

Western Sub Regional RTEP: AEP Supplemental Projects

October 18, 2024

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

Need Number: AEP-2024-OH015

Process Stage: Need Meeting SRRTEP-W - 10/18/2024

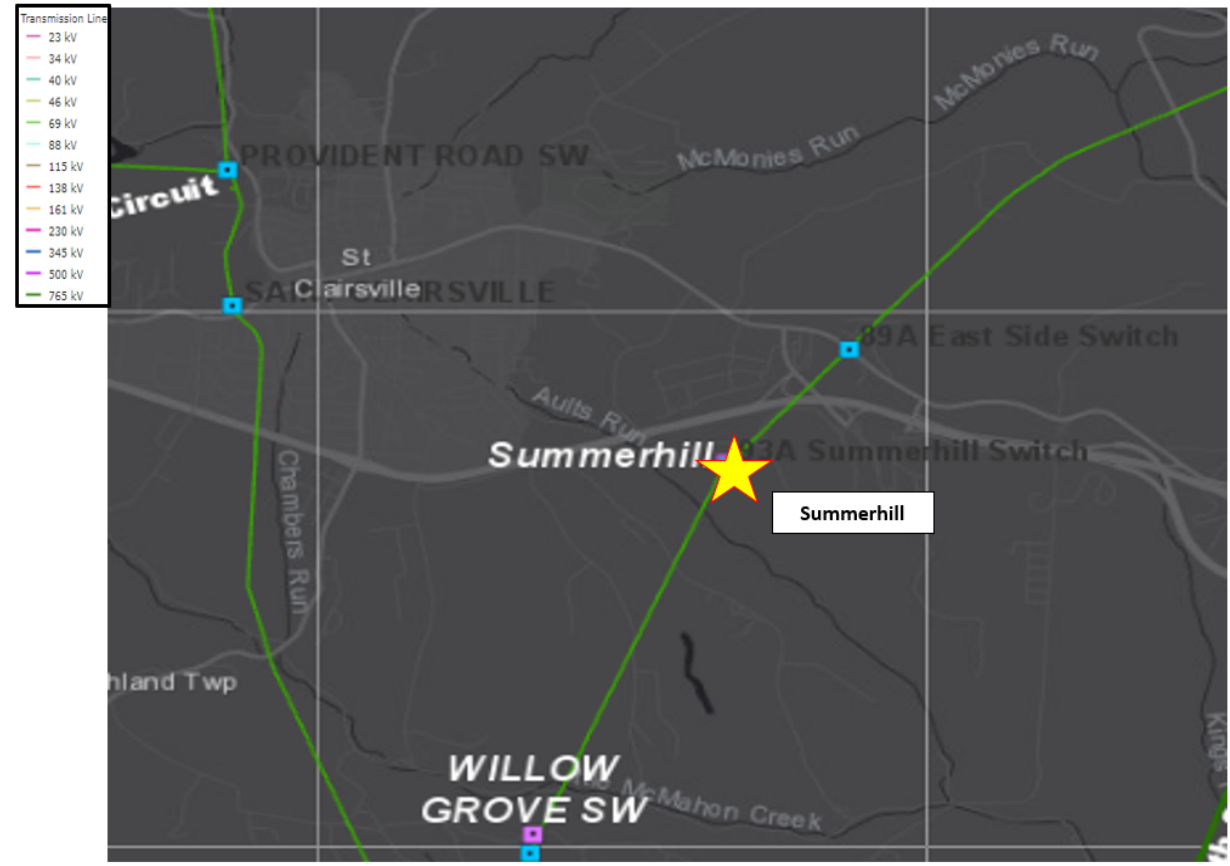
Supplemental Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement:

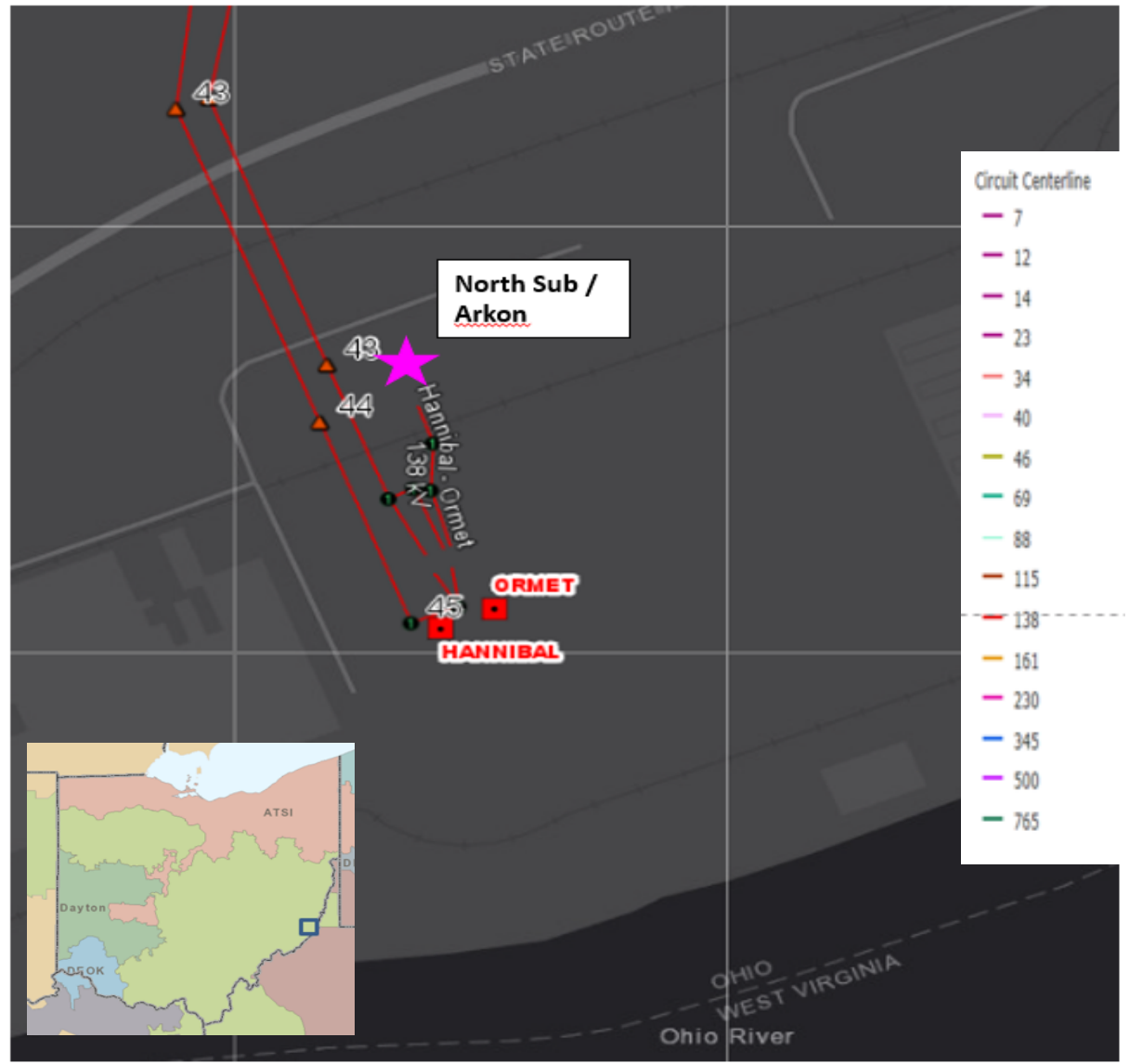
Summerhill Station Switch:

- The 69kV phase-over-phase switch pole outside Summerhill station was originally installed in 1977. It is a wood pole structure which has warped since installation, placing the switch attachments out of alignment and causing increased maintenance to keep operational. It also has increasing levels of rot and woodpecker damage.
- In addition, the legacy sectionalizing controls on the switch have been unreliable. The switch lacks an RTU and SCADA functionality, limiting the capabilities of AEP’s control center. Local field employees must be sent to the station to troubleshoot or operate the switches.
- The switch is a 2-way switch, rather than a standard 3-way switch, resulting in the need to interrupt the 69kV transmission through-path when scheduling an outage at the station.



Need Number: AEP-2024-OH039
Process Stage: Need Meeting SRRTEP-W - 10/18/2024
Supplemental Project Driver: Customer Service
Specific Assumption Reference: AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 12)

Problem Statement:
 A customer has requested an increase to their existing service out of AEP's Hannibal 138 kV station in Monroe County, OH. The anticipated increase in load is 100MW, bringing the customer's total load to 200 MW at the site. They have requested an in-service date of April 2025.



Need Number: AEP-2024-OH044

Process Stage: Need Meeting SRRTWP-W - 10/18/2024

Supplemental Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement:

Line Name: West Lancaster - Memorial Drive 69 kV Line

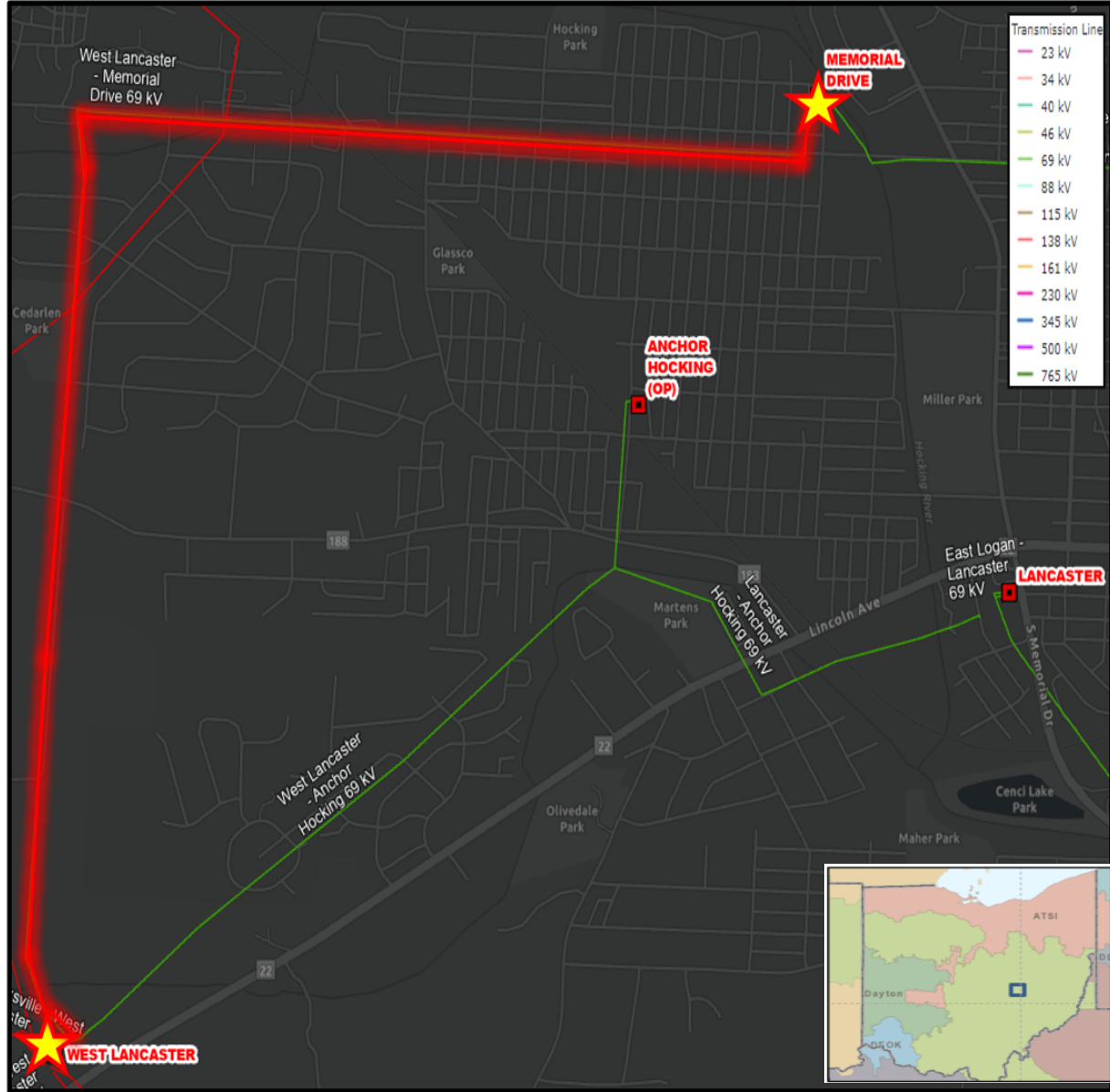
- Original Install Date (Age): 1962
- Length of Line: 3.12 miles
- Total structure count: 66 Wood Poles (49 from 1962, 1 from 1967, 1 from 1969, 11 from 1970s, and 4 from 1999.)
- Conductor Type: 3.12 miles of 336.4 kCM ACSR 30/7 (Oriole) from 1963.

Outage History:

– East Lancaster – Ralston – West Lancaster 69 kV circuit: From 2015, there have been 4 permanent outages and 13 momentary outages.

Open Conditions:

- Currently, there are 17 structures with at least one open condition, which relates to 26% of the structures on this line.
- The entire line was inspected by a ground crew who completed a comprehensive walking inspection. The following conditions were reported: 15 broken moldings, 4 structures with heart rot, 3 structures with shell rot, multiple structures with grounding missing, 2 structures with woodpecker holes, 5 structures with pole damage, 1 bent structure and 1 conductor with broken strands.



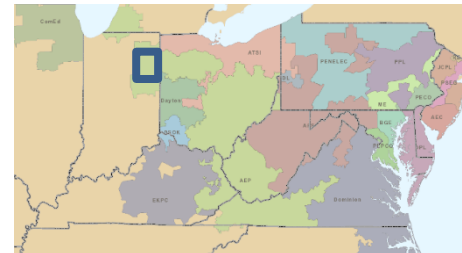
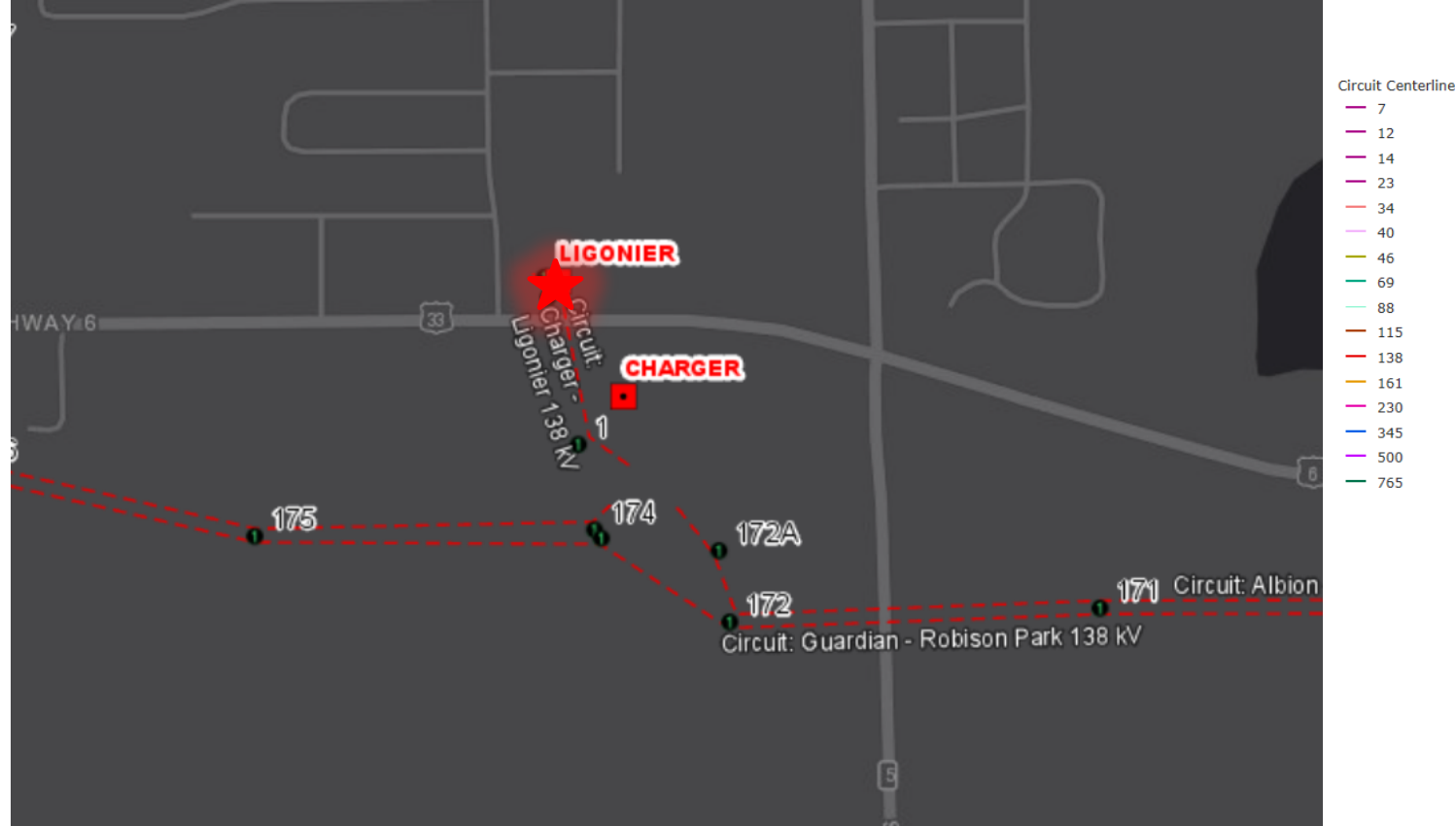
Solutions

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

Need Number: AEP-2024-IM010
Process Stage: Solution Meeting SRRTEP-W - 10/18/2024
Previously Presented: Need Meeting 04/19/2024
Supplemental Project Driver: Customer Need
Specific Assumption Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 12)

Problem Statement:
 I&M Distribution has requested to retire Ligonier station and to relocate the delivery point to Charger Station.

Requested ISD: 2026



AEP Transmission Zone M-3 Process Ligonier, Indiana

Need Number: AEP-2024-IM010
Process Stage: Solution Meeting SRRTEP-W - 10/18/2024

Proposed Solution:

Charger Station: Install 1x 138kV circuit breaker ~~to~~ at Charger Station. Install 2x 138/12kV distribution banks with feeders at Charger Station. Estimated Cost: \$1.6 M

Charger - Ligonier 138kV: Retire 138/12kV Ligonier station and remove ~0.25 miles of 138kV transmission line from Charger – Ligonier Station. Estimated Cost: \$0.4 M

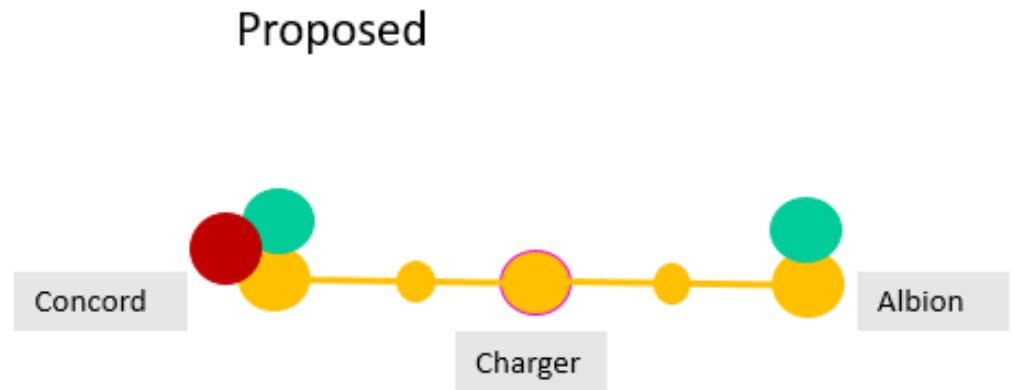
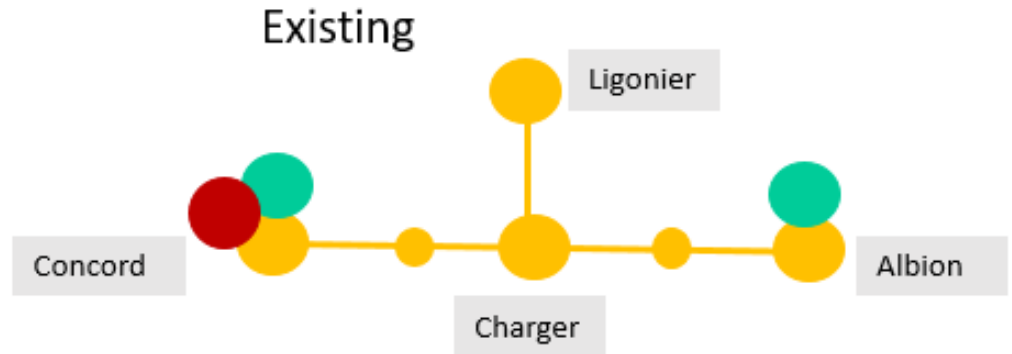
Transmission Cost Estimate: \$2 M

Alternatives Considered:

Considering the existing space at Charger and the request to retire the existing station, no other alternates were identified. Rebuilding Ligonier station is not needed with the capacity replaced at Charger. Charger was established under project s1615.

Projected In-Service: 09/14/2027

Project Status: Scoping



Need Number: AEP-2023-OH004

Process Stage: Solution Meeting SRRTEP-W - 10/18/2024

Previously Presented: Need Meeting 1/20/2023

Project Driver:

Equipment Condition/Performance, Operational Flexibility and Efficiency, & Customer Service

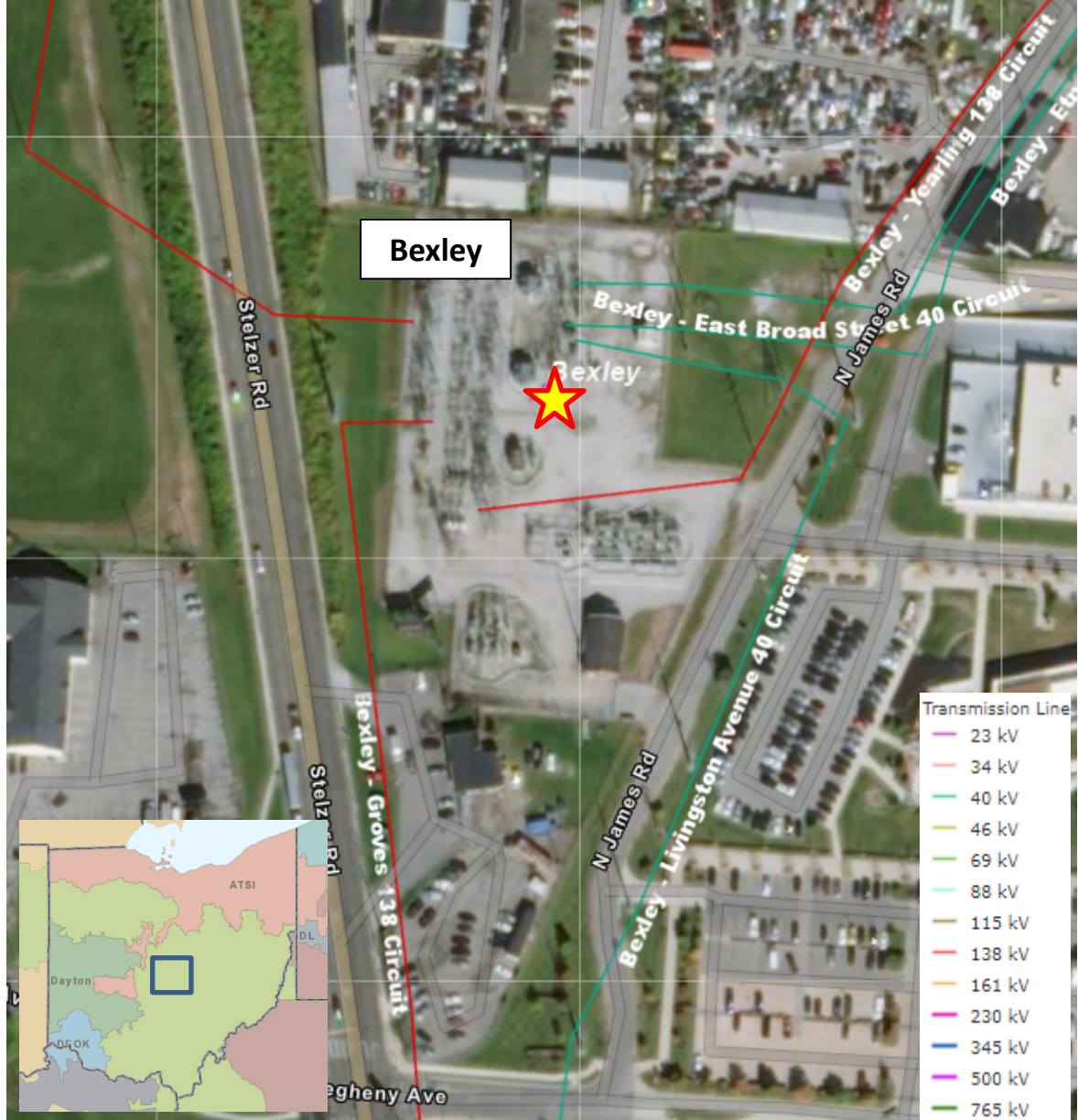
Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement:

Bexley Station 138kV:

- AEP Ohio has indicated they have equipment rehabilitation needs at the station.
- 2 – 138/39.4/13.8kV: (TR 1 & 2) Westinghouse Vintage 1955 rated 41.66 MVA transformers.
 - TR 1 & 2 do not have arresters on the 40 kV or 13kV windings
 - Several small oil leaks and nitrogen leaks on TR1 and TR2
 - No oil containment on any of the transformers
 - Bus A, Phase A and B exit cable switches are hot on TR1
- 5 – 40kV: (CBs 41, 42, 43, 44, & 47) & 2 - 138kV: (CBs 105 & 106) are oil type breakers.
 - 2-138kV: (CBs 105 & 106) 1970s vintage FK & ALP oil breakers.
 - 5-40kV: (CBs 41, 42, 43, 44, & 47) 1960s & 1970s vintage GE & Westinghouse oil breakers.
 - 1-40kV: CB-42 has 14 Fault Operations (Manufacture recommended: 10)
- 1 – 40kV: (CB 45) is a SF6 type breaker has limited spare part availability, and poor historical reliability
- 1 – 40kV: CS-Bank 3 is an SF6 2030-69 model circuit switcher, which has been identified as needing replacement due lack of to spare part availability, historical reliability, and lack of vendor support.
- The 40kV system is an obsolete voltage class and as a result is difficult to obtain replacement parts.



Need Number: AEP-2023-OH004

Process Stage: Solution Meeting SRRTEP-W - 10/18/2024

Previously Presented: Need Meeting 1/20/2023

Project Driver:

Equipment Condition/Performance, Operational Flexibility and Efficiency, & Customer Service

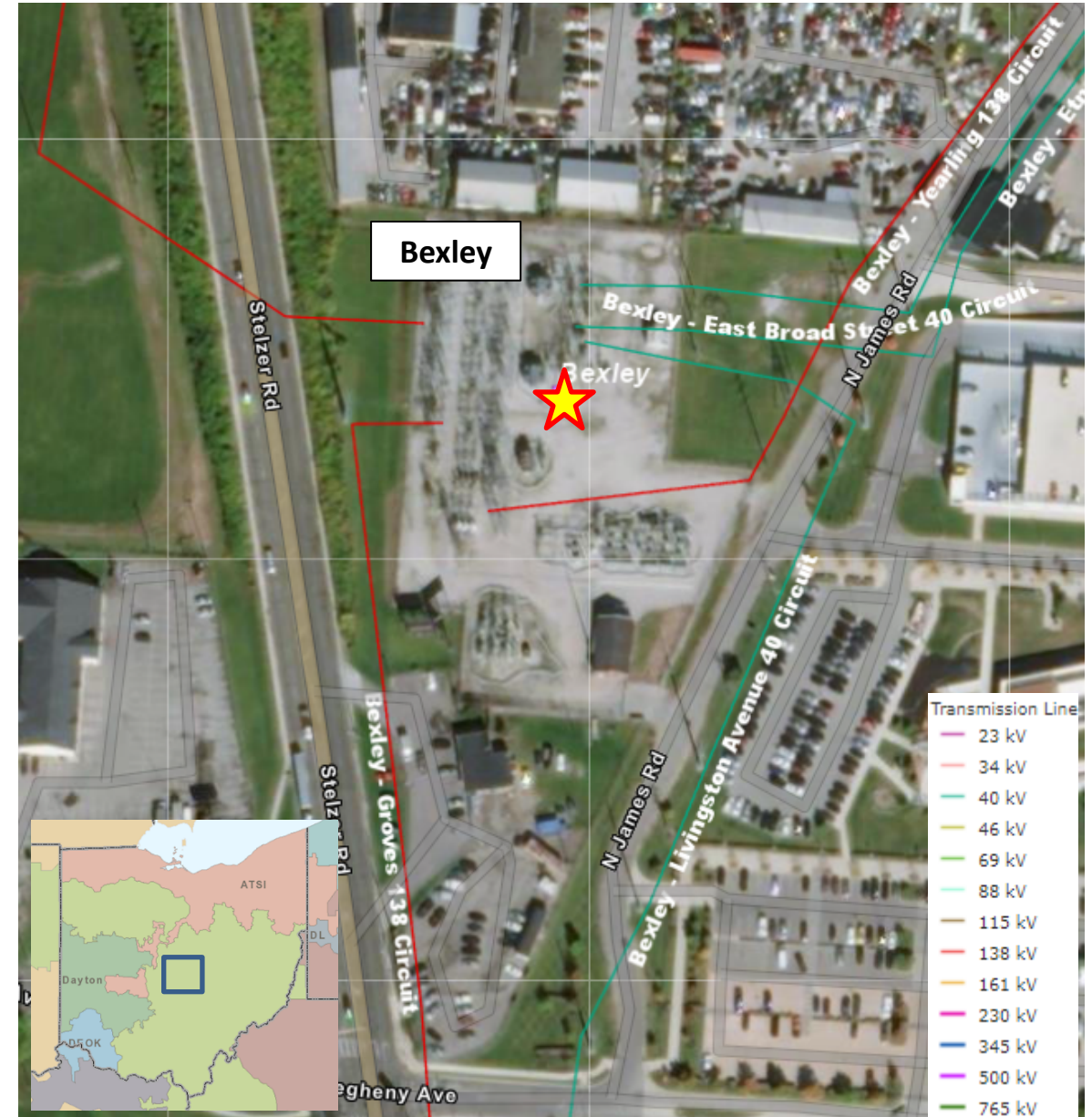
Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement:

Bexley Station 138kV:

- 30 – Microprocessor relays: The identified relays are obsolete, no longer supported, or have been identified as high risk of failures.
- 124 – Electromechanical relays: EM relays have limited spare part availability, a lack vendor support, no SCADA functionality, and no fault data collection ability.
- 1 – Static relay: this type of relay has significant limitations with regard to fault data collection and retention.
- The station has experienced 6 outages between 2017 – 2022 with a CMI of 2,595,064.



Need Number: AEP-2023-OH004

Process Stage: Solution Meeting SRRTEP-W - 10/18/2024

Proposed Solution:

Bexley Station Work: At Bexley, work will be performed to address asset renewal concerns associated with the site and transmission equipment including work to allow for the retirement of the existing 40 kV yard at the station. This includes replacing 138 kV circuit breaker '106' with a 138 kV 63 kA 3000 A circuit breaker. Note that 138 kV breaker '105' that was identified in the original need statement failed in the field and has been subsequently replaced. Estimated Cost: \$4.423 M

Bexley Station 40 kV Bypass: Transmission line work will be completed outside Bexley to allow 40 kV circuits to bypass the station to accommodate the retirement of the 40 kV yard. Estimated Cost: \$2.192 M

Etna Road Station 40 kV Bypass: Transmission line work will be completed to allow 40 kV circuits to bypass Etna Road station to accommodate the 40 kV equipment retirement at Etna Road. Poth station (s2639) replaced the distribution function of Etna Road. The proposed work will disconnect the station from the 40 kV transmission grid and retire the remaining equipment in the station. Estimated Cost: \$0.618 M

Transmission Cost Estimate: \$7.233 M

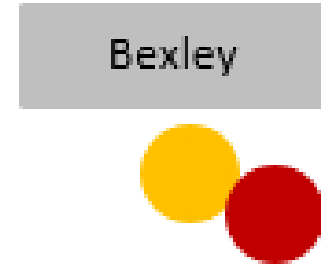
Alternatives Considered:

Considering the needs can be addressed by retirement only with other capacity already installed at other locations to replace the obsolete 40 kV equipment, no other alternatives were identified. Replacing the 40 kV equipment would not be practical or necessary.

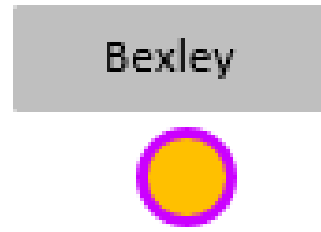
Projected In-Service: 09/30/2026

Project Status: Scoping

Existing:



Proposed:



Legend	
765 kV	
345 kV	
138 kV	
69 kV	
40 kV	
23 kV	
New	

Need Number: AEP-2022-OH068

Process Stage: Solutions Meeting SRRTWP-W - 10/18/2024

Previously Presented: Need Meeting 09/16/2022

Project Driver:

Equipment Material/Condition/Performance/Risk

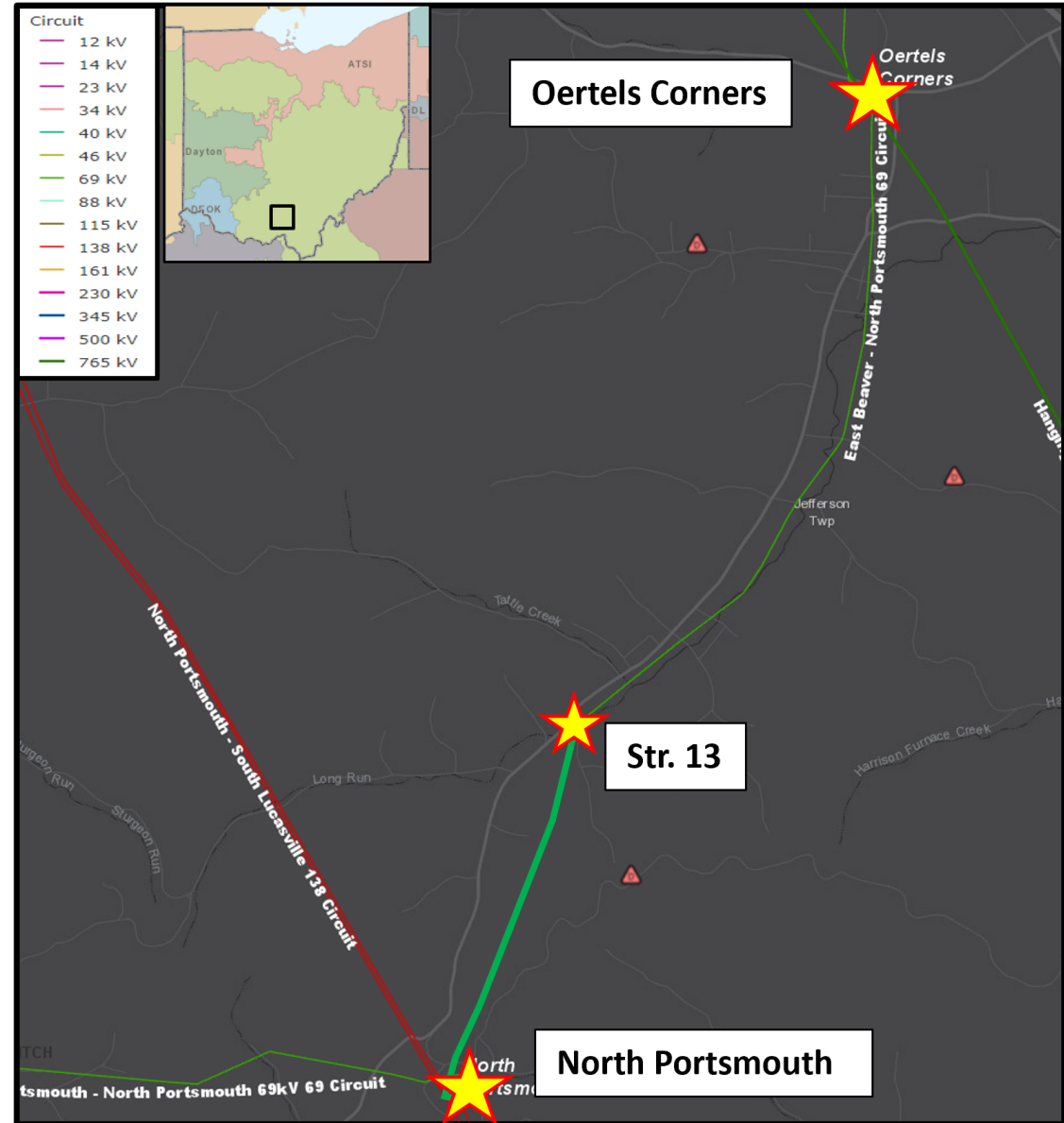
Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement:

Oertels – North Portsmouth 69 kV:

- Original Install: 1947
- Total Length: ~4.7 Miles
- Conductor Types:
 - ~3.05 miles of 1/0 ACSR 6/1 (Raven) from 1947
 - ~1.65 miles of 3/0 ACSR 6/1 (Pigeon) from 1947
- Outage History:
 - 13 momentary & 10 permanent outages
 - Total CMI of 4,619,162
- Total Structure Count: 80 Wooden
 - 32 from 1940's, 7 from 1960s, 1 from 1970's 32 from 1980's 4 from 1990's 4 from 2010s
- Open Conditions: There are 36 structures with at least one open condition which relates to 45% of the structures on this line. There are 41 structure related open conditions dealing with broken and split crossarms, burnt crossarm, rot on crossarms, woodpecker holes, and rot top on poles. 3 hardware related open conditions dealing with missing ground lead wires & broken or burnt insulators. 9 forestry related open conditions.
- Additional Information: 3.1 miles of the line is already being rebuilt under b3362.



AEP Transmission Zone M-3 Process Scioto County, Ohio

Need Number: AEP-2022-OH068

Process Stage: Solutions Meeting SRRTEP-W - 10/18/2024

Proposed Solution:

North Portsmouth-Oertels Corner 69 kV Line: Rebuild ~1.7 miles of 69 kV line from North Portsmouth to str. 13 on the North Portsmouth-Oertels Corner 69 kV line using ACSR 556 Dove. The remaining ~3.05 miles of the line is to be rebuilt under b3362. Estimated Cost: \$3.873 M

Transmission Cost Estimate: \$3.873 M



Alternatives Considered:

No viable transmission alternative identified given the nature of the remaining needs left on the asset after the proposed baseline rebuild (b3362).

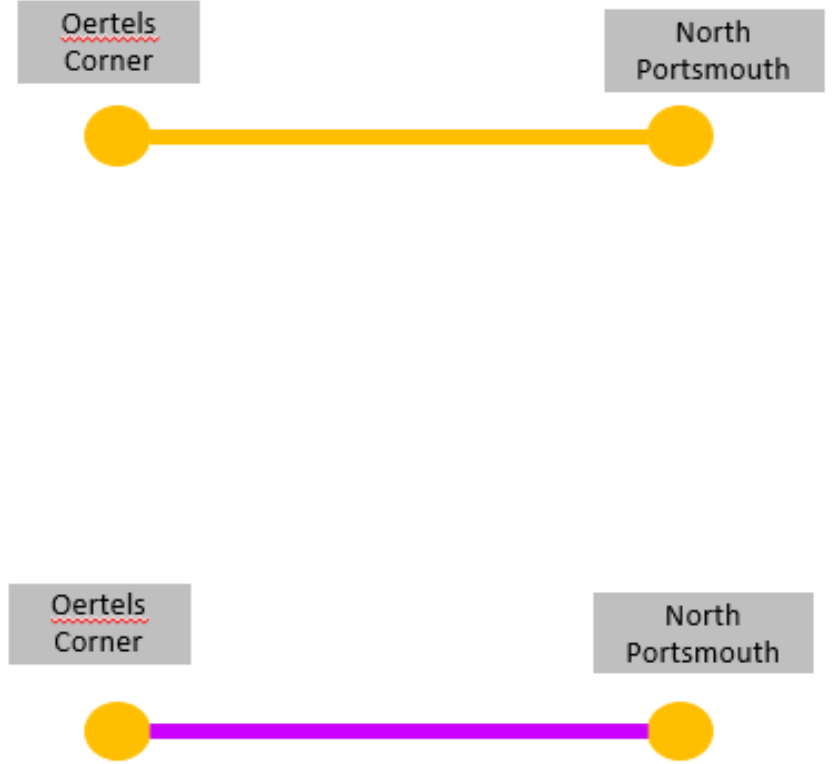
Projected In-Service: 05/01/2026

Project Status: Scoping

Existing:

Legend	
765 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

Proposed:



Need Number: AEP-2023-OH070

Process Stage: Solutions Meeting SRRTEP-W - 10/18/2024

Previously Presented: Need Meeting 5/19/2023

Project Driver: Customer Service

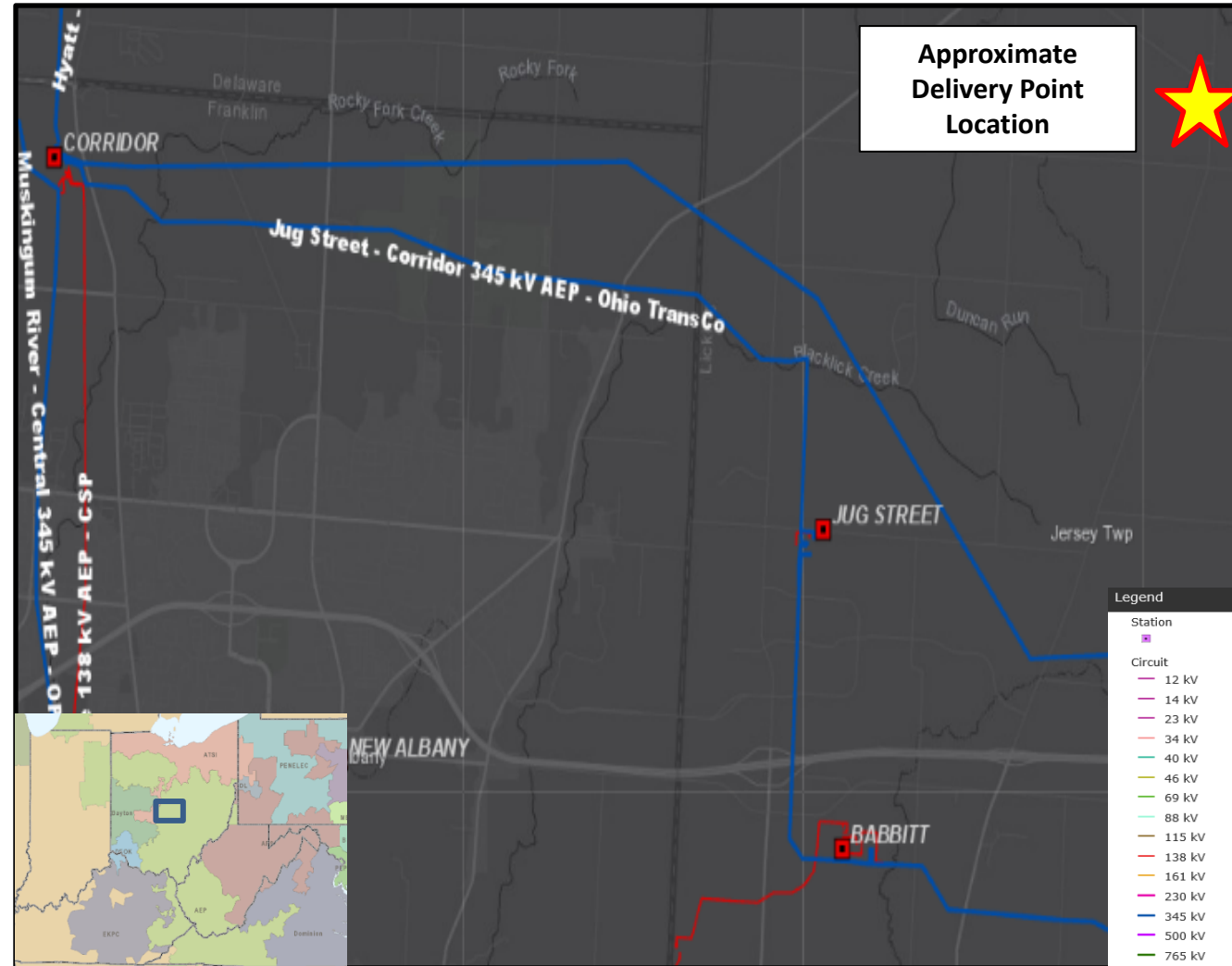
Specific Assumption Reference:

AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 12)

Problem Statement:

Customer Service:

- Buckeye Power, Inc. (Buckeye), on behalf of The Energy Cooperative (Licking REC) has requested a new 138 kV delivery point in New Albany Ohio.
- The projected demand at this delivery point is 24 MW in 2025 with an expected ultimate load of 43 MW by 2033.
- The customer has requested an ISD of June 2025



AEP Transmission Zone M-3 Process New Albany, OH

Need Number: AEP-2023-OH070

Process Stage: Solutions Meeting SRRTEP-W - 10/18/2024

Proposed Solution:

Kiber Station 138 kV: Install 4 - 90kA 4000A 138 kV circuit breakers at the proposed Kiber station (s3442.17) to accommodate the 138 kV line extensions to LRE's Groves Corner station.. Estimated Cost: \$11.5 M

Groves Corner Station (LRE): Install 12 kV customer metering.. Estimated Cost: \$0.097 M

Kiber - Groves Corner 138 kV Line: Construct a ~2.0-mile 138kV double circuit transmission line utilizing 2-bundled ACSS 1033.5 MCM Curlew conductor SE rating (561 MVA) between Kiber and Licking REC's greenfield delivery point Groves Corner.. Estimated Cost: \$20.691 M

Transmission Cost Estimate: \$32.288 M

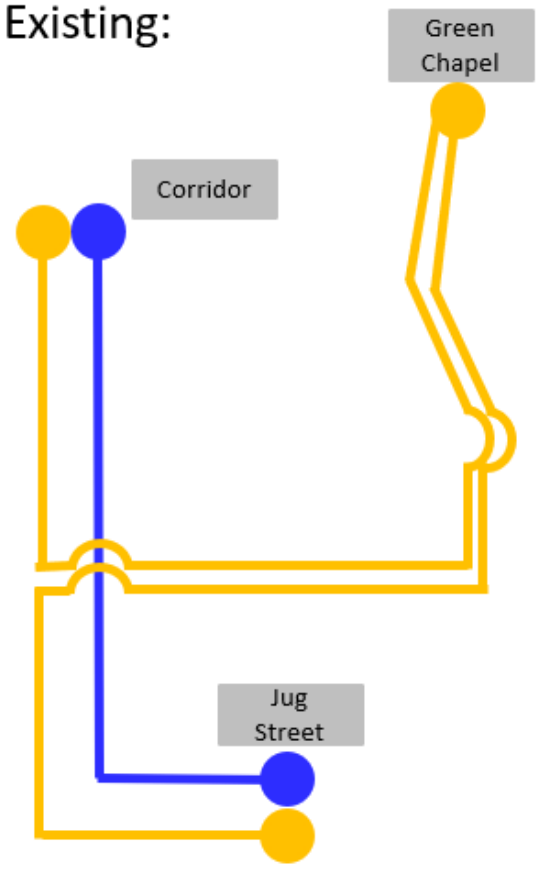
Alternatives Considered:

Consideration was given to serving the site out of the proposed Green Chapel station (s2857), but lack of physical space available at the station made the alternative infeasible.

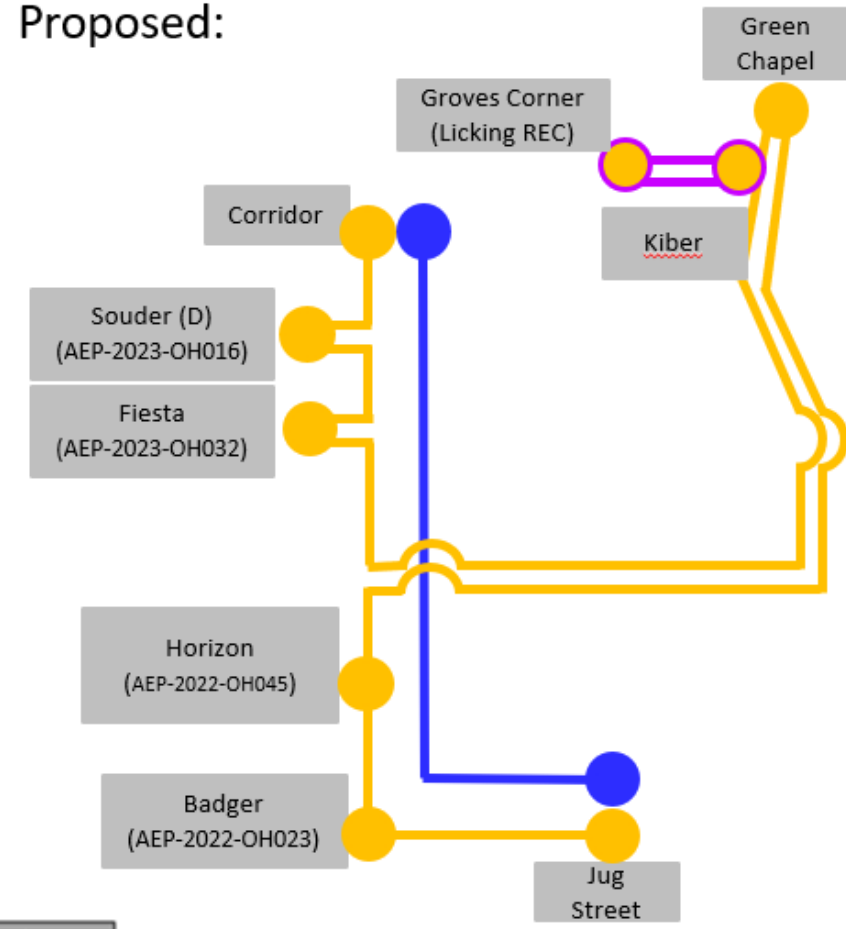
Projected In-Service: 01/02/2026

Project Status: Engineering

Existing:



Proposed:



Legend	
765 kV	
345 kV	
138 kV	
69 kV	
40 kV	
23 kV	
New	

AEP Transmission Zone M-3 Process Wood County, Ohio

Need Number: AEP-2019-OH052

Process Stage: Solutions Meeting SRRTEP-W - 10/18/2024

Previously Presented: Need Meeting 9/25/2019

Supplemental Project Driver:

Equipment Material/Condition/Performance/Risk

Specific Assumption Reference:

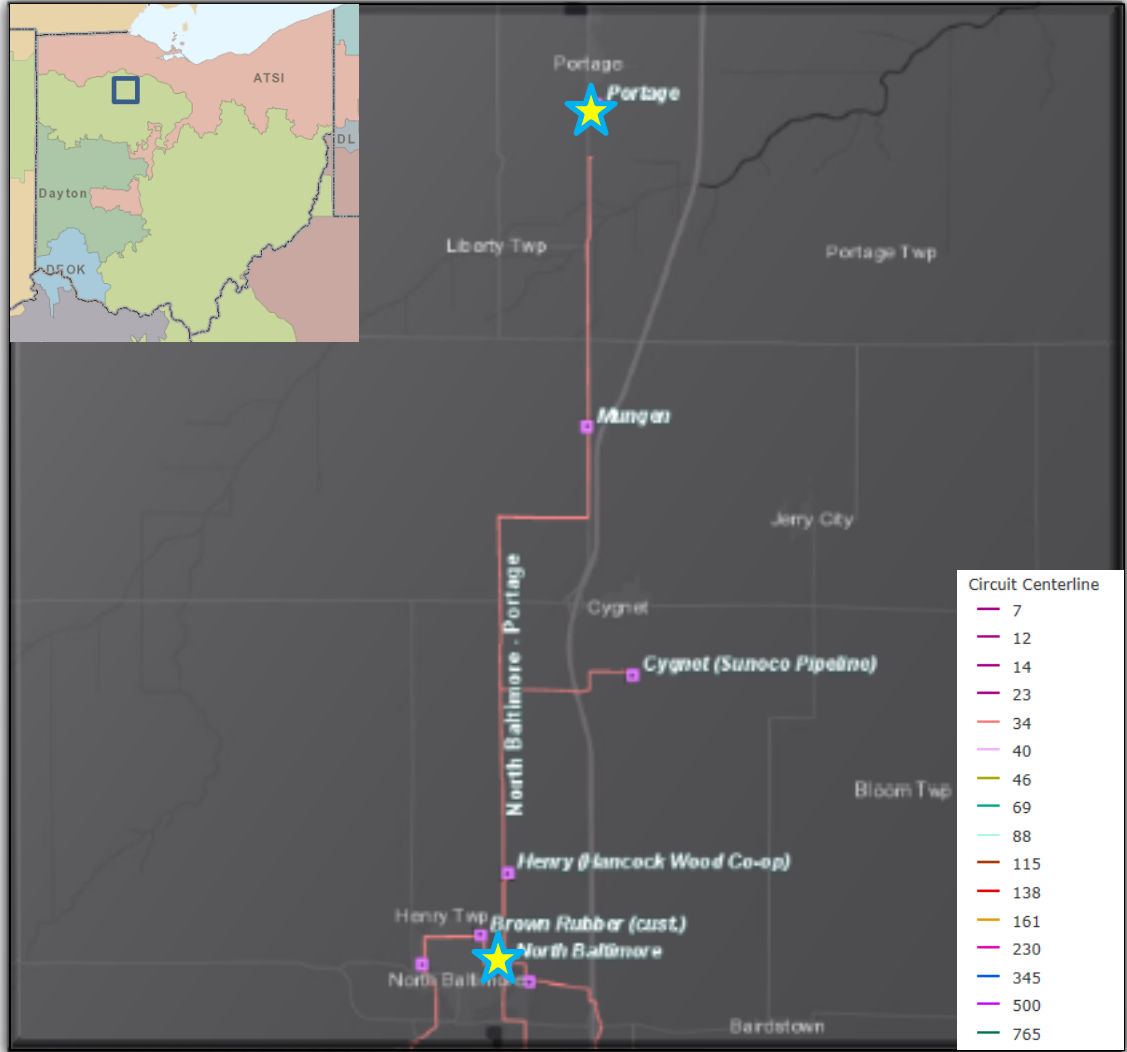
AEP Guidelines for Transmission Owner Identified Needs

Problem Statement:

North Baltimore – Portage 34.5kV (1921)

- Length: 10.00 Miles
- Original Construction Type: Wood
- Conductor Types: 1/0 ACSR 6/1 (40%), 4/0 ACSR 6/1 (20%), 4/0 Copper 7 (30%), & 556,500 CM (10%)
- Momentary/Permanent Outages: 11 (last 5 years)
- CMI: 26,572 (AEP only)
- Total structure count: 325
- Number of open conditions: 24 “A” Conditions & 53 “B” Conditions
 - Open conditions include: (Damaged Insulators, Broken Shield Wires, Pole Rot, & Cracked Guys.)
- Unique structure count with open conditions: 55

Additional Info: Portage is radially fed from AEP’s North Baltimore station, Radial service severely restricts the ability to perform routine maintenance and restoration activities. The maintenance of radial transmission lines often requires costly temporary facilities or other labor-intensive measures involving energized work because a maintenance outage to such radial loads is generally not feasible.





BOUNDLESS ENERGY™

Need Number: AEP-2022-OH027

Process Stage: Solutions Meeting SRRTEP-W - 10/18/2024

Previously Presented: Needs Meeting 04/22/2022

Project Driver:

Equipment Material/Condition/Performance/Risk

Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

Problem Statement:

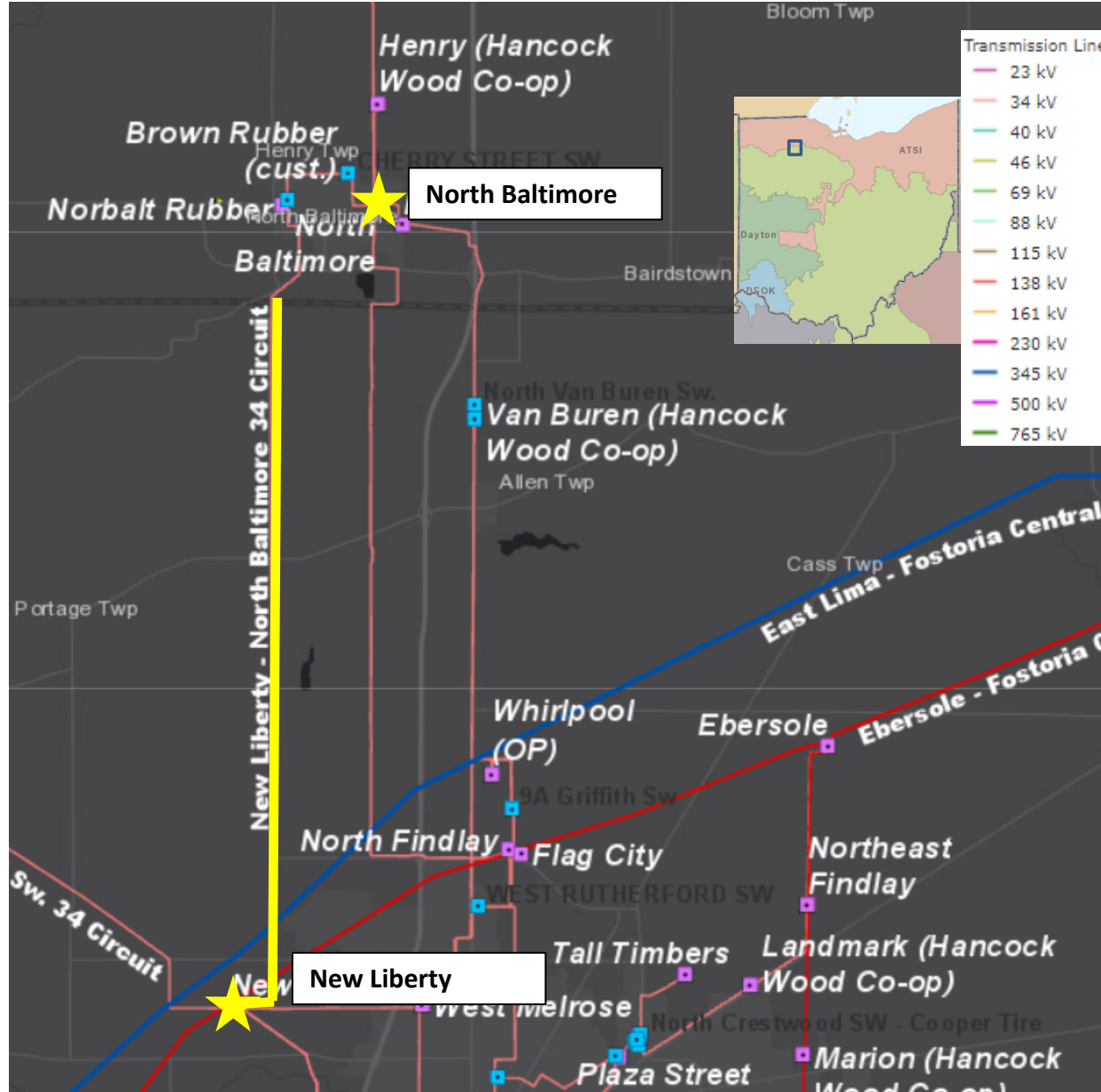
New Liberty – North Baltimore 34kV Line (1940):

- Length of Line: 10.28 Miles
- Total Structure Count: 274
 - Wooden Monopoles
- Conductor Types: 336.4 ACSR 18/1 (Merlin), 4/0 ACSR 6/1 (Penguin)
- Open Conditions: 45 open conditions on 42 unique structures
 - 31 open conditions related to the ground lead wire including broken and stolen
 - 6 structure related open conditions specifically affecting the push pole, crossarm, or pole
 - 7 open conditions related to the guys and insulator
 - 1 conductor related open condition

The New Liberty – North Baltimore 34kV line does not meet 2017 NESC Grade B loading criteria, does not meet the current AEP structural strength requirements and does not meet the current ASCE structural strength requirements. The line is insulated with horizontal post insulators which do not meet current AEP standards for CIFO and minimum leakage distance requirements. The buttwrap grounding on the line does not meet current AEP standards.

Ten representative structures on the line were assessed by ground and drone. 40% had severe pole rot and decay requiring stub poles to be installed to support the existing structures, ground line heart and/or shell rot.

AEP Transmission Zone M-3 Process New Liberty – North Baltimore



AEP Transmission Zone M-3 Process Wood County, Ohio

Need Numbers: AEP-2019-OH052, AEP-2022-OH027

Process Stage: Solution Meeting SRRTEP-W - 10/18/2024

Proposed Solution:

North Baltimore - Portage 34kV Rebuild: Rebuild the existing North Baltimore - Portage 34.5 kV line (~10 miles). There will be approximately 0.3 miles of greenfield line to support ROW efforts and outage constraints. Estimated Cost: \$23.166 M

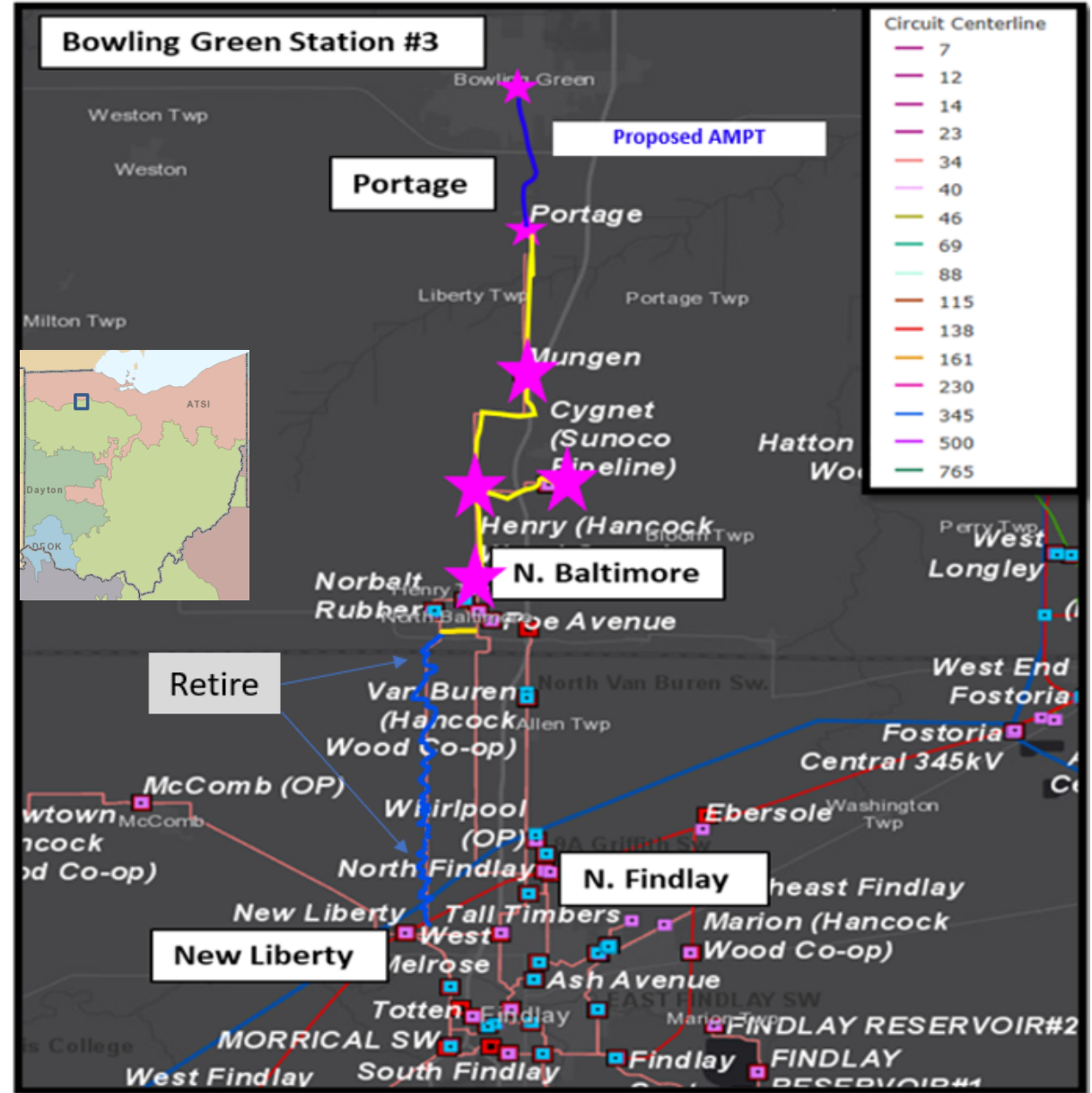
Hammansburg – Buckeye Pipe 34.5kV: Rebuild the ~1.7 mile 34.5kV extension from Hammansburg Tap to Hoiles Switch (Buckeye Pipeline & Cynet Pipeline). Estimated Cost: \$4.365 M

North Baltimore - Henry Co-Op Extension: Several spans of the 34.5 kV extension to the Henry Co-Op delivery will be rebuilt as part of the project. The delivery is currently served via the double circuit section of the North Baltimore - Portage line directly out of North Baltimore. Estimated Cost: \$0.311 M

North Baltimore – New Liberty Retirement: Retire N. Baltimore – New Liberty from structures 179 to 11 (~6.81 miles). Remove conductors for the N. Baltimore – New Liberty circuit on the New Liberty – W Melrose line from structure 11 to New Liberty (~0.43 miles). Estimated Cost: \$1.72 M

North Baltimore - North Findlay #2 Reconfiguration: In order to accommodate the retirement of the ~6.81 miles of line on the North Baltimore - New Liberty 34.5 kV circuit, reconfiguration work will be performed to tie the remaining portion of the circuit into the nearby North Baltimore - North Findlay #2 34.5 kV circuit. This includes constructing ~1.1 miles of new transmission between the two existing lines and retiring ~1.85 miles of the North Baltimore - North Findlay #2 34.5 kV circuit north into North Baltimore. Estimated Cost: \$4 M

Portage SW - Greensburg (AMPT) 34.5 kV: Install approximately ~0.2 miles of greenfield 34.5 kV line between the proposed Portage SW and AMPT's proposed Greensburg 69/34.5kV substation. Estimated Cost: \$0.45 M



AEP Transmission Zone M-3 Process Wood County, Ohio

Need Numbers: AEP-2019-OH052, AEP-2022-OH027

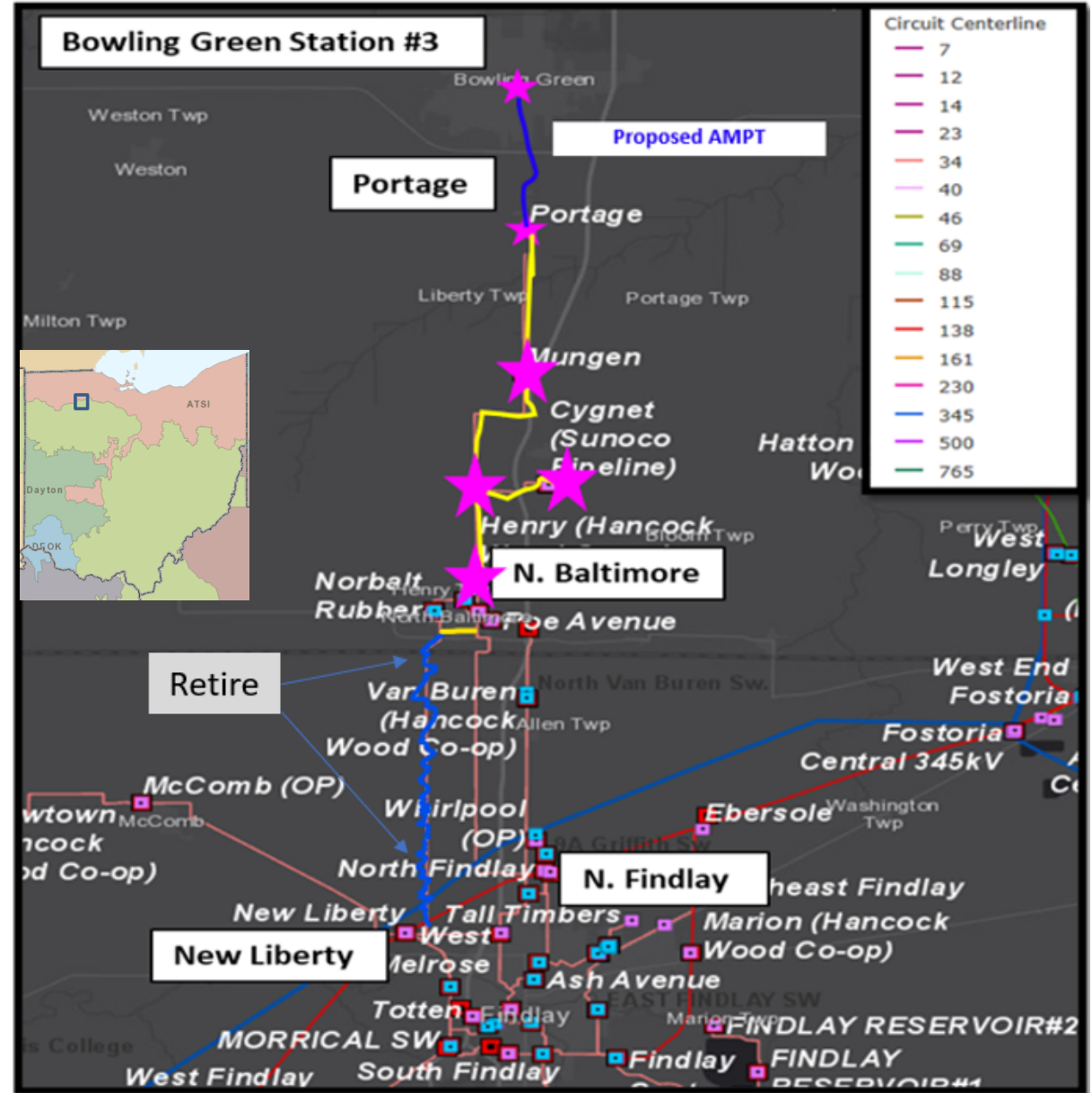
Process Stage: Solution Meeting SRRTWP-W - 10/18/2024

Proposed Solution:

Poe Road - Greensburg (AMPT) 69 kV: In order to provide a second source into the 34.5 kV network served from the North Baltimore - Portage 34.5 kV circuit. AMPT will be constructing approximately 7 miles of 69 kV circuit between Poe Rd and the proposed Greensburg station. 3.5 miles of the line will be greenfield single circuit extending from right outside their existing Gypsy Lane station to a newly proposed Greensburg AMPT substation near Portage SW. To get the new circuit back to Poe Rd station AMPT will be rebuilding the existing Gypsy Lane-Poe Road 69 kV line for approximately 3.5 miles from single circuit to double circuit tower arrangement utilizing the existing right-of-way. Estimated Cost: \$20.1 M

Poe Road Substation (AMPT): AMPT will rebuild their Poe Road substation and reconfigure the 69 kV yard into a 6-breaker ring bus configuration. To accommodate the station work they will re-terminate the existing three (3) 69 kV circuits and two (2) 69/12 kV transformers at the station along with establishing a position to accommodate the new Greensburg-Poe Road 69 kV circuit. Estimated Cost: \$13.3 M

Greensburg (AMPT): AMPT will build a greenfield 69/34.5 kV station tentatively called "Greensburg". The station will initially accommodate one (1) 69 kV breaker, one (1) 34.5 kV breaker, and one (1) 69/34.5 kV 50 MVA transformer. This station will terminate the new 69 kV circuit from Poe Road and connect to the end of the existing AEP 34.5 kV system near Portage SW. Estimated Cost: \$9.8 M



AEP Transmission Zone M-3 Process Wood County, Ohio

Need Numbers: AEP-2019-OH052, AEP-2022-OH027

Process Stage: Solution Meeting SRRTEP-W - 10/18/2024

Proposed Solution:

Remote End work Sandridge 69kV (FE): FE will perform remote end relay work at Sandridge 69kV substation to accommodate the reconfiguration of AMPT's Poe Rd station. Estimated Cost: \$0.1 M

Portage PoP Switch: At Portage 34.5 kV Tap, Install a new 69 kV, 1200A, 3-way POP switch to accommodate the new 34.5 kV connection to AMPT's Greensburg station. Estimated Cost: \$0.784 M

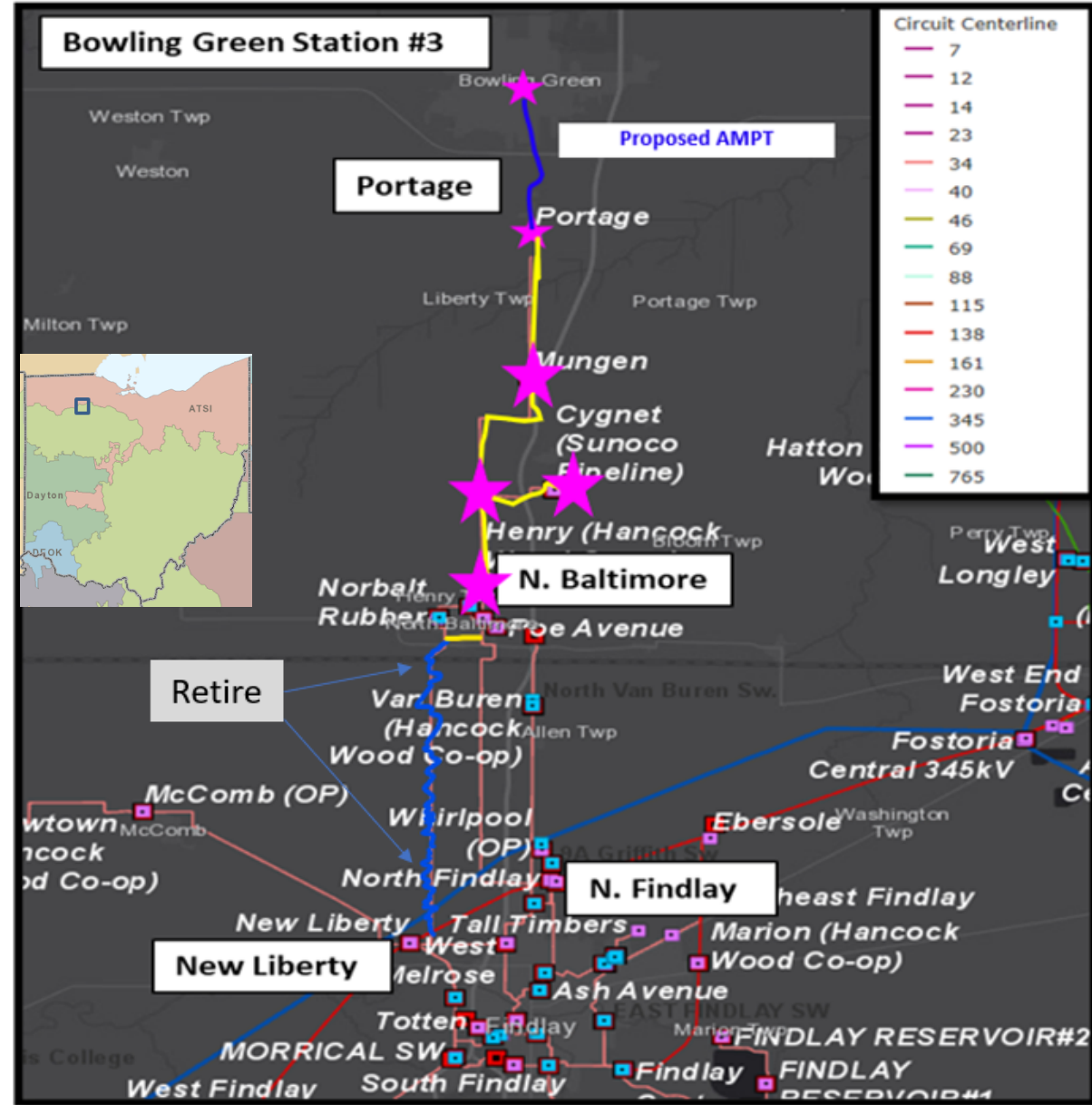
Mungen PoP Switch: Replace existing Mungen hard tap with a new 69 kV, 1200A, 3-way POP switch. Estimated Cost: \$0.678 M

Hammansburg PoP Switch: Replace existing Hammansburg hard tap with a 69 kV, 1200A, 3-way POP switch. Remove existing one-way line switch. Estimated Cost: \$0.866 M

North Baltimore Station Work: At North Baltimore 34.5 kV substation in order to accommodate the reconfiguration and retirements of the 34.5 kV circuits to New Liberty and North Findlay existing 34.5 kV circuit breaker 'M' towards New Liberty substation will be retired. Additional relaying work will be performed at the station to accommodate the proposed work in the area. Estimated Cost: \$0.474 M

New Liberty Station Removal Work: Work will be performed at New Liberty to accommodate the retirement of the 34.5 kV circuit to North Baltimore. Estimated Cost: \$0.09 M

Transmission Cost Estimate: \$80.204 M



AEP Transmission Zone M-3 Process Wood County, Ohio

Need Numbers: AEP-2019-OH052, AEP-2022-OH027

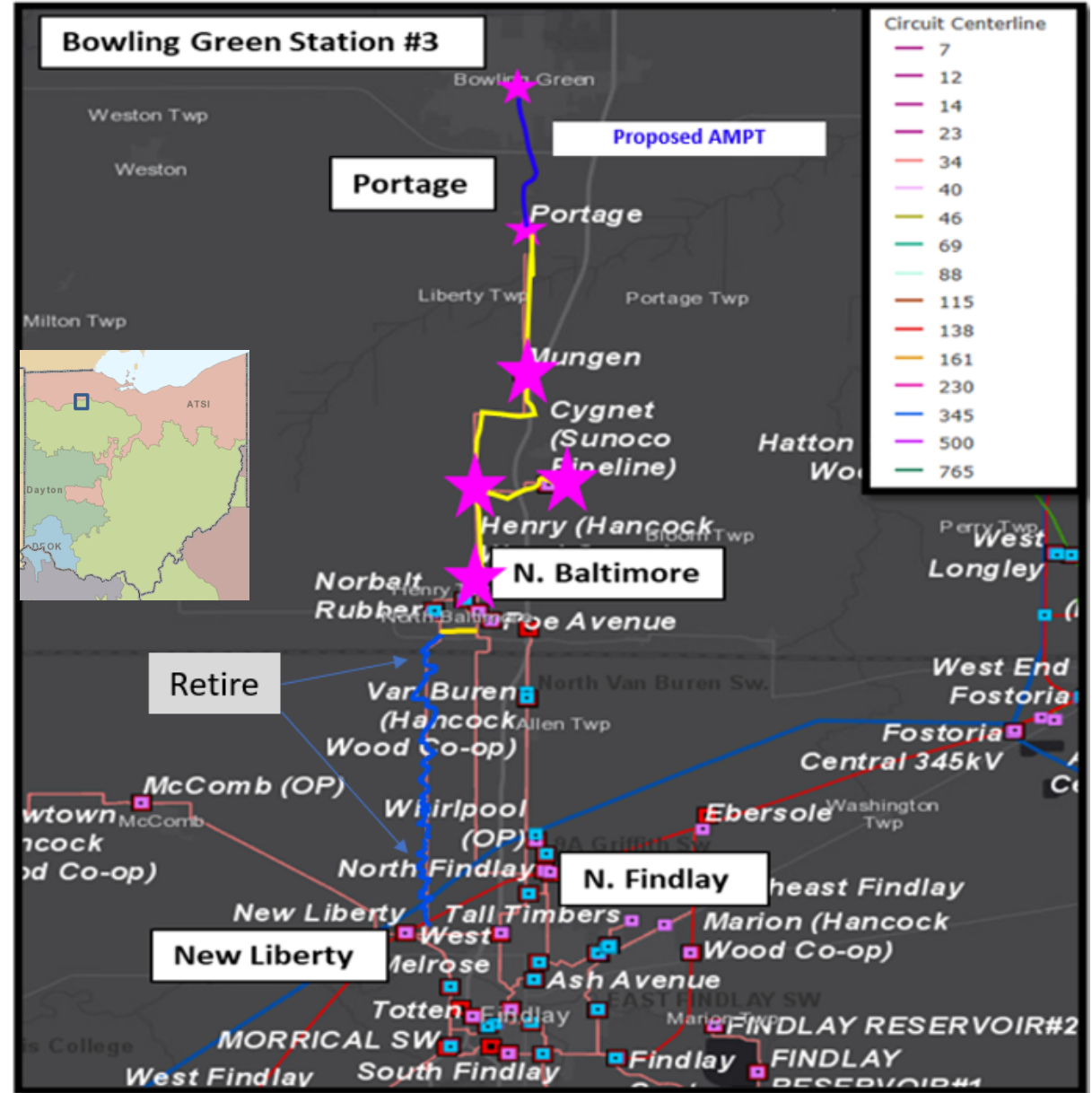
Process Stage: Solution Meeting SRRTEP-W - 10/18/2024

Alternatives Considered:

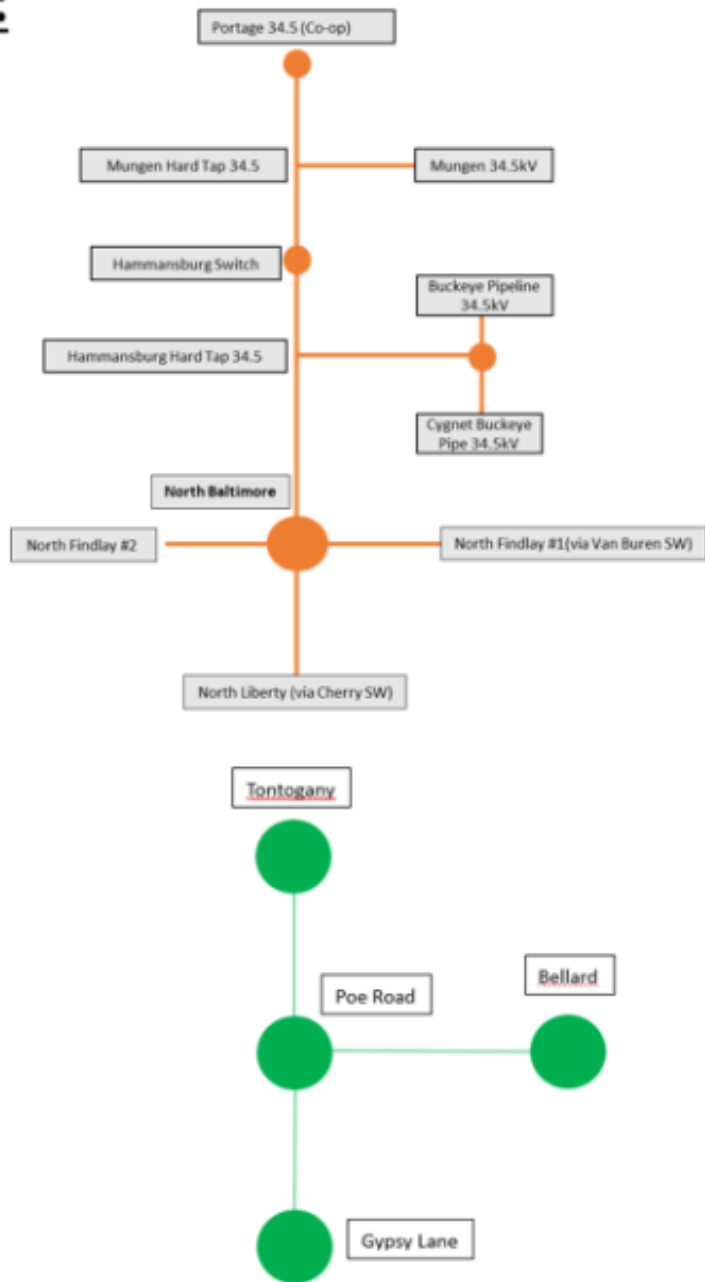
- No viable cost-effective transmission alternatives were identified to address the radial nature of the North Baltimore – Portage line outside of connecting to the AMPT 69 kV system to the north due to lack of other existing infrastructure in the area.
- Constructing the new 69 kV connection from Gypsy Lane – Portage Co-op was considered instead of going to Poe Rd. This option was not chosen due to physical space constraints at the Gypsy Lane station that wouldn't allow the station to be expanded. In addition, the configuration would have resulted in N-1-1 violations that would need resolved increasing the scope of the project further.
- Adding the new 69/34.5 kV transformer to the existing Poe Rd station was considered. This option was not chosen though as the station footprint could not accommodate the transformer and required 34.5 kV equipment.
- Constructing the 69 kV line to the existing Bellard station was considered. This option was not chosen as the station is further away from AEP than Poe Road and would have required additional new greenfield right of way to get a new line out of the station.

Projected In-Service: 11/30/2028

Project Status: Scoping

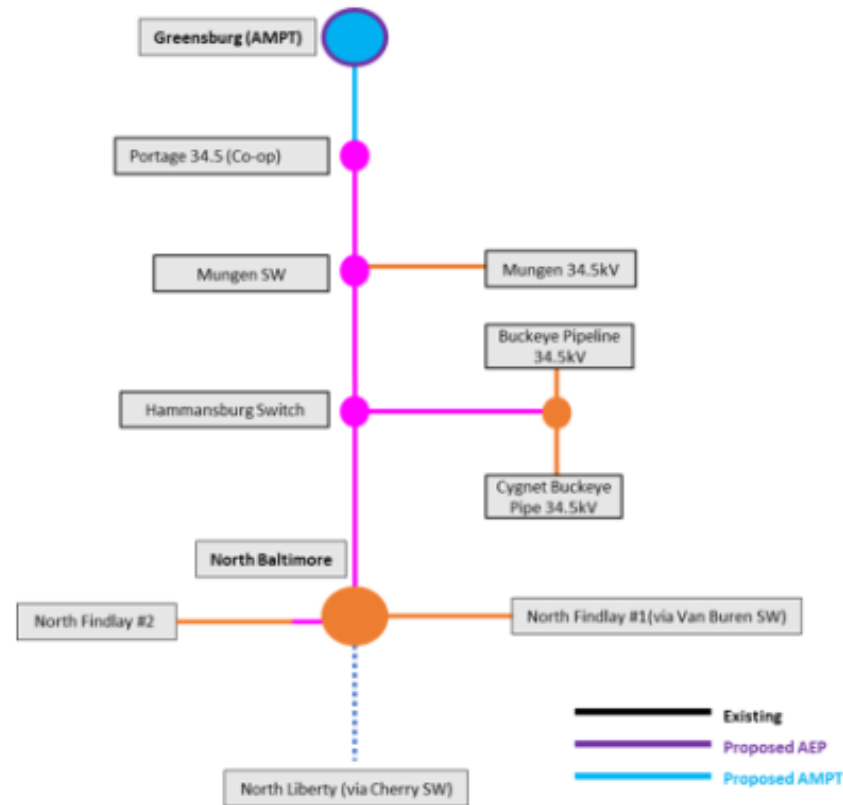
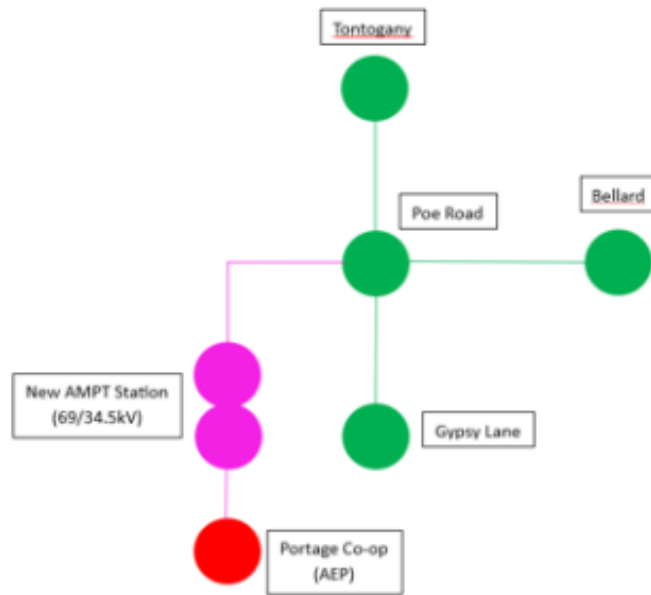


Existing:



Proposed:

Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
New	
Retire	



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

10/8/2024 – V1 – Original version posted to pjm.com

10/11/2024 – V2 – Slide #18 North Baltimore - Henry Co-Op Extension (previously Henry Co-Op Reconfiguration) component description and name updated