Sub Regional RTEP Committee
PJM Mid-Atlantic
Reliability Update

November 17, 2022

Second Review

Baseline Reliability Projects

DPL Transmission Zone: Baseline

Process Stage: Second Review

Criteria: Summer Generation Deliverability

Assumption Reference: 2027 RTEP assumption

Model Used for Analysis: 2027 RTEP Summer case

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: The New Church – Piney 138 kV circuit overloaded for line fault stuck breaker contingency

Violations were posted as part of the 2022 Window 1: FG# GD-S626

Existing Facility Rating: 172SN/226SE, 198WN/255WE MVA

Proposed Facility Rating: 392SN/485SE, 452WN/546WE MVA

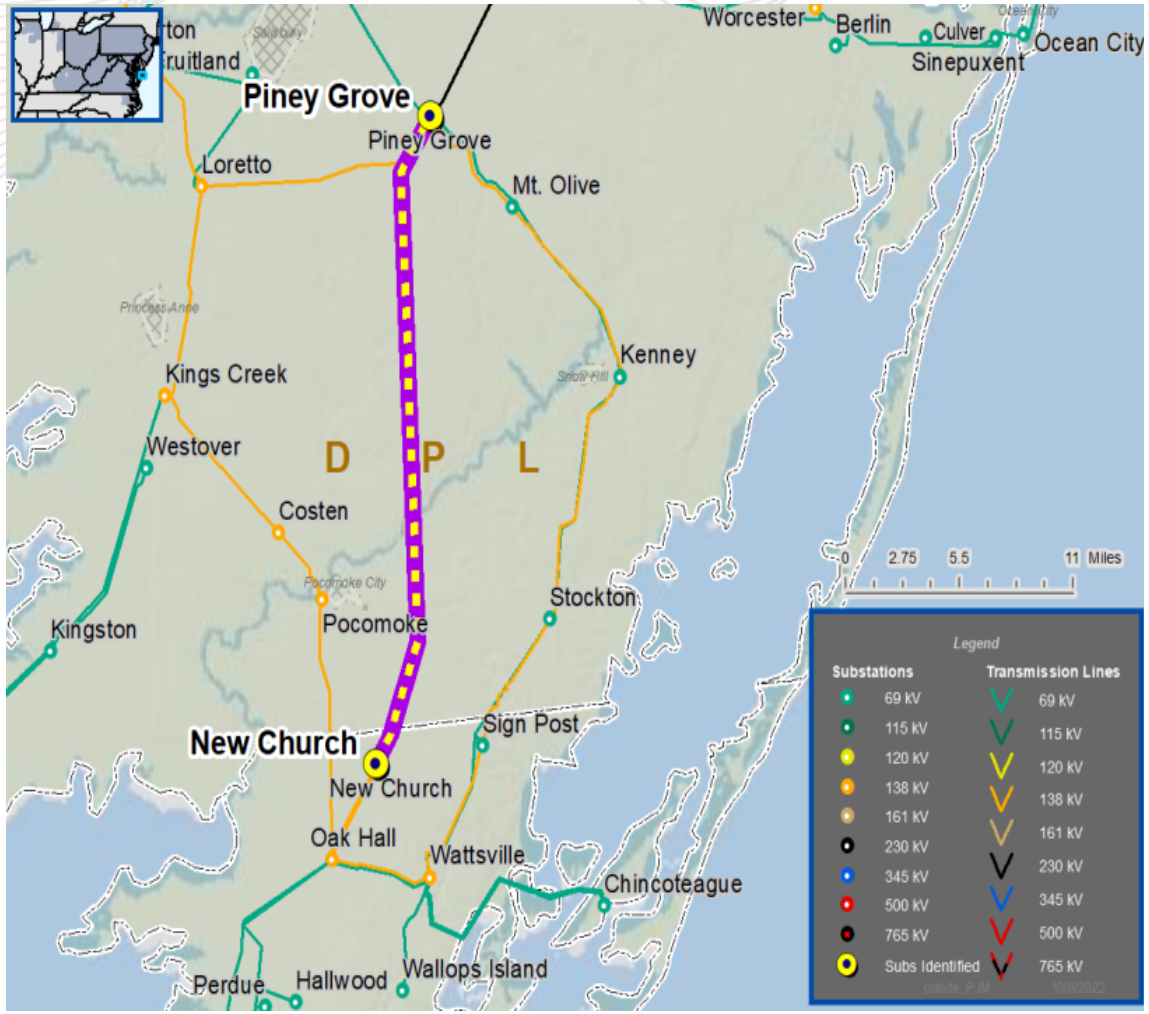
Recommended Solution:
Rebuild the New Church - Piney Grove 138 kV line. (B3749)

Estimated Cost: $63 M

Alternatives

- Operate at higher conductor temperature (and perform clearance mitigations if necessary) – [Option not viable per DPL T&S due to age and condition of the line]
- Reconductor New Church - Piney Grove (21.78 mi) – [Option not viable per DPL T&S due to age and condition of the line]
- Add a 2nd breaker next to existing Loretto 130 CB to eliminate contingency issue [overcrowding at Loretto substation, this would require significant reconfiguration in the yard]

Required In-Service: 6/1/2027
Projected In-Service: 6/1/2027



Penelec Transmission Zone: Baseline

Process Stage: Second Review

Criteria: Summer and Light Load Generation Deliverability

Assumption Reference: 2027 RTEP assumption

Model Used for Analysis: 2027 RTEP Summer and Light Load cases

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: The Seward – Florence 115 kV is overloaded for multiple contingencies.

Violations were posted as part of the 2022 Window 1: FG# -GD-LL25, FG# - GD-S535, FG# - GD-S537 and FG# - GD-S536

Existing Facility Rating: 137SN/172E, 180WN/206WE MVA

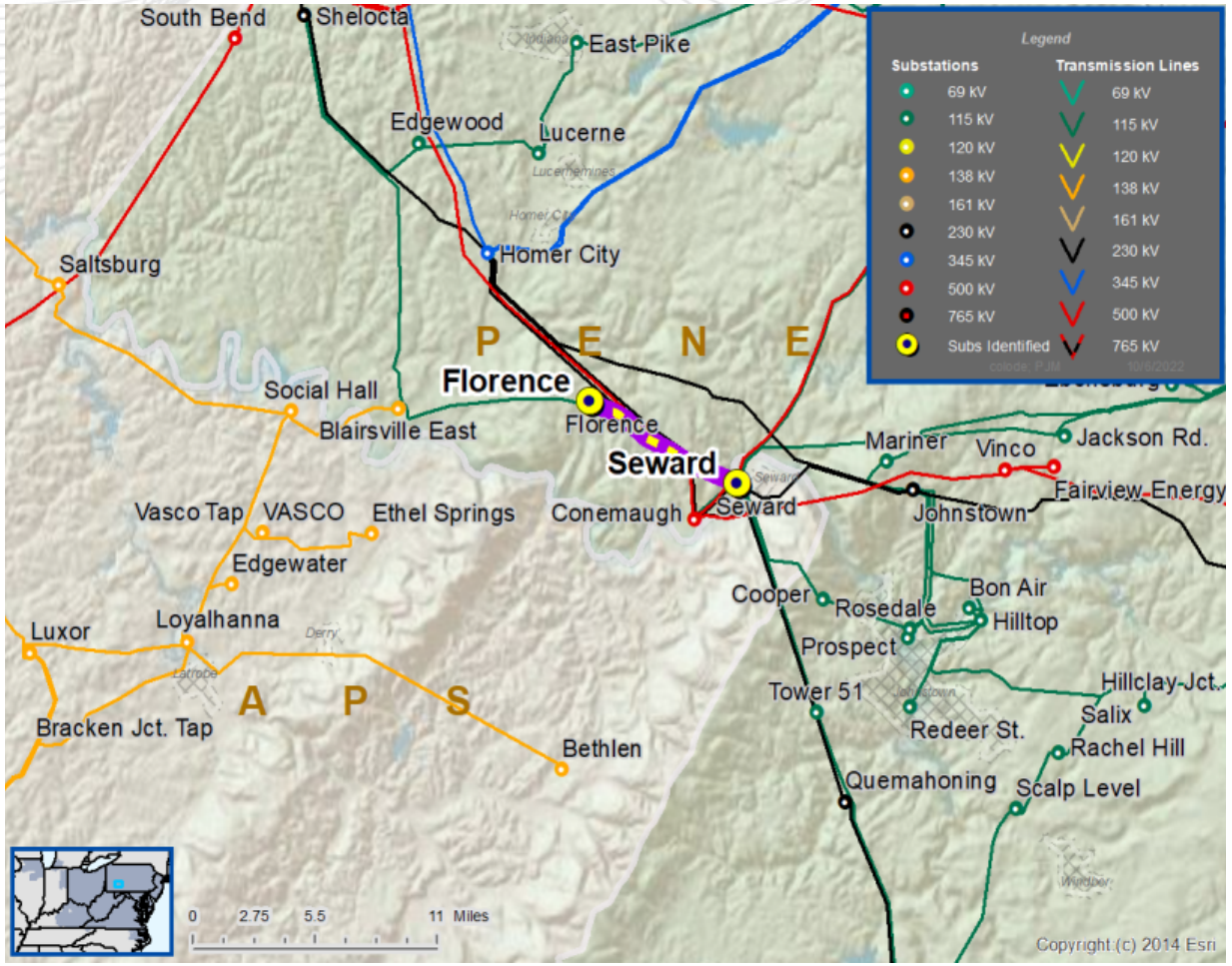
Proposed Facility Rating: 232SN/282SE, 263WN/334WE MVA

Recommended Solution:
Upgrade Seward Terminal Equipment of the Seward-Blairsville 115 kV Line to increase the line rating such that the Transmission Line conductor is the limiting component. (B3750)

Estimated Cost: $0.43 M

Alternatives
N/A

Required In-Service: 6/1/2027
Projected In-Service: 6/1/2027



Penelec Transmission Zone: Baseline

Process Stage: Second Review
Criteria: Summer and Winter Generation Deliverability
Assumption Reference: 2027 RTEP assumption
Model Used for Analysis: 2027 RTEP Summer and Winter cases
Proposal Window Exclusion: Below 200 kV Exclusion
Problem Statement: the Roxbury – AE1-071 115 kV line is overloaded for several contingencies.
Violations were posted as part of the 2022 Window 1:
FG# - 22 Summer flowgates,
FG# - 50 Winter flowgates,

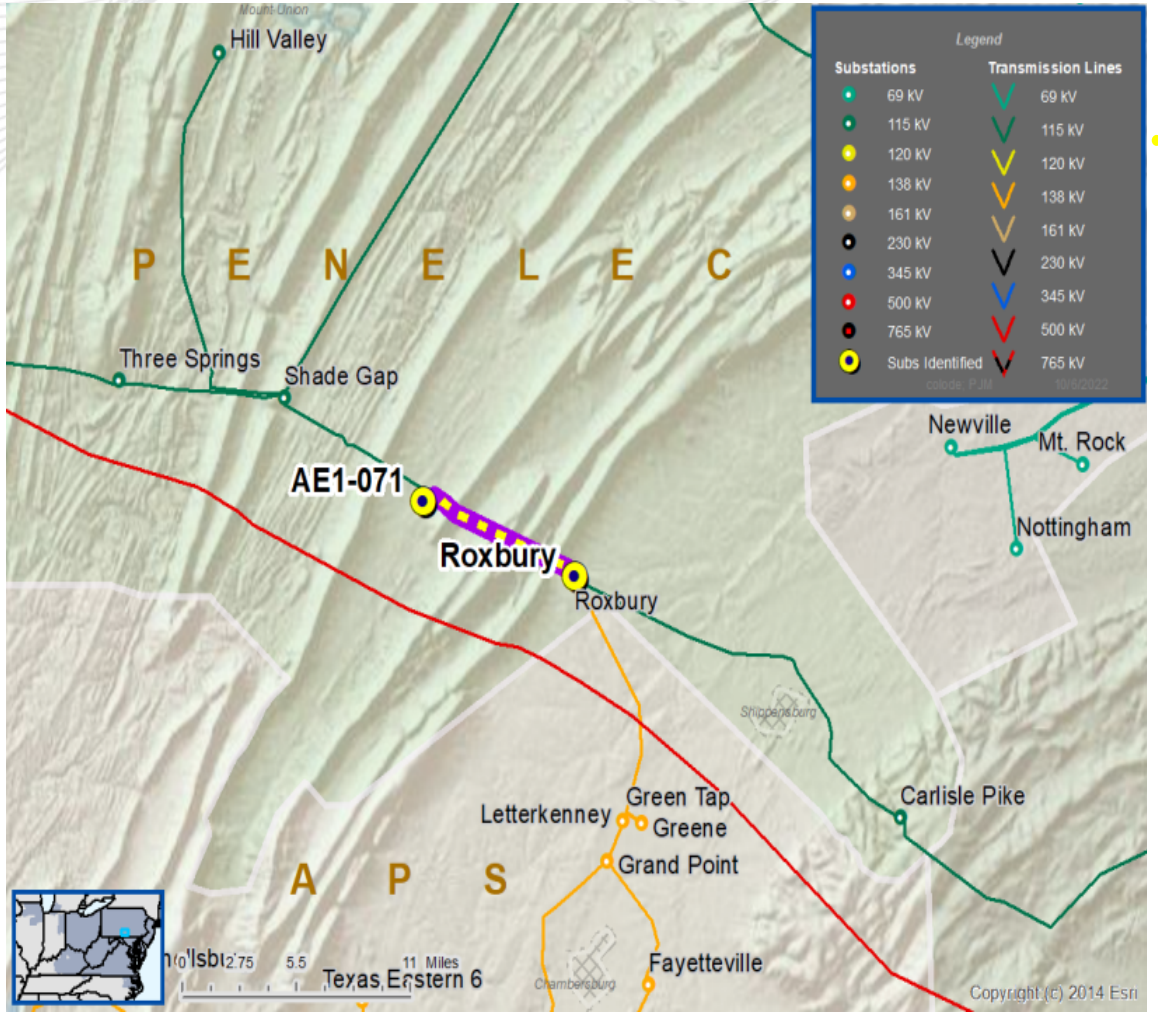
Existing Facility Rating: 133SN/160E, 150WN/190WE MVA
Proposed Facility Rating: 273SN/333SE, 309WN/395WE MVA

Recommended Solution:
Rebuild 6.4 miles of the Roxbury - Shade Gap 115 kV line from Roxbury to the AE1-071 115 kV ring bus with single circuit 115 kV construction. (B3751)

Estimated Cost: $15.03 M

Alternatives
N/A

Required In-Service: 6/1/2027
Projected In-Service: 6/1/2027



Penelec Transmission Zone: Baseline

Process Stage: Second Review
Criteria: Summer and Winter Generation Deliverability
Assumption Reference: 2027 RTEP assumption
Model Used for Analysis: 2027 RTEP Summer and Winter cases
Proposal Window Exclusion: Below 200 kV Exclusion
Problem Statement: the AE1-071 - Shade Gap 115 kV line is overloaded several contingencies.
Violations were posted as part of the 2022 Window 1:
FG# - 2 Summer flowgates,
FG# - 38 Winter flowgates,

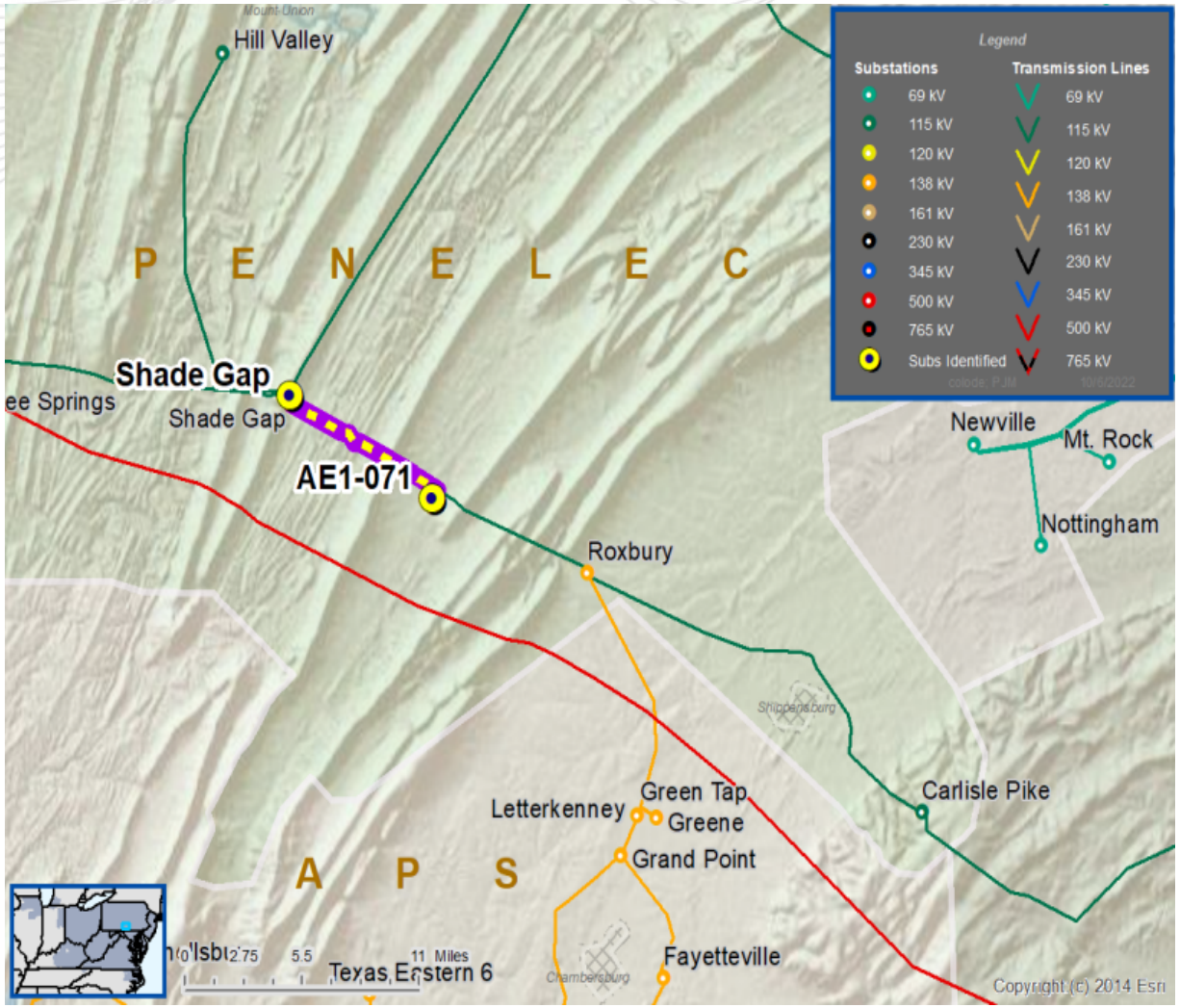
Existing Facility Rating: 133SN/160E, 150WN/190WE MVA
Proposed Facility Rating: 273SN/333SE, 309WN/395WE MVA

Recommended Solution:
Rebuild 7.2 miles of the Shade Gap - AE1-071 115 kV line section of the Roxbury - Shade Gap 115 kV line. (B3752)

Estimated Cost: $17.43 M

Alternatives
N/A

Required In-Service: 6/1/2027
Projected In-Service: 6/1/2027



Penelec Transmission Zone: Baseline

Process Stage: Second Review

Criteria: FERC Form 715

Assumption Reference: 2027 RTEP assumption

Model Used for Analysis: 2027 RTEP Summer

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: The Tyrone North 115/46 kV transformer #2 is overloaded for breaker outage.

Violations were posted as part of the 2022 Window 1: FG# PN-T2

Existing Facility Rating: 43SN/53SE, 54WN/64WE MVA

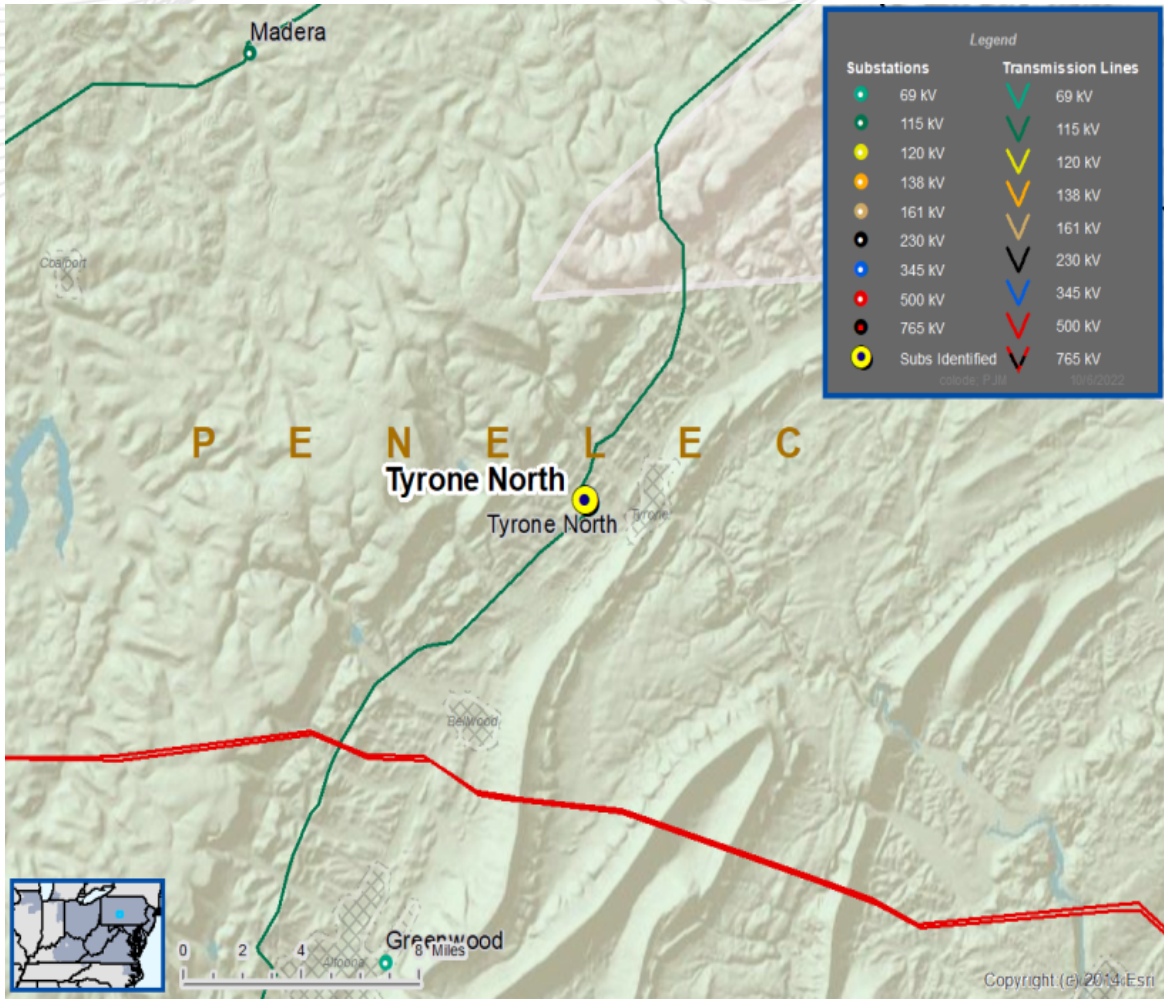
Proposed Facility Rating: 97SN/102SE, 117WN/126WE MVA

Recommended Solution:
Replace the Tyrone North 115 /46 kV transformer with a new standard 75 MVA top rated bank and upgrade the entire terminal to minimum 100 MVA capability for both SN and SE rating. (B3753)

Estimated Cost: $2.82 M

Alternatives
N/A

Required In-Service: 6/1/2027
Projected In-Service: 6/1/2027



Penelec Transmission Zone: Baseline

Process Stage: Second Review

Criteria: FERC Form 715

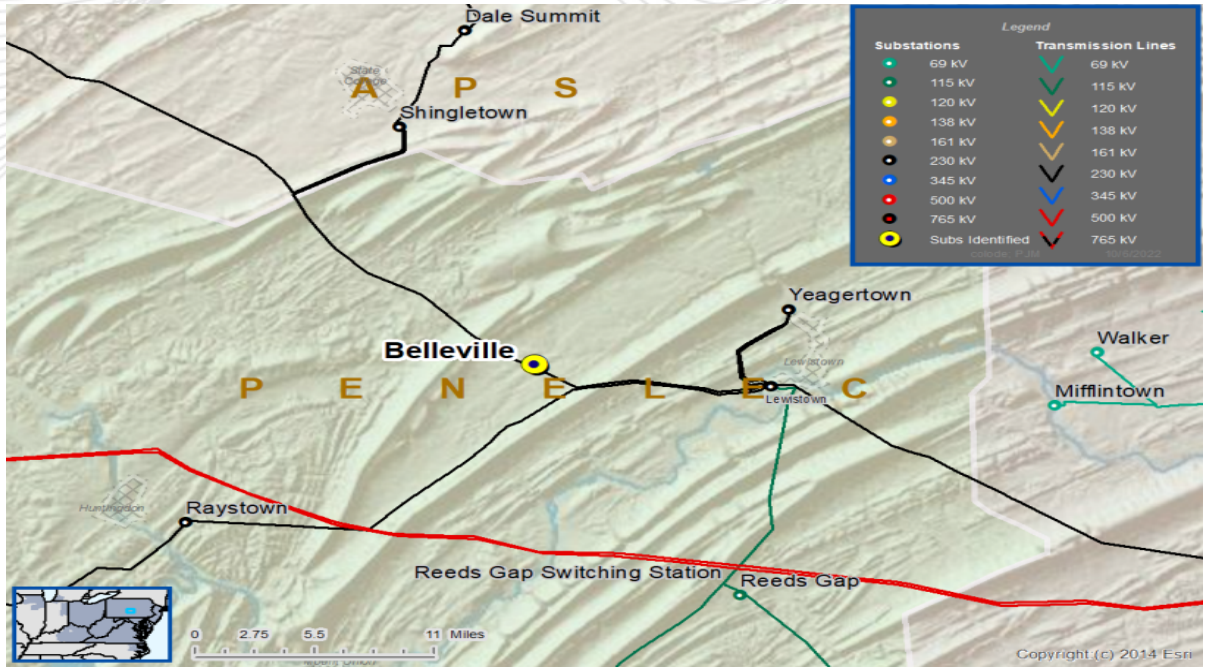
Assumption Reference: 2027 RTEP assumption

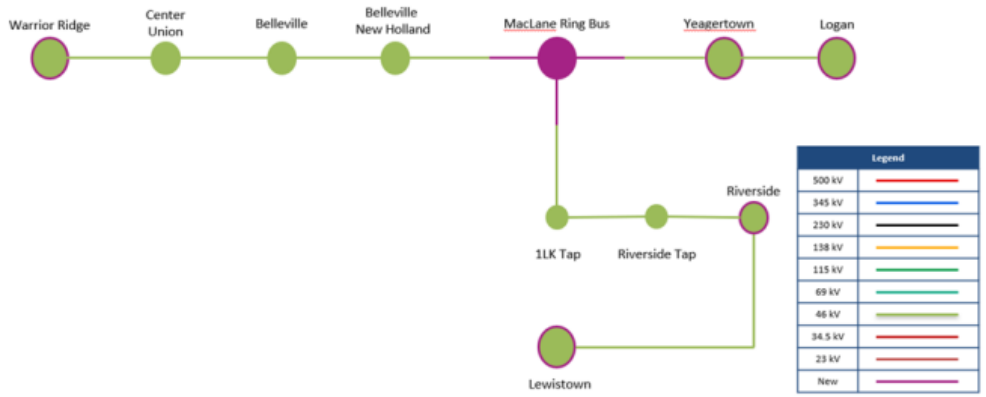
Model Used for Analysis: 2027 RTEP Summer

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: Low voltage violation in the Belleville 46 kV vicinity for multiple single contingencies.

Violations were posted as part of the 2022 Window 1: FG# PN-VM1, FG# PN-VM2, FG# PN-VM3, FG# PN-VM4, FG# PN-VM5 and FG# PN-VM6





Recommended Solution:
At Maclane tap: Construct a new three breaker ring bus to tie into the Warrior Ridge - Belleville 46 kV D line and the 1LK line. (B3754)

Estimated Cost: $10.09 M

Alternatives
-Construct/Build a new 2 mile 46 kV line section to make a Lewistown - Warrior Ridge 46 kV line but it did not resolve all of the issues.

Required In-Service: 6/1/2027
Projected In-Service: 6/1/2027

PSEG Transmission Zone: Baseline

Process Stage: Second Review

Criteria: FERC Form 715

Assumption Reference: 2027 RTEP assumption

Model Used for Analysis: 2027 RTEP Summer and Winter

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: Low voltage and voltage drop violation at Locust 69 kV station for a bus contingency.

Violations were posted as part of the 2022 Window 1: FG# PSEG-VM1,

FG# PSEG-VD3 and FG# PSEG-VD13

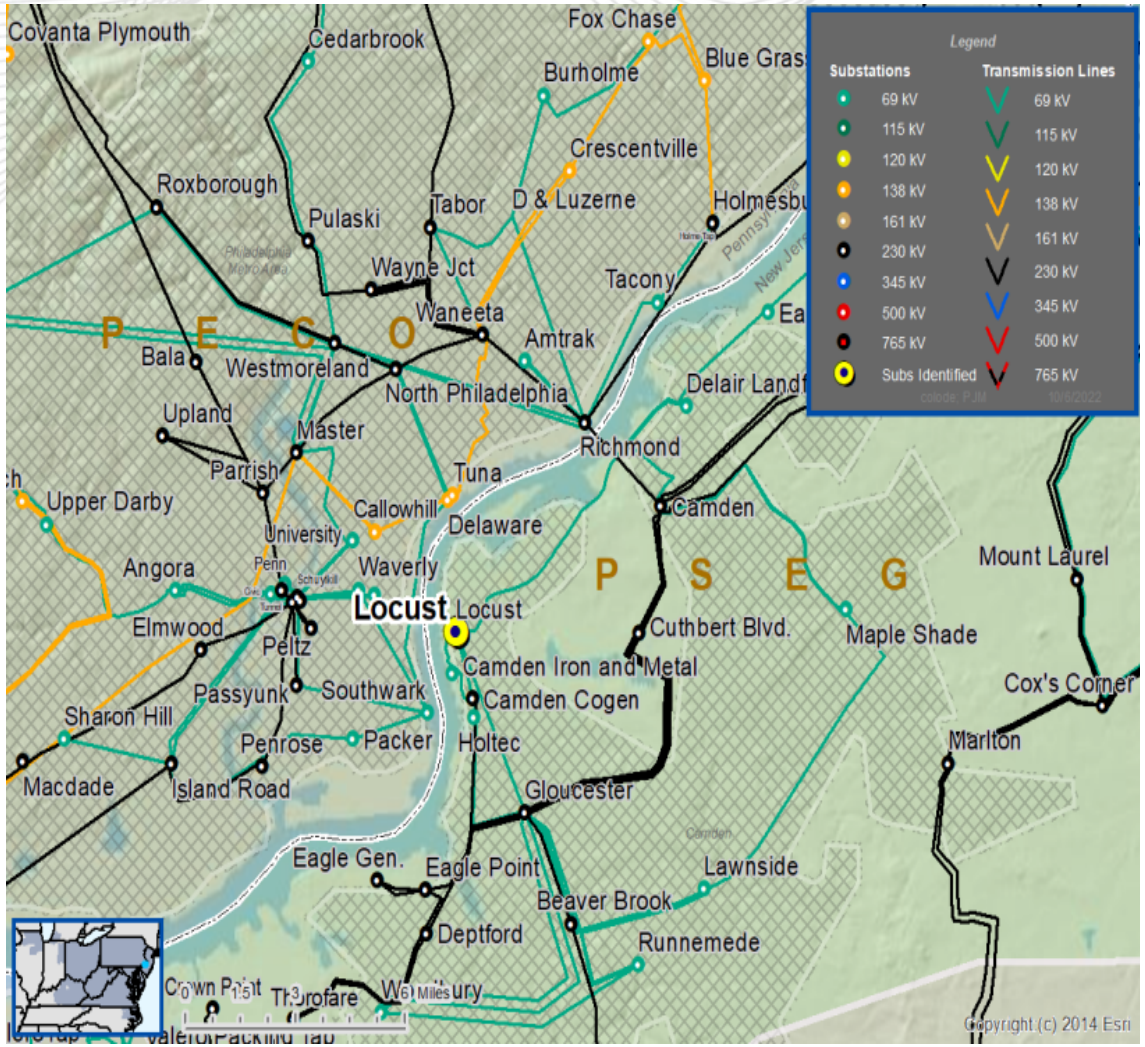
Recommended Solution:
Convert Locust Street 69kV from a Straight Bus to a Ring Bus. (B3755)

Estimated Cost: $30 M

Alternatives
Adding Capacitor banks at Locust station:

- Current straight bus design cannot accommodate connection of capacitor banks in the appropriate locations to address all contingencies.
- Modification of existing bus to a ring requires significant underground modification. Temporary construction contingencies are required to maintain system reliability.

Required In-Service: 6/1/2027
Projected In-Service: 6/1/2027



PSEG Transmission Zone: Baseline

Process Stage: Second Review

Criteria: FERC Form 715

Assumption Reference: 2027 RTEP assumption

Model Used for Analysis: 2027 RTEP Summer and Winter

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: Voltage drop violation at Maple Shade 69 kV station for multiple line fault stuck breaker contingencies.

Violations were posted as part of the 2022 Window 1: FG# PSEG-VD1,

FG# PSEG-VD2 and FG# PSEG-VD1

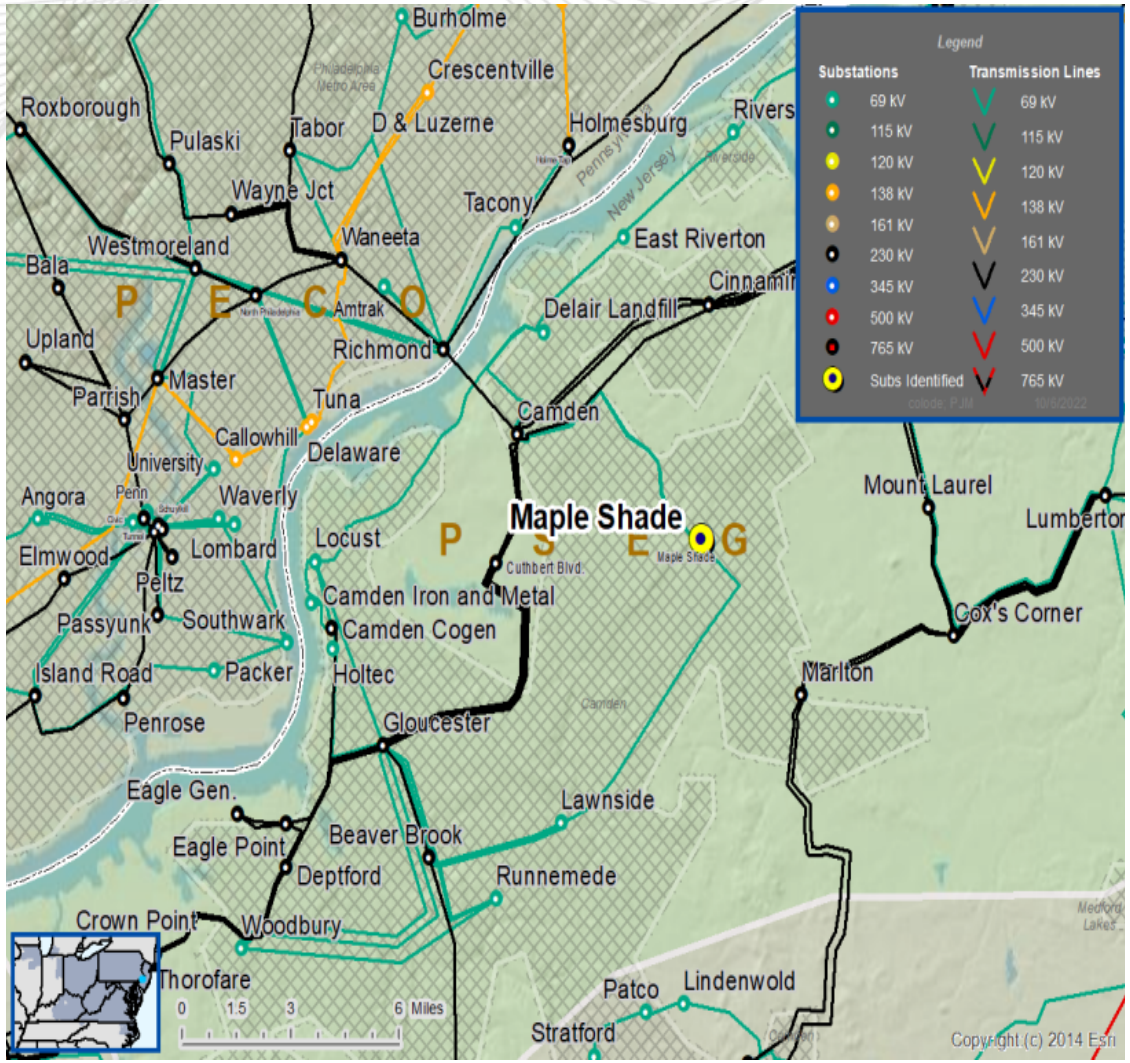
Recommended Solution:
Convert Maple Shade 69kV from a Straight Bus to a Ring Bus. (B3756)

Estimated Cost: $33.9 M

Alternatives
-Adding capacitor banks at Maple Shade:

- Current straight bus design cannot accommodate connection of capacitor banks in the appropriate locations to address all contingencies.
- Modification of existing bus to a ring requires significant underground circuit reconfiguration to provide ample space. Temporary construction contingencies are required to maintain system reliability.

Required In-Service: 6/1/2027
Projected In-Service: 6/1/2027



PSEG Transmission Zone: Baseline

Process Stage: Second Review

Criteria: FERC Form 715

Assumption Reference: 2027 RTEP assumption

Model Used for Analysis: 2027 RTEP Summer

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: Voltage drop violation at Harts Lane station for several multiple N-1-1 contingencies.

Violations were posted as part of the 2022 Window 1: FG# PSEG-VD10 and

FG# PSEG-VD11

Proposed Facility Rating: 95SN/131SE, 95WN/131WE MVA

Recommended Solution:
Construct a new 69kV line from 14th Street to Harts Lane. (B3758)

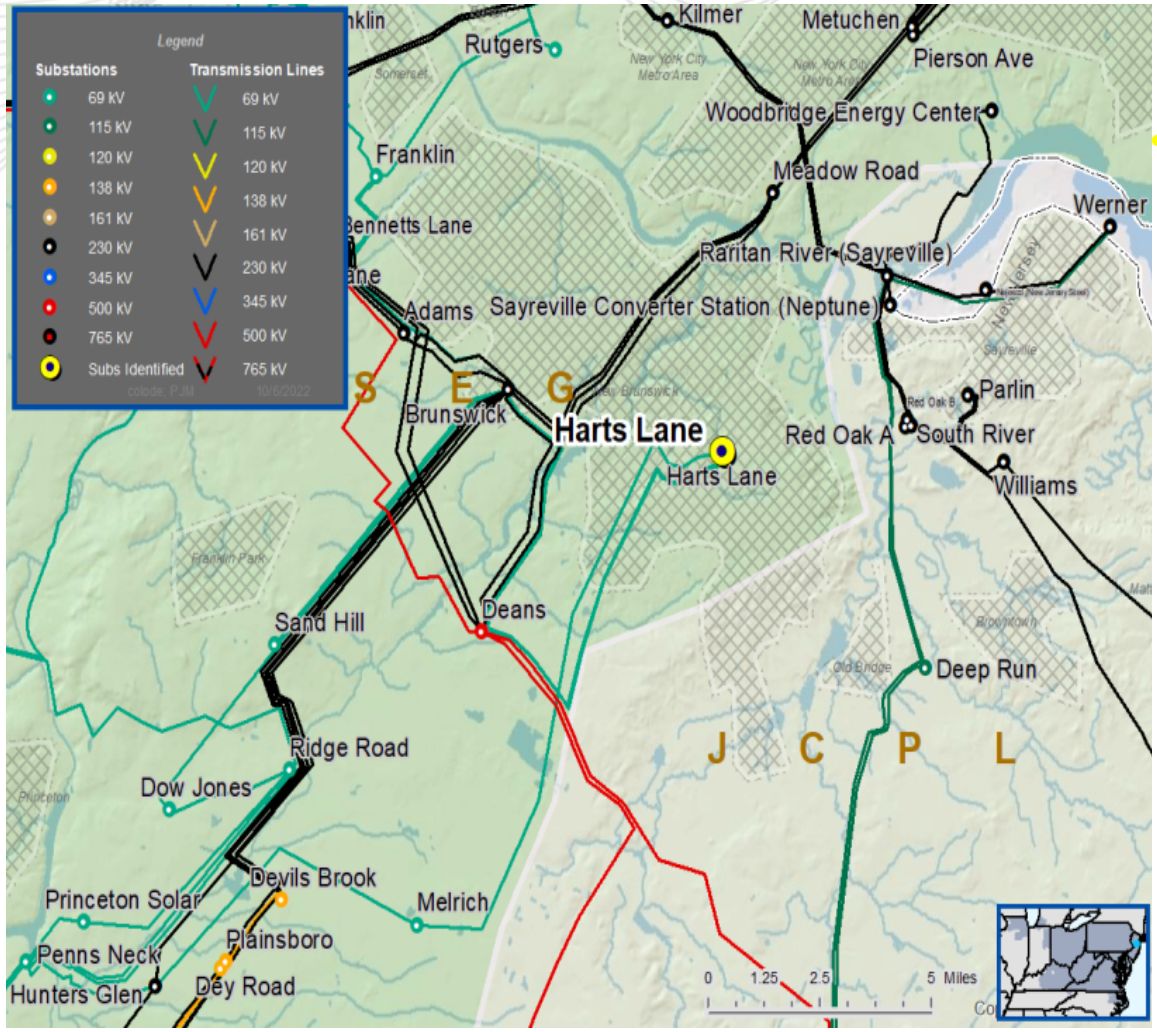
Estimated Cost: $34.4 M

Alternatives
-Install Capacitor bank at Harts Lane:

- Harts Lane already has a capacitor bank, however, reported voltage drop is too great for an additional capacitor bank to be an effective solution.

-Alternative circuit to Brunswick has a more challenging route and provides no benefit to the rest of the area 69kV system.

Required In-Service: 6/1/2027
Projected In-Service: 6/1/2027



Questions?

Upcoming SRRTEP Meetings

2022

- The Next 2022 Mid-Atlantic SRRTEP meetings are as followed
- 12/14

Revision History

V1 – 11/10/2022 – Original slides posted

V2 – 11/15/2022 – removed a slide related to Medford and South Hampton flowgates, the project will e presented in the future.