Subregional RTEP Committee - Mid-Atlantic
FirstEnergy Supplemental Projects

Needs

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

Met-Ed Transmission Zone M-3 Process
Violet Hill No. 6 115-69 kV Transformer

Need Number: ME-2024-003

Process Stage: Need Meeting 02/15/2024

Project Driver:

Operational Flexibility and Efficiency

Equipment Material Condition, Performance, and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- Add/Replace Transformers
- Upgrade relay schemes

End of Life Criteria

- Transformers at or beyond expected service life
- Outdated or obsolete technology and equipment

Problem Statement:

The existing No. 6 115-69 kV Transformer at Violet Hill is 66 years old and is approaching end of life. The transformer is experiencing increased corrective maintenance costs. Maintenance history demonstrates that the transformer has oil leaks and paper degradation.

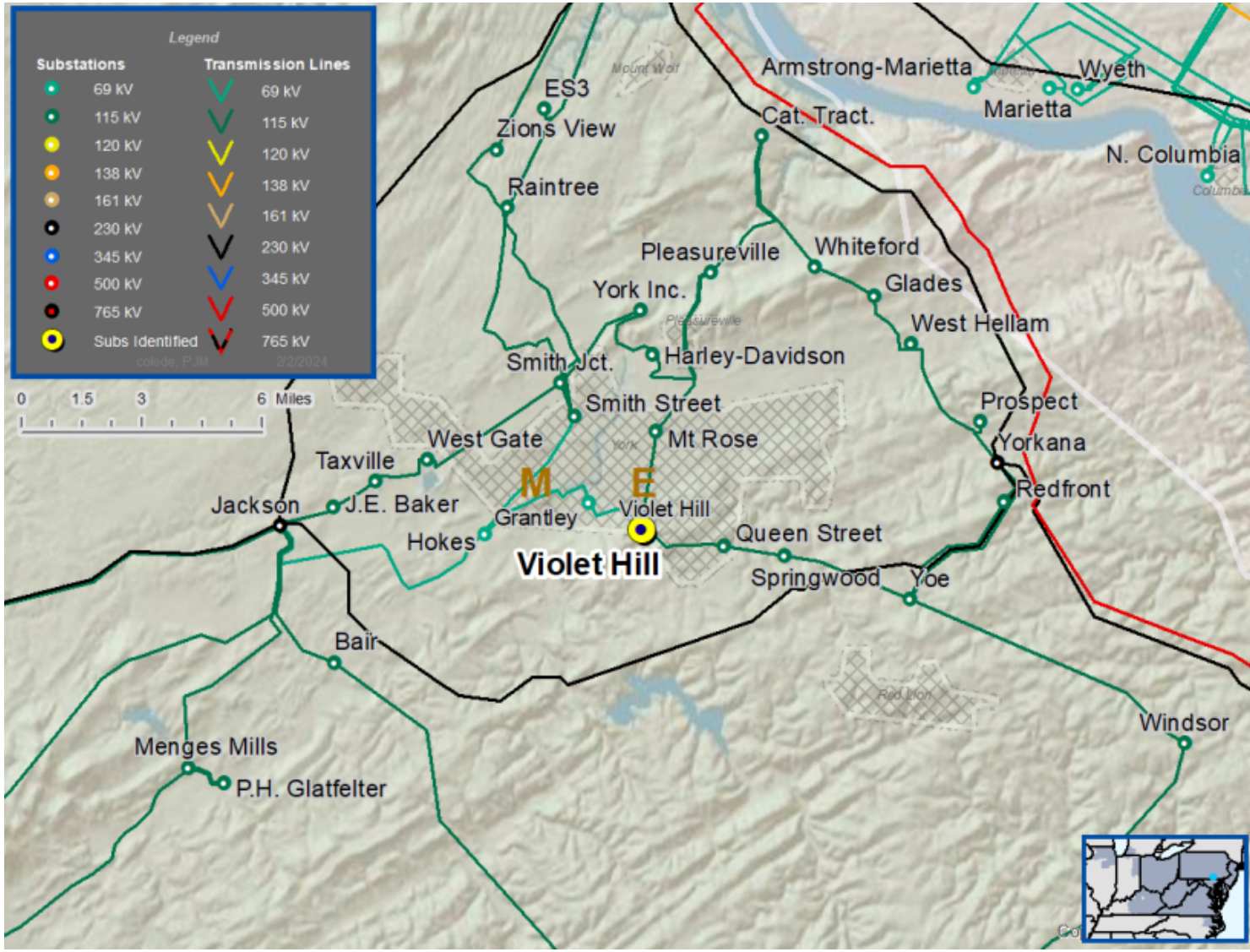
The Violet Hill 69 kV breaker '6B32' and the electromechanical relaying is 55 years old. The relaying equipment has a history of misoperation and is approaching end of life.

The transformer is limited by terminal equipment.

Existing Ratings

84/111 MVA SN/SSTE

109/125 MVA WN/WSTE



Solutions

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

Met-Ed Transmission Zone M-3 Process
Birdsboro – Birdsboro Extrusions 69 kV Line

Need Number: ME-2023-011

Process Stage: Solution Meeting 02/15/2024

Previously Presented: Needs Meeting 11/16/2023

Project Driver:

Increased System Reliability

Specific Assumption Reference:

System Performance Projects

Add/Expand Bus Configuration

- Accommodate Future Transmission Facilities

Build New Transmission Line

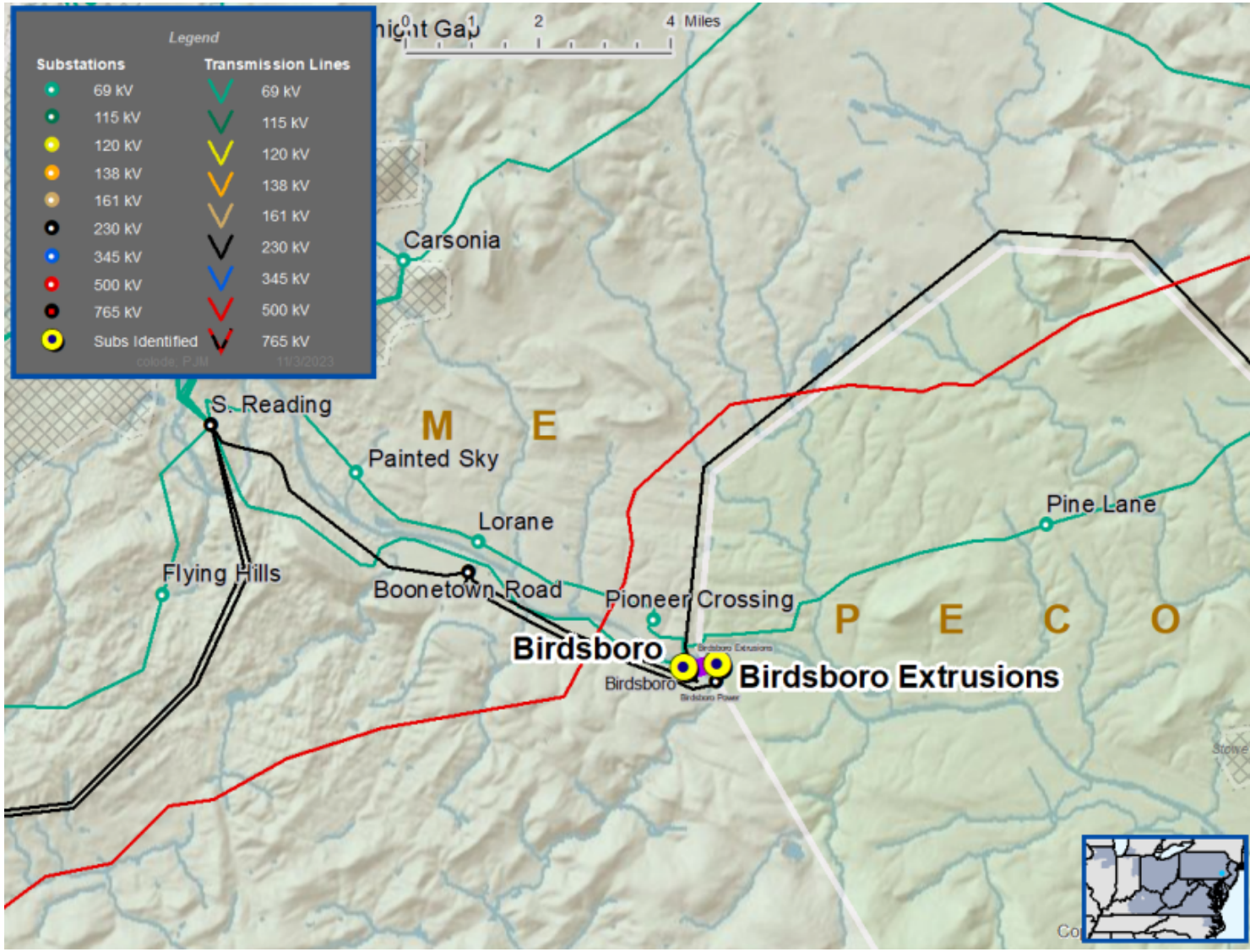
- Network Radial Lines
- Contingency constrained facilities

Automatic Sectionalizing Schemes

Problem Statement:

An N-1-1 contingency can lead to an overload of the Birdsboro – Birdsboro Extrusions 69 kV Line up to 111%.

Existing 69 kV line rating between Birdsboro Substation and Birdsboro Extrusions Substation is 71/90 MVA (SN/SE).



Met-Ed Transmission Zone M-3 Process
Birdsboro – Birdsboro Extrusions 69 kV Line

Need Number: ME-2023-011

Process Stage: Solution Meeting 2/15/2024

Proposed Solution:

- Rebuild and reconductor approximately 0.5 miles of the Birdsboro – Birdsboro Extrusions 69 kV Line.
- At Birdsboro Substation:
  - Replace 69 kV circuit breaker
  - Replace four 69 kV disconnect switches
  - Replace existing line drop and bus conductor
  - Replace existing line and breaker relaying
- At South Reading Substation:
  - Adjust relay settings

Transmission Line Ratings:

- Birdsboro – Birdsboro Extrusions 69 kV Line
  - Before Proposed Solution: 71 / 90 / 85 / 103 MVA (SN/SE/WN/WE)
  - After Proposed Solution: 111 / 134 /125 / 159 MVA (SN/SE/WN/WE)

Alternatives Considered:

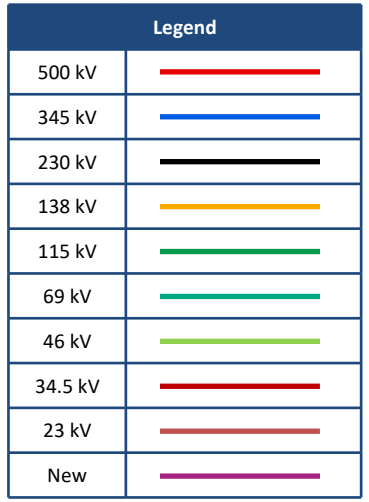
Maintain existing condition and elevated risk of operational constraints.

Estimated Project Cost: $2.1M

Projected In-Service: 12/10/2025

Project Status: Engineering

Model: 2023 RTEP model for 2028 Summer (50/50)



Met-Ed Transmission Zone M-3 Process
Campbelltown 69 kV Ring Bus

Need Number: ME-2019-034

Process Stage: Solution Meeting – 02/15/2024

Previously Presented: Need Meeting – 05/31/2019

Supplemental Project Driver:

Operational Flexibility and Efficiency

Specific Assumption References:

System Performance Projects

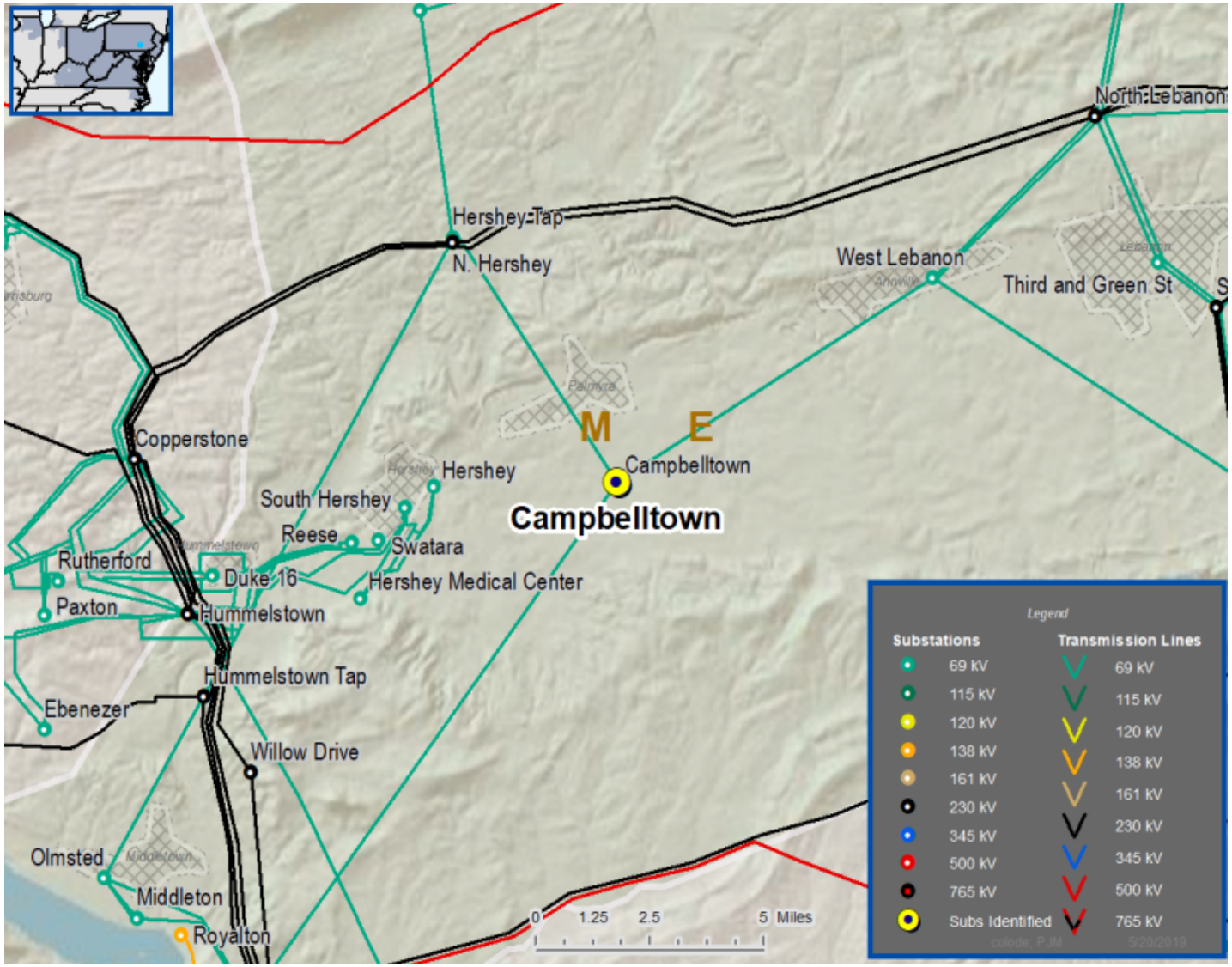
- Load at risk in planning and operational scenarios

Add/Expand Bus Configuration

- Reduce the amount of exposed potential local load loss during contingency conditions
- Eliminate simultaneous outages to multiple networked elements

Problem Statement:

- The loss of Campbelltown Substation results in the loss of approximately 40 MW of load and approximately 8,800 customers.
- Campbelltown Substation consists of:
  - Three networked 69 kV transmission lines
  - Two distribution transformers connected to the bus with switches
  - No bus tie breaker



Met-Ed Transmission Zone M-3 Process
Campbelltown 69 kV Ring Bus

Need Number: ME-2019-034

Process Stage: Solution Meeting – 2/15/2024

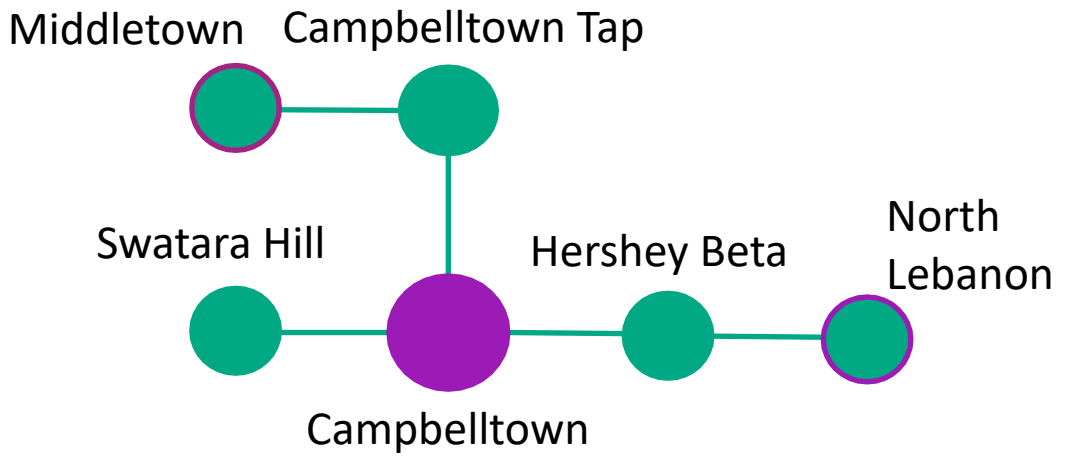
Previously Presented: Need Meeting – 5/31/2019

Proposed Solution:

- Convert Campbelltown into a five breaker 69 kV ring bus
- At Campbelltown Substation:
  - Replace two 69 kV circuit breakers and associated disconnect switches
  - Install two new 69 kV circuit breakers and associated disconnect switches
  - Relocate one existing 69 kV circuit breaker and associated disconnect switches
  - Install new bus conductor
  - Install four standard transmission line relay panels
  - Replace substation conductor

- At North Lebanon Substation:
  - Replace one 69 kV circuit breaker
  - Replace one 69 kV disconnect switch
  - Install one standard transmission line relay panel
  - Replace substation conductor

- At Middletown Substation:
  - Replace one 69 kV circuit breaker
  - Replace one 69 kV disconnect switch
  - Install one standard transmission line relay panel
  - Replace substation conductor



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Met-Ed Transmission Zone M-3 Process
Campbelltown 69 kV Ring Bus

Proposed Solution (continued):

Transmission Line Ratings:

- Campbelltown – Swatara #70 69 kV Line
  - Before Proposed Solution: 71 / 90 / 85 / 109 MVA (SN/SE/WN/WE)
  - After Proposed Solution: 74 / 90 / 85 / 109 MVA (SN/SE/WN/WE)
- Campbelltown – Campbelltown Tap #72 69 kV Line
  - Before Proposed Solution: 82 / 103 / 108 / 124 MVA (SN/SE/WN/WE)
  - After Proposed Solution: 139 / 169 /158 / 201 MVA (SN/SE/WN/WE)

Alternatives Considered:

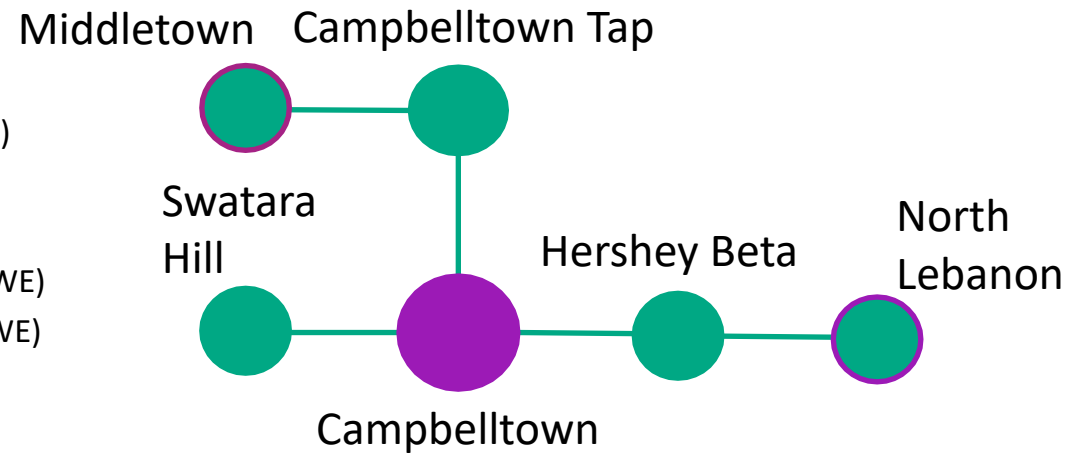
Maintain existing condition with loss of load risk.

Estimated Project Cost: $10.0M

Projected In-Service: 6/1/2026

Status: Engineering

Model: 2023 RTEP model for 2028 Summer (50/50)



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Met-Ed Transmission Zone M-3 Process
Carpenter Technology – South Reading 69 kV Line

Need Number: ME-2019-043

Process Stage: Solution Meeting 2/15/2024

Previously Presented: Need Meeting 07/31/2019

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

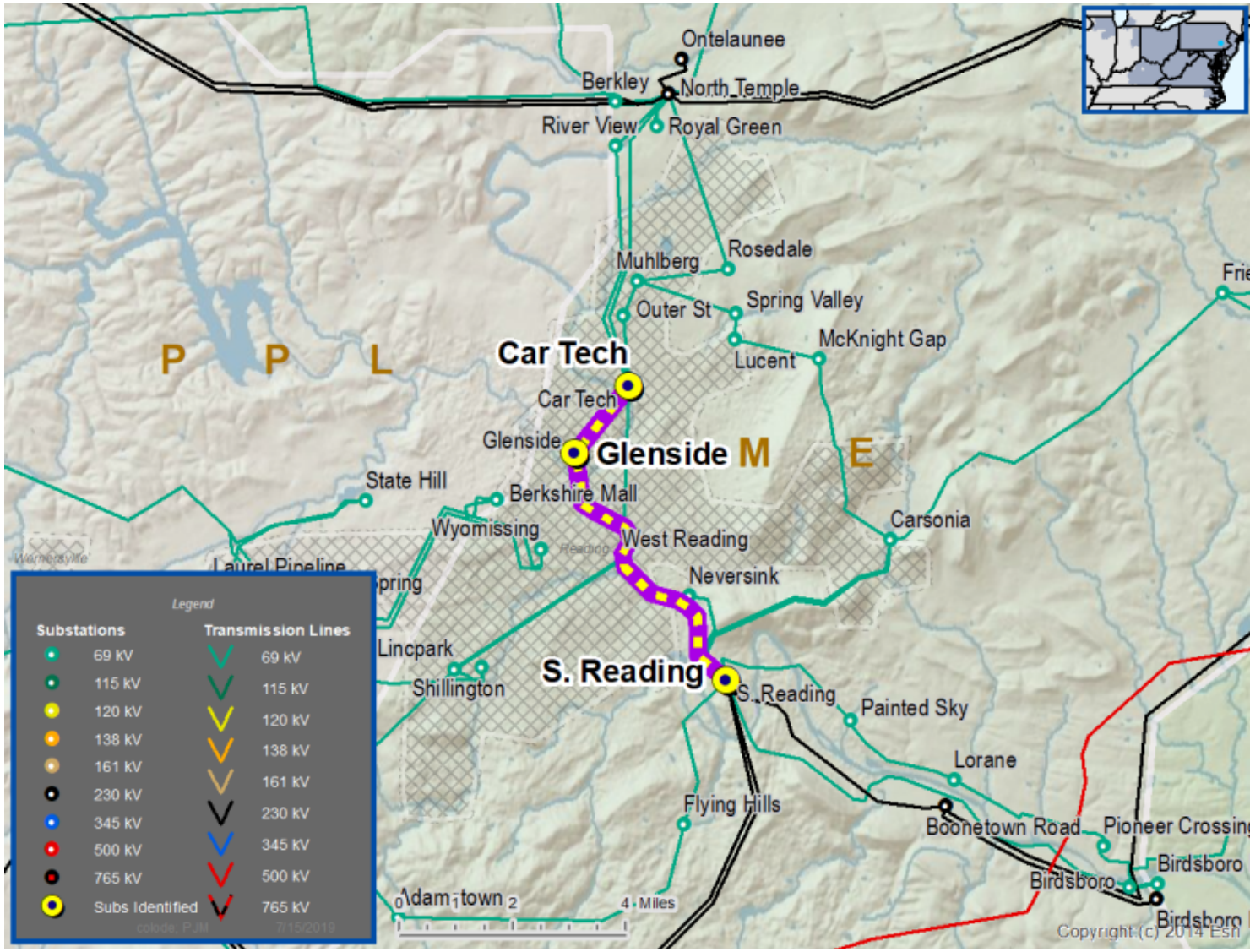
System Performance Projects

- Substation/line equipment limits

Problem Statement:

The Carpenter Technology – South Reading 69 kV Line is exhibiting deterioration.

- Total line distance is approximately 5.9 miles.
- 125 out of 151 structures failed inspection (83% failure rate).
- Failure reasons include age, woodpecker holes, and sound.
- Transmission line ratings are limited by terminal equipment
  - Carpenter Technology – Glenside 69 kV Line
    - Existing line rating: 82/103 MVA (SN/SE)
    - Existing conductor rating: 102/124 MVA (SN/SE)
  - Glenside – South Reading 69 kV Line
    - Existing line rating: 82/103 MVA (SN/SE)
    - Existing conductor rating: 102/124 MVA (SN/SE)



Met-Ed Transmission Zone M-3 Process
Carpenter Technology – South Reading 69 kV Line

Need Number: ME-2019-043

Process Stage: Solution Meeting 2/15/2024

Proposed Solution:

Rebuild approximately 5.9 miles of the Carpenter Technology – South Reading 69 kV Line.

At South Reading Substation:

- Replace 69 kV breaker, line-side disconnect and line relaying
- Install surge arresters

At Carpenter Technology Substation:

- Replace 69 kV line-side disconnect and line relaying

At Glenside Substation:

- Replace 69 kV motor-operated airbreak switches, disconnects and CCVTs

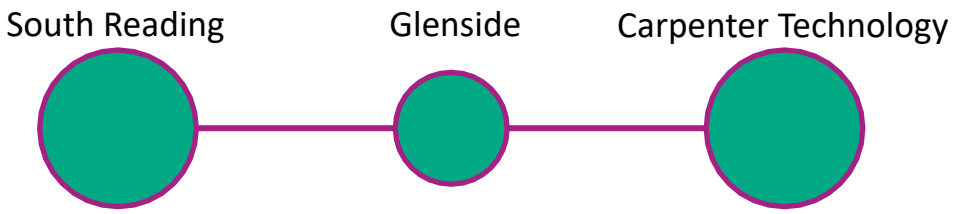
Transmission Line Ratings:

- Carpenter Technology – Glenside 69 kV Line:
  - Before Proposed Solution: 82 / 103 / 108 / 124 MVA (SN/SE/WN/WE)
  - After Proposed Solution: 102 / 124 / 118 / 150 MVA (SN/SE/WN/WE)
- Glenside – South Reading 69 kV Line:
  - Before Proposed Solution: 82 / 103 / 108 / 124 MVA (SN/SE/WN/WE)
  - After Proposed Solution: 102 / 124 / 118 / 150 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain existing condition with elevated risk of failure.

Estimated Project Cost: $15.2M
Projected In-Service: 05/29/2026
Project Status: Engineering
Model: 2023 RTEP Model for 2028 Summer (50/50)



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	


Planning
Community
?

Appendix

High level M-3 Meeting Schedule

Assumptions

Activity	Timing
Posting of TO Assumptions Meeting information	20 days before Assumptions Meeting
Stakeholder comments	10 days after Assumptions Meeting

Needs

Activity	Timing
TOs and Stakeholders Post Needs Meeting slides	10 days before Needs Meeting
Stakeholder comments	10 days after Needs Meeting

Solutions

Activity	Timing
TOs and Stakeholders Post Solutions Meeting slides	10 days before Solutions Meeting
Stakeholder comments	10 days after Solutions Meeting

Submission of Supplemental Projects & Local Plan

Activity	Timing
Do No Harm (DNH) analysis for selected solution	Prior to posting selected solution
Post selected solution(s)	Following completion of DNH analysis
Stakeholder comments	10 days prior to Local Plan Submission for integration into RTEP
Local Plan submitted to PJM for integration into RTEP	Following review and consideration of comments received after posting of selected solutions

Revision History

2/5/2024 – V1 – Original version posted to pjm.com