



Sub Regional RTEP Committee Mid-Atlantic

August 24, 2018

- The following definitions explain the basis for excluding flowgates and/or projects from the competitive planning process and designating projects to the incumbent Transmission Owner.
- Flowgates/projects excluded from competition will include the underlined language on the corresponding slide.
 - Immediate Need Exclusion: Due to the immediate need of the violation (3 years or less), the timing required for an RTEP proposal window is infeasible. As a result, the local Transmission Owner will be the Designated Entity. - Operating Agreement, Schedule 6 § 1.5.8(m)
 - Below 200kV: Due to the lower voltage level of the identified violation(s), the driver(s) for this project are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity - Operating Agreement, Schedule 6 § 1.5.8(n)
 - FERC 715 (TO Criteria): Due to the violation need of this project resulting solely from FERC 715 TO Reliability Criteria, the driver(s) for this project are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity - Operating Agreement, Schedule 6 § 1.5.8(o)
 - Substation Equipment: Due to identification of the limiting element(s) as substation equipment, the driver(s) for this project are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity - Operating Agreement, Schedule 6 § 1.5.8(p)

First Review

Baseline Reliability and Supplemental Projects

N-1-1 Voltage (Winter)

Below 200 kV

Problem Statement:

- Low voltage at West Fall 115 kV bus for N-1-1 contingency loss of 2-230/46 kV transformers and a capacitor bank at Altoona substation. (FG# N2-WVM1 and N2-WVM2)

Proposed Solution:

- Install one 115 kV 36 MVAR capacitor at West Fall 115 kV substation.

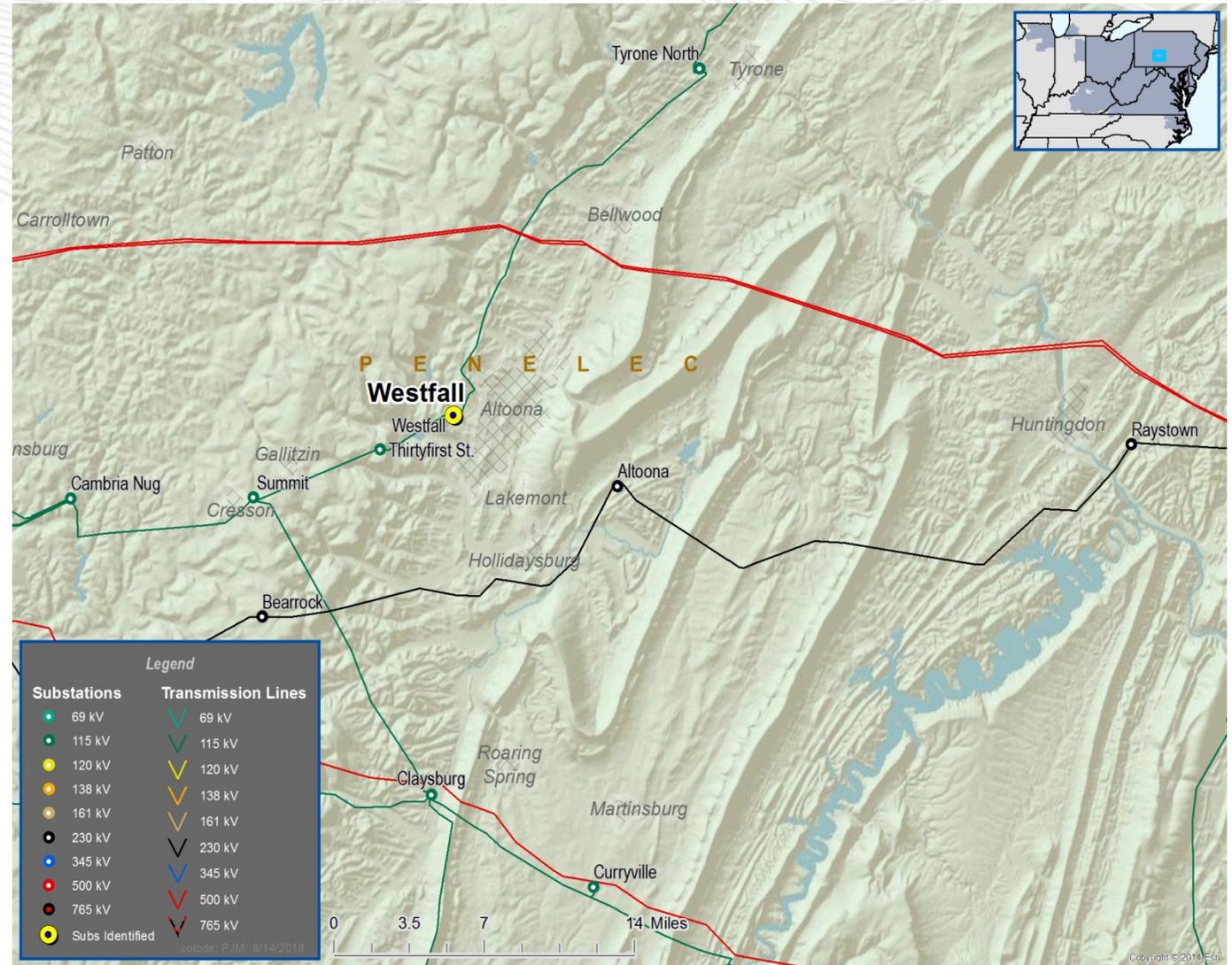
Alternatives Considered:

- None

Estimated Project Cost : \$0.9454 M

Required IS Date: 6/1/2023

Status: Conceptual



Second Review

Baseline Reliability and Supplemental Projects

Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Operational Flexibility and Efficiency

- Provide networked source for radial load that cannot be transferred to other substations

Selected Solution:

Hunterstown – Lincoln (963) 115 kV Line. (S1725.1)

- Loop the Hunterstown – Lincoln (963) 115 kV line ~9 miles into Orrtanna substation

Orrtanna 115 kV Substation. (S1725.2)

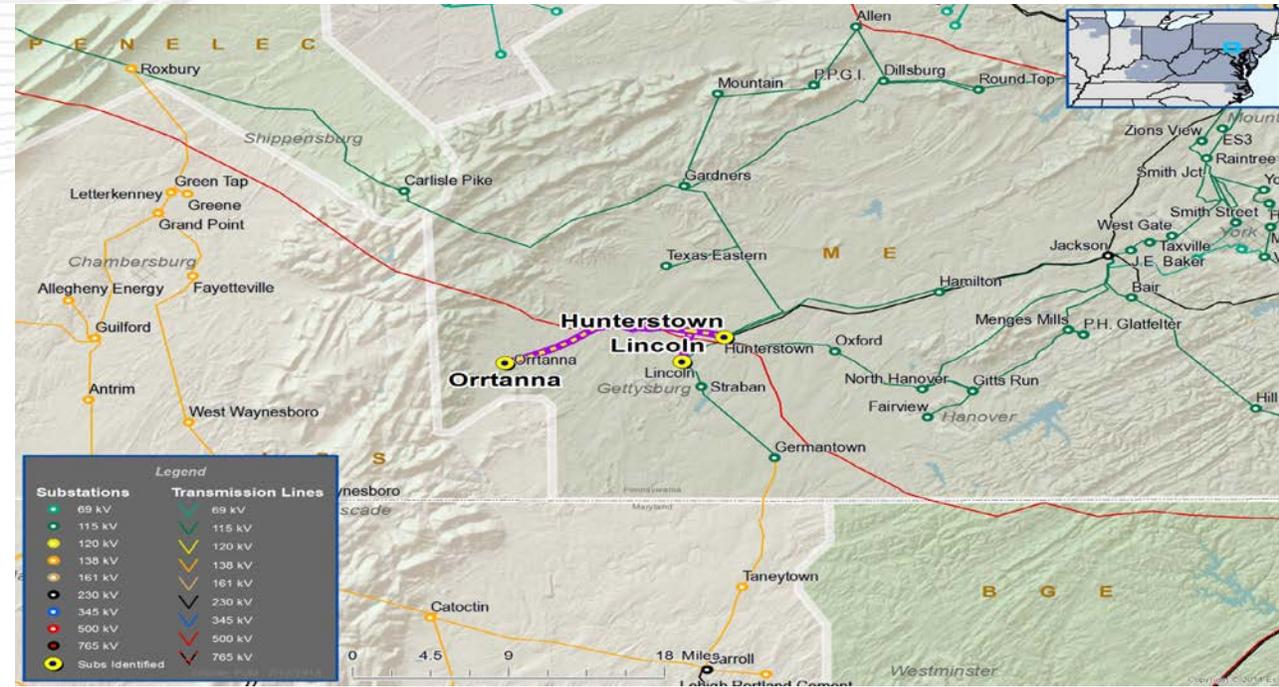
- Construct a five (5) breaker 115 kV ring bus

Estimated Project Cost (Line Loop): \$30.9M

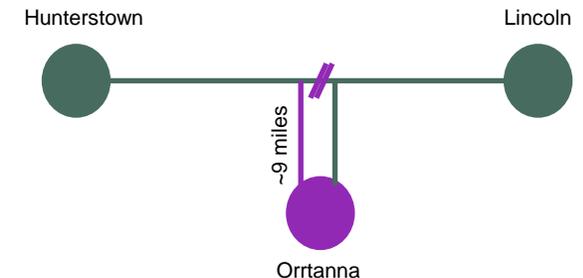
Estimated Project Cost (Ring Bus): \$ 9.2M

Projected IS date: 12/31/2021

Status: Conceptual



Legend	
500 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	



Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Operational Flexibility and Efficiency

- Improve operational flexibility during maintenance and restoration efforts.
- Reduce amount of potential local load loss under contingency conditions.
- Eliminate the simultaneous outages to three or more system elements

Selected Solution:

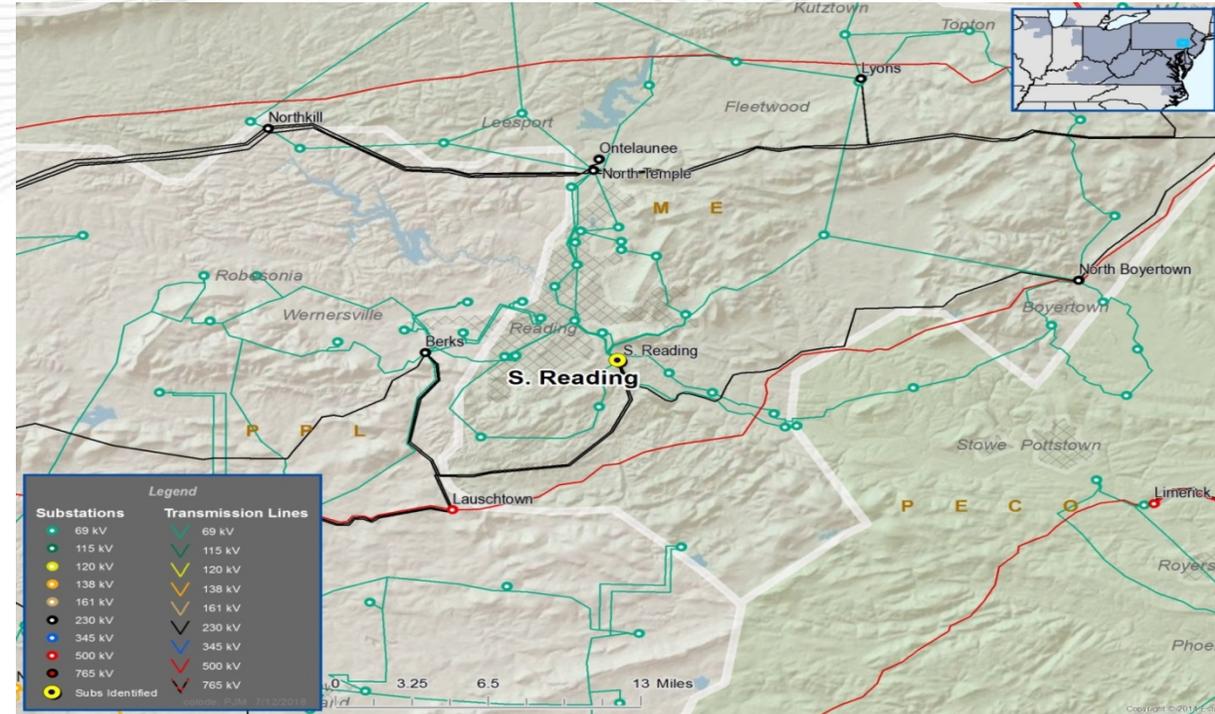
South Reading Substation. (S1726)

- Expand the existing 69 kV yard to a breaker-and-a-half configuration

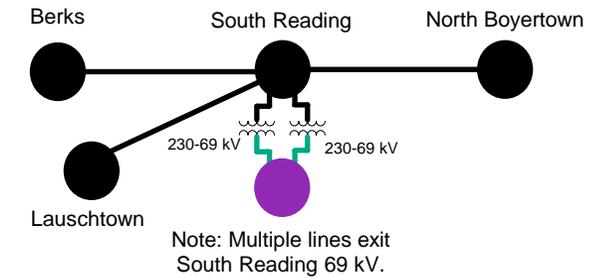
Estimated Project Cost : \$19.4M

Projected IS date: 12/31/2020

Status: Conceptual



Legend	
500 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	



Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Operational Flexibility and Efficiency

- Improve operational flexibility during maintenance and restoration efforts.
- Reduce amount of potential local load loss under contingency conditions

Selected Solution:

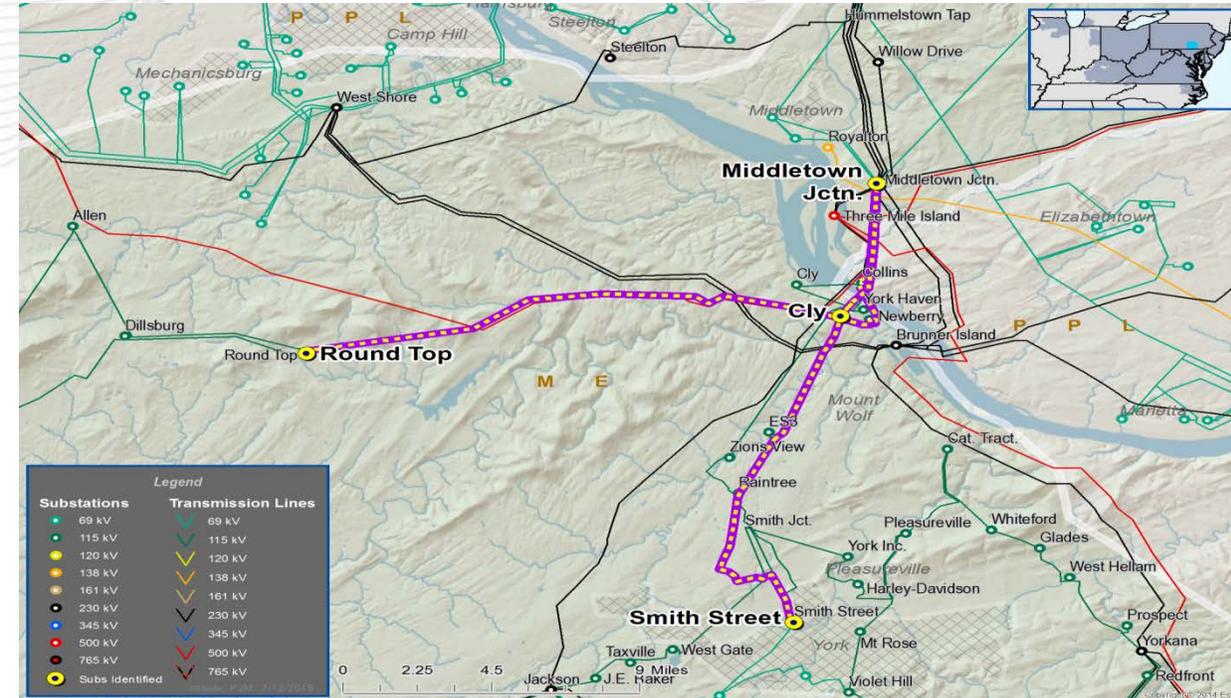
Cly Substation

- Construct a five (5) breaker 115 kV ring bus. (\$1727.1)
- Loop the existing Middletown Jct. – Round Top and Middletown Jct. – Smith Street 115 kV line into the ring bus. (\$1727.2)

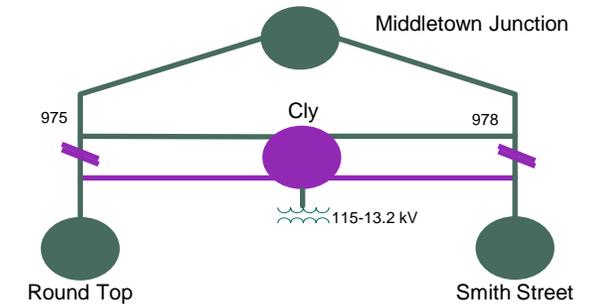
Estimated Project Cost : \$12.2M

Projected IS date: 12/31/2020

Status: Conceptual



Legend	
500 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	



Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Operational Flexibility and Efficiency

- Improve operational flexibility during maintenance and restoration efforts.
- Eliminate the simultaneous outages to three or more system elements
 - Loss of the South Reading – Hosensack 230 kV line also outages the North Boyertown 230-69 kV transformer.

Selected Solution:

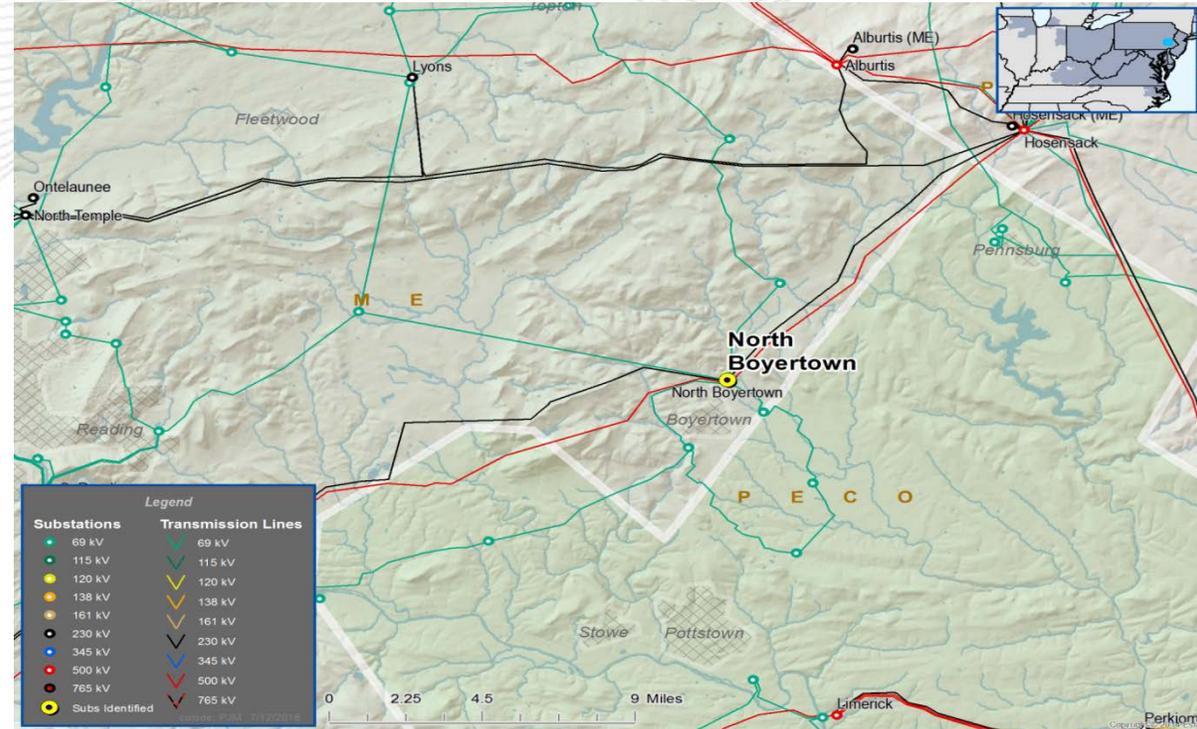
North Boyertown Substation

- Expand the 230 kV bus to a three (3) breaker 230 kV ring bus. (S1728)

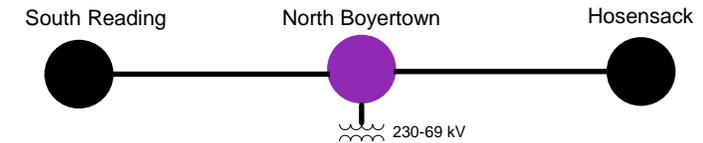
Estimated Project Cost : \$5.0M

Projected IS date: 12/31/2020

Status: Conceptual



Legend	
500 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	



Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Operational Flexibility and Efficiency

- Improve operational flexibility during maintenance and restoration efforts.
- Reduce amount of potential local load loss under contingency conditions.
- Eliminate the simultaneous outages to three or more system elements

Selected Solution:

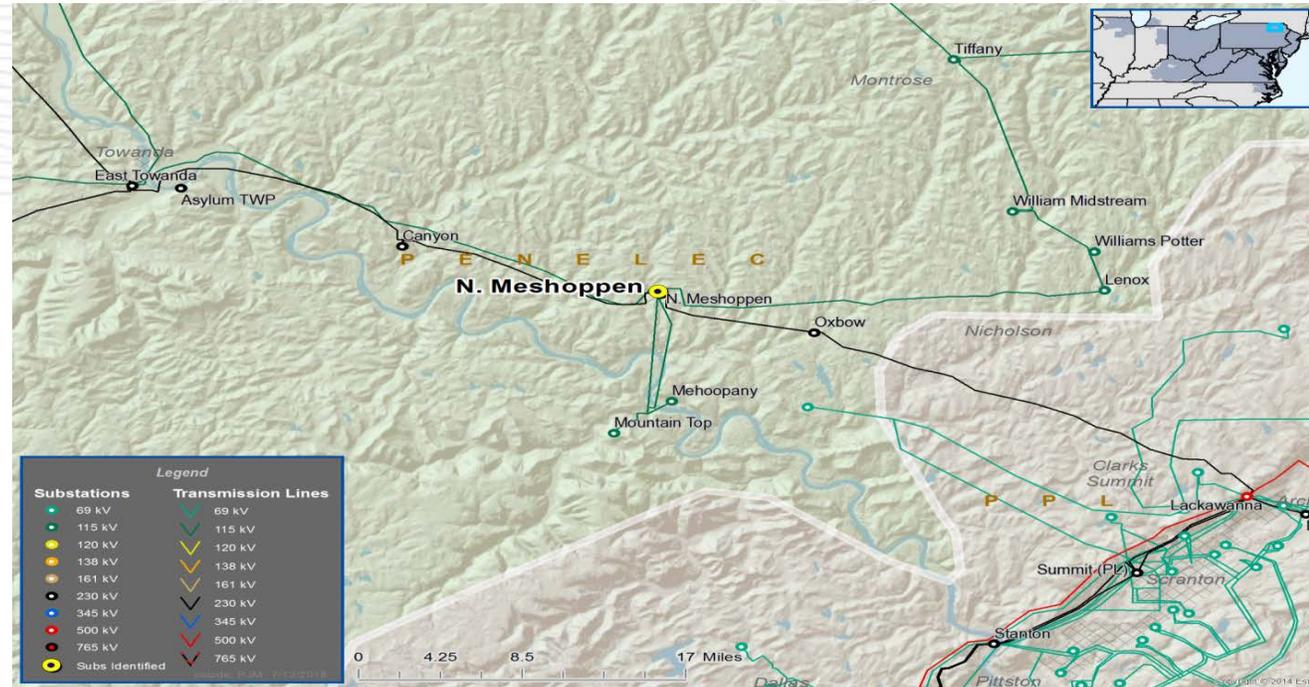
North Meshoppen Substation

- Expand the existing 115 kV yard to a breaker-and-a-half configuration. (S1729)

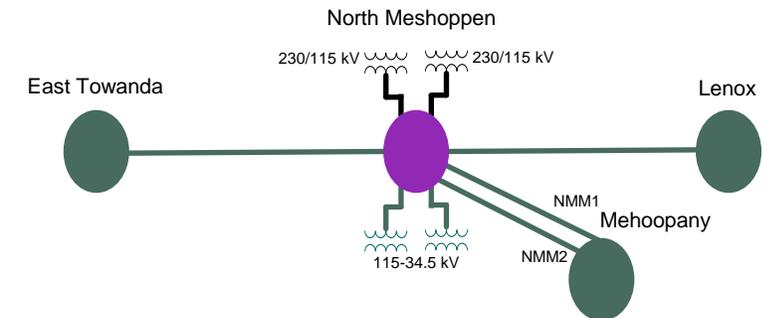
Estimated Project Cost: \$17.6M

Projected IS date: 12/31/2020

Status: Conceptual



Legend	
500 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	



Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Operational Flexibility and Efficiency

- Improve operational flexibility during maintenance and restoration efforts.
- Reduce amount of potential local load loss under contingency conditions.
- Eliminate the simultaneous outages to three or more system elements.

Selected Solution:

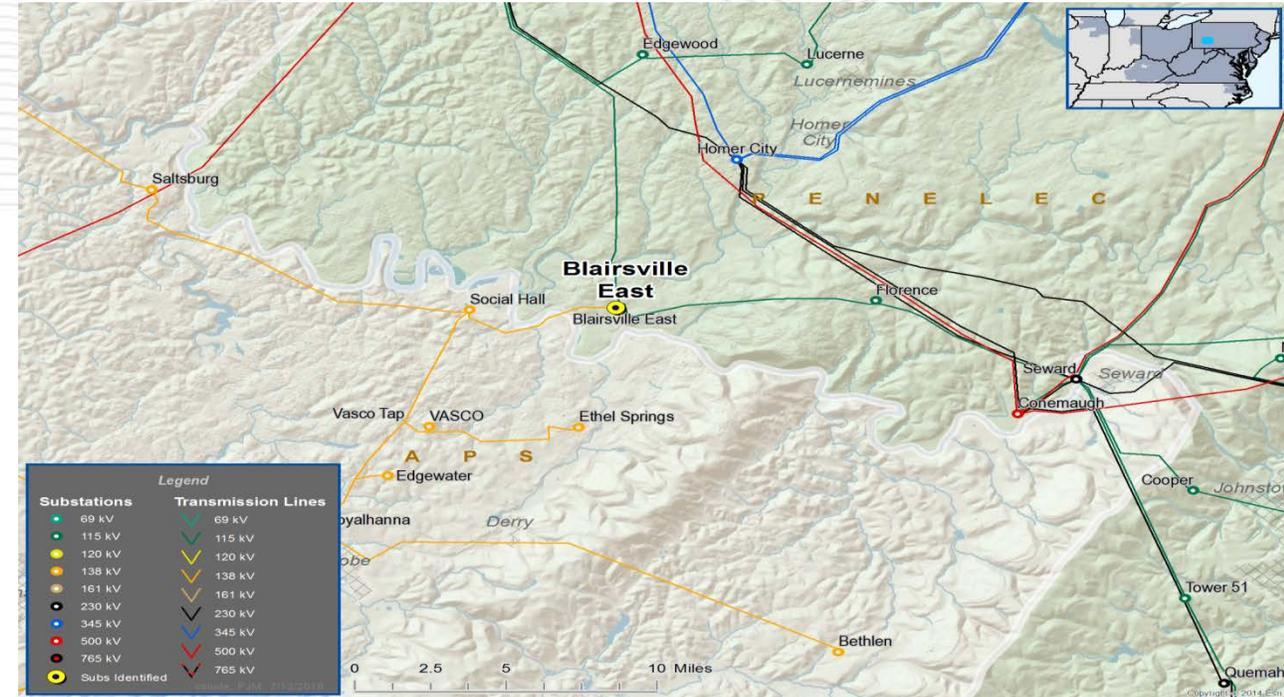
Blairsville Substation

- Convert the Blairsville East 115 kV substation into a six (6) breaker ring bus. (S1730)

Estimated Project Cost: \$9.0M

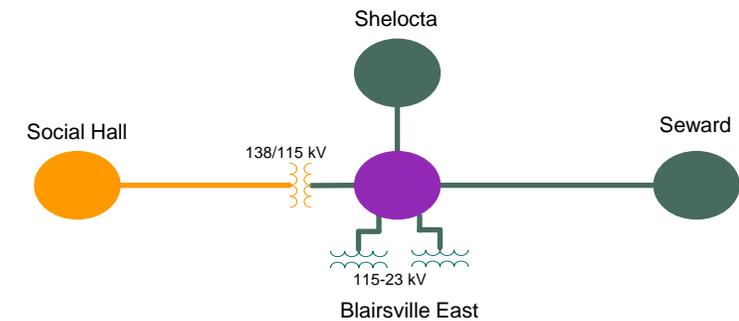
Projected IS date: 12/31/2019

Status: Conceptual



Legend	
Substations	Transmission Lines
69 kV	69 kV
115 kV	115 kV
120 kV	120 kV
138 kV	138 kV
161 kV	161 kV
230 kV	230 kV
345 kV	345 kV
500 kV	500 kV
765 kV	765 kV
Subs Identified	

Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	



Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Operational Flexibility and Efficiency

- Improve operational flexibility during maintenance and restoration efforts.
- Reduce amount of potential local load loss under contingency conditions.
- Eliminate the simultaneous outages to three or more system elements.

Selected Solution:

Erie West Substation

- Convert the Erie West 115 kV substation into a five (5) breaker ring bus. (S1731)

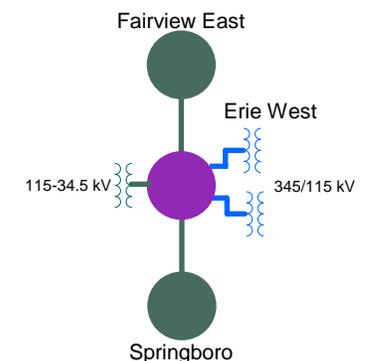
Estimated Project Cost: \$4.8M

Projected IS date: 12/31/2019

Status: Conceptual



Legend	
500 kV	
345 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	





Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Operational Flexibility and Efficiency

- Improve operational flexibility during maintenance and restoration efforts.
- Reduce amount of potential local load loss under contingency conditions.
- Eliminate the simultaneous outages to three or more system elements

Selected Solution:

Raystown Substation (S1732)

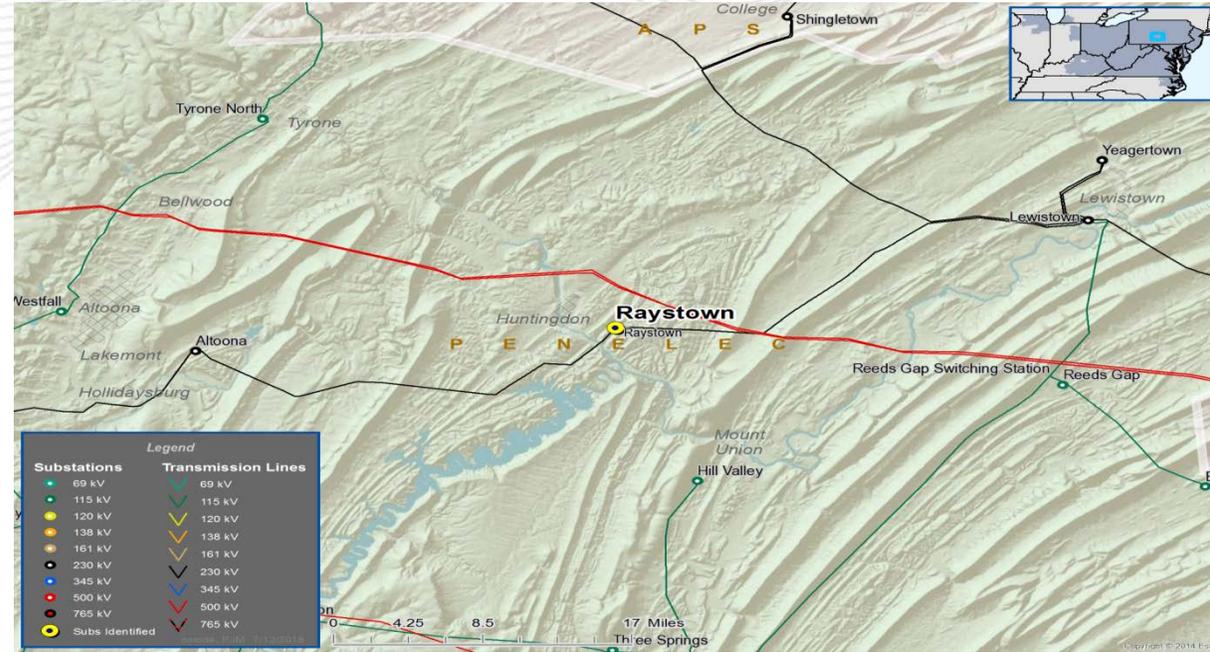
- Install a second 230-46 kV transformer (100 MVA).
- Install 3-230 kV circuit breakers to create a four (4) breaker 230 kV ring bus.
- Install 46 kV bus tie breaker

Estimated Project Cost: \$ 8.0M

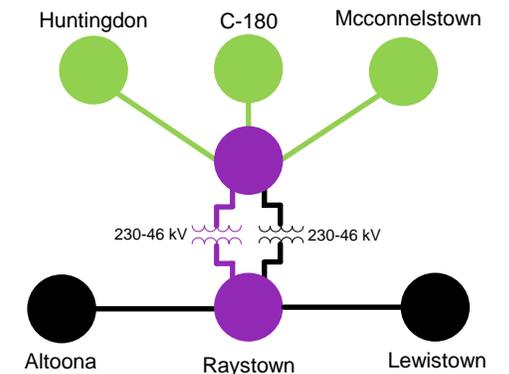
Projected IS date: 6/1/2019

Status: Engineering

Penelec Transmission Zone: Supplemental Project Raystown Substation



Legend	
500 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	



Penelec Transmission Zone: Supplemental Project Hill Valley – Mount Union – Lewistown 46 kV Line

Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Operational Flexibility and Efficiency

- Improve operational flexibility during maintenance and restoration efforts.
- Transmission line that cannot be utilized for post contingency switching or networking normally open points

Selected Solution:

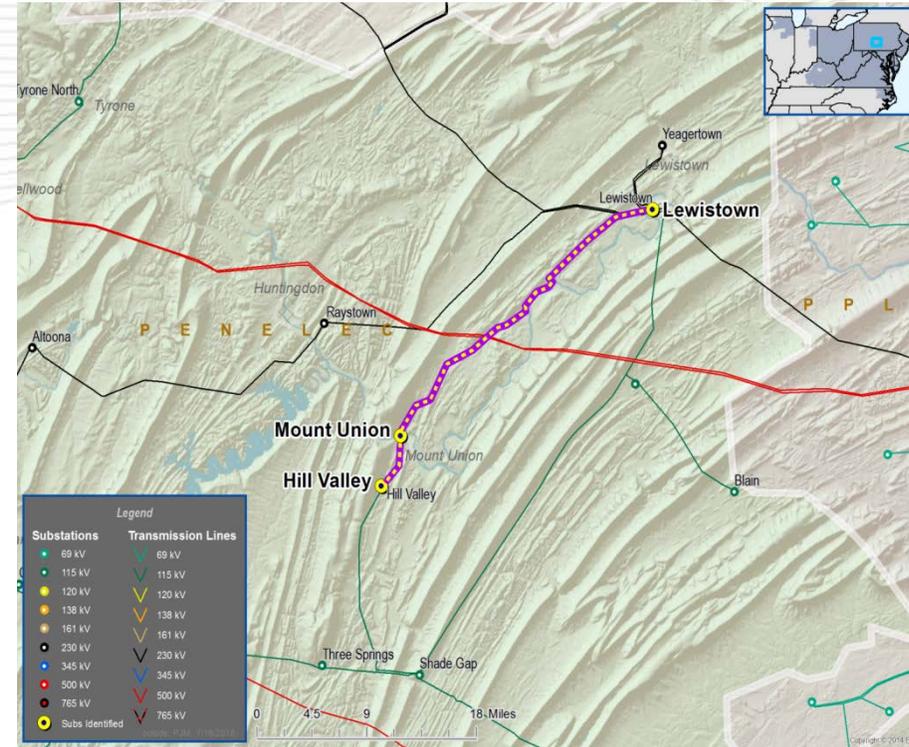
Hill Valley – Mount Union - Lewistown 46 kV Line. (S1733)

- Reconductor/Rebuild line and upgrade terminal equipment
- Replace line tap switches at Lewistown Industrial Park, Strodes Mill, McVeytown, and Atkins Mills

Estimated Project Cost: \$37.2M

Projected IS date: 12/31/2020

Status: Conceptual



Legend	
500 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	



Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Operational Flexibility and Efficiency

- Improve operational flexibility during maintenance and restoration efforts.
- Upgrade existing line switches to desired operating capability (i.e. line charging, loop splitting, etc.).

Selected Solution:

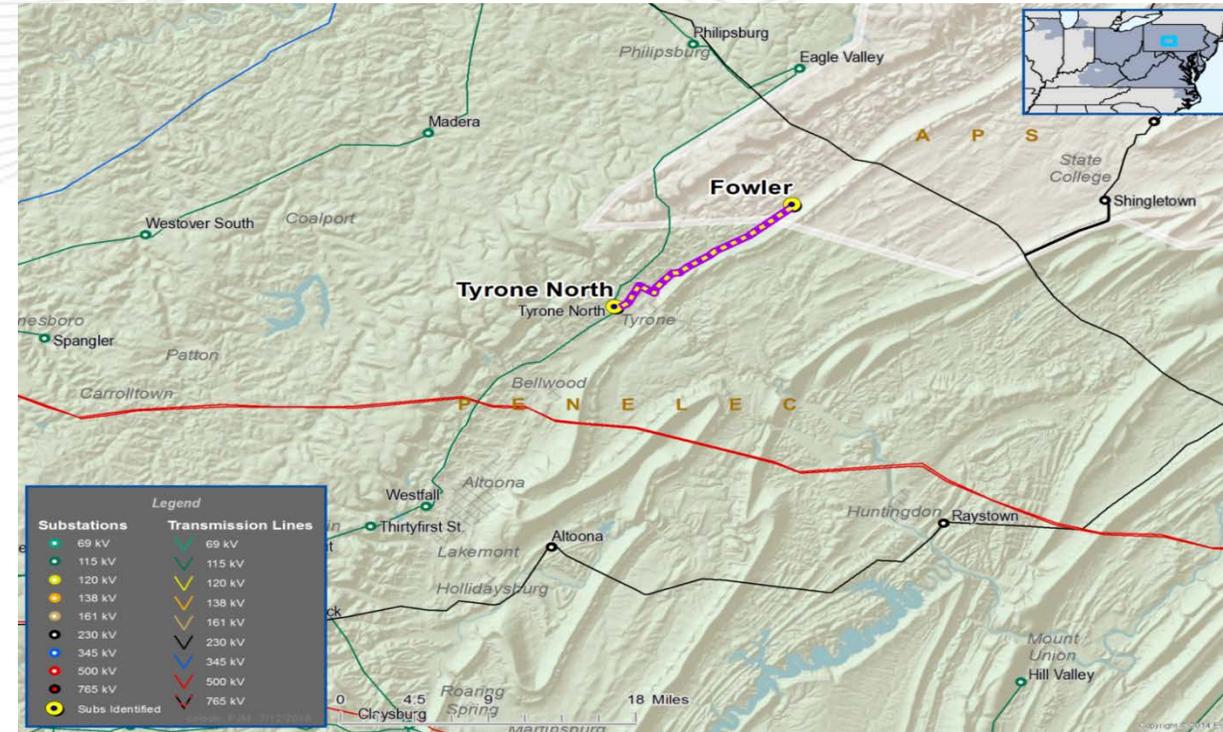
Tyrone North – Fowler 46 kV Line. (S1734)

- Upgrade terminal equipment at Tyrone North.
- Replace switches at Westvaco and Vail to provide appropriate interrupting capability.

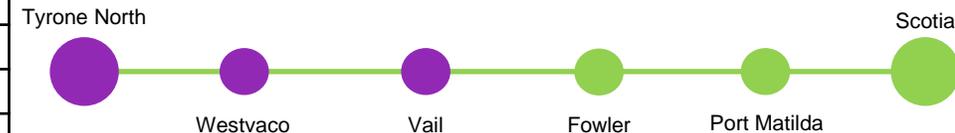
Estimated Project Cost: \$1.5M

Projected IS date: 6/1/2019

Status: Conceptual



Legend	
500 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	



Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Equipment Material Condition, Performance and Risk

- Improve system reliability and performance
- Remove obsolete & deteriorated equipment.
- Eliminate the simultaneous outages to three or more system elements

Selected Solution:

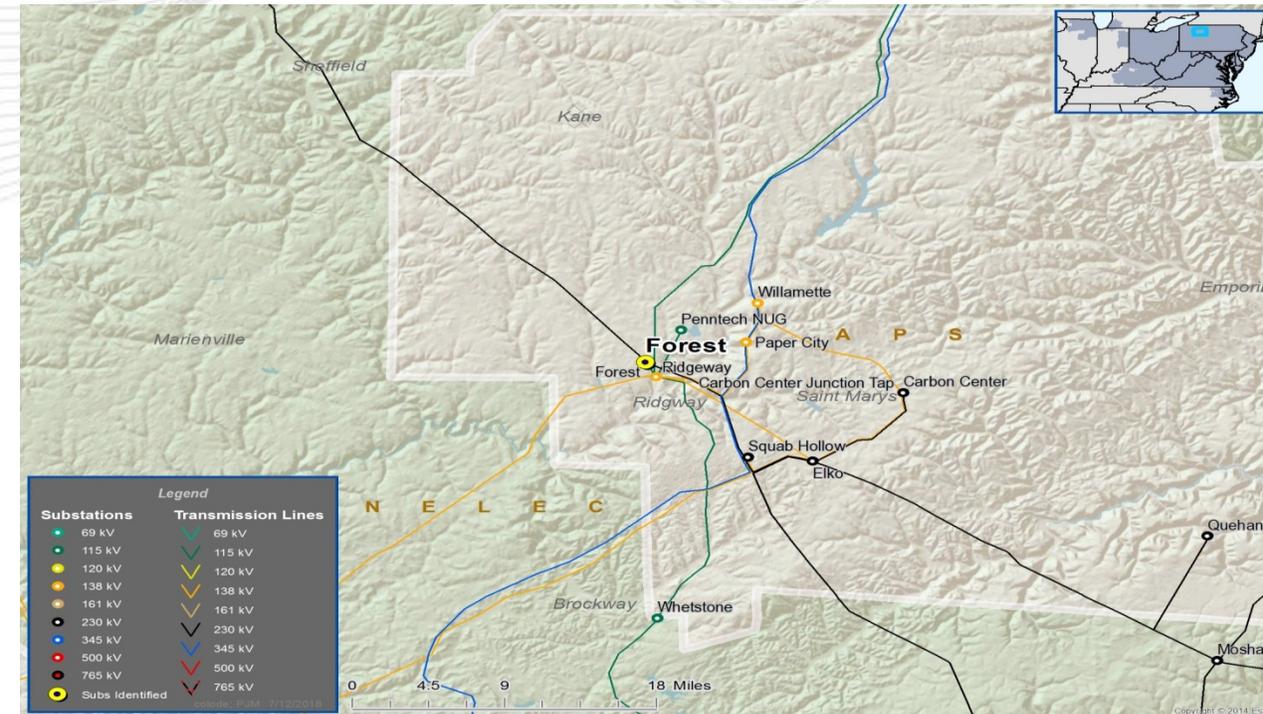
Forest Substation (S1735)

- Replace the existing 150 MVA 230/115 kV transformer.
- Convert the Forest 230 kV substation into a three (3) breaker ring bus.

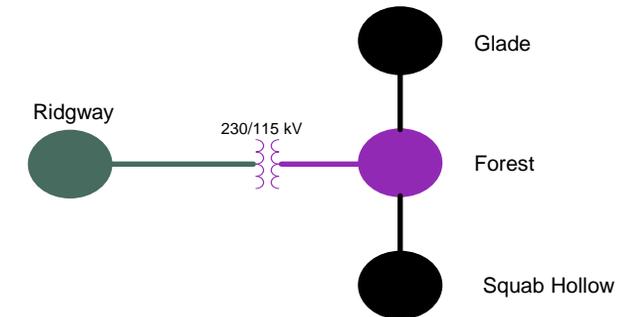
Estimated Project Cost: \$9.1M

Projected IS date: 6/1/2020

Status: Conceptual



Legend	
500 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	



Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

Equipment Material Condition, Performance and Risk

- Improve system reliability and performance
- Remove obsolete & deteriorated equipment.

Selected Solution:

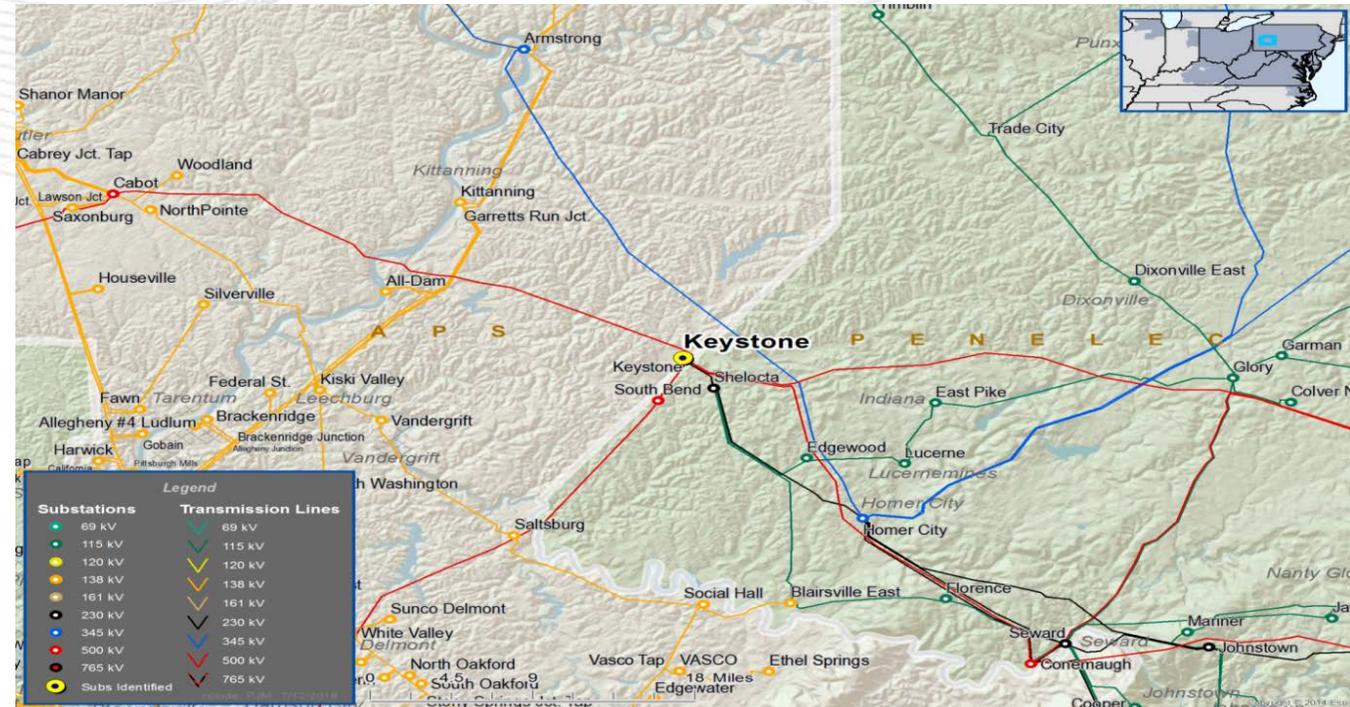
Keystone Substation. (S1736)

- Replace the existing 351 MVA 500/230 kV transformer.
- Install a 500 kV high side breaker.

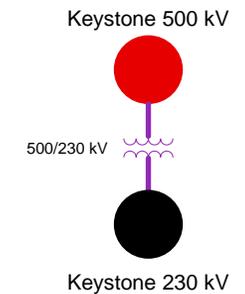
Estimated Project Cost: \$ 21.7M

Projected IS date: 12/31/2019

Status: Conceptual



Legend	
500 kV	
230 kV	
115 kV	
69 kV	
46 kV	
New	



Previously Presented : 07/20/2018

Problem Statement (Scope and Need/Drivers):

RECO Planning Criteria (N-1 Criteria Violation)

- Loss of Line #75 (Orangeburg - West Nyack 69 kV) overloads the Line # 46 (Closter - Harings Corner 69 kV)
- To get below normal rating, over 9,000 customers would need to be shed.

Recommended Solution:

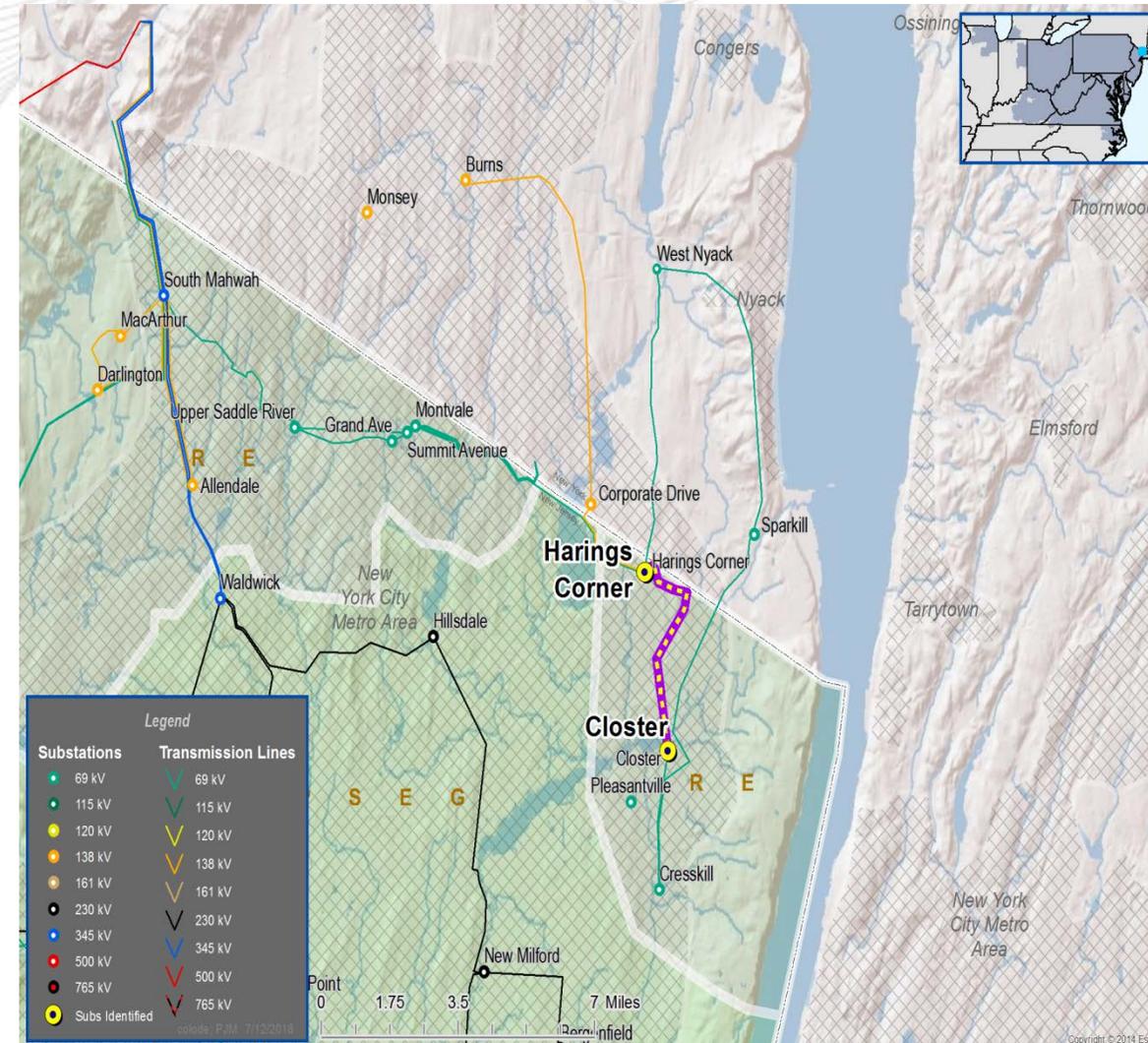
- Install 69 kV underground transmission line from Harings Corner Station terminating at Closter Station (about 3 miles). (B3029)
- Reconfigure Closter Station to accommodate the UG transmission line from Harings Corner Station.
- The existing Line 751 will be terminated at Closter station while the rest of the line will continue to feed Cresskill Substation in parallel with the existing Line 61

**This project is already approved by municipal.

Estimated Project Cost: \$ 22M

Required IS date: 05/31/2020

Status: Planning and Engineering



Previously Presented : 07/20/2018

Problem Statement:

Infrastructure Resilience: Orange Valley is a 26kV station currently below FEMA 100 year flood elevations and is at risk in case of a major storm event.

Equipment Material Condition, Performance and Risk: Station equipment at East Orange and Orange Valley 26kV supplied stations has been identified as being in poor condition and must be addressed. Both of these stations are Type C stations, which have metal clad buildings that rust and leak over time, causing bus failures. East Orange was installed in 1959 and serves over 21,000 customers and 34 MW of load. Orange Valley was installed in 1952 and serves over 7,000 customers and 16 MW of load.

Selected Solution:

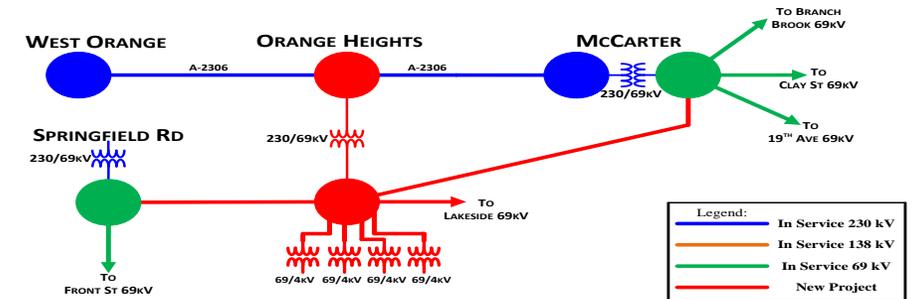
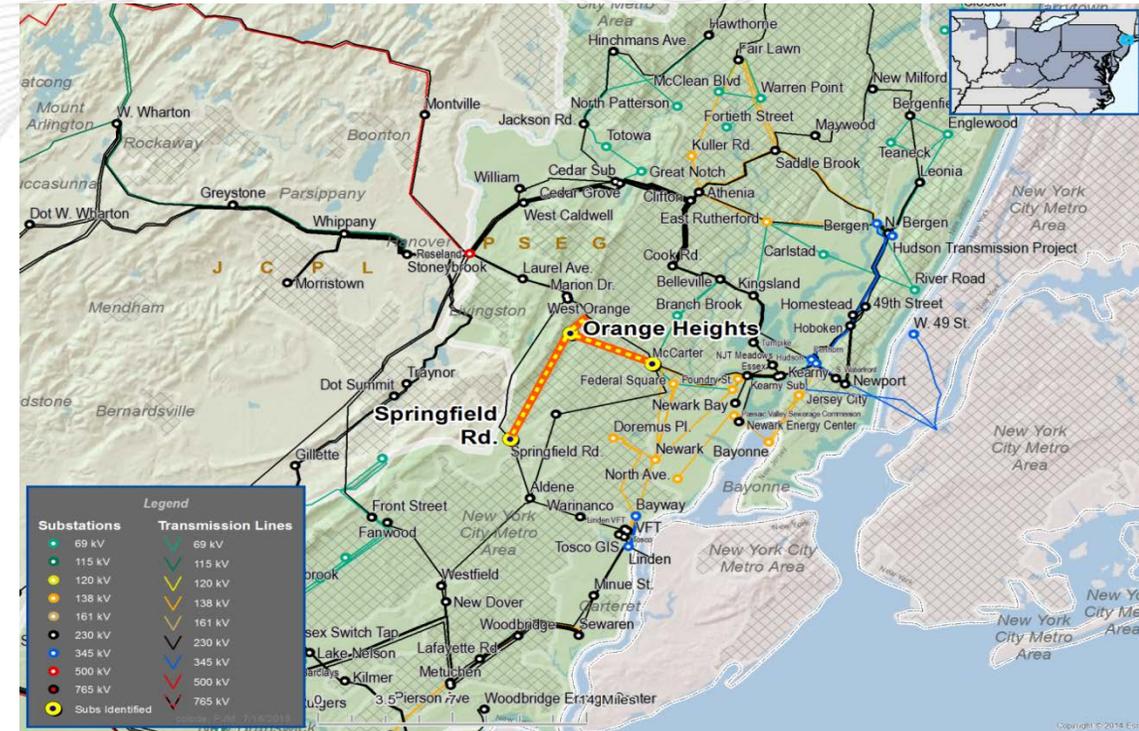
Construct a 230/69/4kV station near the location of Orange Valley. (\$1722)

- Purchase new property near Orange Valley.
- Install a 230kV ring bus with one (1) 230/69kV transformer.
- Install a 69kV breaker-and-a-half bus with three (3) 69/4kV transformers.
- Construct a 69kV network between Lakeside, McCarter, Springfield Rd, and the new station.
- Enables retirement of Orange Valley and East Orange 26kV Substations

Estimated Project Cost: \$ 328M

Expected IS date: 10/31/2022

Status: Engineering



Previously Presented : 07/20/2018

Problem Statement:

Infrastructure Resilience: Lakeside is a 26kV station that is currently below FEMA 100 year flood elevations and is at risk in case of a major storm event.

Equipment Material Condition, Performance and Risk: Station equipment at Lakeside has been identified as being in poor condition because of its extreme age. In addition, the physical building is deteriorated and must be addressed. The majority of the equipment at the station is still original. Lakeside was installed in 1929 and serves over 10,000 customers and 22 MW of load.

Selected Solution:

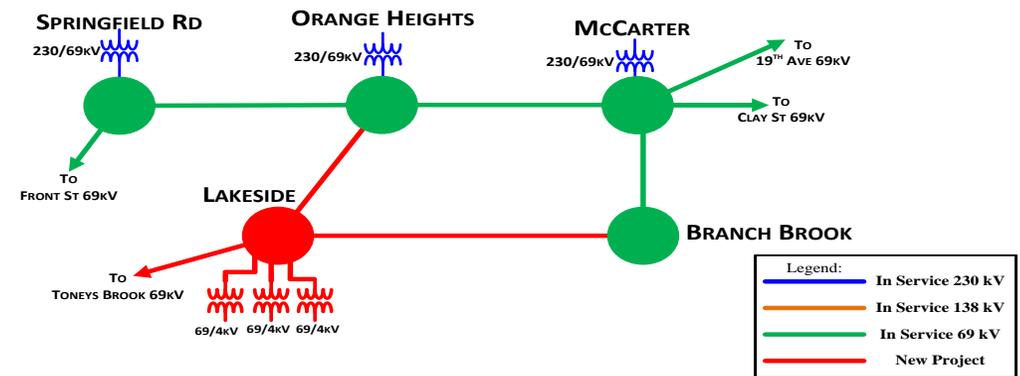
Relocate Lakeside outside of the FEMA flood zone. (S1723)

- Purchase property to relocate the Lakeside station.
- Install a 69kV ring bus and three (3) 69/4kV transformers at the new property.
- Construct a 69kV network between the following stations: Branch Brook, Orange Heights, Toney's Brook, and the new station.

Estimated Project Cost: \$106M

Expected IS date: 10/31/2022

Status: Engineering



Previously Presented : 07/20/2018

Problem Statement:

Infrastructure Resilience: Toney's Brook is a 26kV station that is currently below FEMA 100 year flood elevations and is at risk in case of a major storm event.
Equipment Material Condition, Performance and Risk: Station equipment at Toney's Brook 26kV supplied station has been identified as being in poor condition and must be addressed. This station is a Type C station, which has metal clad buildings that rust and leak over time, causing bus failures. Toney's Brook was installed in 1964 and serves over 9,000 customers and 23 MW of load.

Selected Solution:

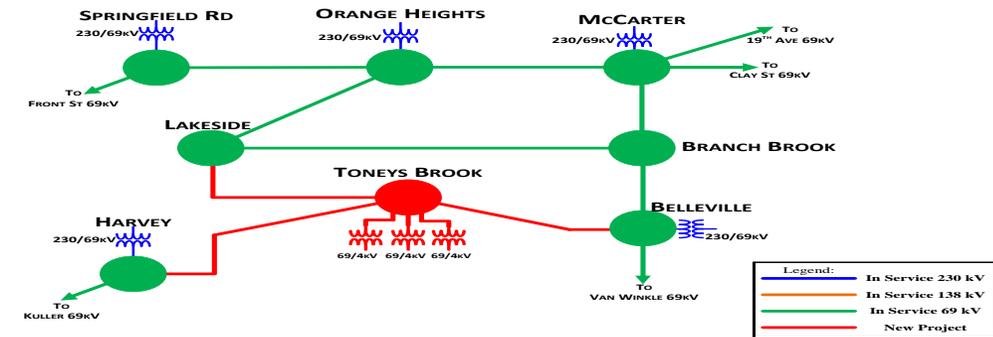
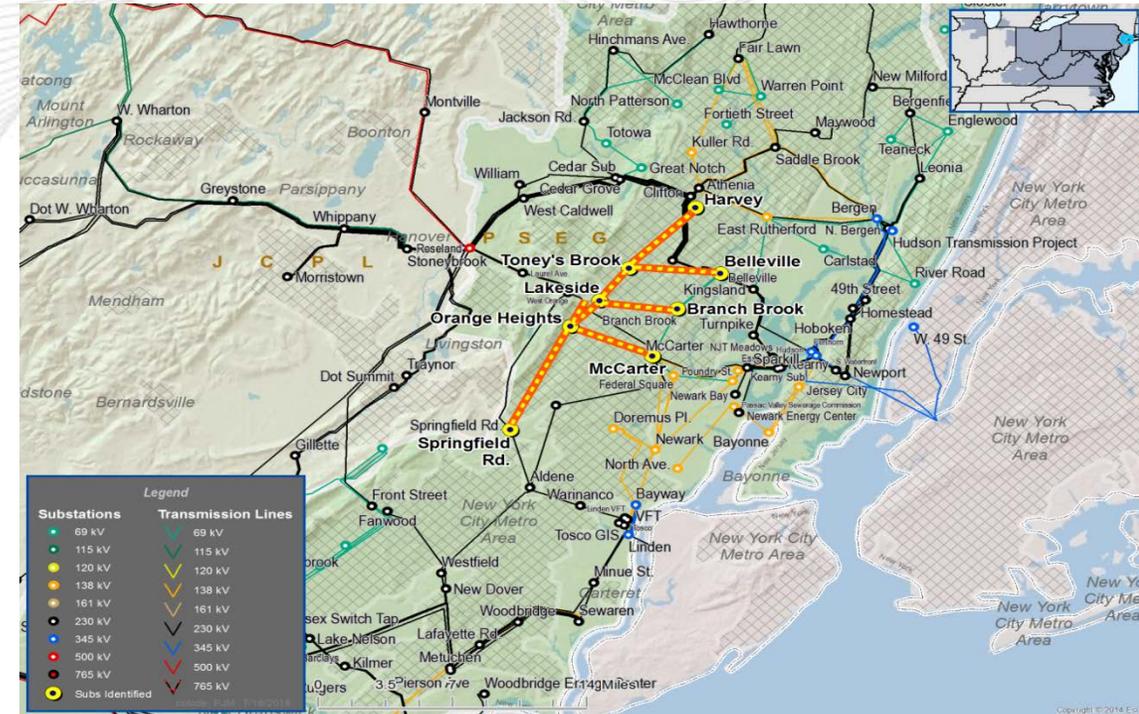
Raise and rebuild Toney's Brook above FEMA flood elevation. (S1724)

- Purchase neighboring property to accommodate new construction.
- Install a 69kV ring bus and three (3) 69/4kV transformers at Toney's Brook.
- Construct a 69kV network between the following stations: Belleville, Harvey, Lakeside, and Toney's Brook.

Estimated Project Cost: \$98M

Expected IS date: 10/31/2022

Status: Engineering



Next Steps

Mid-Atlantic	Start	End
9/21/2018	8:30	12:30
10/26/2018	8:30	12:30
11/28/2018	8:30	12:30
12/07/2018	8:30	12:30



- PJM will retire the RTEP@pjm.com email address as of September 1, 2018. Stakeholders with questions about planning updates or planning windows should use the [Planning Community](#).
- PJM is enhancing the way we communicate to follow industry standards and maintain its standing as an industry leader.
- The [Planning Community](#) is a vital avenue for PJM members and staff to collaborate on planning updates, including RTEP windows, and get their questions answered.



Revision History

8/21/2018 – V2 – Added Slide 2 - Exclusion Definitions

Updated slides 7 – 17 (was 6-16) to improve bubble diagrams.

8/17/2018 – V1 – Original version posted to pjm.com