AEP TRANSMISSION
An AEP Company
BOUNDLESS ENERGY™

SRRTEP Committee Western
AEP Supplemental Projects

August 29, 2019

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

AEP Transmission Zone M-3 Process
Marmet, West Virginia

Need Number: AEP-2019-AP027

Process Stage: Need Meeting 8/29/2019

Supplemental Project Driver:

Equipment Material/Condition/Performance/Risk

Specific Assumption Reference:
AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:
Belle – Cabin Creek – Marmet Hydro 46 kV Circuit (7.58 miles)

- Majority of the circuit is constructed with 1930s lattice structures.
- Between 2015-2018 the circuit experienced 4 momentary and 3 permanent outage resulting in approximately 24 k customer minutes of interruption
- There are currently 13 open conditions associated with the structures and hardware and include heavy rust, broken insulators and damaged shield wire hardware.
- The line does not comply with current NESC Standards.
- Most structures are situated on an extreme side hill, which also sits above the WV Turnpike which presents a significant danger/risk should the structures fail.
- This line parallels the Belle – Cabin Creek – Marmet line, need AEP-2019-AP028.

AEP Transmission Zone M-3 Process
Marmet, West Virginia

Need Number: AEP-2019-AP028

Process Stage: Need Meeting 8/29/2019

Supplemental Project Driver:

Equipment Material/Condition/Performance/Risk

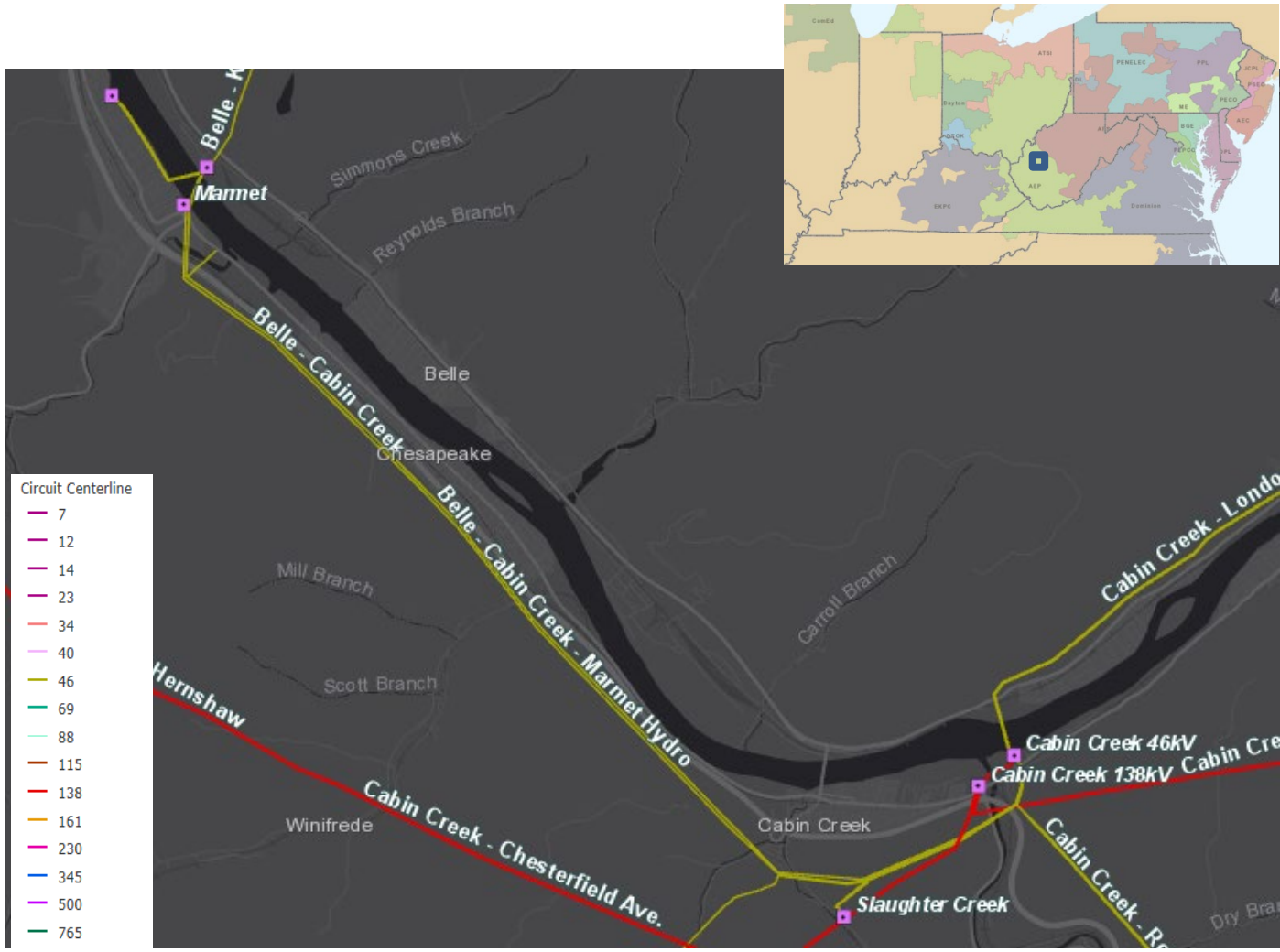
Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:

Belle – Cabin Creek 46 kV Circuit (7.14 miles)

- Majority of the circuit is constructed with 1930s lattice structures.
- Between 2015-2018 the circuit experienced 6 momentary and 2 permanent outage resulting in approximately 242 k customer minutes of interruption
- There are currently 13 open conditions associated with the structures and hardware and include heavy rust, broken insulators and corroded shield wire.
- The line does not comply with current NESC Standards
- Most structures are situated on an extreme side hill, which also sits above the WV Turnpike which presents a significant danger/risk should the structures fail.
- This line parallels the Belle – Cabin Creek – Marmet line, need AEP-2019-AP027.



AEP Transmission Zone M-3 Process
Marmet, West Virginia

Need Number: AEP-2019-AP029

Process Stage: Need Meeting 8/29/2019

Supplemental Project Driver:

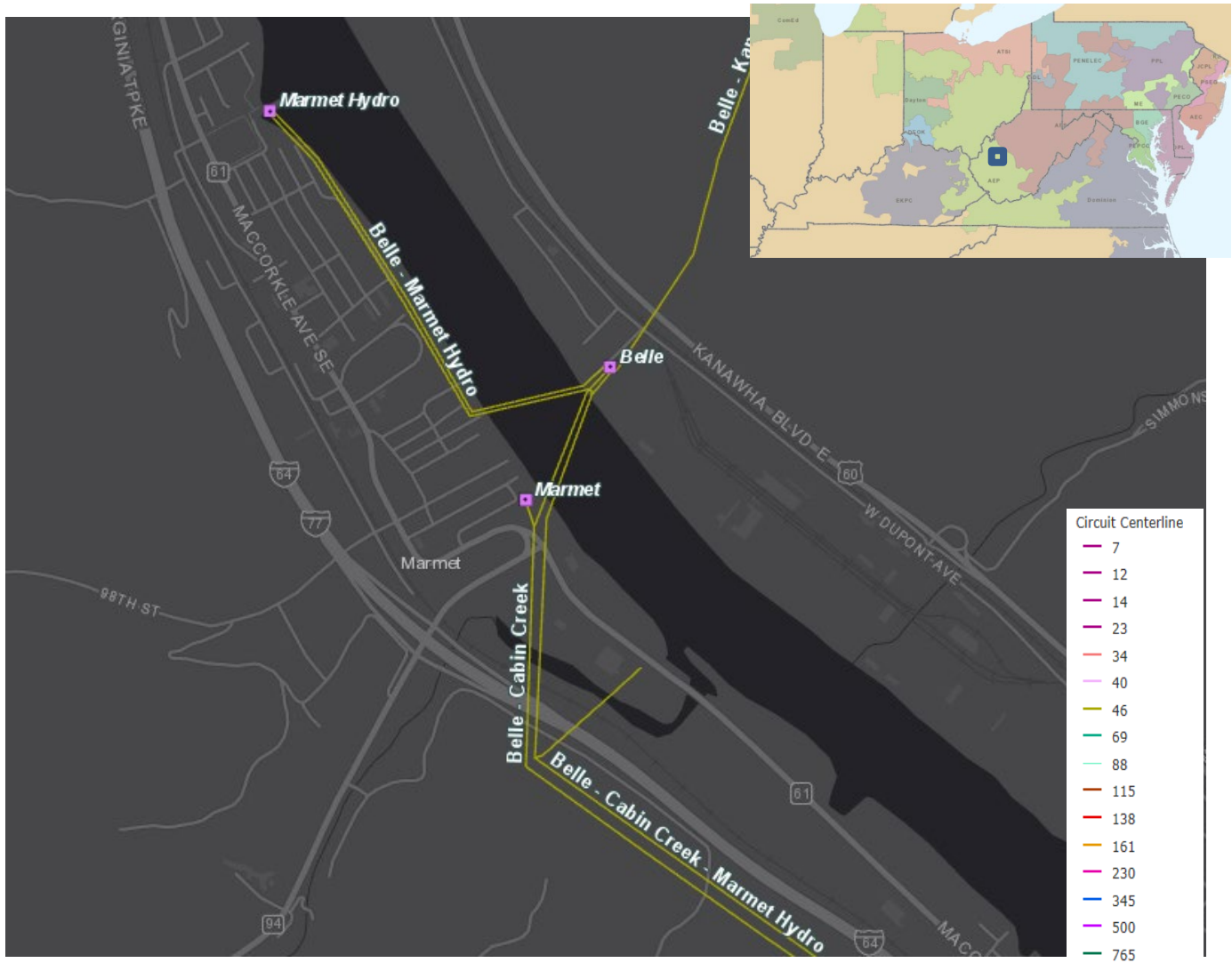
Equipment Material/Condition/Performance/Risk

Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:

- Marmet Hydro is currently served off a hard tap on the Belle – Marmet Hydro – Cabin Creek 46 kV circuit
  - Hard taps are difficult to maintain due to required outages or temporary jumper configurations in lieu of a switch.
  - Hard taps result in extended outages to customers due to the inability to sectionalize faulted facilities.



AEP Transmission Zone M-3 Process
Logan County, WV

Need Number: AEP-2019-AP030

Process Stage: Need Meeting 08/29/2019

Supplemental Project Driver:

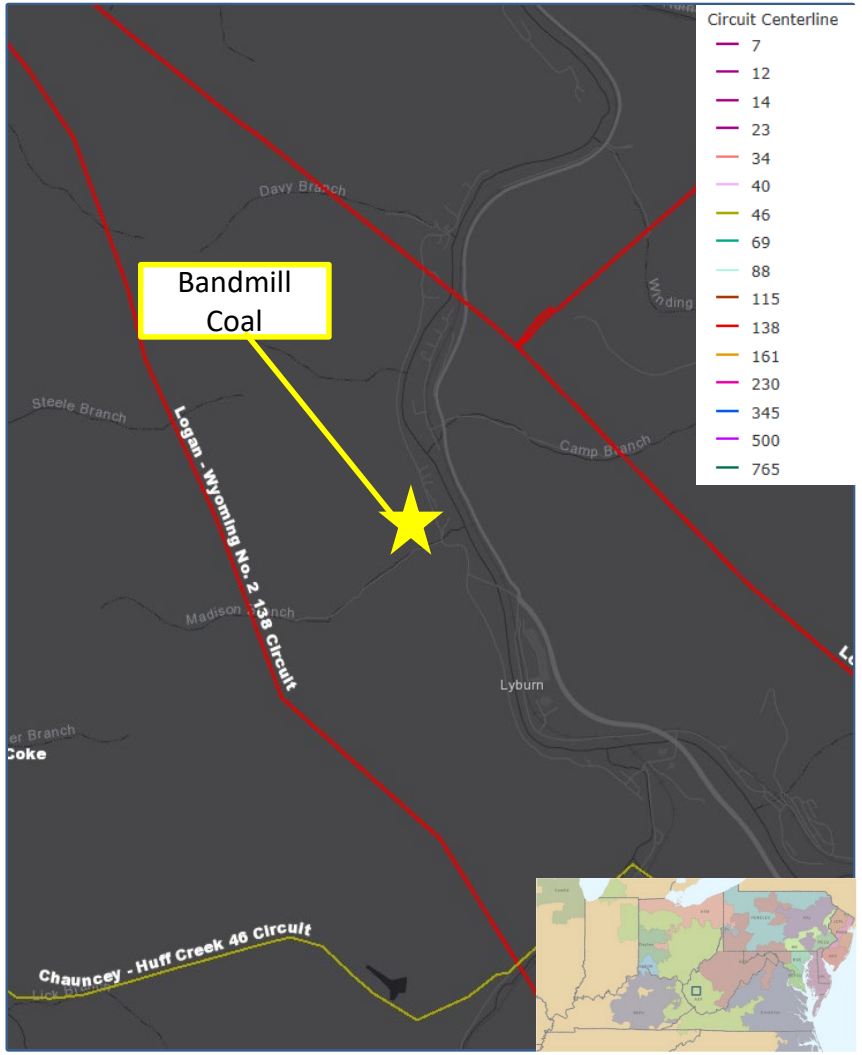
Customer Service

Specific Assumption References:

AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

Problem Statement:

Bandmill Coal LLC has requested a new transmission delivery point to serve a new facility in Neibert, WV. Projected load is 8 MW.



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AEP Transmission Zone: Supplemental
Pike County, Kentucky

Need Number: AEP–2019-AP032

Process Stage: Needs Meeting 08/29/2019

Supplemental Project Driver:

Equipment Material/ Condition/Performance/Risk, Operational Flexibility and Efficiency

Specific Assumption References:

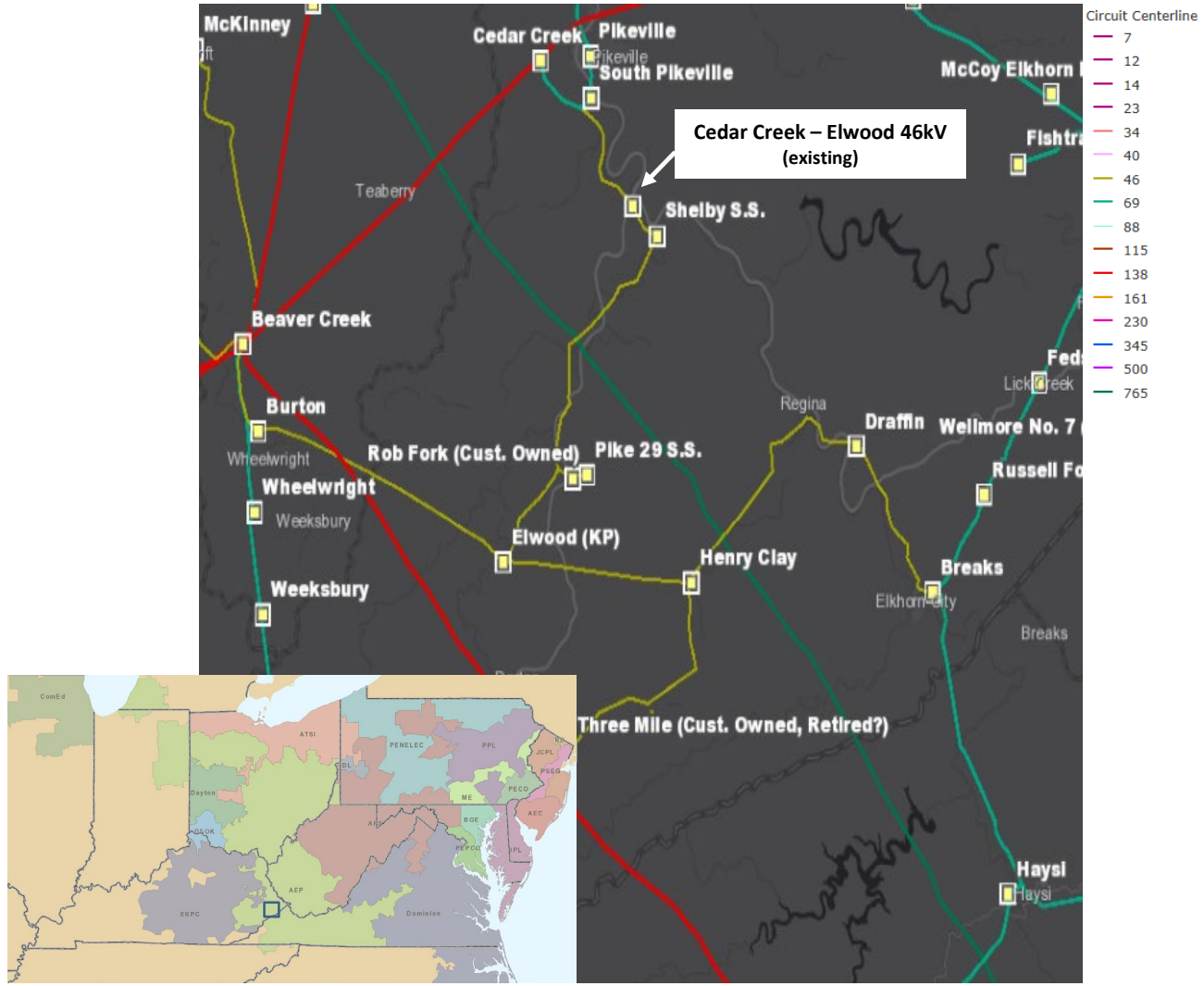
AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Model: N/A

Problem Statement:

Equipment Material/Condition/Performance/Risk:

- The 46 kV transmission Cedar Creek – Elwood 46kV circuit (~15.5 miles) is 1966 Vintage and has 81 open conditions. The majority of open conditions are structure related including Rot Top/Shell, Woodpecker and Burnt damage. The two permanent outages on this circuit have caused 176,728 CMI over the past five years. Also over this time span, there have been 18 momentary outages.



AEP Transmission Zone: Supplemental Adams 69kV Breaker

Need Number: AEP–2019–IM027

Process Stage: Needs Meeting 08/29/2019

Supplemental Project Driver:

Equipment Material/ Condition/Performance/Risk

Specific Assumption References:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Model: N/A

Problem Statement:

<u>Adams 69kV Station: 69kV Circuit Breaker D</u>

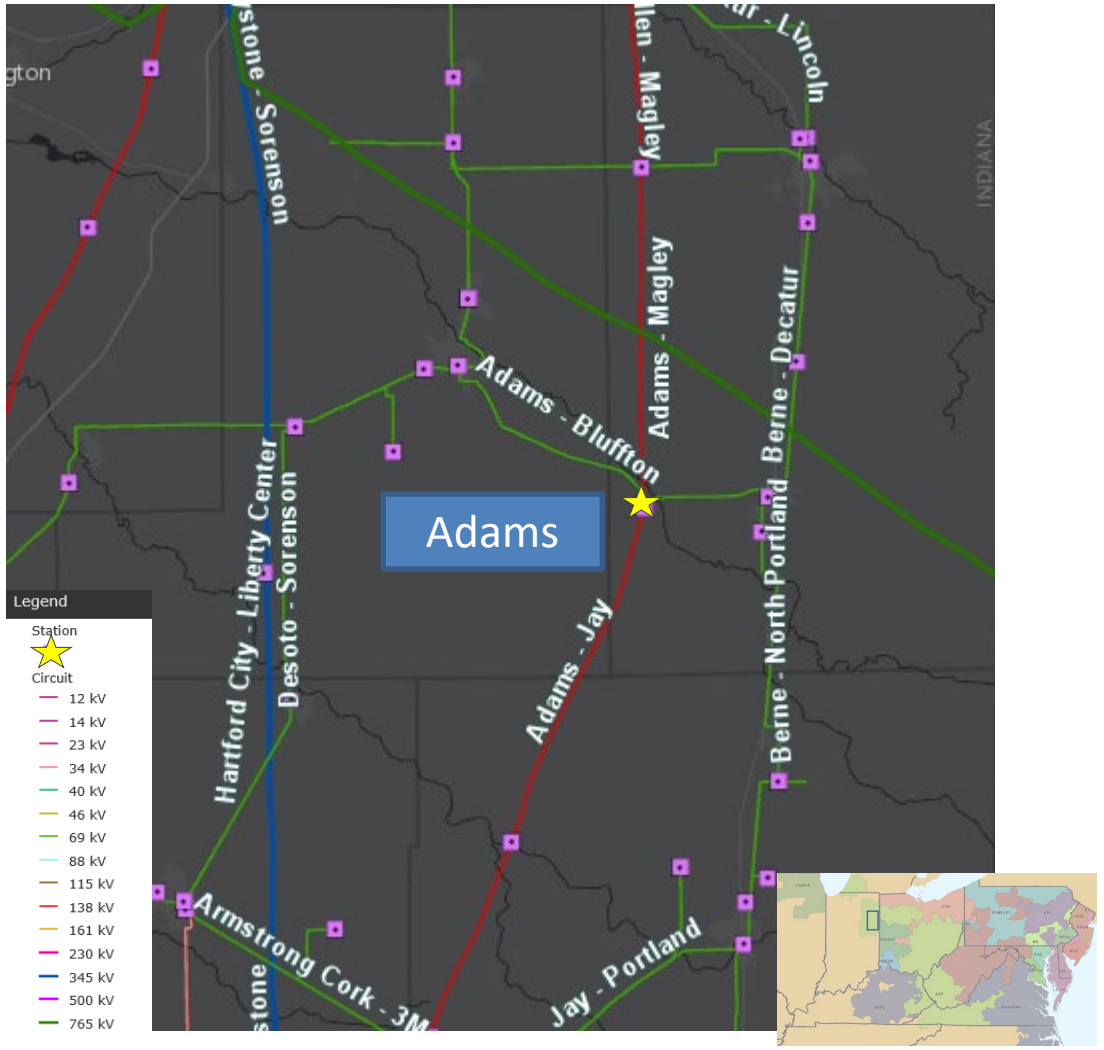
Vintage 1966 Oil filled McGraw Edison CF type breaker

Last oil breaker at Adams station

Oil filled breakers have much more maintenance required due to oil handling that their modern, vacuum counterparts do not require

Spare parts are not available and these models are no longer vendor supported

Fault operations (10) – Manufacturers recommended maximum (10)



Need Number: AEP-2019-IM028

Process Stage: Needs Meeting 08/29/2019

Supplemental Project Driver: Customer Service

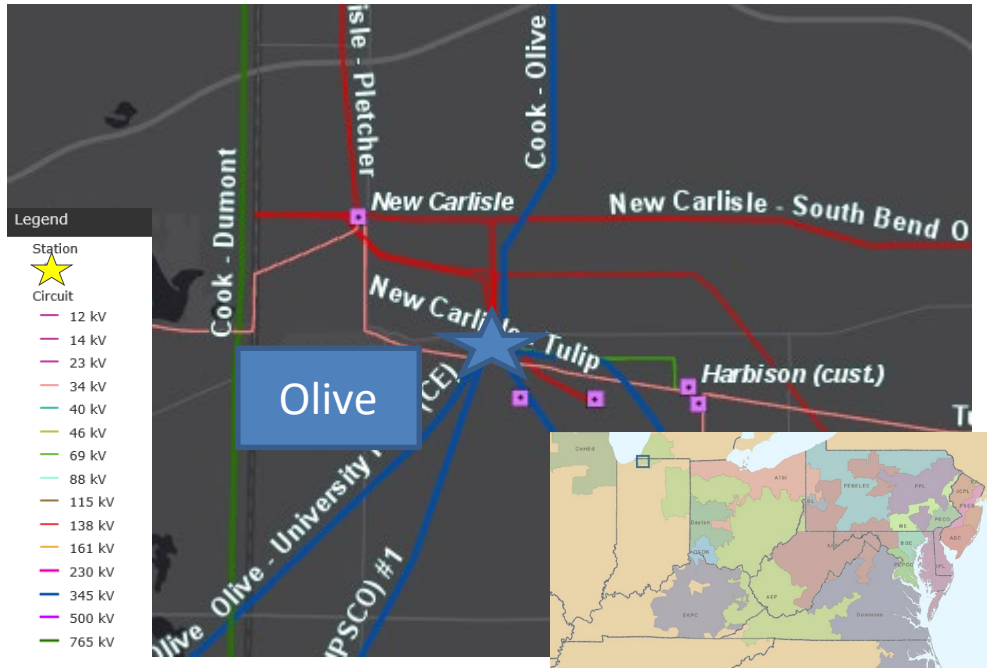
Specific Assumptions Reference: AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

Model: 2024 RTEP

Problem Statement:

Olive 345/138/69 kV station

NIPSCO has requested a new 69 kv delivery point at Olive station for a ~1.5 MW load.



Need Number: AEP-2019-IM029

Process Stage: Needs Meeting 08/29/2019

Supplemental Project Driver: Customer Service

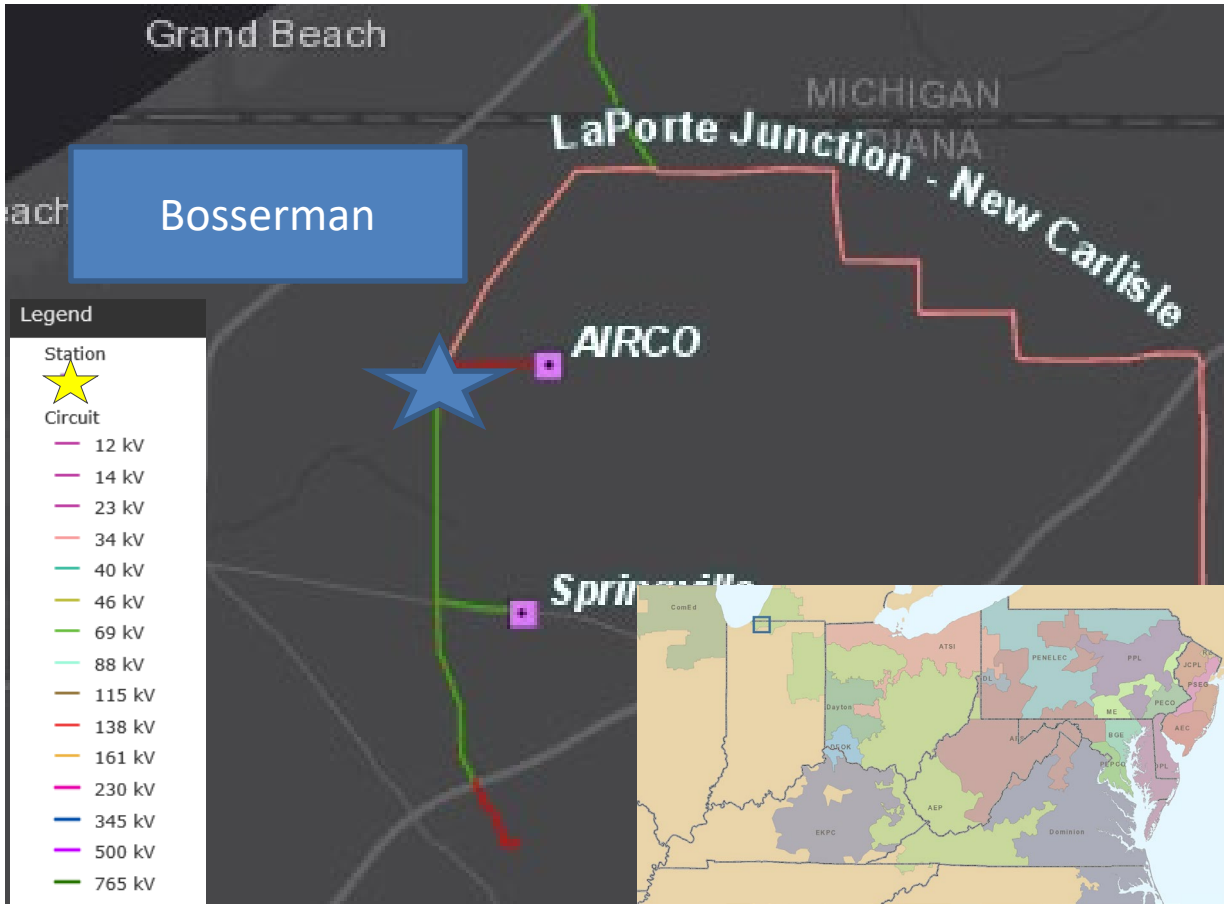
Specific Assumptions Reference: AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

Model: 2024 RTEP

Problem Statement:

Bosserman 138/69kV station:

NIPSCO has requested a new 69kV delivery point at Bosserman station for a ~1.5MW load.



Need Number: AEP-2019-IM032

Process Stage: Needs Meeting 08/29/2019

Supplemental Project Driver: Customer Service

Specific Assumptions Reference: AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

Model: 2024 RTEP

Problem Statement:

<u>Bendix – West Side 34.5 kV line</u>

NIPSCO is modifying their Grandview feed on the Bendix – West Side 34.5kV line to become their main feed. This feed is currently normally open and is served off of a hard tap.

Need Number: AEP-2018-IM035

Meeting Date: Needs Meeting 08/29/19

Process Stage: Needs Meeting 08/29/19

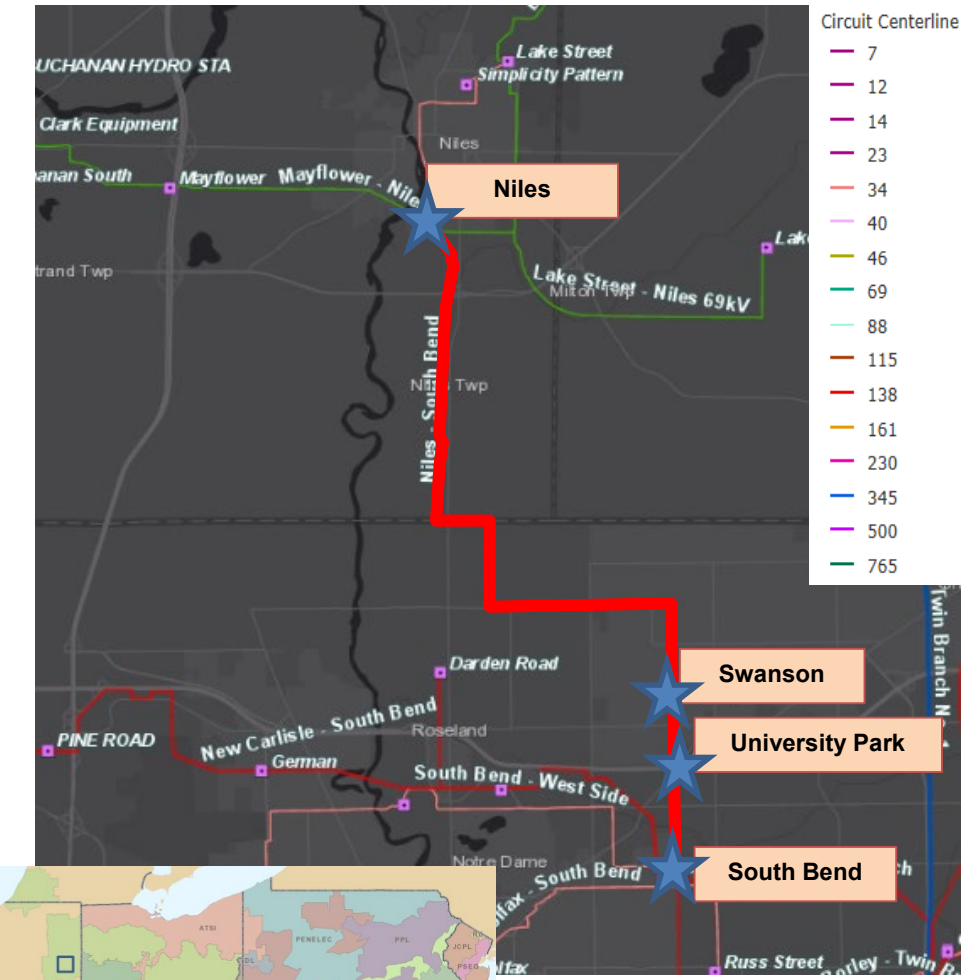
Supplemental Project Driver: Equipment Material/Condition/Performance/Risk

Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:

<u>South Bend – Niles 69 kV Line (~11.47 Miles)</u>

- 1968 vintage wood pole construction
- Forced Momentary outages: 5
- Forced Permanent outages: 3
- Total structure related open conditions – 47
- Unique structure count with open conditions – 44
- Insect Damage, Rotten Poles, Broken/Burnt cross-arm, Woodpecker holes, broken/burnt insulators, stolen/broken ground wires, broken guy strain insulators and cracked stub pole.
- More than three in-line sectionalizing MOABS



AEP Transmission Zone M-3 Process
Knox County, Ohio

Need Number: AEP-2019-OH050

Process Stage: Need Meeting 08/29/2019

Supplemental Project Driver:

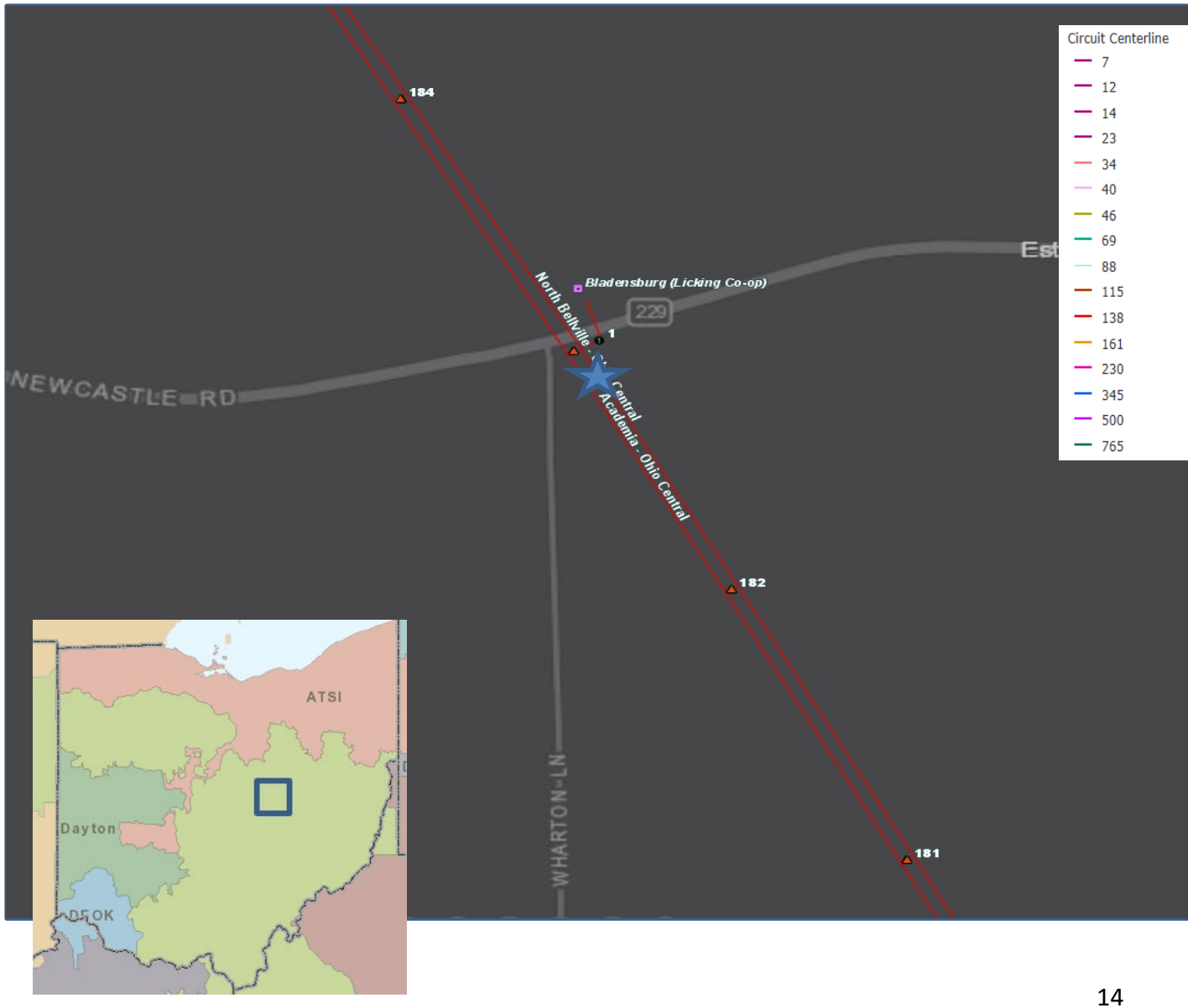
Equipment Material/Condition/Performance/Risk

Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs

Problem Statement:

- The Bladensburg Licking Rural Electrification Co-op (LRE) 138 kV delivery point, connected to the 45 mile North Bellville – Ohio Central 138 kV circuit, has a load of 3.9 MW peak demand serving 1449 customers. The Bladensburg load is 100% transferrable but under high loading conditions transferring loads can take several hours. For heavy loading periods LRE has experienced areas of low voltage while transferring loads.
- The Blandensburg delivery point has experienced approximately 553,000 minutes of CMI over the last 5 years.
- This delivery point is connected to the North Belleville – Ohio Central 138 kV circuit via a hard tap which limits operational flexibility and the effectiveness of protection schemes. In addition, it is difficult to coordinate maintenance efforts because the line cannot be removed from service without either a customer outage or temporary jumper configuration.



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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

AEP Transmission Zone M-3 Process
Amos PK Replacement

Need Number: AEP-2018-AP012

Process Stage: Solutions Meeting 08/29/2019

Previously Presented: Needs Meeting 12/05/2018

Supplemental Project Driver:

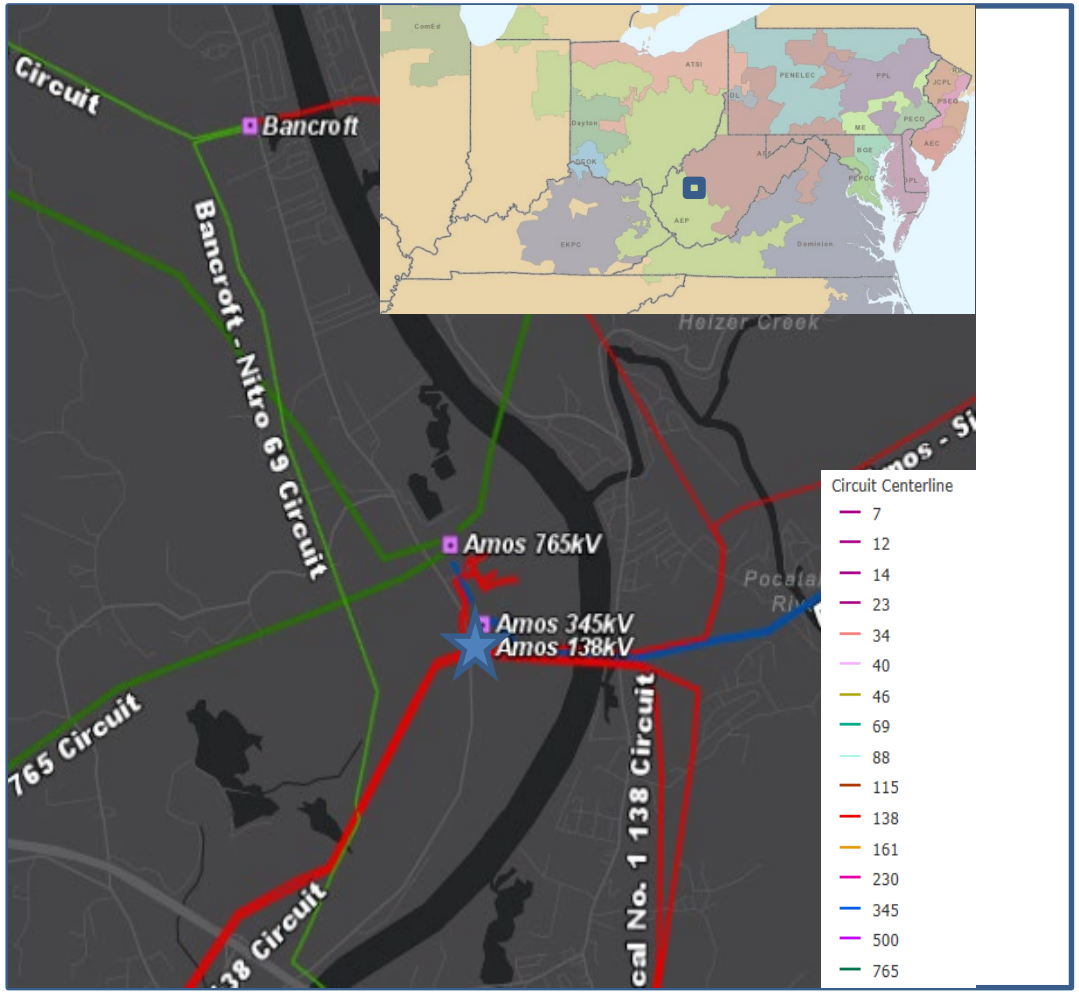
Equipment Material/Condition/Performance/Risk

Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:

138 kV circuit breakers A, A1, B, B1, B2, D, D1, D2, E, E1, E2 are all PK type air blast breakers that were manufactured between 1971-1975. Air blast breakers are being replaced across the AEP system due to their potential for catastrophic and violent failures. During failures, sharp pieces of porcelain from their bushings are typically expelled from the breakers and can be a safety hazard to field personnel. In addition, breakers A, A1, B, B1, E, E1 have experienced 40, 28, 11, 17, 75, and 96 fault operations, which exceed the manufacturer's designed number of 10 fault operations.



AEP Transmission Zone M-3 Process
Amos PK Replacement

Need Number: AEP-2018-AP012

Process Stage: Solutions Meeting 08/29/2019

Proposed Solution:

Replace existing 138 kV circuit breakers A, A1, B, B1, B2, D, D1, D2, E, E1, E2 with new 138 kV 80 kA 3000 A circuit breakers.

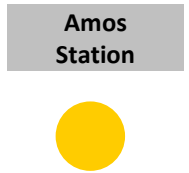
Estimated Cost: $7.7M

Alternatives Considered:

No viable transmission alternative.

Projected In-Service: 12/30/2020

Project Status: Scoping



Legend	
345 kV	
138 kV	
69 kV	
46 kV	
New	

AEP Transmission Zone: Supplemental
Allen – Robison Park 138kV Rebuild

Need Number: AEP-2019-IM013

Process Stage: Solution Meeting 08/29/2019

Previously Presented: Needs Meeting 03/28/2019

Supplemental Project Driver: Equipment Condition/Performance/Risk

Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:

<u>Robison Park – Haviland 138 kV Line (~12 Miles)</u>

1926 vintage steel lattice line construction

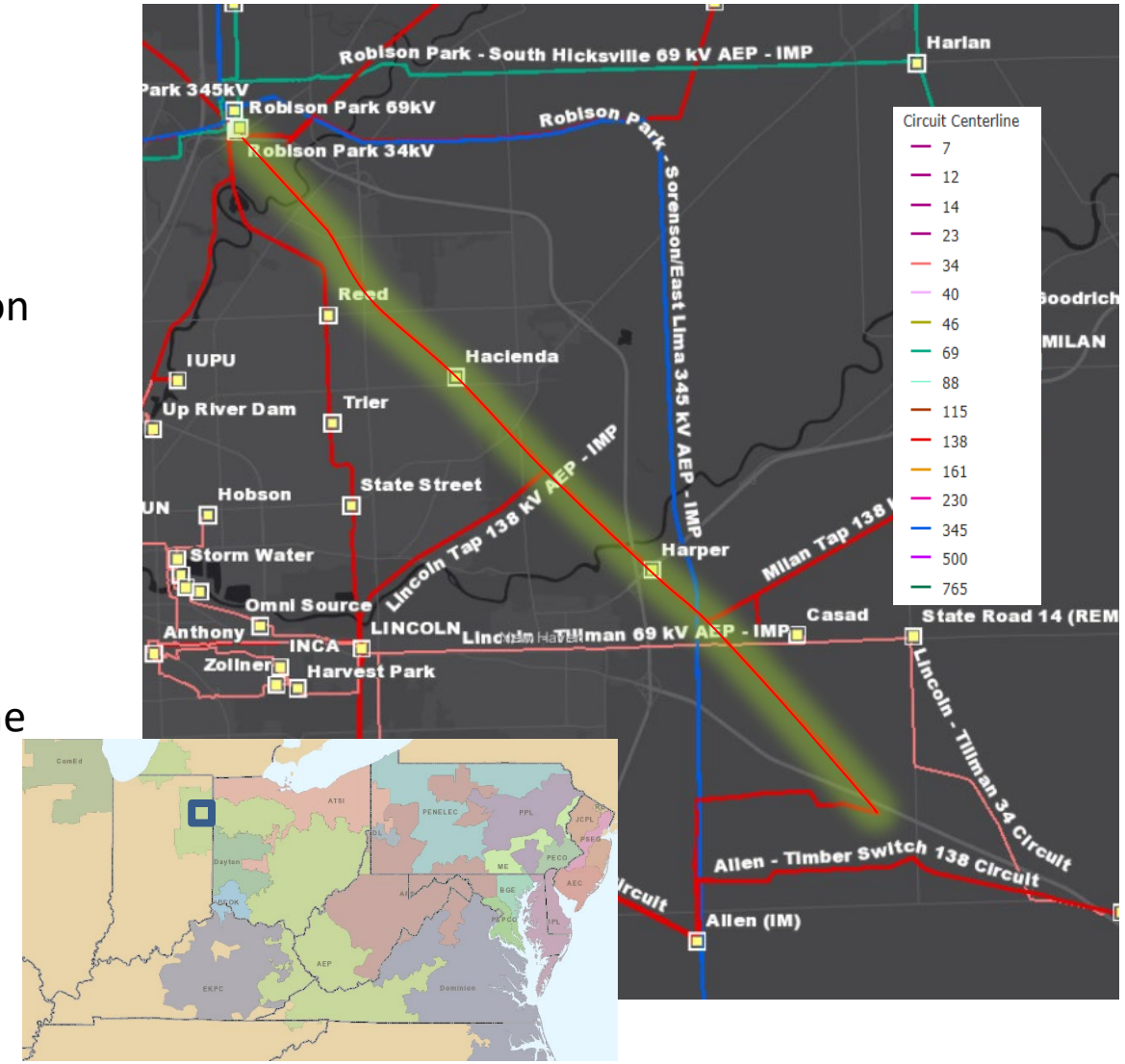
There are currently 56 open conditions, future conditions are expected due to the type of construction and condition as the structures and conductor age.

The O&M cost of the line is expected to increase as the age of the line increases.

CMI: 1,768

Forced Momentary Outages: 2

Forced Permanent Outages: 1



AEP Transmission Zone: Supplemental
Allen – Robison Park 138kV Rebuild

Need Number: AEP-2019-IM013

Process Stage: Solutions Meeting 08/29/2019

Proposed Solution:

Allen – Rob Park 138kV line:
Rebuild 12 miles of the 138kV Allen – Robison Park double circuit line using 795 ACSR Drake conductor.

Estimated Cost: $34.9M

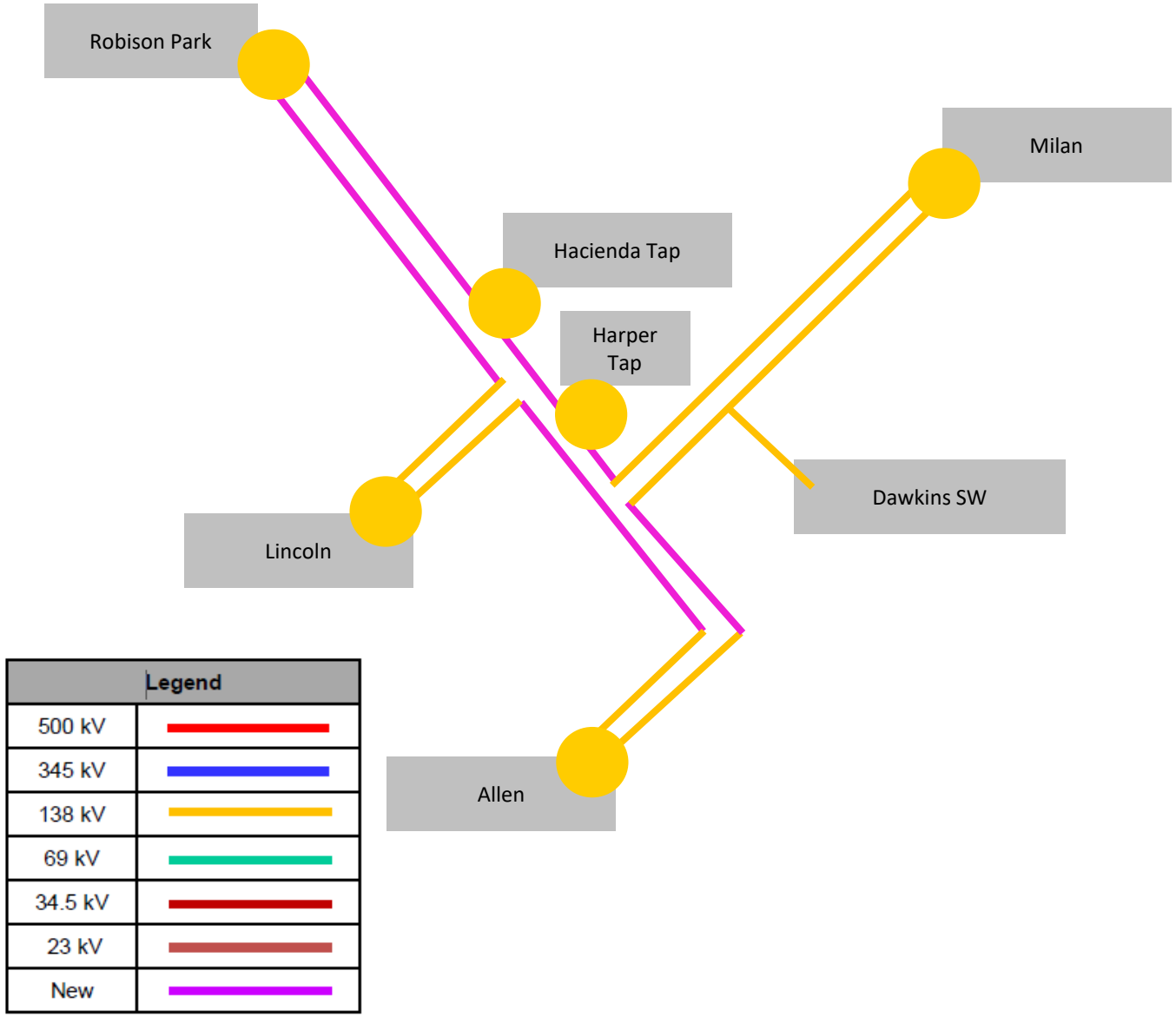
Alternatives Considered:

Rebuild line as single circuit with 4 breaker switching stations on the Lincoln and Milan interconnections. This would be a more costly option and would cause AEP to lose the redundancy of the second path from Allen to Rob Park. For this reason, this option was not chosen.

Estimated Cost: $42M

Projected In-Service: 10/15/2022

Project Status: Scoping



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

8/19/2019 – V1 – Original version posted to pjm.com

8/23/2019 – V2 – Remove Slide #7 (AEP-2019-AP031)

– Remove Slide #15 (AEP-2019-OH048)

8/27/2019 – V3 – Update Slide #8 (AEP-2019-AP032)

10/16/2019 – V4 –Slide #20, Add Estimated cost for the Alternative