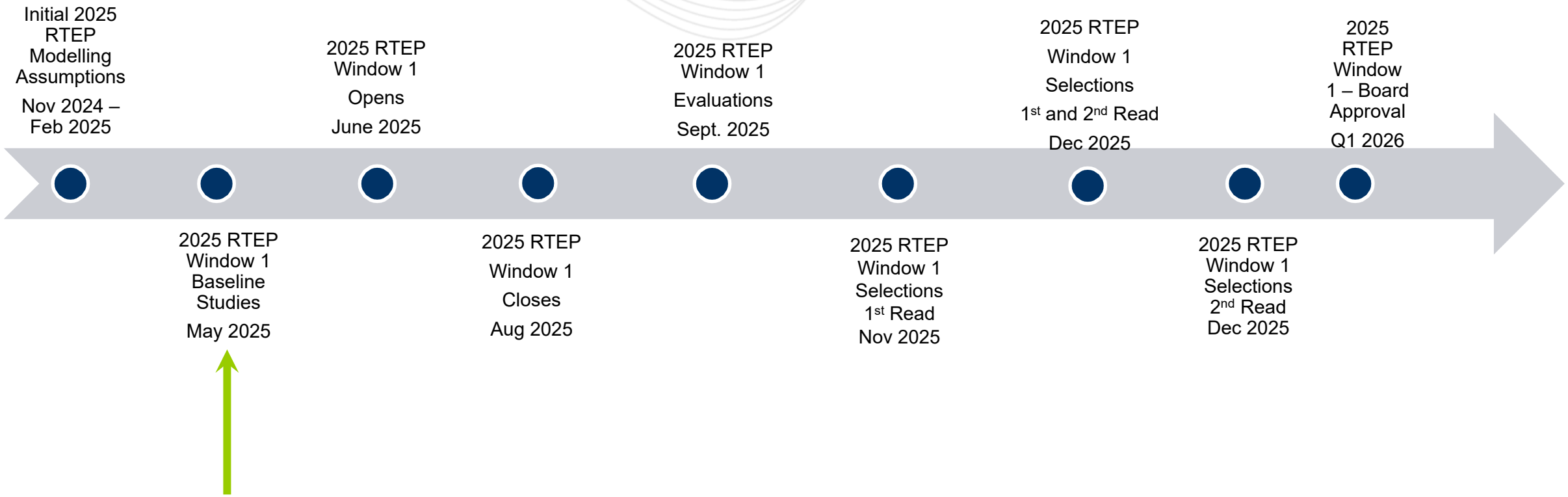
Reliability Analysis Update

Stan Sliwa, Senior Lead Engineer
PJM Transmission Planning

Transmission Expansion Advisory Committee
May 6, 2025

2025 RTEP Window 1 Update

2025 RTEP Window 1 – Timeline



Scope Change & Cost Updates
Baseline Reliability Projects

Dominion Transmission Zone: Baseline 230kV Line #2054 Charlottesville-Proffit

Scope Change for b3800.360

Previously Presented: 12/5/2023

Original Proposed Scope:

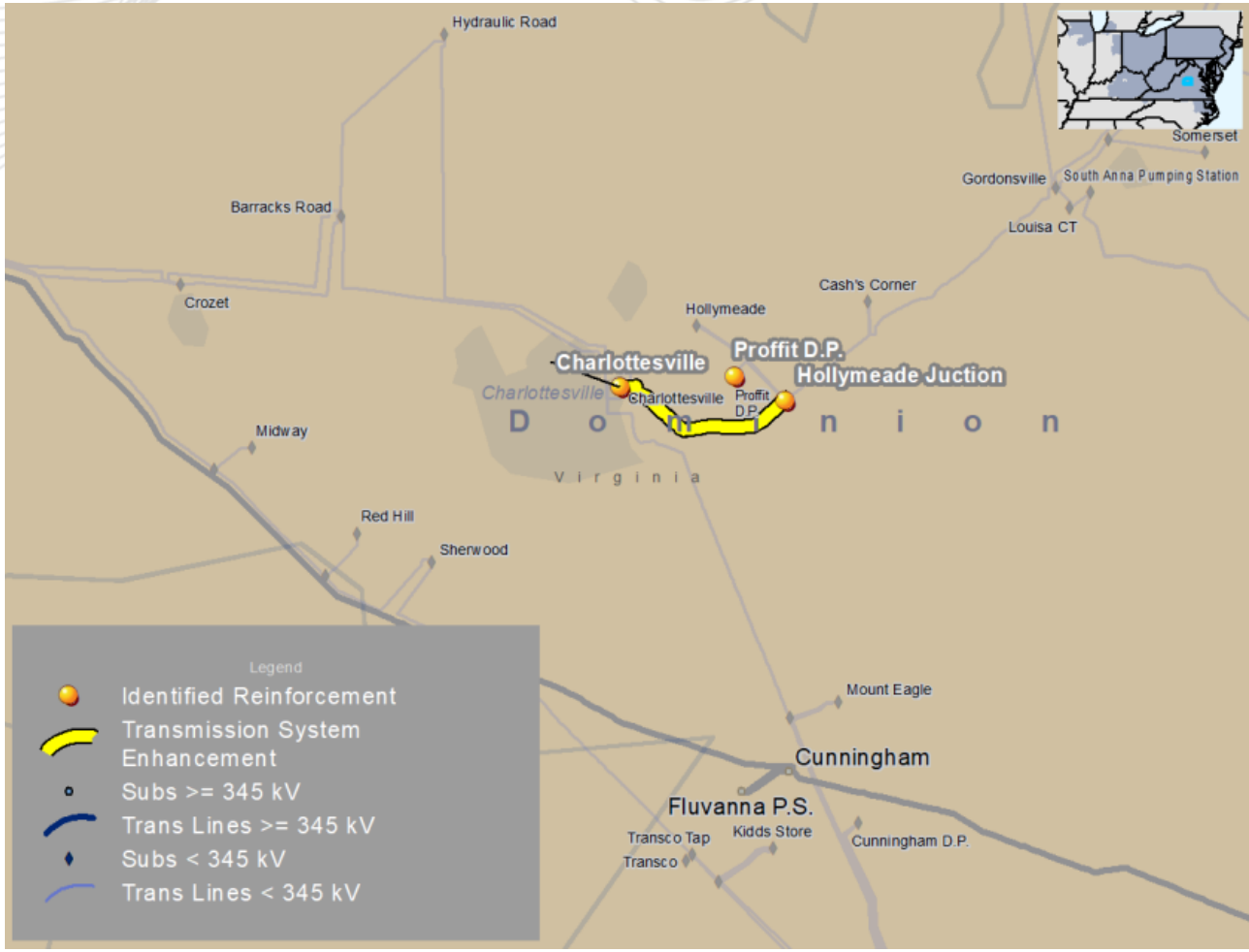
Wreck/Rebuild 230kV Line #2054 segment Charlottesville – Hollymeade Junction using double-circuit capable 500/230 kV poles. (The 500kV circuit will not be wired as part of this project.)

Revised Scope:

Wreck/Rebuild 230kV Line #2054 segment Charlottesville – Hollymeade Junction using double-circuit capable 230 kV poles. (The second 230kV circuit will be wired but not have terminal ends.)

Reason for Scope Change:

Due to Right-of-Way restrictions, Dominion is proposing to build double-circuit 230/230kV structure.



Revised Cost Estimate: ~~$70.14 M~~ $46.53 M

Revised Projected IS Date: ~~6/1/2028~~ 12/1/2028

Dominion Transmission Zone: Baseline 230kV Line #2135 Hollymeade – Gordonsville

Scope Change for b3800.300 & b3800.301

Previously Presented: 12/5/2023

Original Proposed Scope:

- Wreck/Rebuild 230kV Line #2135 segment Hollymeade Junction – Cash's Corner using double-circuit capable 500/230 kV poles. (the 500kV circuit will not be wired as part of this project). **b3800.300**
- Wreck/Rebuild 230kV Line #2135 Cash's Corner – Gordonsville using double-circuit capable 500/230 kV poles. (the 500kV circuit will not be wired as part of this project). **b3800.301**

Revised Scope:

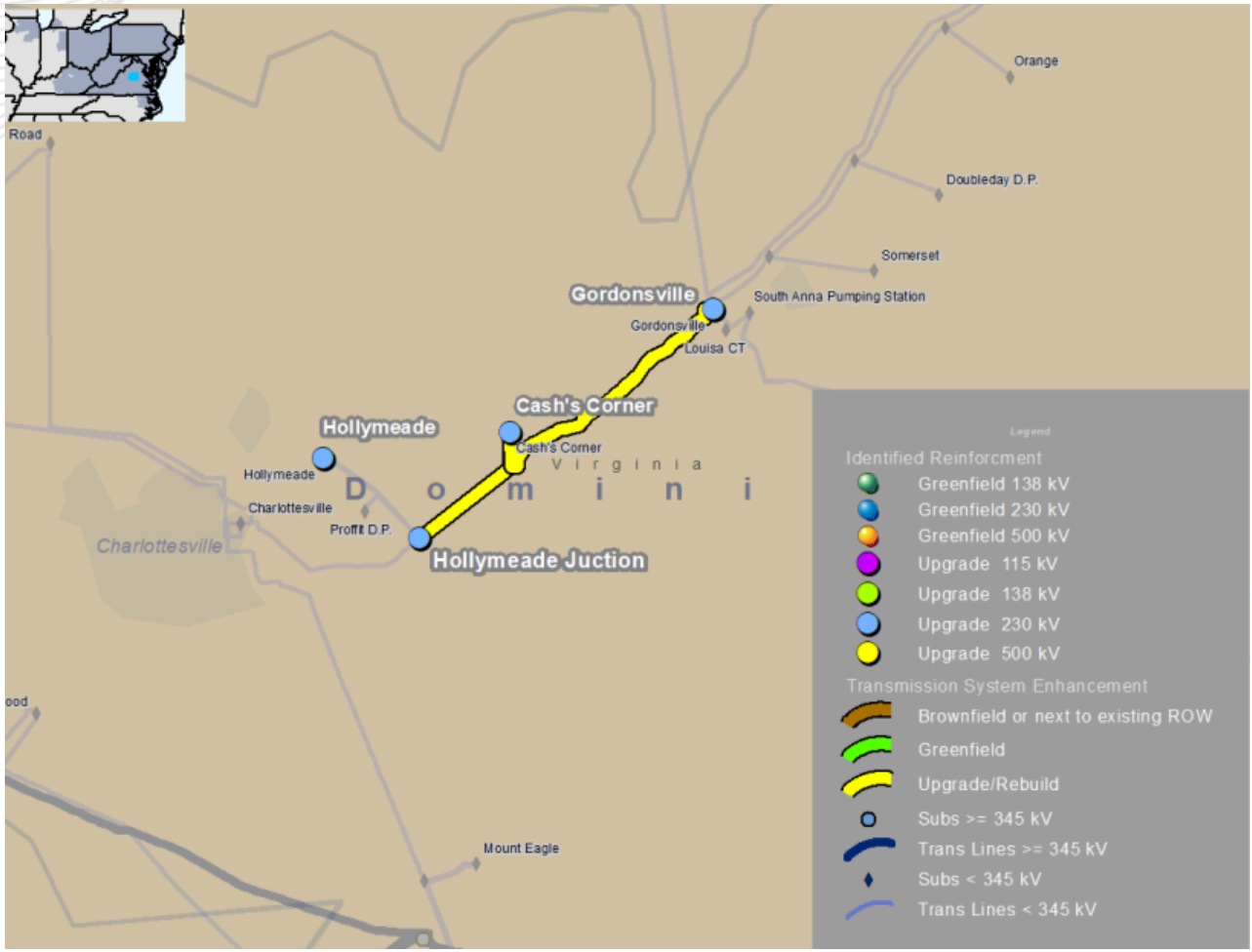
- Wreck/Rebuild 230kV Line #2135 segment Hollymeade Junction – Cash's Corner using double-circuit capable 230 kV poles. (The second 230kV circuit will be wired but not have terminal ends.) **b3800.300**
- Wreck/Rebuild 230kV Line #2135 Cash's Corner – Gordonsville using double-circuit capable 230 kV poles. (The second 230kV circuit will be wired but not have terminal ends.) **b3800.301**

Reason for Scope Change:

Due to Right-of-Way restrictions, Dominion is proposing to build double-circuit 230/230kV structure.

Revised Cost Estimate: ~~$53.96 M~~ $36.0 M

Revised Projected IS Date: 6/1/2028



Dominion Transmission Zone: Baseline Hollymeade/Charlottesville Switch Upgrades

Scope Change for b3800.304

Previously Presented: 12/5/2023

Original Proposed Scope:

Upgrade Hollymeade substation switch 213549 and line leads to 4000A continuous current rating of 230 kV line No. 2135.

Revised Scope:

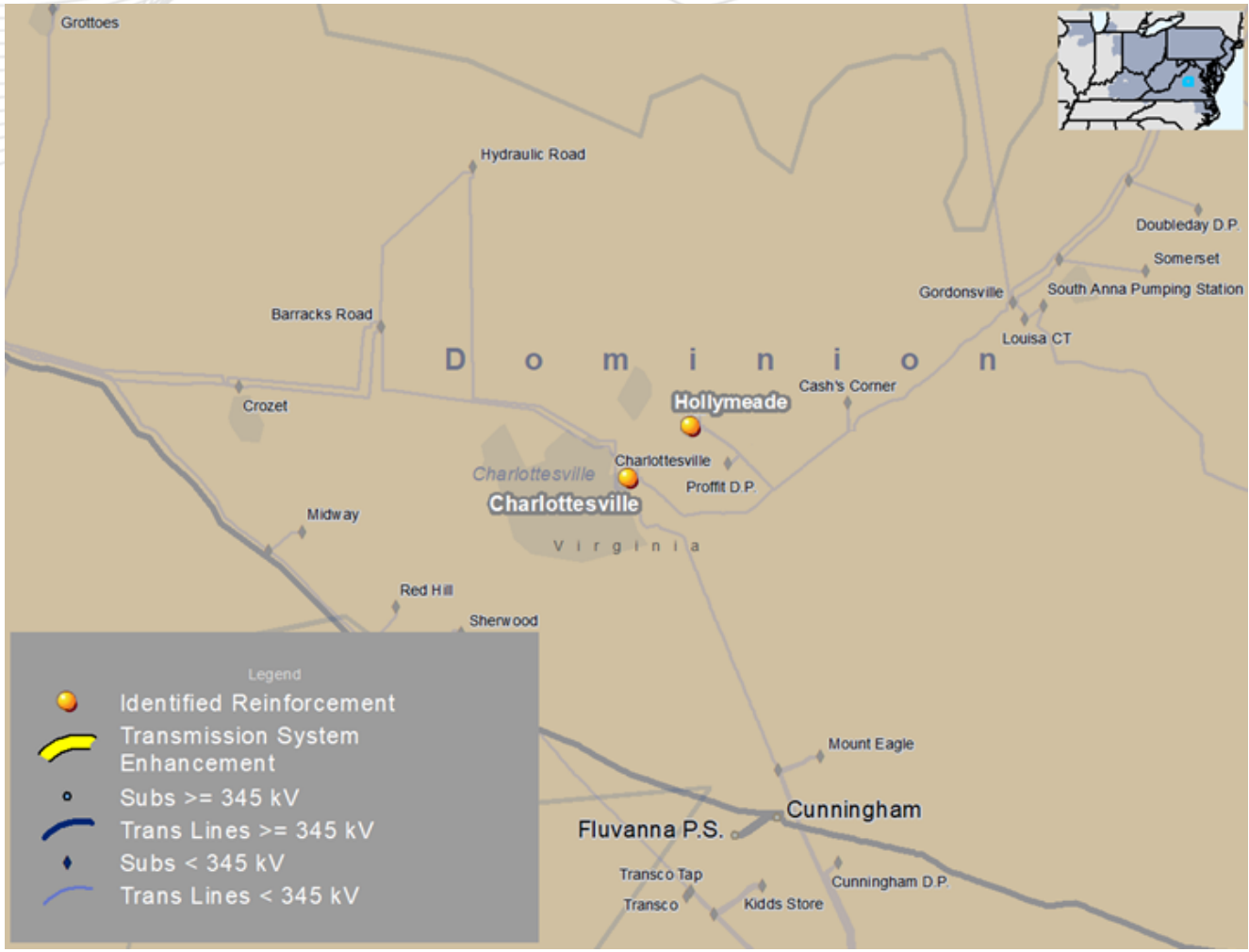
Upgrade Charlottesville substation switch 205415 and line leads to 4000A continuous current rating of 230 kV line No. 2054.

Reason for Scope Change:

The Hollymeade substation switch 213549 rating is sufficient to not limit 230 kV line No. 2135. Charlottesville substation switch 205415 is being upgraded to not limit 230 kV line No. 2054.

Cost Estimate: $0.3 M

Projected IS Date: ~~6/1/2028~~ 12/30/2028



Dominion Transmission Zone: Baseline 500kV Line #557 Elmont-Chickahominy

Scope Change for b3692 (500kV Line Elmont – Chickahominy):

Part of the recommended solution for 2021 RTEP Window 1 (2021-W1-124) is to rebuild 500kV line #557 Elmont – Chickahominy to address violations identified on the line based on Dominion's End-of-Life Criteria.

Original Proposed Scope:

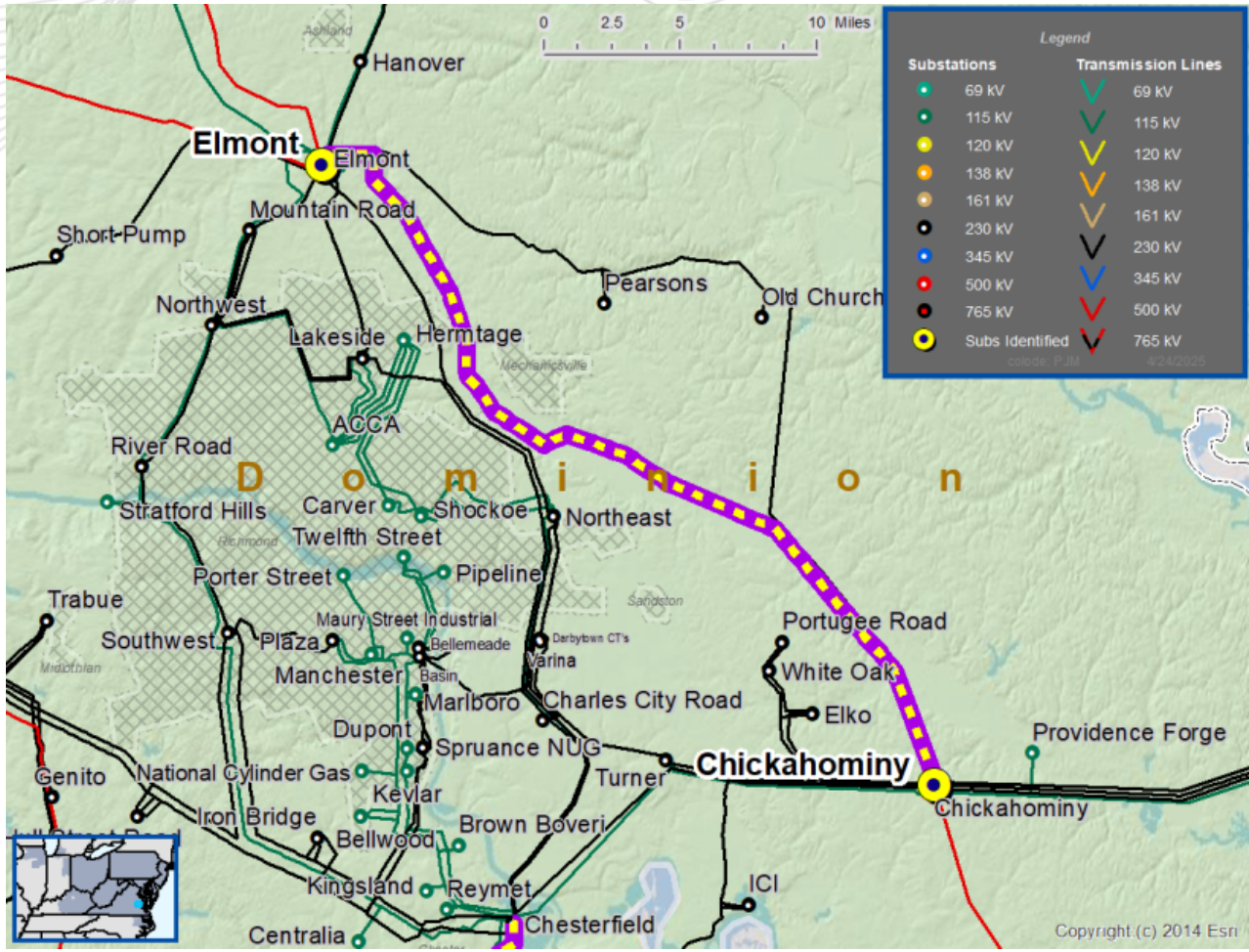
Rebuild approximately 27.7-miles of 500 kV transmission line from Elmont to Chickahominy with current 500 kV standards construction practices to achieve a summer rating of 4330 MVA.

Transmission Estimated Cost: $58.155 M

Required IS Date: 6/1/2026

Projected IS Date: 6/1/2026

Previously Presented: 11/30/2021



Dominion Transmission Zone: Baseline 500kV Line #557 Elmont-Chickahominy

Revised Solution for b3692 (500kV Line Elmont – Chickahominy):

Structure change from lattice structures to H-frame structures for the whole span of the transmission line.

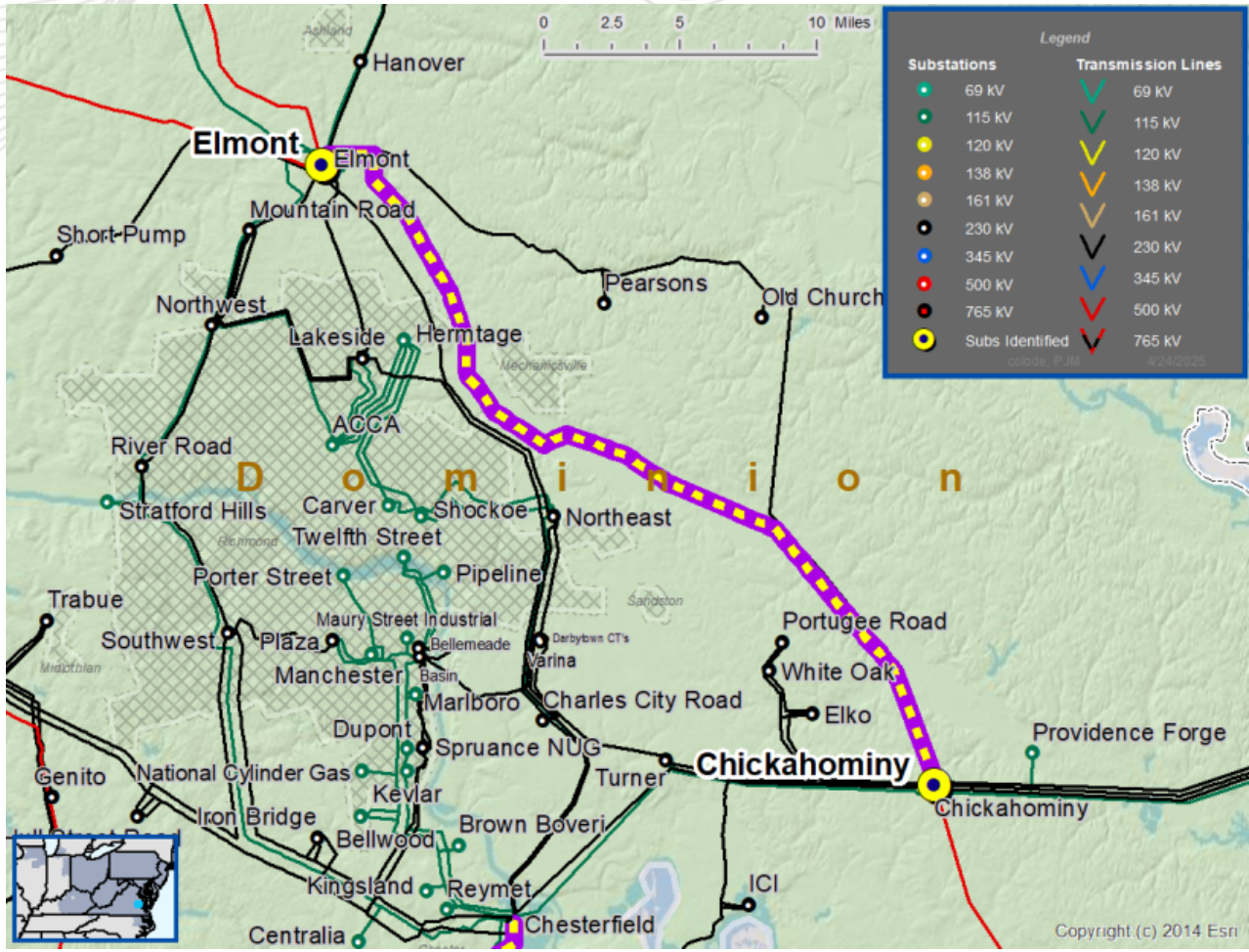
Reason for Scope Change & Cost Update:

Transmission ROW contains approximately 8 miles of heavy swamp terrain that requires additional materials for access increasing construction costs. In addition, inflation between 2021 & 2023 timeframes increased material costs.

Additional Cost Estimate: $52.5 M

Revised Cost Estimate: $110.66 M

Revised In-Service Date: 6/30/2028



Dominion Transmission Zone: Baseline 500kV Line #557 Elmont-Chickahominy

Additional 230kV Scope for b3692 (500kV Line Elmont – Chickahominy):

Switch to 5/2 H-frame structures and install approximately 27.7 miles of 230kV transmission line (but not be terminated) from Elmont to Chickahominy. String up approximately 8 miles of new 230kV conductor on the open arms of the structures of 230kV Line #2075 that runs parallel to 500kV Line #557.

Reason for additional 230kV Scope Change & Cost Update:

The general area within proximity of the Line #557 Elmont-Chickahominy rebuild has received approximately 15 Delivery Point requests, mainly data centers, since proposing this project during the 2021 RTEP Open Window 1.

Since Line #2075 runs parallel to Line #557 in the same ROW corridor, the 8 mile portion that runs through the heavy swamps will be strung up with new 230kV conductor on the open arms of the structures for Line #2075 for future use. This will minimize future environmental impacts and construction costs due to the challenges of the swampy terrain in this ROW.

Additional Scope Cost Estimate: $74.5 M

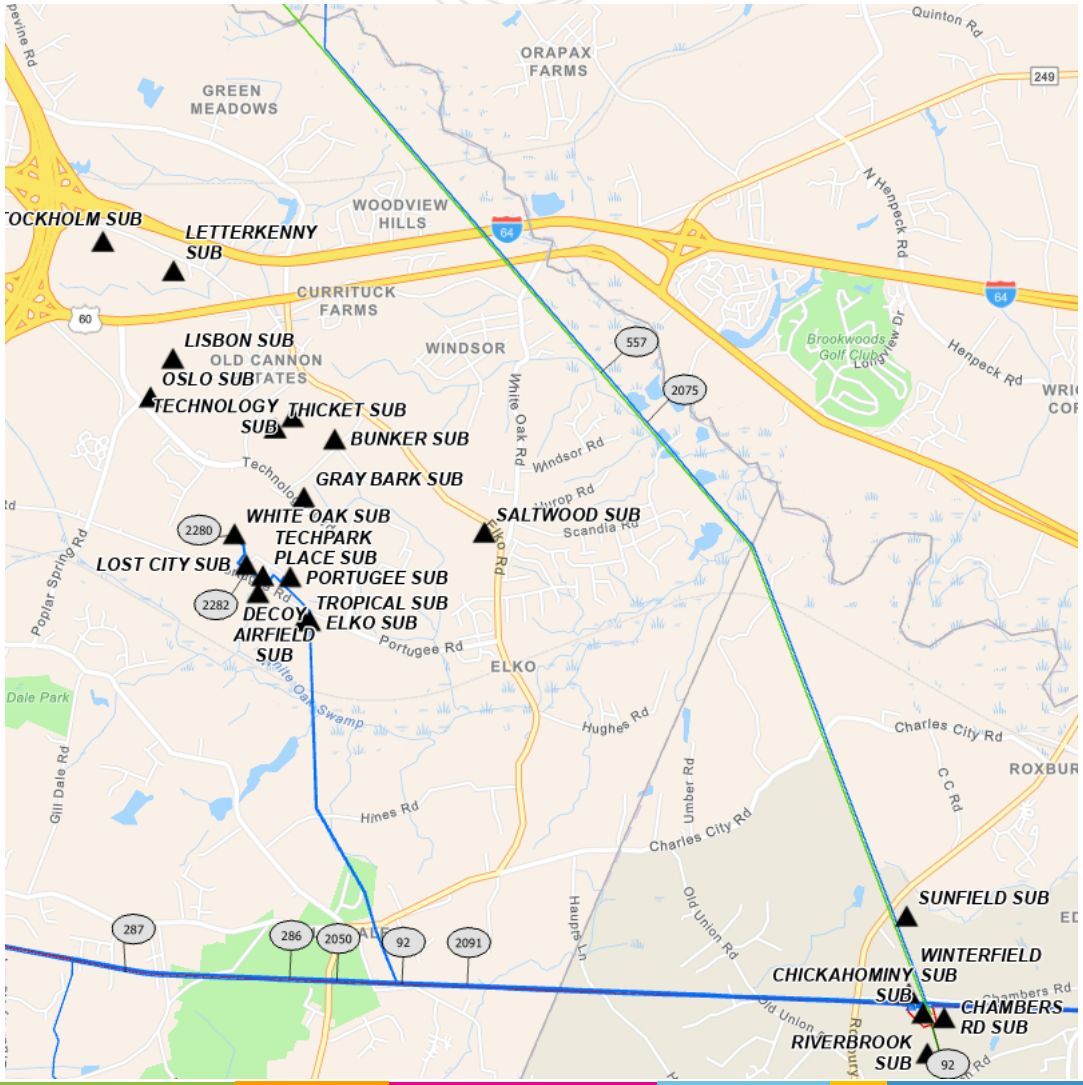
Original Cost Estimate: $58.155 M

Revised Cost Estimate: $110.66 M

Additional Scope Cost Estimate: $74.5 M

Total Proposed Cost Estimate: $185.16 M (increase of $127 M)

Revised In-Service Date: 6/30/2028



AEP/Dominion Transmission Zones
138kV Line Leesville(AEP) – Altavista(DOM)

Scope Change for b4000.207

Previously Presented: 12/5/2023

Original Proposed Scope:

- Leesville 138kV Station Upgrade: Replace 795 KCM AAC, 37-Str. IPS Sch. 40 1272 KCM AAC, 61-Str. 1272 KCM AAC, 61-Str. PH A,B,C ALTA VISTA CB-A BUS DISC ALTA VISTA CB-A LINE DISC Wavetrap (1200A) Relay Thermal Limit 1356 Amps (**b4000.207**) **Estimated Cost: $0.6 M**

Revised Scope:

- **(AEP)** Leesville 138kV Station Upgrade: Replace 795 KCM AAC, 37-Str. IPS Sch. 40 1272 KCM AAC, 61-Str. 1272 KCM AAC, 61-Str. PH A,B,C ALTA VISTA CB-A BUS DISC ALTA VISTA CB-A LINE DISC Wavetrap (1200A) Relay Thermal Limit 1356 Amps (**b4000.207**) **Estimated Cost: $0.6 M**
- **(DOM)** Altavista 138kV Station Upgrade: Replace two switches, a wave trap and leads to upgrade all related substation equipment to 2000A. (**b4000.360)** **Estimated Cost: $1.0 M**

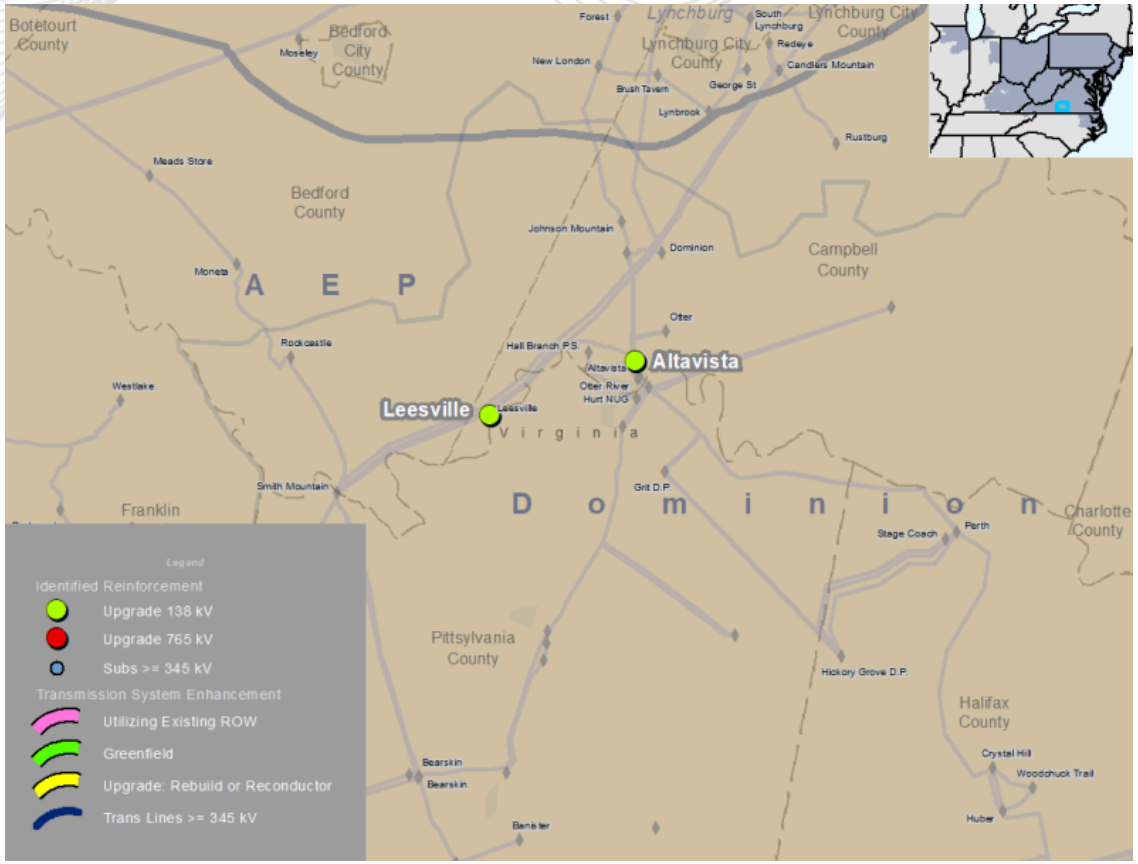
Reason for Scope Change:

- Upgrades required on the Dominion side of the tie line to achieve proposed rating.

Total Estimated Cost: $~~0.6 M~~ 1.6 M

Required IS Date: 6/1/2029

Projected IS Date: 12/31/2029



Existing/Preliminary Facility Ratings:

Facility Name	Existing Ratings (SN/SE/WN/WE) MVA	Preliminary Ratings (SN/SE/WN/WE) MVA
Leesville - Altavista 138 kV	287/337/363/400	295/411/373/461

Baseline b3793.3 Update

- PJM is correcting the designated entity for the B3793.3 upgrade. The project scope involves a tie line between DPL and LS Power, but the B3793.3 substation equipment upgrade at Silver Run was incorrectly assigned to DPL. B3793.3 will be canceled and replaced with B3793.4, which will be assigned to LS Power resulting in no change to the cost of this project.

DPL Transmission Zone: Baseline

Process Stage: Recommended Solution

Criteria: Summer Generation Deliverability

Assumption Reference: 2028 RTEP assumption

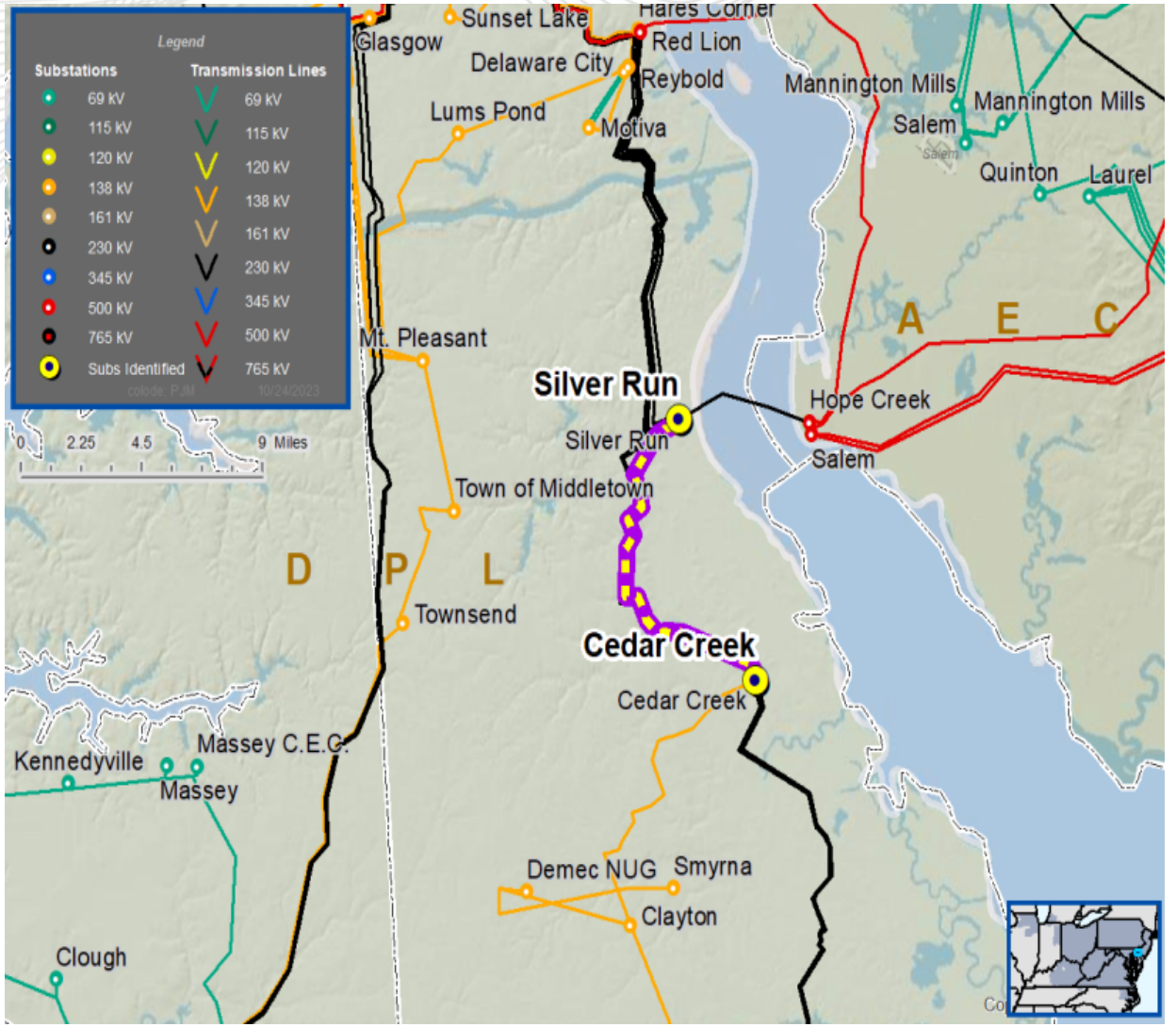
Model Used for Analysis: 2028 RTEP Summer case

Proposal Window Exclusion: No

Problem Statement: The Silver Run – Cedar Creek 230 kV circuit overloaded for several contingencies

Violations were posted as part of the 2023 Window 1: FG#s

2023W1-IPD-S1	2023W1-IPD-S5	2023W1-IPD-S9	2023W1-IPD-S13	2023W1-IPD-S17	2023W1-IPD-S27
2023W1-IPD-S2	2023W1-IPD-S6	2023W1-IPD-S10	2023W1-IPD-S14	2023W1-IPD-S18	2023W1-IPD-S28
2023W1-IPD-S3	2023W1-IPD-S7	2023W1-IPD-S11	2023W1-IPD-S15	2023W1-IPD-S19	2023W1-IPD-S29
2023W1-IPD-S4	2023W1-IPD-S8	2023W1-IPD-S12	2023W1-IPD-S16	2023W1-IPD-S26	



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DPL Transmission Zone: Baseline

Recommended Solution: Proposal #2023-W1-573

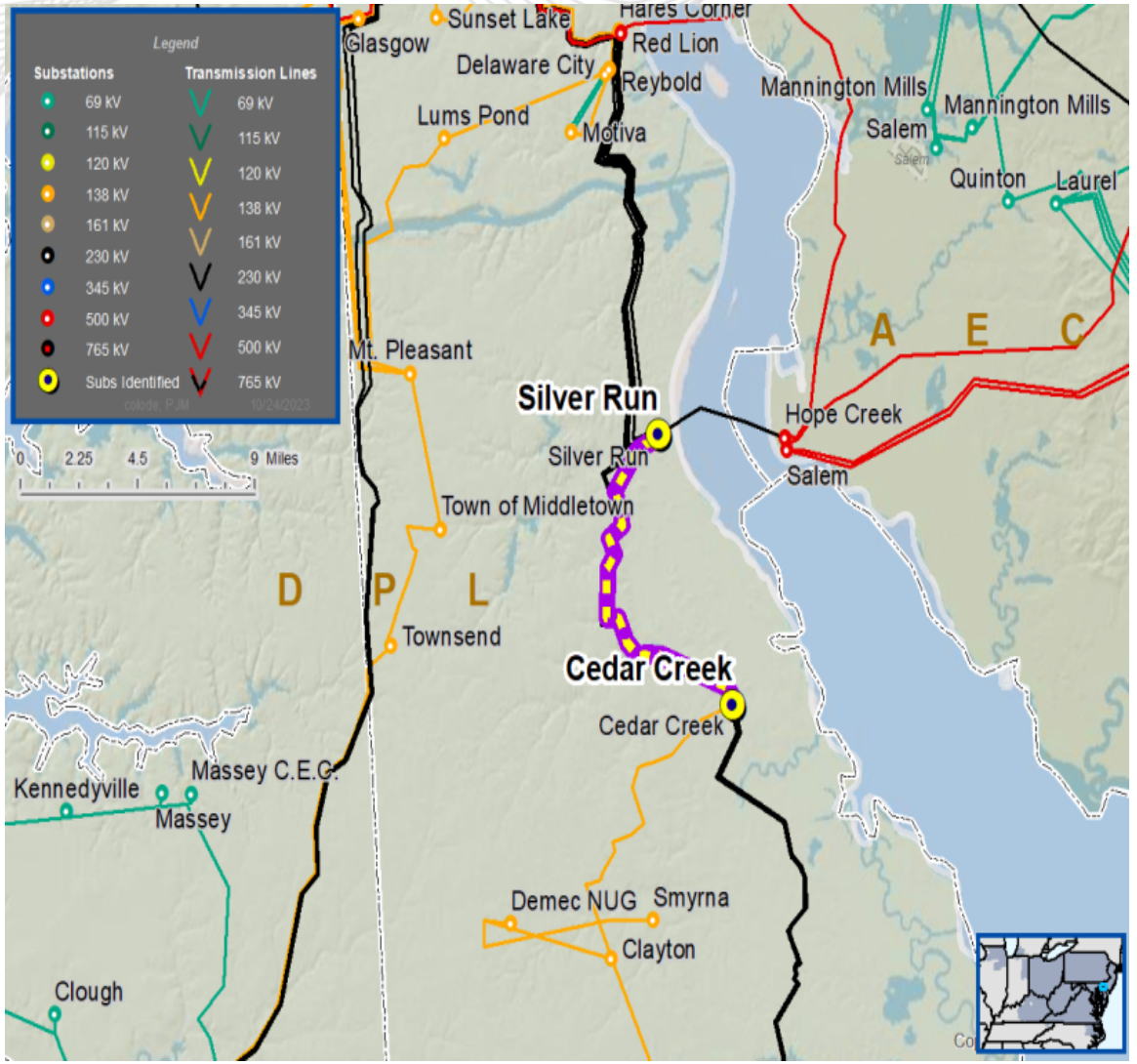
- Reconductor Silver Run - Cedar Creek 230kV line. Reconductor 8.8 miles of 230 kV Circuit with 1594-T11/ACCR “Lapwing” conductor and replace all insulators with high temp hardware. **(B3793.1)**
- **Cedar Creek**– Replace three (3) standalone CTs, disconnect switch, stranded bus, and rigid bus to achieve higher rating. **B3793.2)**
- ~~**Silver Run** - Replace three(3) 1-1590 ACSR Jumpers and one(1) air disconnect switch. **B3793.3) Estimated Cost: $0.58M**~~
- **Silver Run -** Replace three(3) 1-1590 ACSR Jumpers and one(1) air disconnect switch. **B3793.4) Estimated Cost: $0.58M**

Existing Facility Rating: 653SN/808SE, 753WN/911WE MVA

Proposed Facility Rating: 996SN/1146SE , 1060WN/1209WE MVA
Estimated Cost: $8.7 M
Alternatives

- None

Required In-Service: 6/1/2028
Projected In-Service: 6/1/2028



PECO Transmission Zone: Baseline b3737.50 – Cut '5034' 500 kV line in and out of Bramah

Scope Change & Cost Update for Baseline Project b3737.50

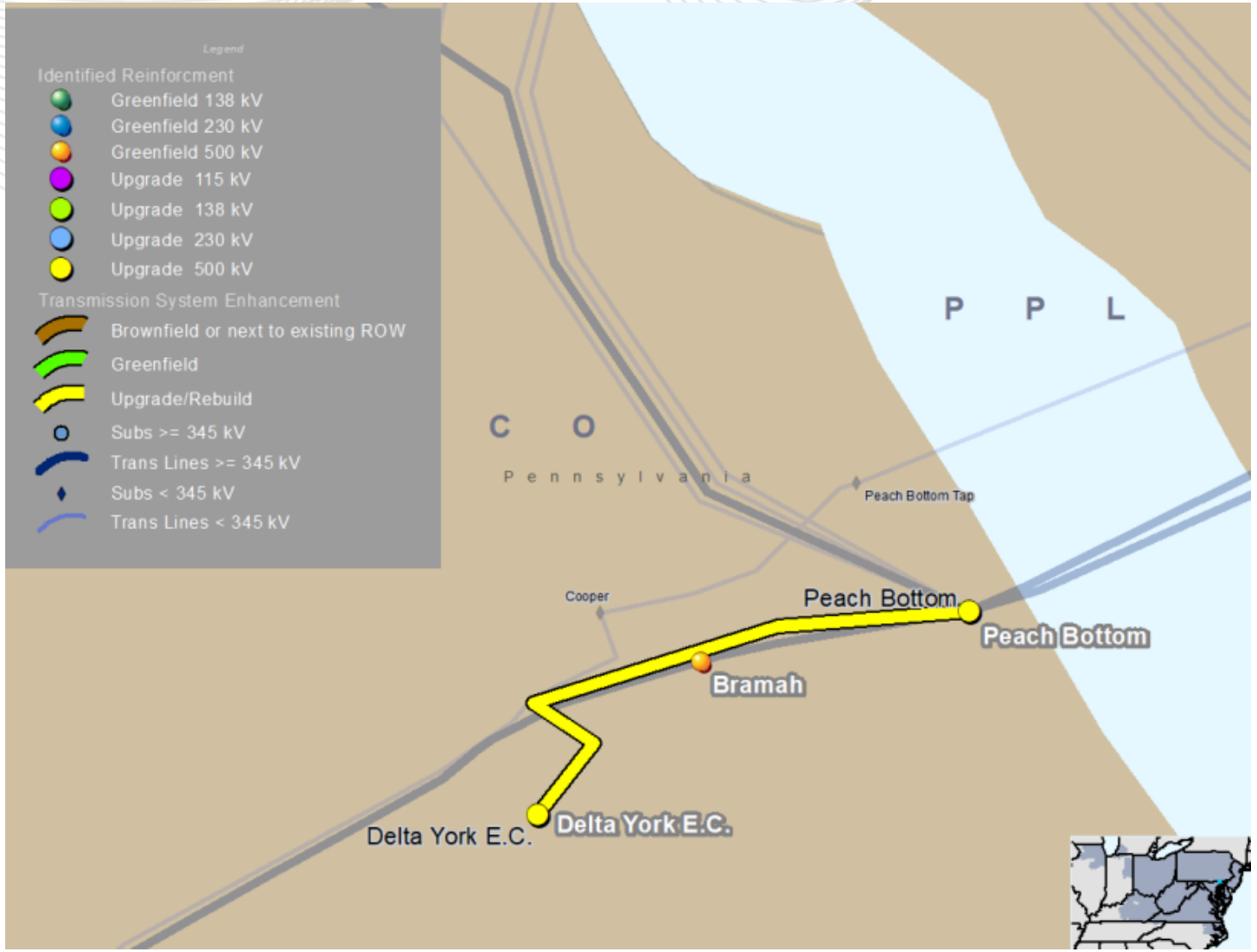
Original b3737.50 Project Description (Transource NJSAA Proposal):
Bring the Peach Bottom-Delta York 500 kV (5034) line "in and out" of Bramah (North Delta) by constructing a new Peach Bottom - Bramah - Delta York 500 kV line, with 0.3 miles of cut-in and cut-out lines.

Revised b3737.50 Project Description:
Bring the Peach Bottom-Delta York 500 '5034' kV line "in and out" of Bramah substation by partially demolishing the 5034 line to construct a new Peach Bottom – Bramah – Delta York 500 kV line, with 0.87 miles of cut-in and cut-out lines.

Required IS Date : 6/1/2029 (Unchanged)

Estimated Cost ~~$1.56M~~ **$12M**

Reason for Scope Change & Cost Update
The Project and cost was originally proposed by Transource as part of NJBPU SAA 1.0. The 5034 line is in fact, currently owned by Calpine. Calpine and PECO have reached an agreement that will allow PECO to effectuate the cut-in of the 5034 line into the new Bramah (North Delta) 500 kV substation. PECO will assume Transmission Owner responsibility for the 5034 line, subject to FERC approval. PJM's recommendation of this scope change is conditioned on FERC's approval of the pending transaction. The revised project and cost reflects PECO's estimation of the new scope and cost to cut-in the line to Bramah substation.



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Reliability Analysis Update

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Revision History

Version No.	Date	Description
1	May 1st, 2025	• Initial slides posted

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Resources Available to PJM Stakeholders

(Transmission Planning)

Reference Resources

- PJM Learning Center – Overviews on PJM's priorities and responsibilities, including Planning responsibilities

- Process to build a new facility – Overview of the steps and parties involved in the process to build a new facility from the need to completion.

- PJM Manual 14B – Details on how PJM conducts analysis (web or pdf)

- PJM Manual 14F – Overview of the competitive process (web or pdf)

Reference Resources

- Generation interconnection queue – List of all projects for proposed generation. PJM does not solicit these requests, but PJM will ensure each project can operate reliably.
  - Serial process – Historic view of all projects submitted prior to 2022
  - Cluster process – Progress of all projects processed with the reformed interconnection process

- PJM Manual 14H – Overview of the generation interconnection process (web or pdf)

Reference Resources

- General PJM training – A variety of training resources on various aspects of PJM, including overviews such as PJM Introduction and PJM 101: The Basics.

- 2022 RTEP Window 3 FAQ – A lot of great background that applies to the current body of work.

- PJM's Client Management team – Single point of contact for any questions about PJM.
  - Phone: (610) 666-8980 or (866) 400-8980
  - E-mail: custsvc@pjm.com