 kV rebuild: \$79.70 million

D. PSEG Transmission Zone

- Baseline project b3855.1-3 – Jackson Road-Cedar Grove 230 kV new line: \$84.58 million

PJM also recommended regional baseline projects totaling \$6.13 million, whose individual cost estimates are less than \$10 million. Those projects included breaker replacements and terminal equipment upgrades.

A more detailed description of the larger-scope projects that PJM recommended to the Board is provided in the following sections.

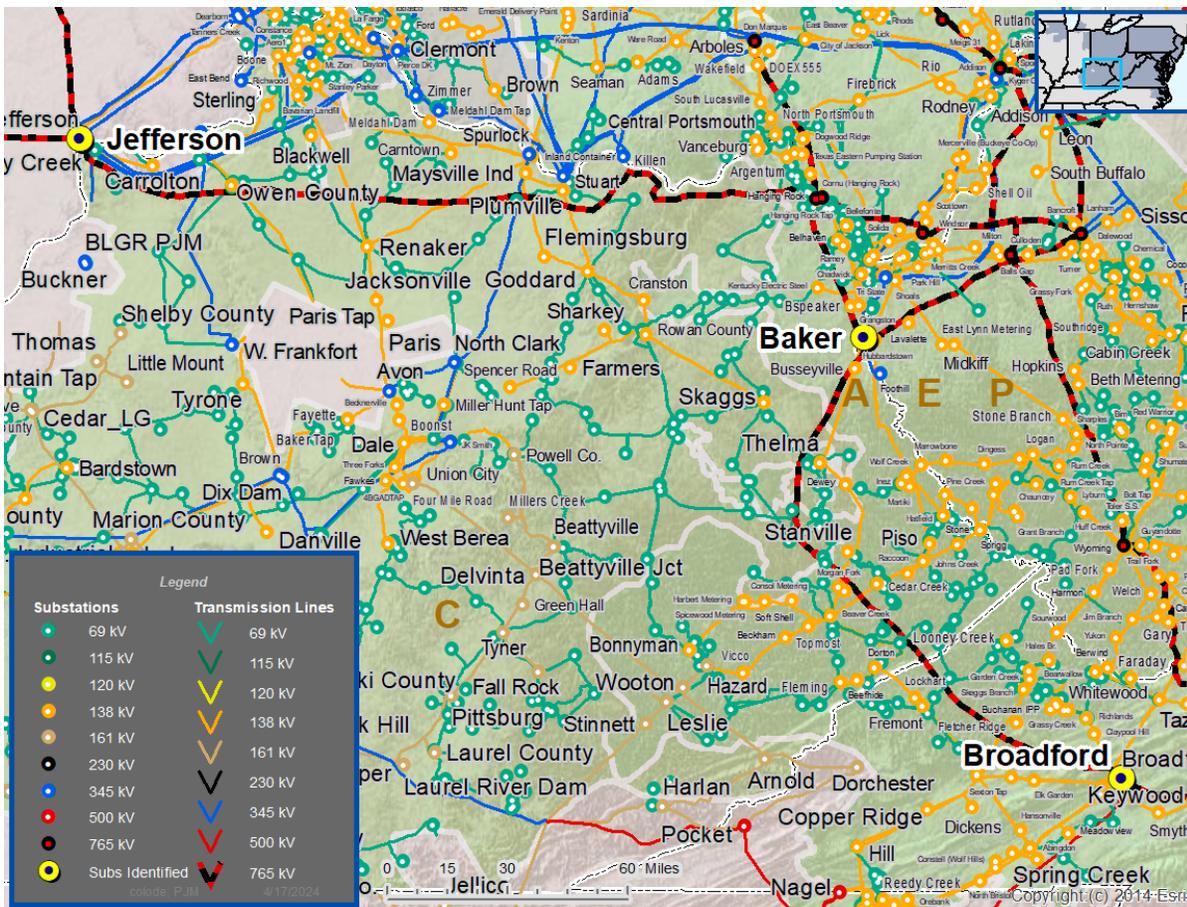
E. Baseline Reliability Project Details

Baseline Project b3847.1-2 – Baker, Broadford and Jefferson 765 kV Breakers

AEP Transmission Zone

PJM Operations has requested flexibility in the ability to switch 765 kV reactors at Baker, Broadford and Jefferson stations. Currently, these reactors are tied directly to their respective 765 kV lines and require a line outage to switch the reactors on and off. During recent winter storm events, PJM determined that having the ability to remove these reactors from service, without taking the line out of service, could have helped support certain operating conditions.

Map 1. b3847.1-2: Baker, Broadford and Jefferson Breakers



PJM determined that the operational performance issues described above create an immediate reliability need for which a competitive Window was not feasible. The recommended solution is to add a 765 kV breaker at Baker station for the reactor on the Broadford 765 kV line, add two 765 kV breakers to the reactors at Broadford station on the Baker and Jacksons Ferry 765 kV lines and add a 765 kV breaker to the reactor at Jefferson station on the Greentown 765 kV line. The estimated cost for this project is \$60.95 million. This project addresses an existing operational performance need and the transmission owner has been asked to use best efforts to complete the

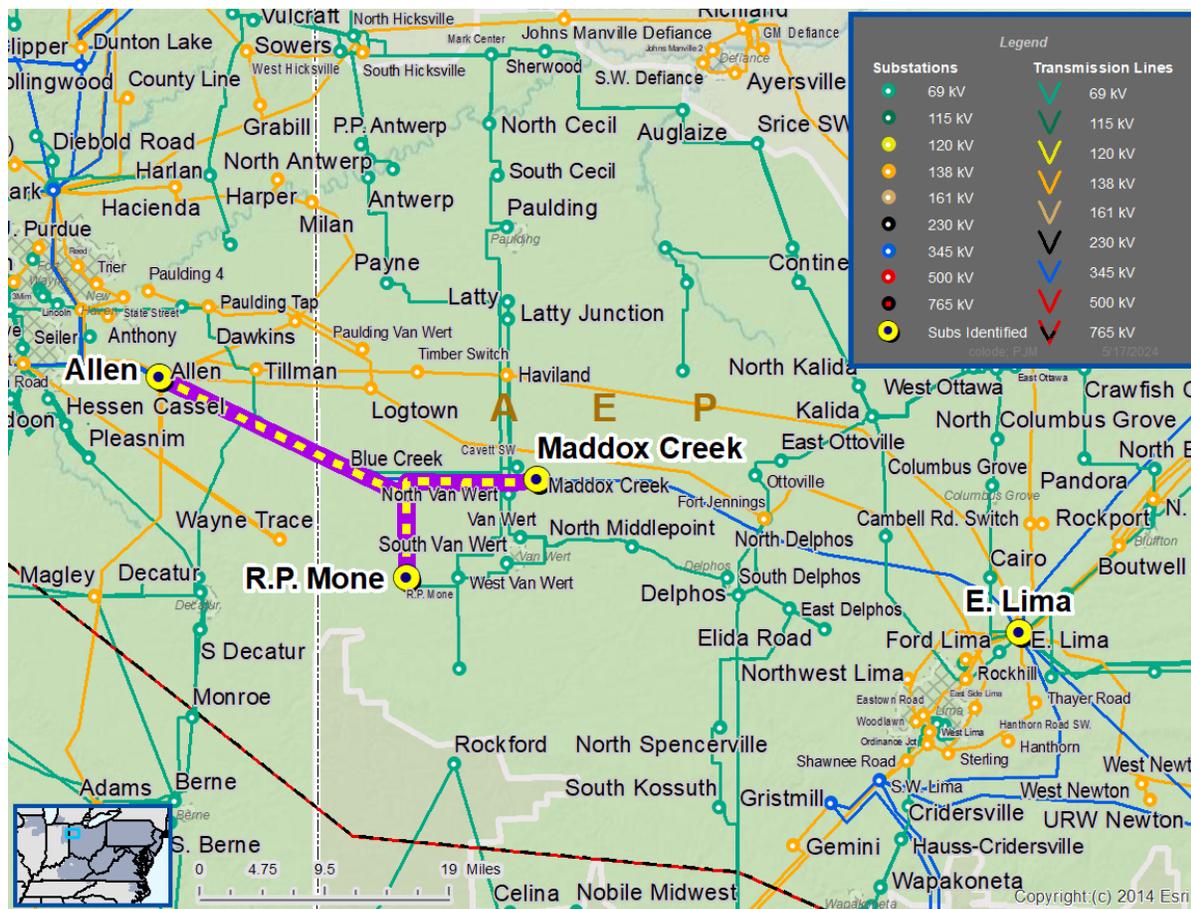
project in a timely manner. The current targeted in-service date is June 2027 taking into consideration the long-lead timeline required for 765kV breakers and substation work. The local transmission owner, AEP, will be designated to complete this work.

Baseline Project b3851.1-4 – Allen-R.P. Mone and Mone-Maddox Creek 345 kV Line Rebuilds and Breaker Replacements

AEP Transmission Zone

In the 2023 RTEP Window 2 2028 summer and winter cases, the R.P. Mone-Maddox Creek 345 kV line is overloaded for the generator deliverability test for both N-1 and N-2 outages. Furthermore, in 2028 winter cases, the Allen-R.P. Mone 345 kV line is overloaded for the generator deliverability test for an N-1 outage.

Map 2. b3851.1-2: Allen-RP Mone-Maddox Creek 345 kV



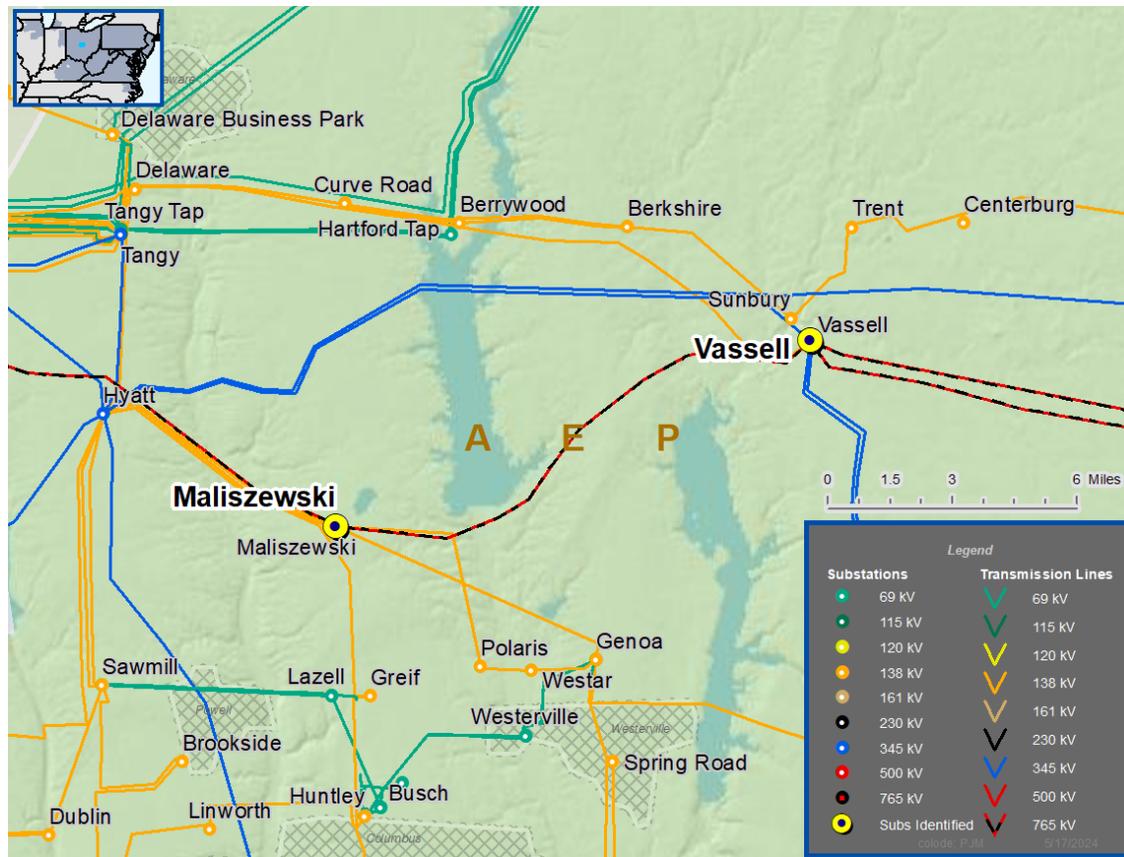
The recommended solution, solicited through 2023 RTEP Window 2, is to rebuild 18.6 mile Allen-R.P. Mone 345 kV line and rebuild 9.4 mile R.P. Mone-Maddox Creek 345 kV line. The project will also replace breakers “B1” and “B” at Maddox Creek 345 kV and breakers “M” and “M2” at East Lima 345 kV substations. The estimated cost for this project is \$92.47 million. This project has a required and projected in-service date of June 2027, consistent with

AEP forecast of when the load levels studied in the 2023 RTEP Window 2 2028 cases is expected to materialize. The local transmission owner, AEP, will be designated to complete this work.

**Baseline Project b3852.1-2 – Vassell and Maliszewski 765 kV Transformer Bank and Breaker
AEP Transmission Zone**

In the 2023 RTEP Window 2 2028 summer case, the Genoa-Westar 138 kV line is overloaded for the generator deliverability test for N-2 outages; and in 2028 summer and winter cases, the Genoa-Westar 138 kV line is overloaded in N-1-1 test for multiple contingency pairs. In 2028 summer case, the Maliszewski-Polaris 138 kV line is overloaded in generator deliverability test and base case analysis test for N-2 outages; and in 2028 summer and winter cases, the Maliszewski-Polaris 138 kV line is overloaded in N-1-1 test for multiple contingency pairs. In 2028 summer case, the Genoa-Spring Road 138 kV line is overloaded in N-1-1 test for multiple contingency pairs. In 2028 summer and winter cases, the Polaris-Westar 138 kV line is overloaded in N-1-1 test for multiple contingency pairs. In 2028 summer and winter cases, Maliszewski transformer 765/138 kV transformer and Maliszewski 138 kV series reactor bypass are overloaded for the generator deliverability test and base case analysis test for N-1 and N-2 outages. In 2028 summer case, the Morse-Spring Road 138 kV line, the Marysville-Hyatt 345 kV line, the Hyatt-Vassell 345 kV line, the Hyatt-Maliszewski No. 2 138 kV line, and the Genoa-Maliszewski 138 kV No. 2 line are overloaded in N-1-1 test for multiple contingency pairs.

Map 3. b3852.1-2 Vassell 765/345 kV Bank and Maliszewski 765 kV Breaker



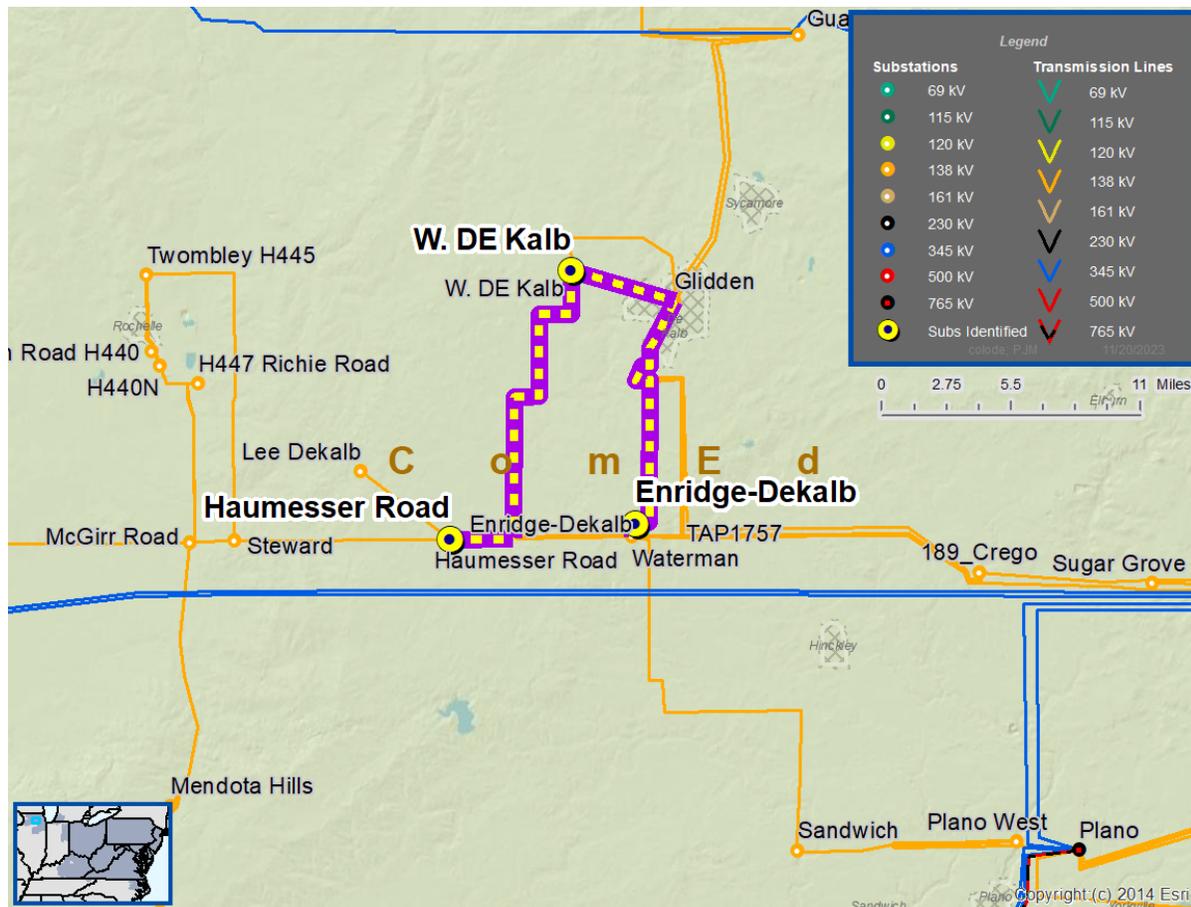
The recommended solution, solicited through 2023 RTEP Window 2, is to connect and energize a second 765/345 kV transformer bank at Vassell station and replace 765 kV breaker “D” at Maliszewski station. The estimated cost for this project is \$33.73 million. This project has a required and projected in-service date of June 2027, consistent with AEP’s forecast of when the load levels studied in the 2023 RTEP Window 2 2028 cases is expected to materialize. The local transmission owner, AEP, will be designated to complete this work.

Baseline Project b3811.1-.3 – Haumesser Road 138 kV

ComEd Transmission Zone

In the 2023 RTEP Window 1 2028 winter case, the Haumesser Road-West DeKalb tap-ESS H452 (Enridge-DeKalb) tap 138 kV line is overloaded for N-1 and N-2 outages.

Map 4. b3811.1-.3 Haumesser Road 138 kV



The recommended solution, solicited through 2023 RTEP Window 1, is to expand Haumesser Road 138 kV substation as a four circuit breaker ring bus, add one 138 kV circuit breaker at H-452 to complete a three circuit breaker ring bus, rebuild 3 miles of 138 kV line 11323 from Haumesser Road to the H-452 tap with double circuit towers and cut the H-452 tap over to the second circuit from Haumesser Road. Both circuits will twisted pair 556 ACSR Parakeet conductor. The estimated cost for this project is \$28.11 million. This project has a required and

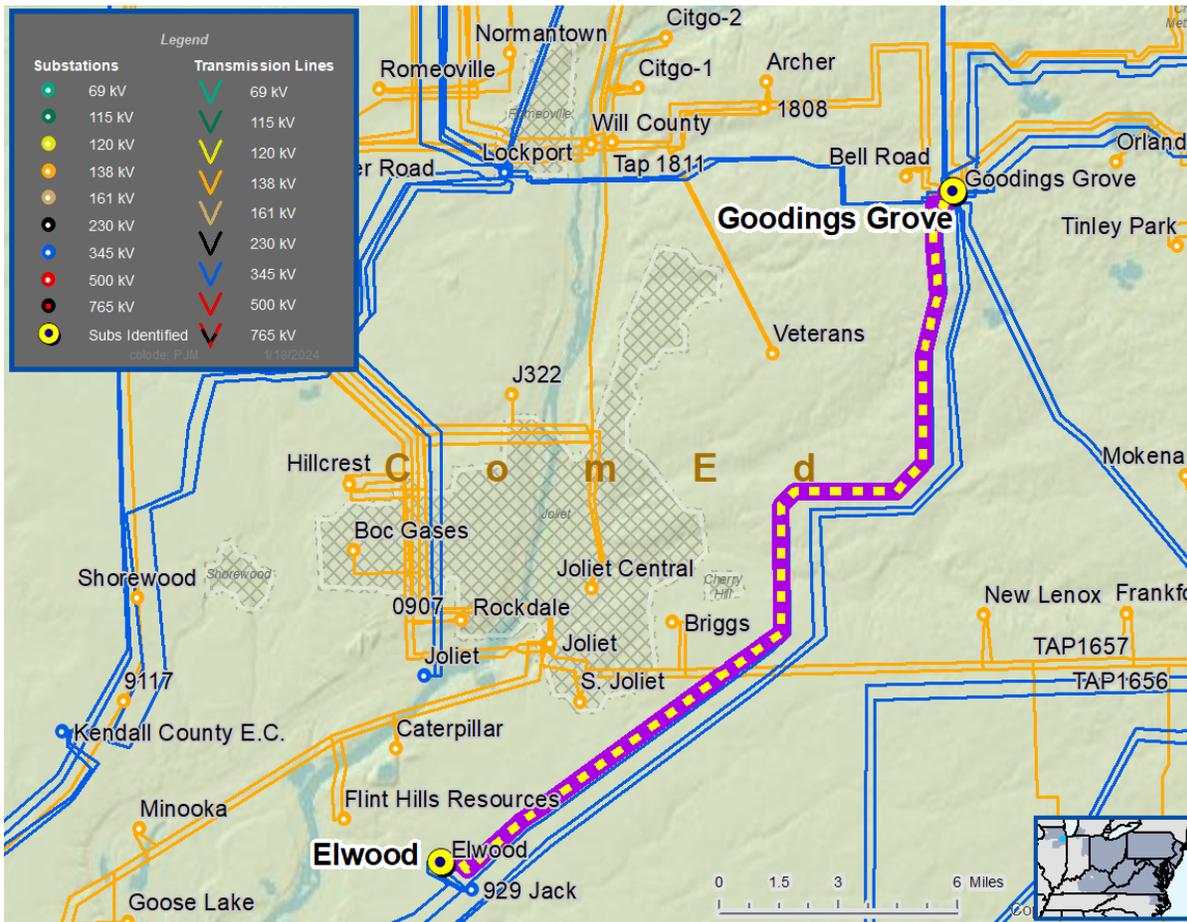
projected in-service date of December 2028, and the local transmission owner, ComEd, will be designated to complete this work.

Baseline Project b3812.1-4 – Elwood-Goodings Grove 345 kV Upgrade

ComEd Transmission Zone

In the 2023 RTEP Window 1 2028 summer case, the Elwood-Goodings Grove 345 kV double circuit is overloaded in the base case and for N-2 outages.

Map 5. b3812.1-4 Elwood-Goodings Grove 345 kV



The recommended solution, solicited through 2023 RTEP Window 1, is to reconductor 345 kV lines 11620 and 11622 from Elwood to Goodings Grove. The project also upgrades Goodings Grove 345 kV circuit breakers, disconnects, associated equipment and adjusts the reclosing cycle for Goodings Grove 345 kV circuit breaker “116 9806” to eliminate the reclosing derating and upgrade the station conductor at Elwood 345 kV substation. The estimated cost for this project is \$61.84 million. This project has a required and projected in-service date of June 2028, and the local transmission owner, ComEd, will be designated to complete this work.

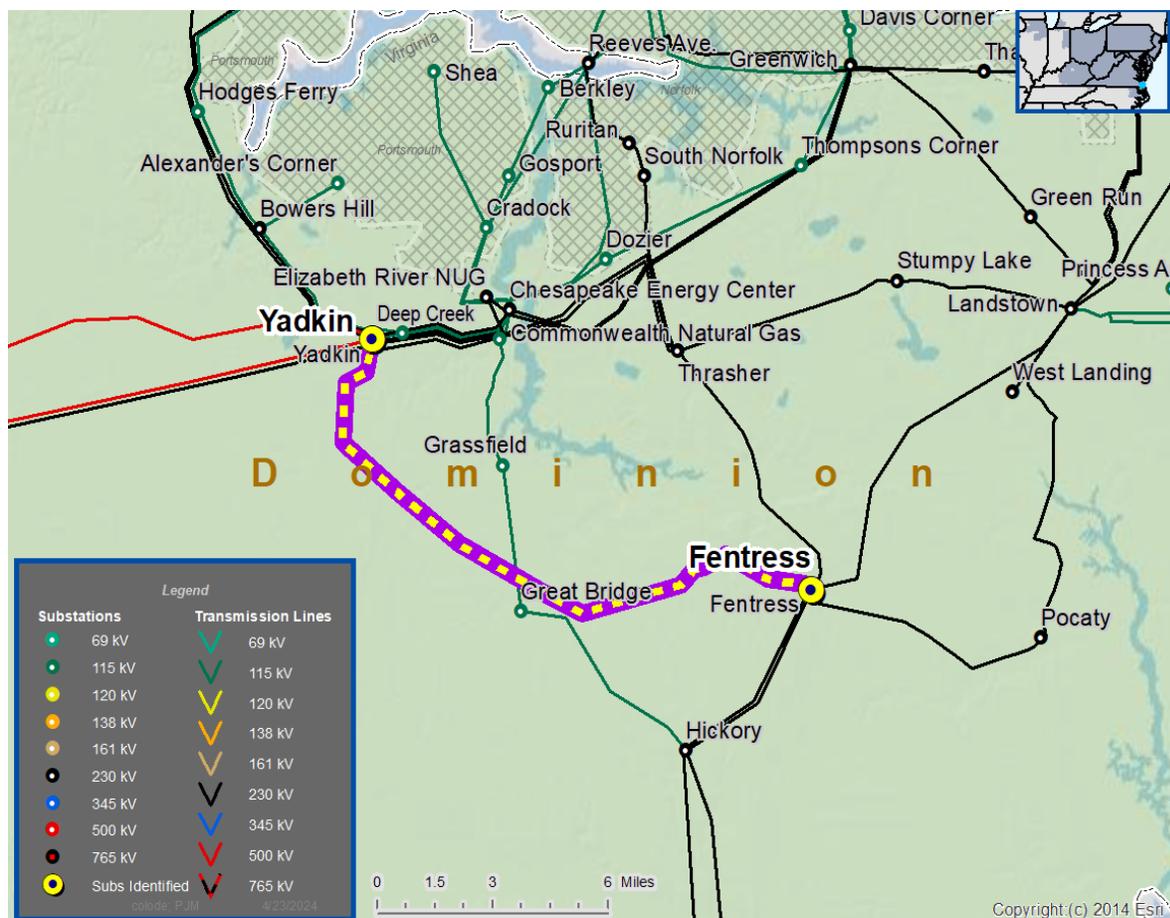
Baseline Project b3850.1-3 – Yadkin-Fentress 500 kV Rebuild

Dominion Transmission Zone

Line No. 588 is approximately 13.66 miles of 500 kV single circuit transmission line connecting Yadkin and Fentress substations. The line was built on series 5 Corten towers. These structures were installed in 1975 and are approaching the end of service life.

Third-party assessments have determined that the towers have corroded to a point where they exhibit premature thinning of structure members and pack-out at joints. If left unaddressed, these issues could result in failure of structures and potentially the collapse of the line.

Map 6. b3850.1-3 Yadkin-Fentress 500 kV



The recommended solution, solicited through 2023 RTEP Window 2, is to rebuild approximately 13.51 miles of 500 kV line No. 588 from structure 588/184 inside Yadkin substation to structure 588/254 outside of Fentress substation. Line No. 588 terminal equipment at Yadkin substation will also be upgraded to a rating of 5000A, and since the new 500 kV line will be using fiber, the wave trap will be removed, and the line protection scheme will be updated. At Fentress substation, since the new 500 kV line will be using fiber, the wave trap will be removed and the line protection scheme will be updated. The estimated cost for this project is \$79.70 million. This project has a required

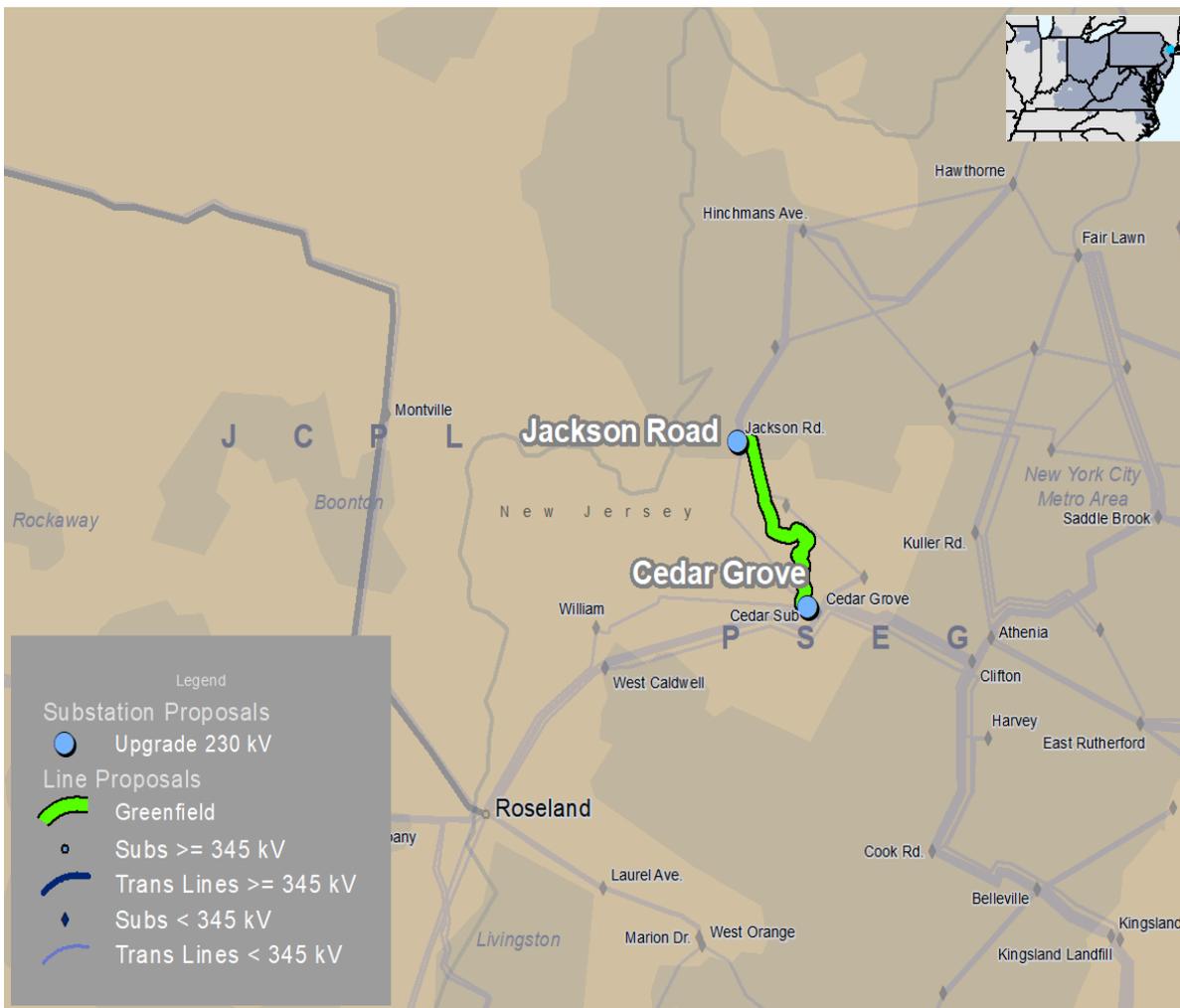
and projected in-service date of June 2028, and the local transmission owner, Dominion, will be designated to complete this work.

Baseline Project b3855.1-3 – Jackson Road-Cedar Grove 230 kV

PSEG Transmission Zone

In the 2023 RTEP Window 2 2028 summer and winter cases, there are a number of N-1-1 thermal violations in Northern New Jersey (Cedar Grove and Jackson area). Four 69 kV lines are overloaded for several N-1-1 contingency combinations.

Map 7. b3855.1-3 – Jackson Road-Cedar Grove 230 kV



The recommended solution, solicited through 2023 RTEP Window 2, is to build 4 miles of new 230 kV XLPE circuit (using 345 kV rated 5000 kcmil cable) from Jackson Road 230 kV station to Cedar Grove 230 kV station. The project will expand a new 230 kV bay at the existing Cedar Grove station with one line position by adding two 230 kV circuit breakers and associated disconnect switches, and replace the existing HPFF termination structure with a new XLPE termination structure to connect to spare GIS bay position at the Jackson 230 kV substation. The

estimated cost for this project is \$84.58 million. This project has a required and projected in-service date of June 2028, and the local transmission owner, PSEG, will be designated to complete this work.

IV. Transmission Owner Criteria Projects

Of the \$447.51 million of new recommended baseline transmission system enhancements, approximately \$83.33 million is driven by transmission owner planning criteria, which makes up approximately 19% of the new project cost estimates.

V. Changes to Previously Approved Projects

Scope/Cost Changes

The following scope/cost modifications were recommended:

New Jersey State Agreement Approach Project:

- At the New Jersey Board of Public Utilities' February 2024 meeting, the New Jersey Board of Public Utilities requested prebuild provisions around the Larrabee station for civil work to minimize disturbance to the shoreline and in the vicinity of the Larrabee substation. This resulted in a scope addition for baseline project b3737.22 [Larrabee Collector station scope of the New Jersey State Agreement Approach (SAA) project]. The additional scope includes prebuild extension work, such as duct banks, to accommodate four HVDC circuits from the prebuild point of demarcation to each offshore wind generator's converter station area on the Larrabee Collector station property. Three sets of AC collector lines with a combined total of 12 230 kV AC circuits that will run from each offshore wind generator's converter station area to the Larrabee Collector station AC interface will also be added. Since then, the scope has been amended to increase the sizing of the autotransformers from 450 MVA to 480 MVA. The previous cost for b3737.22 was \$216.3 million, and the updated cost is \$217.1 million, resulting in a cost increase of \$0.8 million.
- All of the changes noted above result in a net cost increase of \$0.8 million for the New Jersey SAA project.

2022 RTEP Window 3 Project:

502 Junction to Woodside to Aspen 500 kV Project Scope Change

- In December 2023, the PJM Board approved baseline b3800 to address the 2022 RTEP Window 3 violations, which included a new 500 kV line from 502 Junction to Woodside to Aspen designated to NextEra, FirstEnergy, and Dominion.
- NextEra initiated collaborative discussions with the incumbent Transmission Owners along the existing Doubs – Goose Creek Corridor to investigate a more feasible route that would minimize area impact for the new Woodside to Aspen 500 kV line segment. Following these discussions, the entities agreed that the line section from Woodside to Aspen should be rerouted from the originally proposed greenfield line route to an alternate route within the existing transmission line rights of way along the Doubs – Goose Creek Corridor containing the rebuilt Doubs – Goose Creek and the new Doubs – Aspen 500 kV lines.

- As part of this change, the new 500 kV line from Woodside will now terminate into Goose Creek substation, instead of Aspen, due to space constraints within the Corridor and also to minimize unnecessary line crossings.
- To implement this scope change, NextEra, FirstEnergy, and Dominion have identified the following project changes:
 - Cancel baseline b3800.119: New 500 kV transmission line from Woodside substation to Aspen substation. Original estimated cost: \$71.72 million. Updated cost estimate: \$0 million. Decrease of \$71.72 million
 - Scope change baseline b3800.105: Millville-Doubs Rebuild – Rebuild 16 miles of the 138 kV line with 500 kV overbuild (increase of 10 miles from original project). Original estimated cost: \$52.35 million. Updated cost estimate: \$147.45 million. Increase of \$95.1 million
 - New Baseline b3800.128: Construct ~2 miles of 500 kV line from existing structure MVF1-101 on the Doubs-Millville 138 kV line, around Doubs substation, and into the entrance of the Doubs-Goose Creek Corridor. \$13.2 million
 - New Baseline b3800.129: Construct new Woodside-Goose Creek 500 kV line for ~15 miles on single circuit monopole structures within the Doubs-Goose Creek Corridor. \$115.3 million
 - Scope change baseline b3800.120: Terminate new NextEra 500 kV line from Woodside into Goose Creek substation (instead of termination at the new Aspen substation). The Goose Creek 500 kV cap bank will be moved to Aspen substation. No cost change.
 - New baseline b3800.375: Construct new Woodside-Goose Creek 500 kV line for ~3 miles on single circuit monopole structures within the Doubs-Goose Creek Corridor. \$15.6 million

Chanceford to Conastone 500 kV Project Scope Changes

- In December 2023, the PJM Board approved baseline b3800 to address the 2022 RTEP Window 3 violations, which included a new 500 kV line from Chanceford (new 500 kV substation near Otter Creek) to Conastone to Doubs designated to PPL, Exelon, and PSEG.
- PPL proposed to build a new 500 kV line from Chanceford – Conastone by upgrading and replacing structures on the existing Otter Creek to Conastone 230 kV line corridor using double-circuit 500 kV and 230 kV structures. However, following engineering reviews, an assessment of future additional 500 kV needs in the corridor, and to minimize future impacts to the local community, this scope is being revised to rebuild the 230 kV line corridor using double-circuit 500 kV structures, with the rebuilt 230 kV Otter Creek to Conastone circuit still operating at 230 kV initially.
- In addition, following detailed reviews by the incumbent entities involved with the tapping of the new Chanceford substation into the TMI – Peach Bottom 500 kV line, PPL, FirstEnergy and Exelon, clarifications of scope and cost were identified.
- To implement these scope changes, PPL, FirstEnergy, and Exelon have identified the following project changes:

- Scope change baseline b3800.3: Build new 500 kV AC line from the new Chanceford (near Otter Creek) 500 kV switchyard – toward Pennsylvania/Maryland border ~12.5 miles. Rebuild the existing Otter Creek-Conastone 230 kV line to become a double circuit 500 kV line; operate Conastone circuit at 230 kV initially. Original estimated cost: \$83.3 million. Updated cost estimate: \$102.8 million. Increase of \$19.5 million
- Scope change baseline b3800.2: Break the existing TMI-Peach Bottom line within the existing right-of-way and install new structures rerouting the line toward Chanceford switchyard taps being constructed by PPL. Original estimated cost: \$18.3 million. Updated cost estimate: \$7.43 million. Decrease of \$10.87 million
- New baseline b3800.53: Construct a double circuit 500 kV line from the existing TMI-Peach Bottom 500 kV right-of-way to the proposed Chanceford switchyard approximately 1 mile in length. – \$12.59 million
- Scope change baseline b3800.5: Peach Bottom-TMI 500 kV – Replace terminal equipment at Peach Bottom. Original estimated cost: \$0.0 million. Updated cost estimate: \$2.5 million. Increase of \$2.5 million

Red Lion – Hope Creek 500 kV Terminal Upgrades Scope Changes

- Through detailed project review following project selection, Exelon has updated estimated costs for the following scopes:
 - Baseline b3800.39: Red Lion-Hope Creek 500 kV – Replace four 500 kV breakers and the stranded bus at Red Lion 500 kV substation. Original estimated cost: \$4 million. Updated cost estimate: \$6 million. Increase of \$2.0 million

All of the scope changes noted above result in a net cost increase of \$194 million for the 2022 RTEP Window 3 project.

Cancellations

The following cancellations were recommended:

- Baseline b3007.1-2 (Blairsville East-Social Hall 138 kV): As the Beaver Valley 1 & 2 generation units withdrew the deactivation request, those upgrades were no longer needed to address reliability issue. However, the base case used to perform interconnection queue studies included those upgrades. As a result, the status of the upgrades were put on hold. Per the latest study, those upgrades are no longer needed for interconnection queue and will be canceled, yielding a net decrease of \$6.27 million.
- Baseline b3702 (Charlottesville-Proffit 230 kV series reactor) is no longer required as result of the 2022 Window 3 approved solution. This cancellation yields a net decrease of \$11.38 million.
- Baseline b3728.1-2 (Peach Bottom-Conastone 500 kV) is no longer required due to recently approved 2022 Window 3 solution, specifically the scope related to the Conastone-Peach Bottom 500 kV will amend this project scope. The b3728.1 and b3728.2 upgrades will be replaced with part of the b3800 scope and will be canceled. This cancellation and yields a net decrease of \$5.8 million.

All of the changes noted above result in a net decrease of \$23.45 million.

VI. Review by the Transmission Expansion Advisory Committee (TEAC)

Project needs and recommended solutions as discussed in this report were reviewed with stakeholders during 2024, most recently at the July 9, 2024, TEAC meeting. Written comments were requested to be submitted to PJM to communicate any concerns with project recommendations. PJM is currently addressing some clarifying questions and comments received regarding the 502 Junction to Woodside to Aspen 500 kV line designated to NextEra, FirstEnergy, and Dominion.

VII. Cost Allocation

Cost allocations for recommended projects are shown in Attachment A (for allocation to a single zone) and Attachment B (for allocation to multiple zones).

Cost allocations are calculated in accordance with Schedule 12 of the Open Access Transmission Tariff. The allocations will be filed at FERC 30 days following approval by the Board.

VIII. Board Approval

The PJM Reliability and Security Committee is requested to endorse the additions and changes to the RTEP proposed in this white paper and recommends to the full Board for approval the new projects and changes to the existing RTEP projects as detailed in this white paper. The RTEP is published annually on PJM's website.

Attachment A – Reliability Project Single-Zone Allocations

Upgrade ID	Description	Cost Estimate (\$M)	TO	Cost Responsibility	Required In-Service Date
b3811.1	Expand Haumesser Road 138 kV substation as a four-circuit breaker ring bus.	\$15.91	ComEd	ComEd	12/1/2028
b3811.2	Add one 138 kV circuit breaker at H-452 to complete a three-circuit breaker ring bus.	\$1.98	ComEd	ComEd	12/1/2028
b3811.3	Rebuild 3 miles of 138 kV line 11323 from Haumesser Road to the H-452 tap with double circuit towers. Cut the H-452 tap over to the second circuit from Haumesser Road. Both circuits to use twisted pair 556 ACSR Parakeet conductor.	\$10.22	ComEd	ComEd	12/1/2028
b3848.1	Open East Rutherford 69 kV tie breaker (26K).	\$0.00	PSEG	PSEG	6/1/2028
b3848.2	Move line U-775 (East Rutherford to Hasbrouck Heights) currently on section 2 to section 7 of the ring bus.	\$2.14	PSEG	PSEG	6/1/2028
b3849.1	Perform all necessary engineering design and evaluation to increase Fairlawn 69 kV GIS from 50 kA to 55 kA.	\$1.49	PSEG	PSEG	6/1/2028
b3853.1	Replace over duty Ladysmith CT 230 kV circuit breakers SX1272 and SX3472 with an interrupting rating of 63 kA.	\$1.25	Dominion	Dominion	6/1/2025
b3854.1	Replace over duty Carson 230 kV circuit breakers 200272 and 24972-3 with an interrupting rating of 63 kA.	\$1.25	Dominion	Dominion	6/1/2025

Attachment B – Reliability Project Multi-Zone Allocations

Upgrade ID	Description	Cost Estimate (\$M)	TO	Cost Responsibility	Required In-Service Date
b3800.53	Construct a double circuit 500 kV line from the existing TMI-Peach Bottom 500 kV right-of-way to the proposed Chanceford switchyard ~1.0 miles in length.	\$12.59	PPL	<p style="text-align: center;">Load-Ratio Share Allocation:</p> AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%)	6/1/2027
b3800.128	Construct new Woodside-Goose Creek 500 kV line for ~15 miles on single circuit monopole structures within the Doubs-Goose Creek Corridor. (FE Portion)	\$13.20	APS	<p style="text-align: center;">Load-Ratio Share Allocation:</p> AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%)	6/1/2027
b3800.129	Construct 500 kV line from existing structure MVF1-101 on the Doubs-Millville 138 kV line around Doubs substation and into the entrance of the Doubs-Goose Creek corridor. (~2 miles)	\$115.30	APS	<p style="text-align: center;">Load-Ratio Share Allocation:</p> AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%)	6/1/2027

Upgrade ID	Description	Cost Estimate (\$M)	TO	Cost Responsibility	Required In-Service Date
b3800.375	Construct new Woodside-Goose Creek 500 kV line for ~3 miles on single circuit monopole structures within the Doubs-Goose Creek Corridor. (DOM Portion)	\$15.60	Dominion	<p>Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%)</p> <p>DFAX Allocation: APS (9.26%) / BGE (7.30%) / Dominion (72.31%) / PEPCO (11.13%)</p>	6/1/2027
b3812.1	Reconductor 345 kV lines 11620 and 11622 from Elwood to Goodings Grove.	\$56.18	ComEd	<p>Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%)</p> <p>DFAX Allocation: ComEd (100.00%)</p>	6/1/2028
b3812.2	Upgrade Goodings Grove 345 kV circuit breakers, disconnects and associated equipment.	\$5.16	ComEd	<p>Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%)</p> <p>DFAX Allocation: ComEd (100.00%)</p>	6/1/2028

Upgrade ID	Description	Cost Estimate (\$M)	TO	Cost Responsibility	Required In-Service Date
b3812.3	Upgrade station conductor at Elwood 345 kV.	\$0.50	ComEd	Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%) DFAX Allocation: ComEd (100.00%)	6/1/2028
b3812.4	Adjust reclosing cycle on for Goodings Grove 345 kV circuit breaker “116 9806” to eliminate the reclosing derating.	\$0.00	ComEd	Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%) DFAX Allocation: ComEd (100.00%)	6/1/2028
b3847.1	Add a 765 kV breaker at Baker station for the reactor on the Broadford 765 kV line.	\$23.36	AEP	Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%) DFAX Allocation: AEP (70.68%) / EKPC (8.12%) / PEPCO (21.20%)	6/1/2024

Upgrade ID	Description	Cost Estimate (\$M)	TO	Cost Responsibility	Required In-Service Date
b3847.2	Add two 765 kV breakers to the reactors at Broadford station on the Baker and Jacksons Ferry 765 kV lines.	\$29.05	AEP	<p>Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%)</p> <p>DFAX Allocation: AEP (36.98%) / BGE (9.18%) / DAYTON (0.04%) / DEOK (0.10%) / Dominion (40.81%) / EKPC (0.05%) / PEPCO (12.84%)</p>	6/1/2024
b3847.3	Add a 765 kV breaker to the reactor at Jefferson station on the Greentown 765 kV line.	\$8.53	AEP	<p>Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%)</p> <p>DFAX Allocation: AEP (64.50%) / DEOK (27.02%) / EKPC (6.06%) / OVEC (2.42%)</p>	6/1/2024
b3850.1	Rebuild ~13.51 miles of 500 kV line No. 588 from structure 588/184 inside Yadkin substation to structure 588/254 outside of Fentress substation.	\$78.60	Dominion	<p>Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%)</p> <p>DFAX Allocation: Dominion (100.00%)</p>	6/1/2028

Upgrade ID	Description	Cost Estimate (\$M)	TO	Cost Responsibility	Required In-Service Date
b3850.2	Line No. 588 terminal equipment at Yadkin substation will be upgraded to a rating of 5000A. Since the new 500 kV line will be using fiber, the wave trap will be removed and the line protection scheme will be updated.	\$0.96	Dominion	Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%) DFAX Allocation: Dominion (100.00%)	6/1/2028
b3850.3	At Fentress substation, since the new 500 kV line will be using fiber, the wave trap will be removed and the line protection scheme will be updated.	\$0.14	Dominion	Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%) DFAX Allocation: Dominion (100.00%)	6/1/2028
b3851.1	Rebuild Allen-R.P. Mone 345 kV line (18.6 miles).	\$49.88	AEP	AEP (0.71%) / DAYTON (99.28%) / OVEC (0.01%)	6/1/2027
b3851.2	Rebuild R.P. Mone-Maddox Creek 345 kV line (9.4 miles).	\$39.03	AEP	AEP (78.50%) / DAYTON (21.50%)	6/1/2027
b3851.3	Replace breakers “B1” and “B” at Maddox Creek.	\$1.80	AEP	AEP (80.97%) / DAYTON (19.03%)	6/1/2027
b3851.4	Replace two 345 kV breakers “M” and “M2” at East Lima station.	\$1.76	AEP	AEP (80.97%) / DAYTON (19.03%)	6/1/2027
b3852.1	Connect and energize a second 765/345 kV bank at Vassell station.	\$30.83	AEP	AEP (88.81%) / DAYTON (6.22%) / DEOK (4.89%) / OVEC (0.08%)	6/1/2027

Upgrade ID	Description	Cost Estimate (\$M)	TO	Cost Responsibility	Required In-Service Date
b3852.2	Replace 765 kV breaker D at Maliszewski station.	\$2.90	AEP	<p>Load-Ratio Share Allocation: AEC (1.65%)/AEP (14.29%)/APS (5.82%)/ATSI (7.49%)/BGE (4.01%)/ComEd (14.06%)/Dayton (2.03%)/DEOK (3.21%)/Dominion (13.89%)/DPL (2.55%)/DL (1.59%)/EKPC (2.35%)/JCPL (3.59%)/ME (1.81%)/OVEC (0.06%)/PECO (5.11%)/PENELEC (1.73%)/PEPCO (3.68%)/PPL (4.43%)/PSEG (5.99%)/RE (0.24%)/Neptune (0.42%)</p> <p>DFAX Allocation: AEP (68.04%) / ATSI (9.61%) / DAYTON (1.92%) / DL (3.35%) / Dominion (17.06%) / EKPC (0.02%)</p>	6/1/2027
b3855.1	Build 4 miles new 230 kV XLPE circuit using (345 kV rated 5000 kcmil cable) from Jackson Road 230 kV station to Cedar Grove 230 kV station.	\$77.15	PSEG	PSEG (95.85%) / RE (4.15%)	6/1/2028
b3855.2	Expand a new 230 kV bay at the existing Cedar Grove station with one line position by adding two 230 kV circuit breakers and associated disconnect switches.	\$6.61	PSEG	PSEG (95.85%) / RE (4.15%)	6/1/2028
b3855.3	Replace the existing HPFF termination structure with a new XLPE termination structure to connect to spare GIS bay position at Jackson 230 kV.	\$0.82	PSEG	PSEG (95.85%) / RE (4.15%)	6/1/2028