SRRTEP Committee Western
AEP Supplemental Projects

October 25, 2019

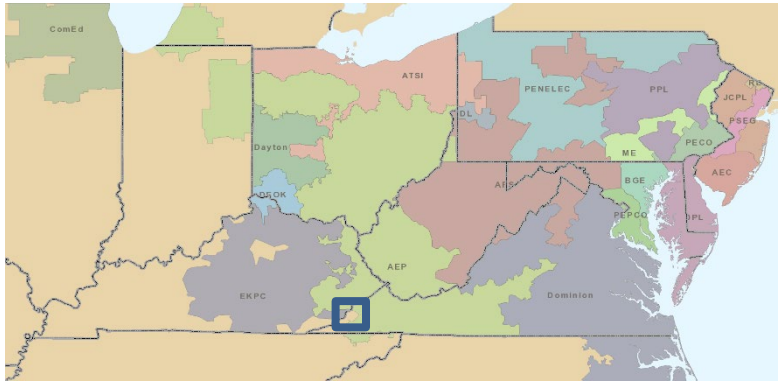
Needs

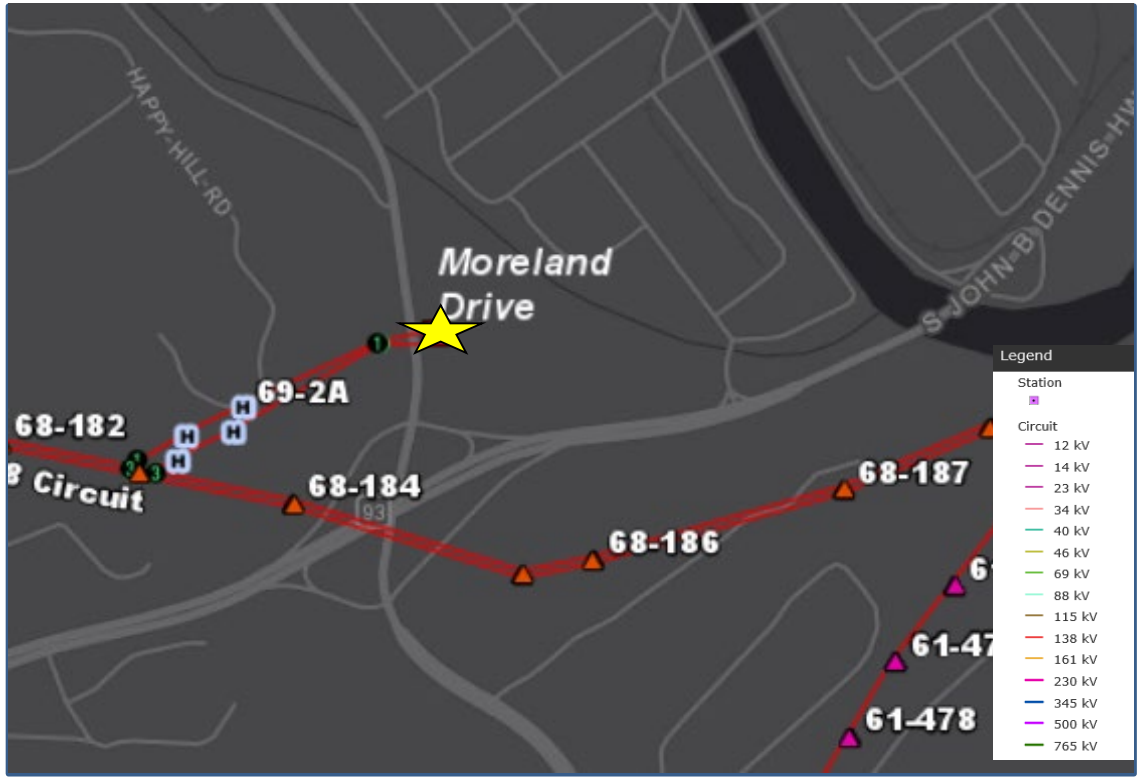
Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

AEP Transmission Zone M-3 Process
Sullivan County, Tennessee

Need Number: AEP-2019-AP041
Process Stage: Needs Meeting 10/25/2019
Process Chronology: Needs Meeting 10/25/2019
Supplemental Project Driver: Customer Service
Specific Assumption References: AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)
Problem Statement:

- Eastman Chemical in coordination with Air Products, has requested a new point of service for their planned new facilities at Moreland Drive.
- The projected peak demand is 47 MW.

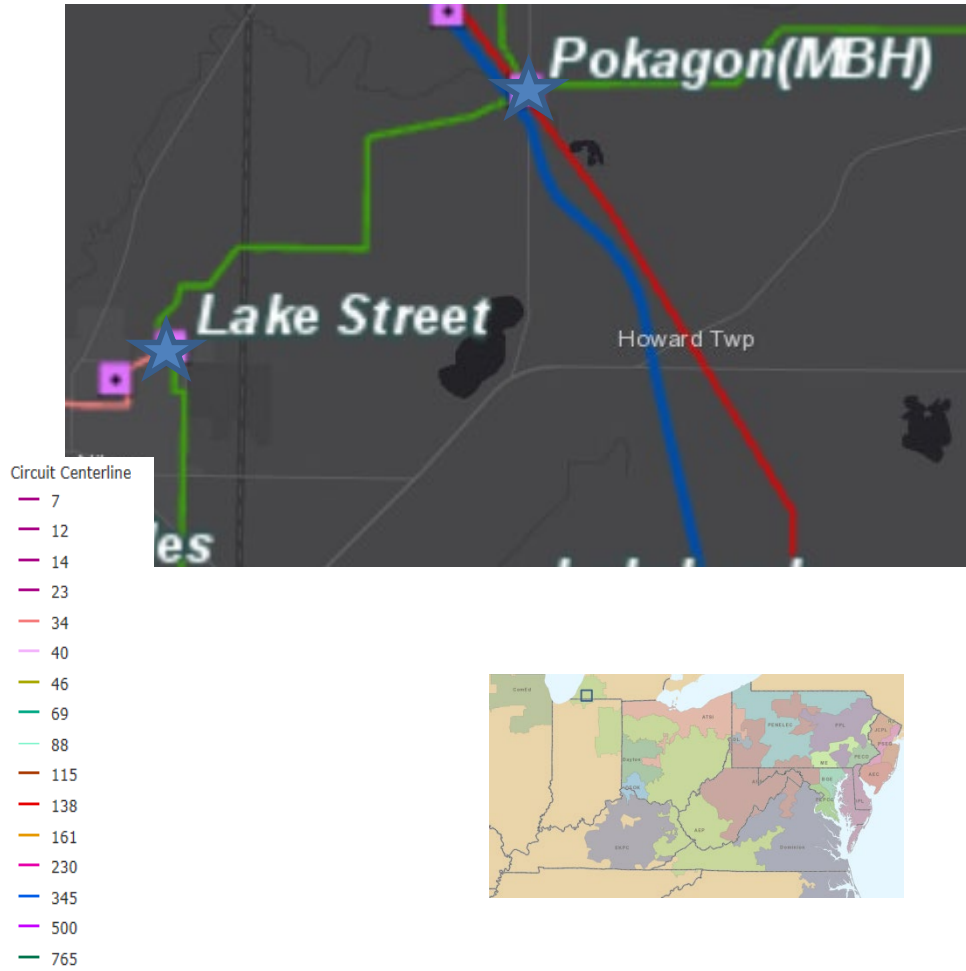




AEP Transmission Zone M-3 Process
Pokagon – Lake St, Michigan

Need Number: AEP-2019-IM025
Process Stage: Needs Meeting 10/25/2019
Supplemental Project Driver: Equipment Material/Condition/Risk/Performance
Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
Problem Statement:
Pokagon – Lake Street 69kV line (4.9 miles)

- 28 open conditions
- 1952 wood cross-arm construction
- Many weather related failures/outages
- 3 momentary outages over the last 5 years

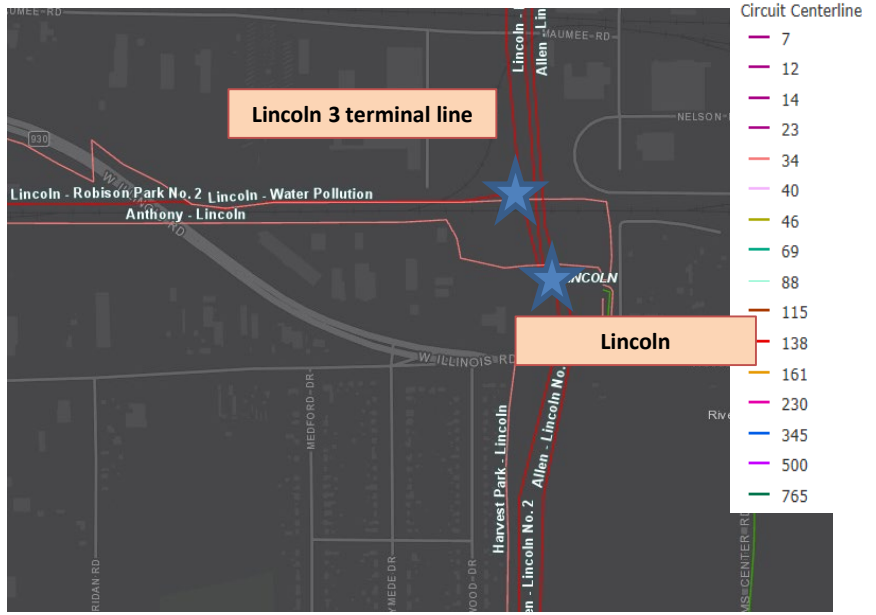


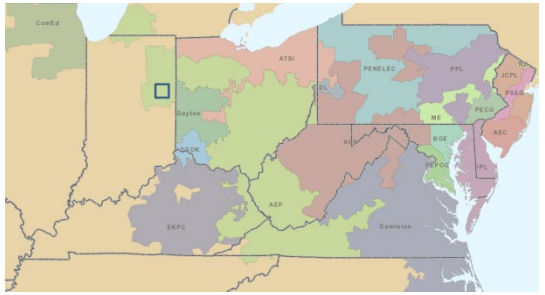
AEP Transmission Zone: Supplemental Lincoln, Indiana

Need Number: AEP-2019-IM038
Process Stage: Needs Meeting 10/25/2019
Supplemental Project Driver: Customer Service and Operational Flexibility
Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
Problem Statement:

Lincoln 138/69/34.5kV Station

- Distribution has requested a new delivery point at Lincoln station.
- There is currently a three terminal line outside Lincoln station that connects Anthony, Lincoln and Robison Park. AEP has been addressing these three terminal lines when feasible.





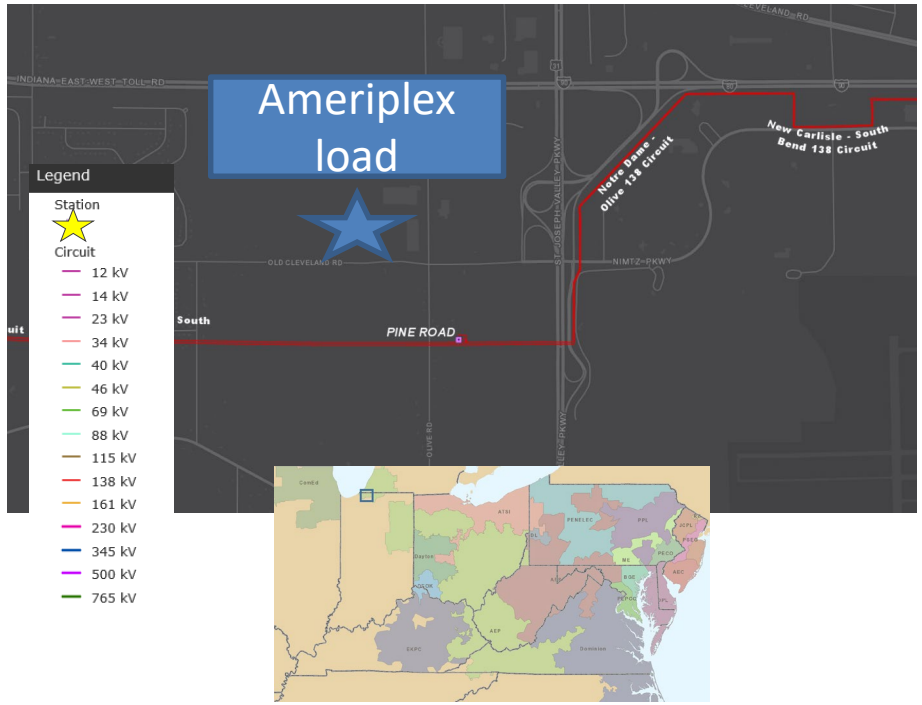
AEP Transmission Zone M-3 Process
Customer Need-South Bend, IN

Need Number: AEP-2019-IM039
Process Stage: Needs Meeting 10/25/2019
Supplemental Project Driver: Customer Service
Specific Assumptions Reference: AEP Interconnection Guidelines (AEP Assumptions Slide 7)

Problem Statement:
South Bend-Olive 138kV line-

- New 1.5MVA block load addition to the Ameriplex complex and new delivery point request from I&M distribution.

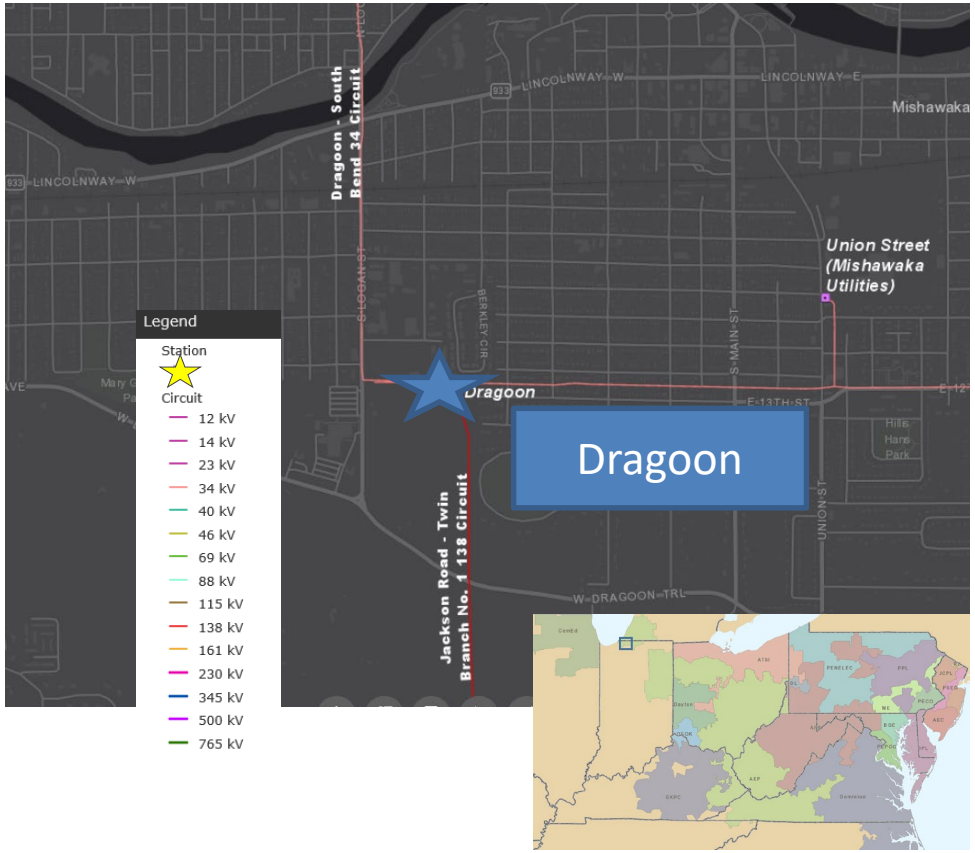
Model: 2024 RTEP



Need Number: AEP-2019-IM040
Process Stage: Needs Meeting 10/25/2019
Supplemental Project Driver: Equipment Material/Condition/Performance/Risk
Specific Assumptions Reference: AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

Problem Statement:
Dragoon Station:

- The 34.5 kV Circuit Breakers A, C and D at Dragoon Station are GE 'FK' oil-filled breaker manufactured in 1968
- 17, 51 and 9 fault operations (manufacturer recommendation of 10)
- Oil filled Breakers without oil containment
- The breakers have the following documented conditions:
    - Bushing problems
    - Unavailability of spare parts
    - Fault operations count
    - High moisture readings
- Oil spills are frequent with failures and routine maintenance which is also an environmental hazard



AEP Transmission Zone: Supplemental South Canton, Ohio

Need Number: AEP-2019-OH055

Process Stage: Needs Meeting 10/25/2019

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

Specific Assumption References:

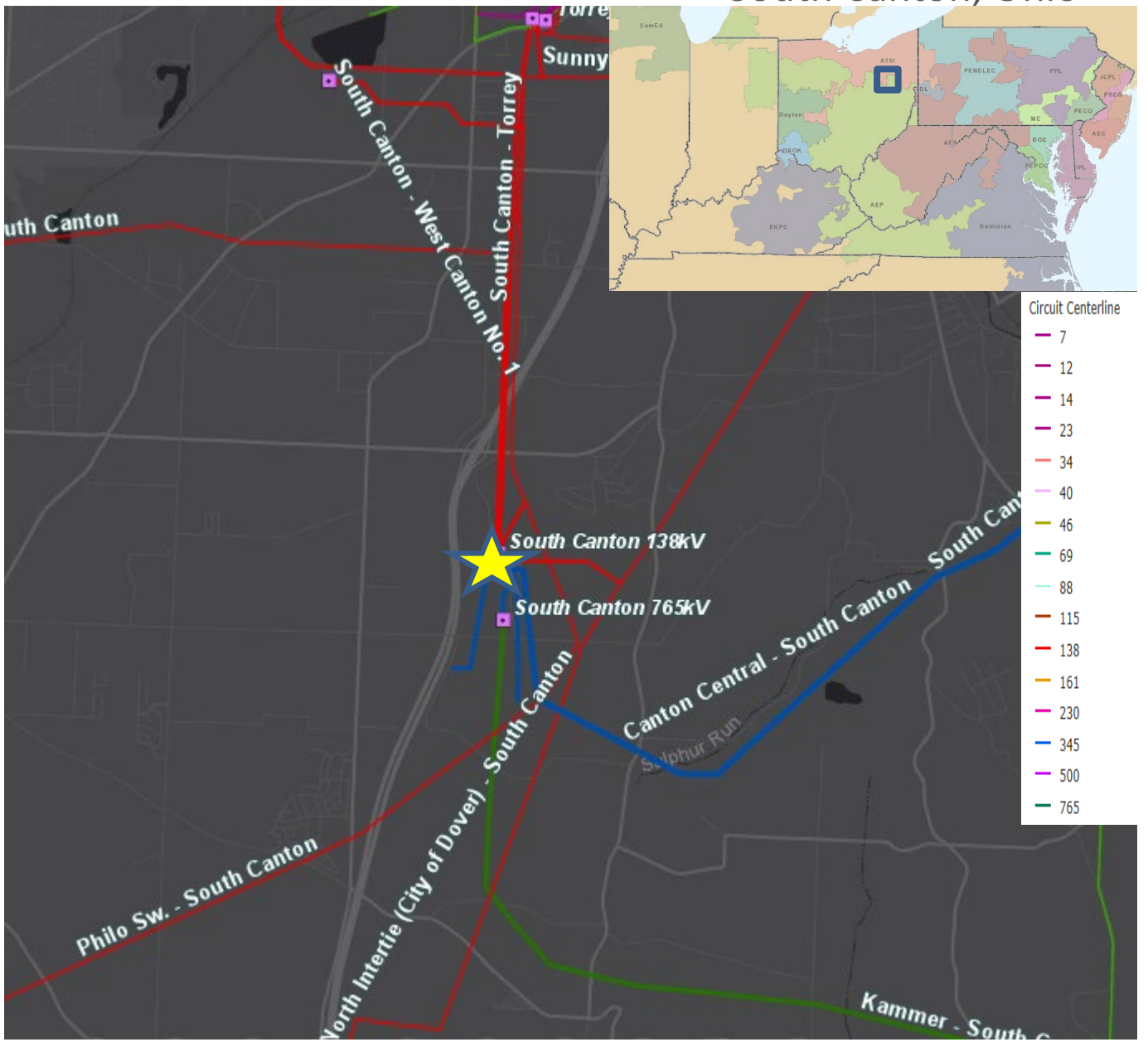
AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

Problem Statement:

138kV Circuit Breakers: K1, L1, & M1

- Interrupting Medium: SF6
- Additional Info: In addition to the 12 - 138kV overdutied breakers at South Canton, these remaining 3 breakers have fault duty in the 95-99% range.

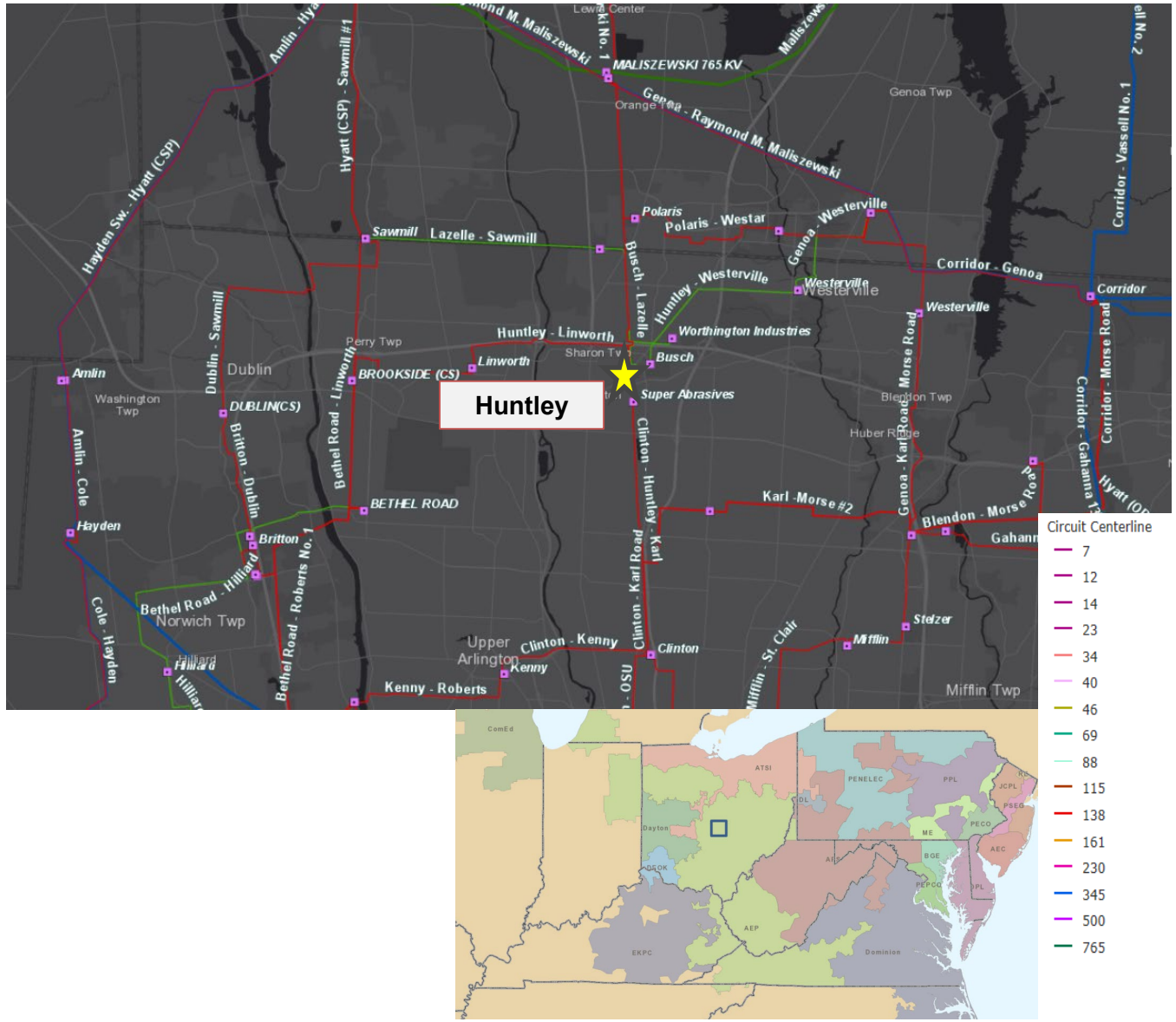
Model: Summer 2019 RTEP



Need Number: AEP-2019-OH056
Process Stage: Needs Meeting 10/25/2019
Supplemental Project Driver: Equipment Condition/Performance/Risk
Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
Problem Statement:

Huntley Station
69/12kV Transformer #6

- The 1976 vintage 69/12kV transformer (33 MVA) has failed beyond repair in the field.



AEP Transmission Zone M-3 Process
Hancock Co, OH

Need Number: AEP-2019-OH057

Process Stage: Needs Meeting 10/25/2019

Supplemental Project Driver:

Customer Service

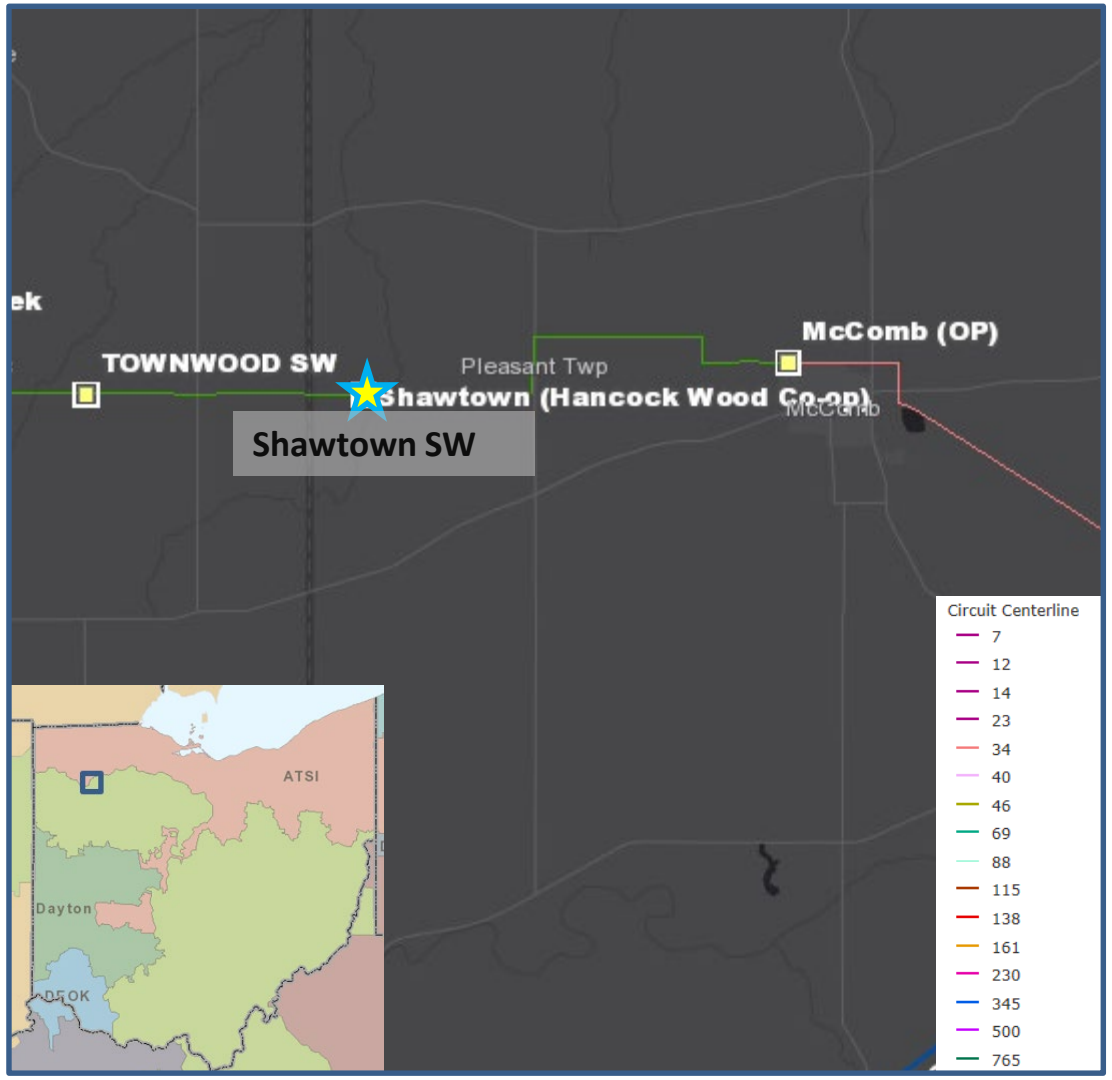
Specific Assumption Reference:

AEP Interconnection Guidelines (AEP Assumptions slide 7)

Problem Statement:

Buckeye Power, Inc. on behalf of Hancock Wood Electric, Inc. has requested a new delivery point adjacent to their existing site.

Model: 2024 RTEP



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
Bandmill

Need Number: AEP-2019-AP030

Process Stage: Solutions Meeting 10/25/19

Previously Presented: Need Meeting 08/29/2019

Supplemental Project Driver:

Customer Service

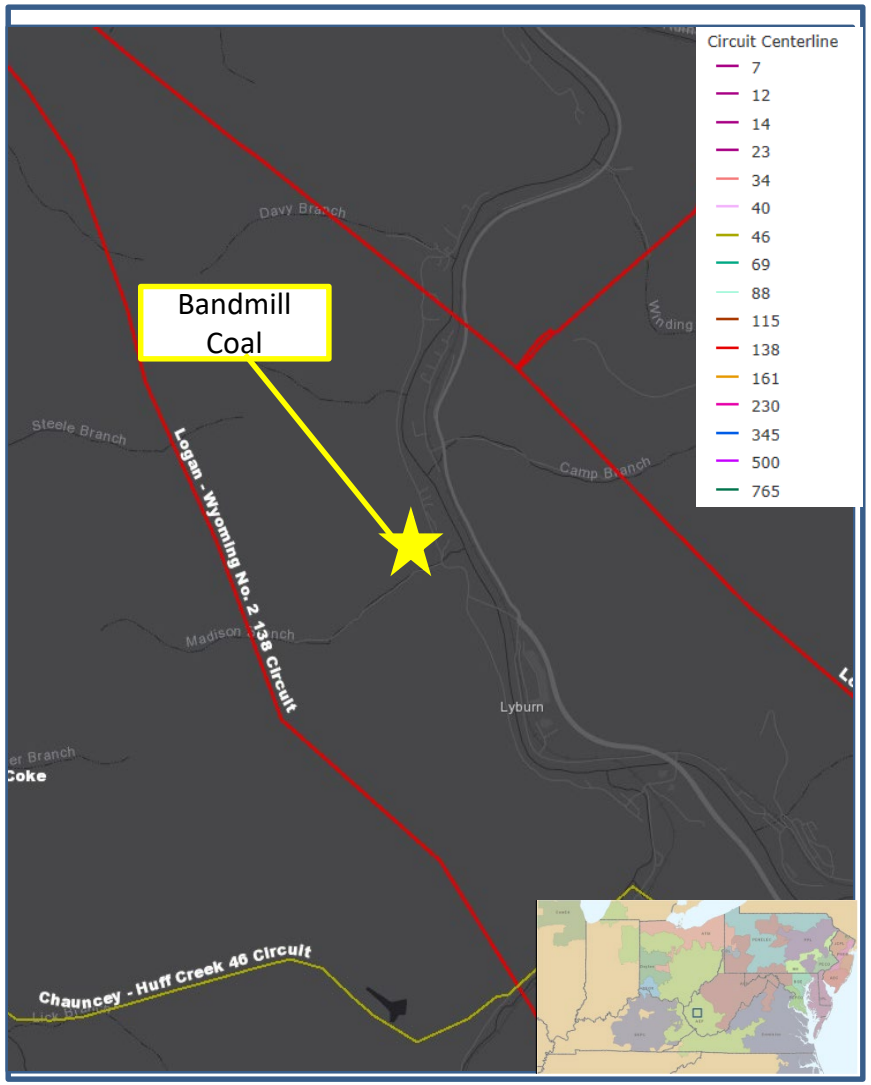
Specific Assumption Reference:

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.

Model: 2024 RTEP



AEP Transmission Zone M-3 Process Bandmill

Need Number: AEP-2019-AP030

Process Stage: Solutions Meeting 10/25/19

Proposed Solution:

Tap the Logan – Wyoming #2 circuit. Install a 138 kV Phase over Phase Switch at a new Lyburn Switching Station.

Estimated Transmission Cost: $2.1M

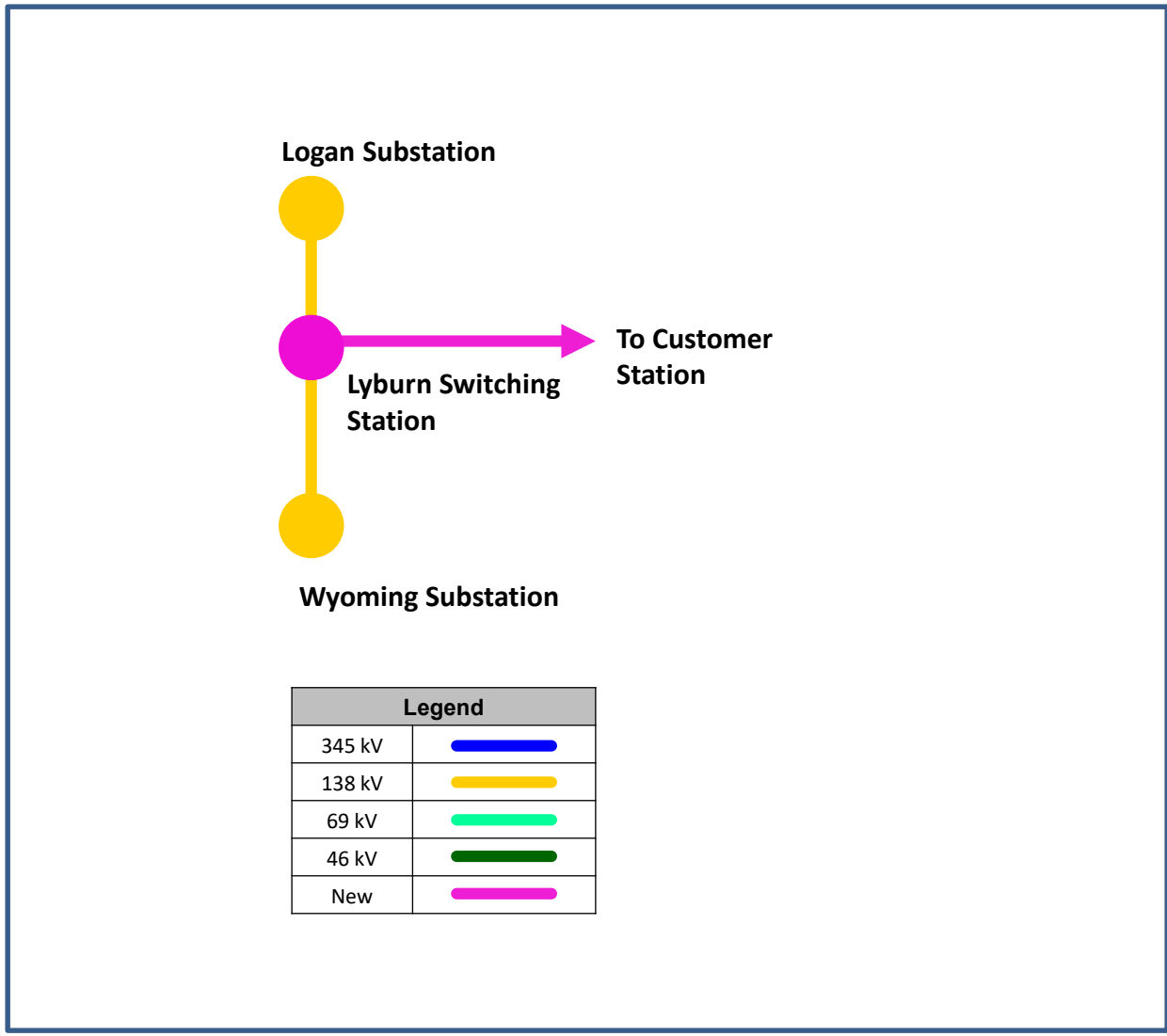
Ancillary Benefits: N/A

Alternatives Considered:

1. Tap the Logan – Wyoming #1 circuit and install a 138 kV Phase over Phase Switch. This option was not preferred as the customer line would involve a highway crossing. The customer line route to their station would also be longer.
   Estimated Transmission Cost: $2.1M

Projected In-Service: 3/29/2020

Project Status: Scoping



AEP Transmission Zone M-3 Process
Botetourt Station

Need Number: AEP-2019-AP039

Process Stage: Solutions Meeting 10/25/2019

Previously Presented: Needs Meeting 9/25/2019

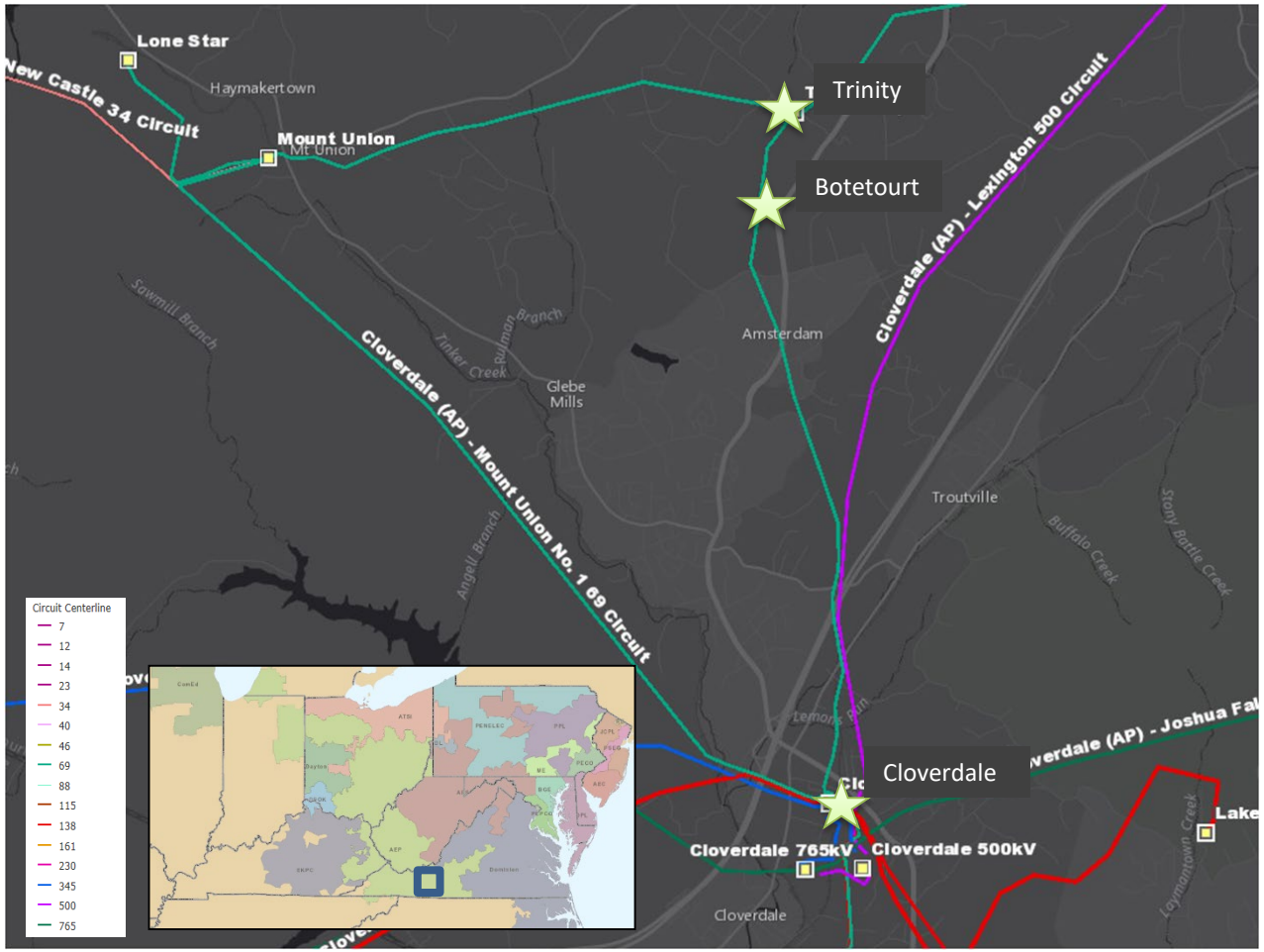
Supplemental Project Driver: Customer Service

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

Problem Statement:

Distribution requested a new station south of Trinity station. The new Botetourt station site will serve load currently fed from Trinity Station in order to prevent future thermal overload of the Trinity/Greenfield distribution feeder and the Trinity 138/12 kV #1 transformer during projected peak loading conditions in 2022. Additional load growth in the area is also expected due to new industrial and commercial customers.

Model: 2024 RTEP



AEP Transmission Zone M-3 Process
Botetourt Station

Need Number: AEP-2019-AP039

Process Stage: Solutions Meeting 10/25/2019

Proposed Solution:

Establish a new 69/12 kV distribution station with one 25 MVA transformer and two distribution feeders. Approximately 9 MVA of load will be transferred from Trinity Station and be fed via two-way service. **Estimated Cost: $0 (Distribution)**

Tap the Cloverdale – Mount Union No. 2 69 kV Circuit near structure 29-50 to provide two-way service. The station will be located one span from the existing line. **Estimated Cost: $0.8 M**

Fiber extension to Botetourt Station (3.5 mi.) **Estimated Cost: $0.4 M**

Cloverdale Station remote end relay settings **Estimated Cost: $0.1 M**

Mount Union Station remote end relay settings **Estimated Cost: $0.1 M**

Total Estimated Transmission Cost: $1.4 M

Ancillary Benefits: Allows for distribution load transfer capability between Trinity and Botetourt stations and provides additional capacity for anticipated load growth in the area.

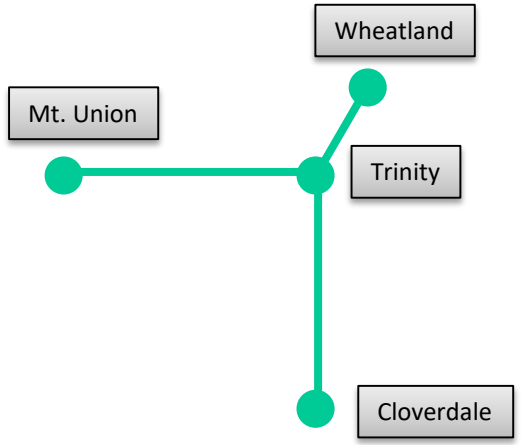
Alternatives Considered:

Due to the location of the Botetourt Center at Greenfield Industrial Park, which will include two new industrial customers (ELDOR auto parts maker and Ballast Point craft brewery) as well as requested expansions of existing industrial customers totaling approximately 9 MVA, the proposed station location was selected to minimize transmission and distribution line extensions.

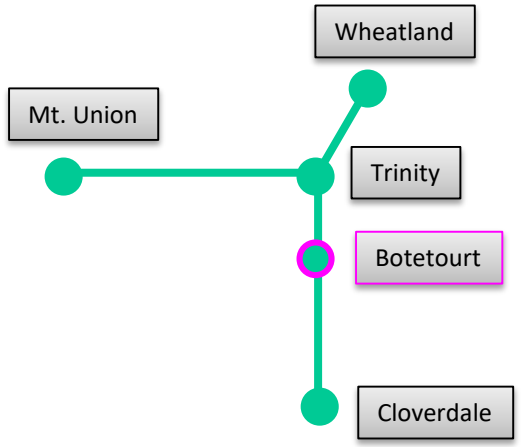
Projected In-Service: 8/1/2020

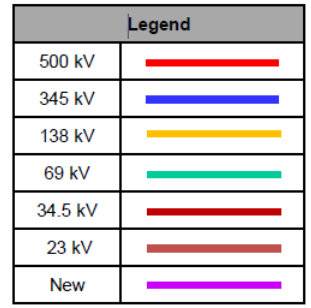
Project Status: Engineering

Existing



Proposed





AEP Transmission Zone M-3 Process
Bennington Station (Service to WVWA)

Need Number: AEP-2019-AP040

Process Stage: Solutions Meeting 10/25/2019

Previously Presented: Needs Meeting 9/25/2019

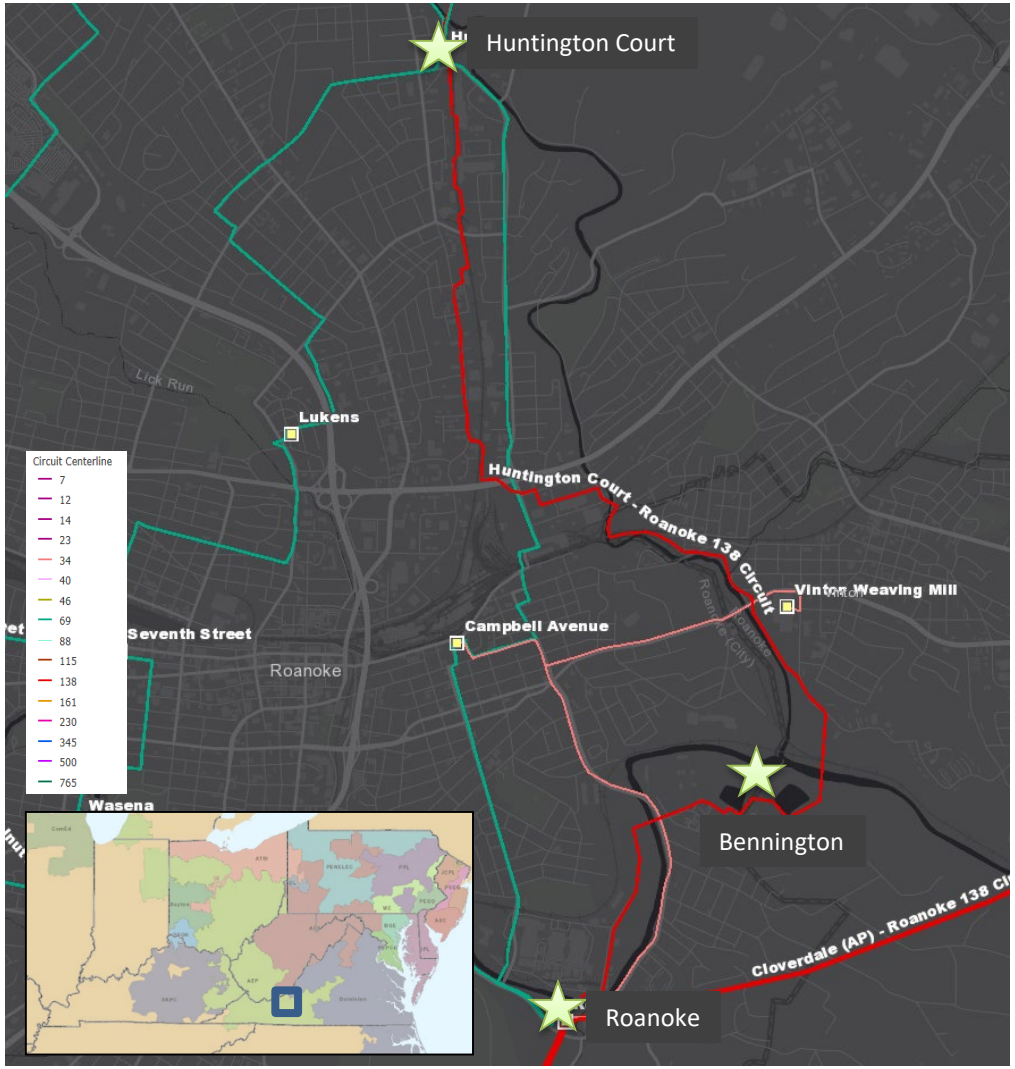
Supplemental Project Driver: Customer Service

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

Problem Statement:

Western Virginia Water Authority (WVWA) requested 138 kV transmission service from AEP to serve approximately 7 MVA. WVWA is currently served from Roanoke Station via the Niagara 12kV feeder.

Model: 2024 RTEP



AEP Transmission Zone M-3 Process
Bennington Station (Service to WVWA)

Need Number: AEP-2019-AP040

Process Stage: Solutions Meeting 10/25/2019

Proposed Solution:

Establish a new Bennington 138 kV switch station by tapping the Huntington Court-Roanoke 138 kV circuit, installing 2-138 kV line MOABs, associated controls, dead-end structure in customer station and 138 kV metering.

Estimated Cost: $0 (100% Reimbursable)

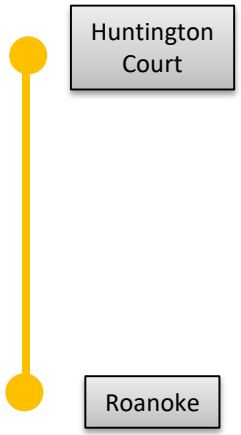
Alternatives Considered:

No additional alternatives were considered after Letter of Commitment was signed pertaining to the scope of work described above.

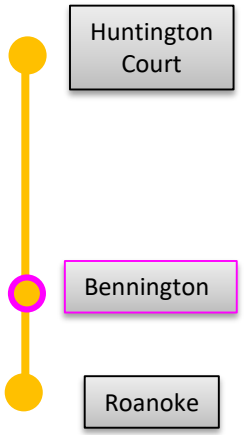
Projected In-Service: 4/20/2020

Project Status: Engineering

Existing



Proposed



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

AEP Transmission Zone: Supplemental
Hickory Creek – Main Street 34.5kV Rebuild

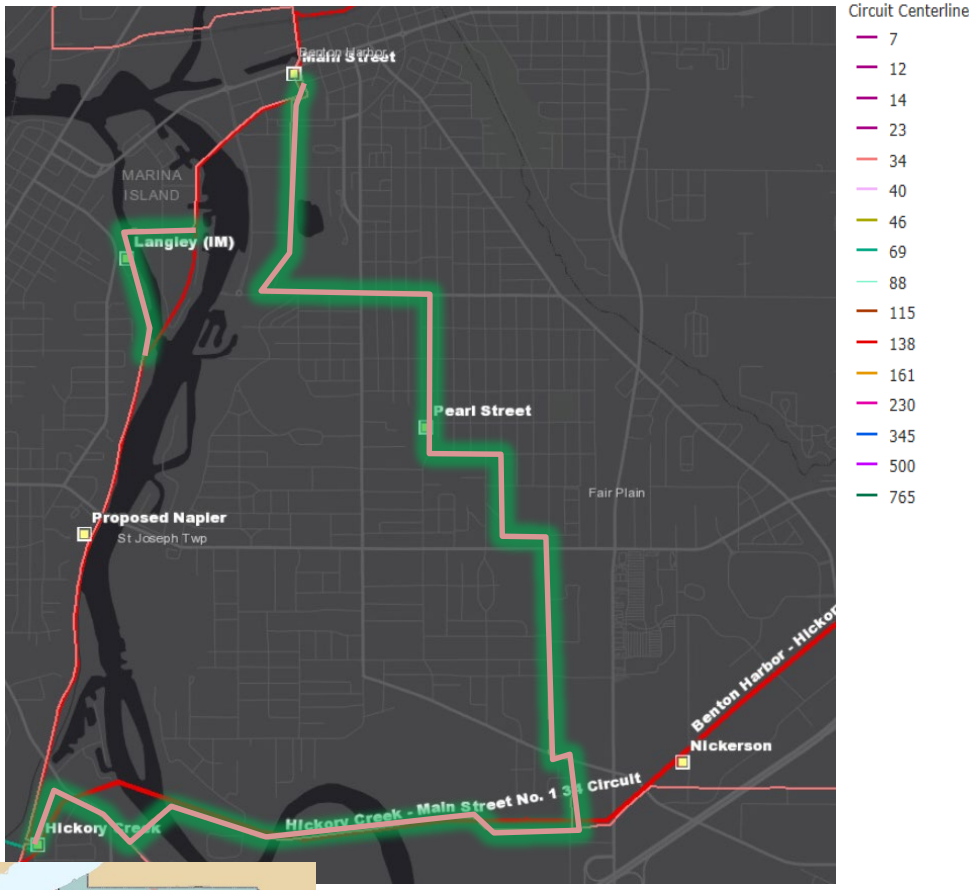
Need Number: AEP-2019-IM002
Process Stage: Solution Meeting 10/25/2019
Previously Presented: Needs Meeting 02/20/2019
Supplemental Project Driver: Equipment Condition/Performance/Risk
Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
Problem Statement:

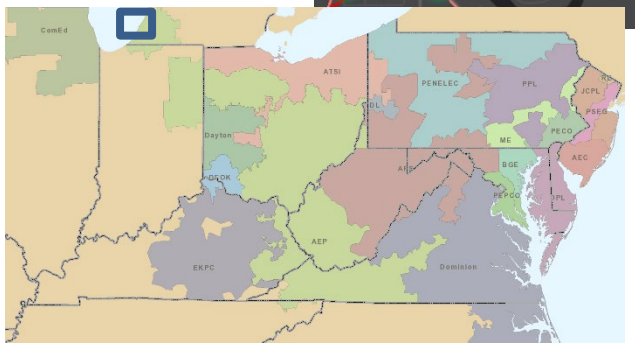
Hickory Creek – Main Street 34.5kV #1 (~6.7 Miles)

- 1950's vintage wood pole line
- There are currently 31 open conditions, future conditions are expected due to the type of construction and condition as the structures and conductor age.

Hickory Creek – Main Street 34.5kV #2 (section in question is the Langley Extension ~.5 miles)

- 1950's vintage wood pole line
- There are currently 11 open conditions on this segment of the line, future condtions are expected due to the type of construction and condition as the structures and conductor age.





AEP Transmission Zone: Supplemental
Hickory Creek – Main Street 34.5kV Rebuild

Need Number: AEP-2019-IM002
Process Stage: Solutions Meeting 10/25/2019

Proposed Solution

Rebuild 6.7 miles of the 34.5kV circuit Main Street-Hickory Creek circuit using 556 ACSR conductor.
Estimated Cost: $19.5M

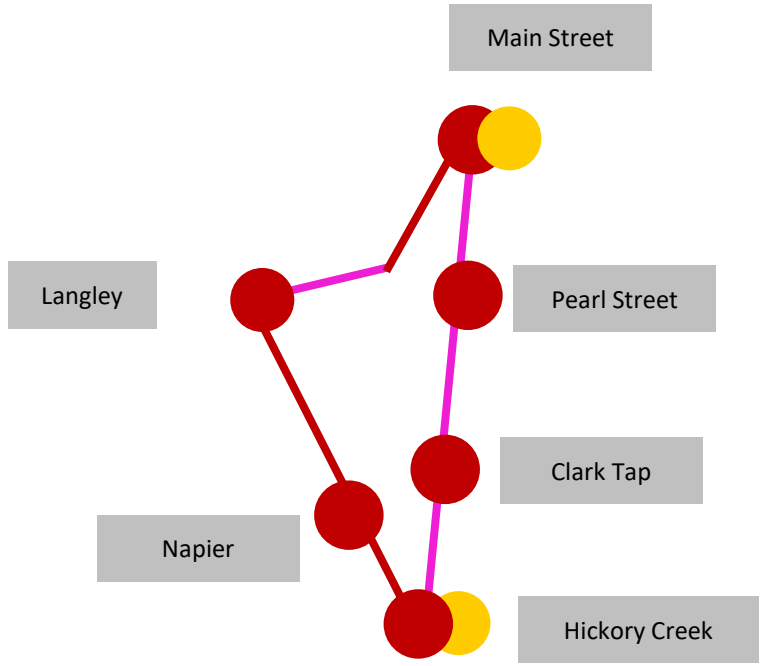
Rebuild the 0.5 miles of the Langley-Main Street 34.5kV branch starting from the Langley station using 556 ACSR conductor.
Estimated Cost: $3.0M
Total Estimated Transmission Cost: $22.5M

Alternatives Considered:
Build a ~3.5 mile 138kV in and out line from the Main Street – Hickory Creek 138kV line to pick up Pearl Street, rebuild Pearl Street at 138kV, Build a ~1 mile double circuit 138kV line from near Nickerson station to pick up Ausco station, rebuild Ausco station as 138kV and retire the Hickory Creek – Main Street 34.5kV line.

This option would cost more than the proposed solution and would involve building brand new lines (as opposed to rebuilding existing ones) through downtown Benton Harbor and over multiple rivers. This would be more costly, has the risks of requiring underground construction, and would have high community impact.

Due to these reasons, this option was not pursued.

Projected In-Service: 2/3/2023
Project Status: Scoping



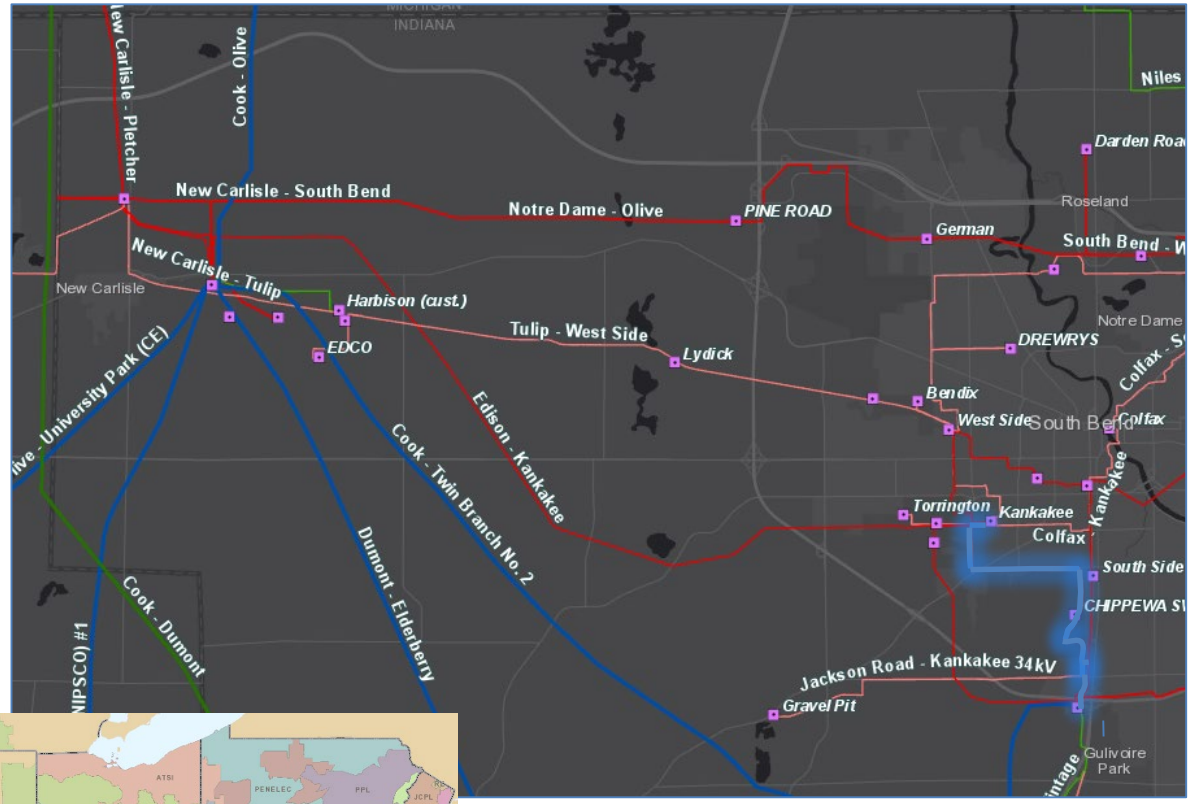
Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

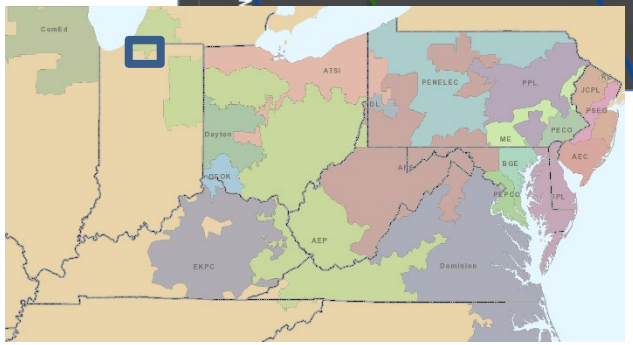
AEP Transmission Zone: Supplemental Western South Bend Area Improvements

Need Number: AEP-2019-IM007
Process Stage: Solutions Meeting 10/25/2019
Process Chronology: Needs Meeting 02/20/2019
Supplemental Project Driver: Equipment Condition/Performance/Risk
Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
Problem Statement:

Kankakee – Jackson Rd 34kV Line (~4 miles)

- 1950's wood pole line
- 88 open conditions with the majority being structure issues. Conditions are expected to increase as the poles continue to age





AEP Transmission Zone: Supplemental Western South Bend Area Improvements

Need Number: AEP-2019-IM007
Process Stage: Solutions Meeting 10/25/2019

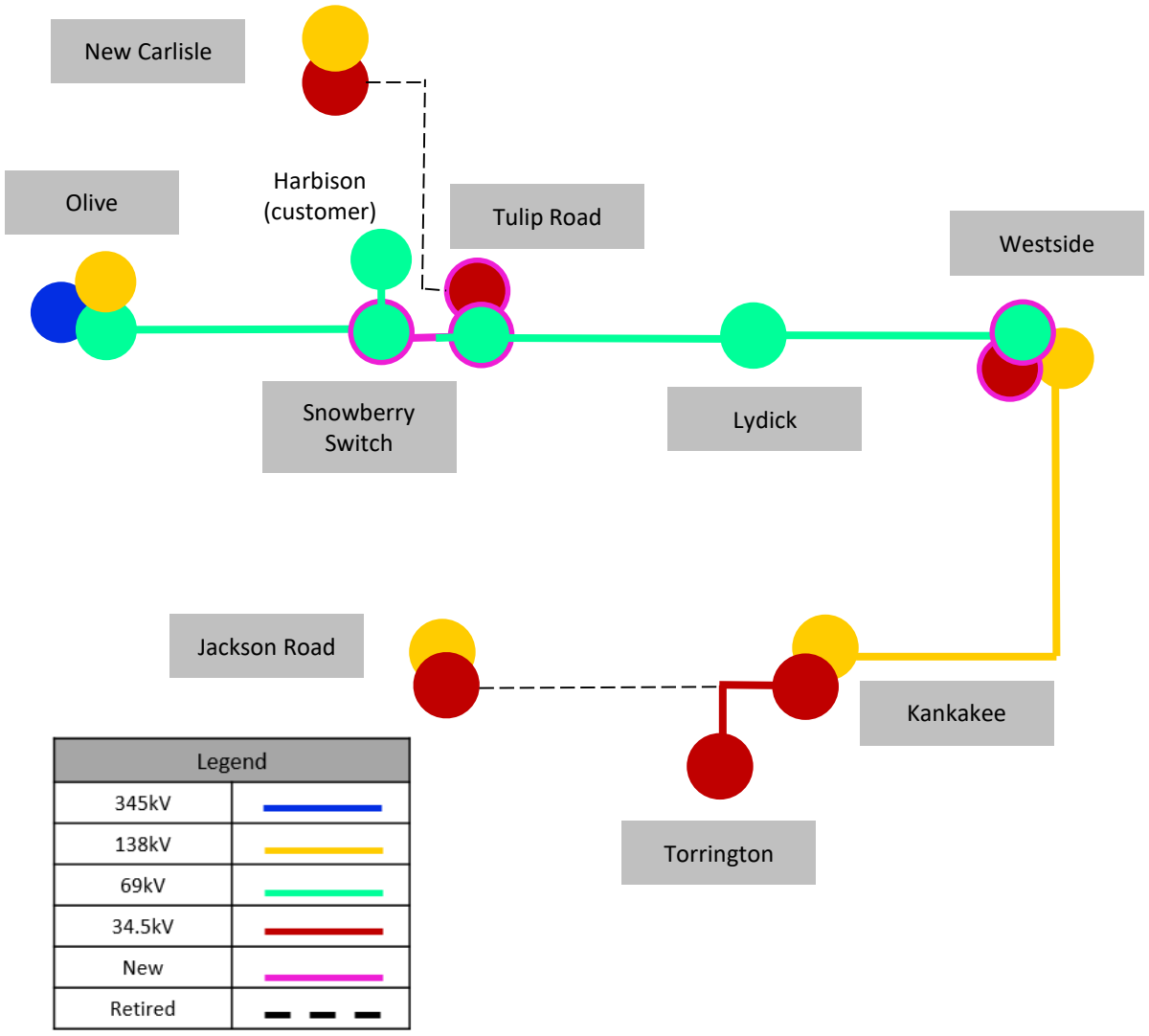
Proposed Solution

Jackson Road-Kankakee 34.5kV Circuit
Retire the 4 mile Jackson Road-Kankakee 34.5kV circuit up to Torrington tap. Torrington will continue to be fed from Kankakee station at 34.5 kV.
Estimated Cost: $1.1M

New Carlisle-Tulip 34.5kV Circuit
Retire the 4 mile New Carlisle-Tulip 34.5kV circuit
Estimated Cost: $0.8M

Snowberry Switch 69kV
Install Snowberry Switch to feed existing Harbison customer from Tulip Road-Olive 69kV line.
Estimated Cost: $1.2M

Tulip Road-Snowberry 69kV Circuit
Reconfigure 0.2 miles 69kV lines to create Tulip Road-Snowberry Switch 69kV circuit.
Estimated Cost: $0.3M



AEP Transmission Zone: Supplemental Western South Bend Area Improvements

Need Number: AEP-2019-IM007
Process Stage: Solutions Meeting 10/25/2019

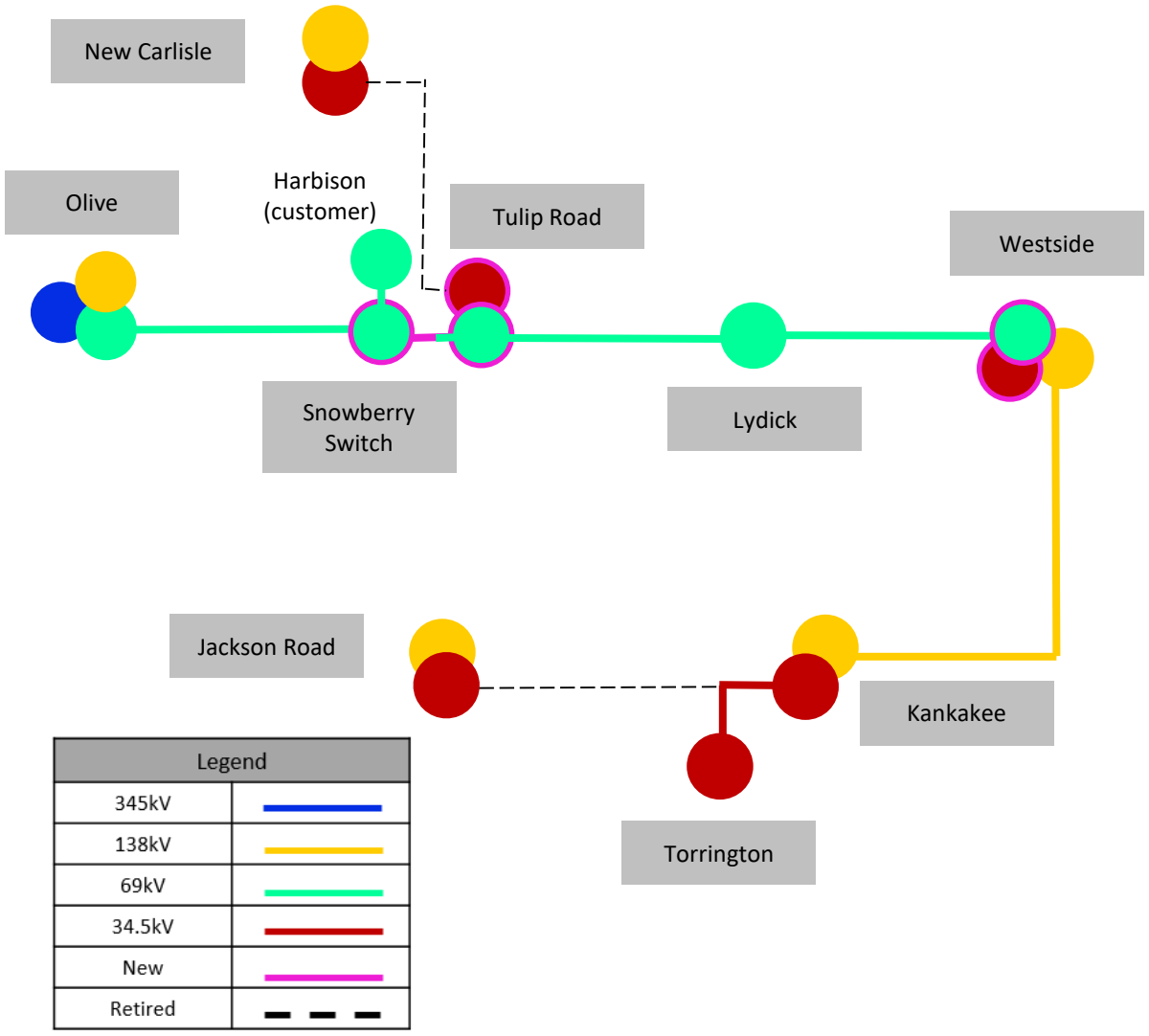
Proposed Solution

Tulip Road Station 34.5/69kV
Install a 69/34kV transformer, a 69kV circuit switcher and 2 new 34kV circuit breakers at Tulip Road to connect to customer loads
Estimated Cost: $1.8M

Westside Station 34.5/69/138kV Station
Re-terminate Lydick-Westside 34.5kV circuit and re-locate the 69kV breaker M to the 69kV bus at Westside.
Estimated Cost: $1.0M

Lydick 12/69kV Station
Replace 34.5kV rated transformer and switchgear at Lydick with 69kV
Estimated Cost: $0.0M

Total Estimated Transmission Cost: $6.2M



AEP Transmission Zone: Supplemental Western South Bend Area Improvements

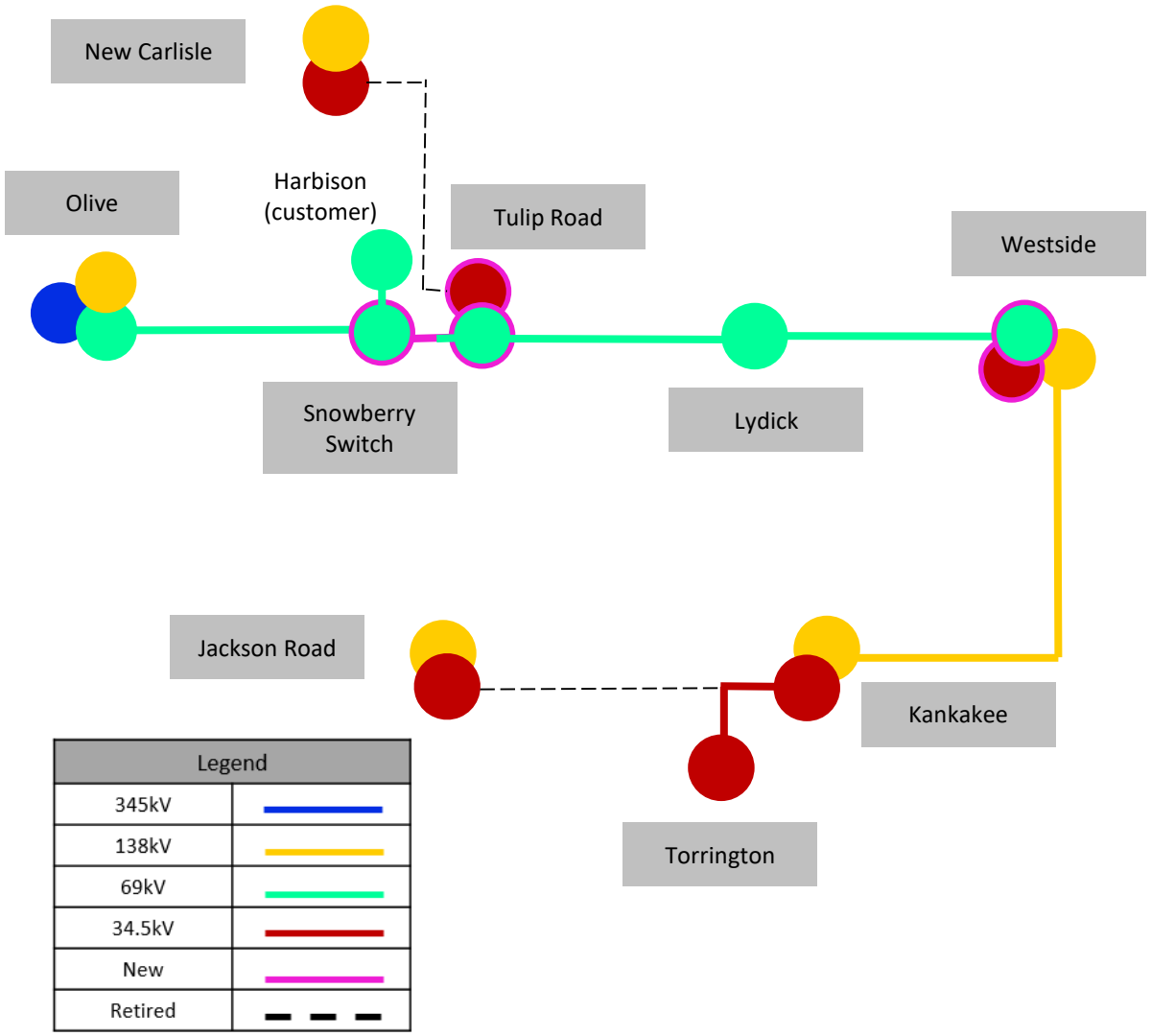
Need Number: AEP-2019-IM007
Process Stage: Solutions Meeting 10/25/2019

Ancillary Benefits:
Retiring the Jackson Road-Kankakee 34.5kV line will lead to a contingency overload on the New Carlisle-Tulip Road 34.5kV line. Instead of addressing this overload by rebuilding the New Carlisle-Tulip Road 34.5kV line, which also has condition issues, it is more cost efficient to retire the 34.5kV line and convert the area to 69kV on existing circuits. The Westside-Tulip Road and Olive-Harbison lines are already built to 69kV with Harbison and Tulip Road only 0.20 miles apart.

This also represents the preferred solution of the I&M Operating Company of AEP to eliminate undesirable drop and pick switching scenarios with area 34.5kV. This solution will not only address the Jackson Road-Kankakee 34.5kV need but will also improve reliability by bringing the area to 69kV.

Alternatives Considered:
Rebuild the 4 mile Jackson Road-Kankakee 34.5kV line and the New Carlisle –Tulip Road 34.5kV. This will also include many tower replacements where the line goes under the existing 138kV lines. This solution is more costly and does not address Operating Company switching concerns.
Cost: $15M

Projected In-Service: 03/25/2021
Project Status: Scoping

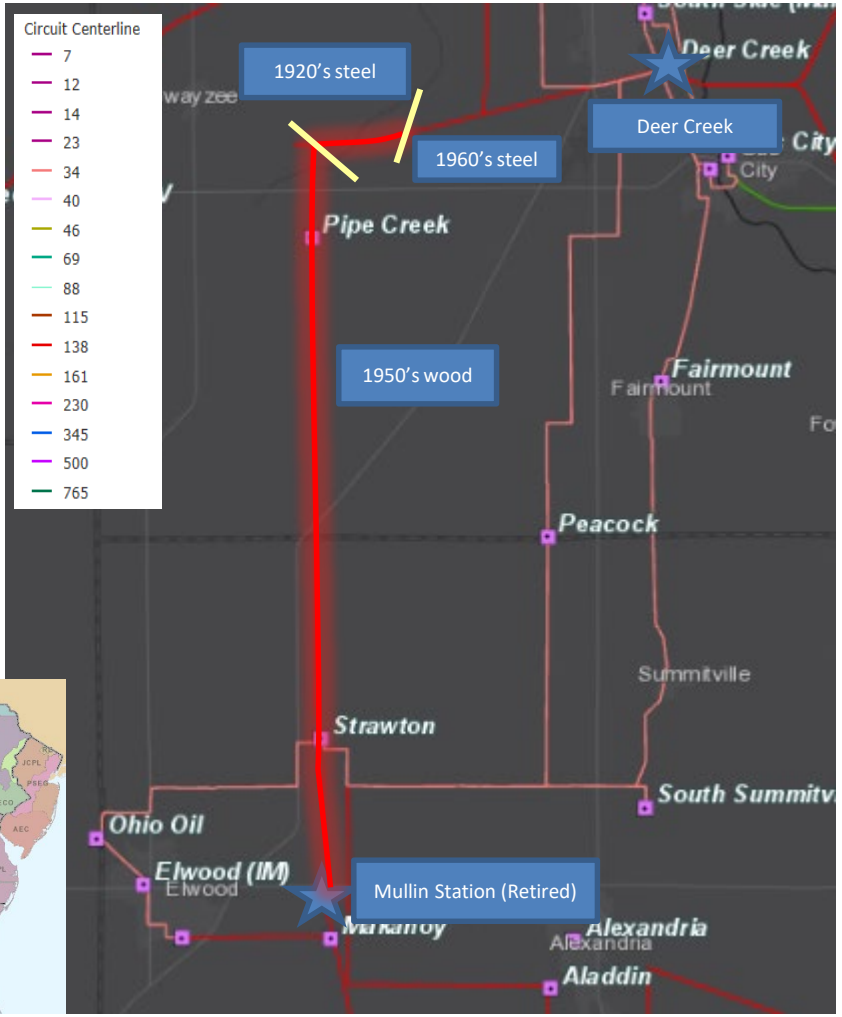


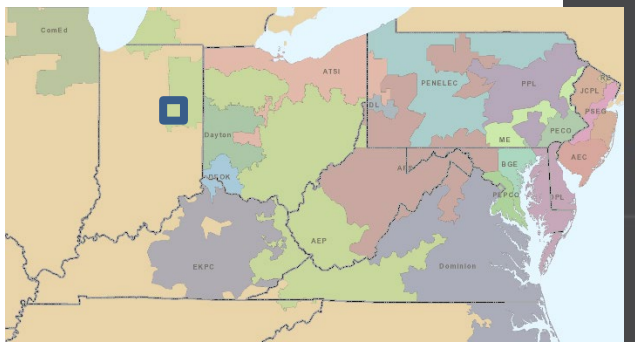
AEP Transmission Zone: Supplemental
Deer Creek – Makahoy 138kV Rebuild

Need Number: AEP-2019-IM023
Process Stage: Solution Meeting 10/25/2019
Previously Presented: Needs Meeting 06/17/2019
Supplemental Project Driver: Equipment Condition/Performance/Risk
Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
Problem Statement:

Deer Creek – Makahoy 138kV line

- ~15 miles – 1950's wood pole construction
- ~1.5 miles – 1920's steel tower construction
- 64 open conditions with the majority being structure and conductor issues
- 18 momentary outages
- 6 permanent outages over the last 10 years

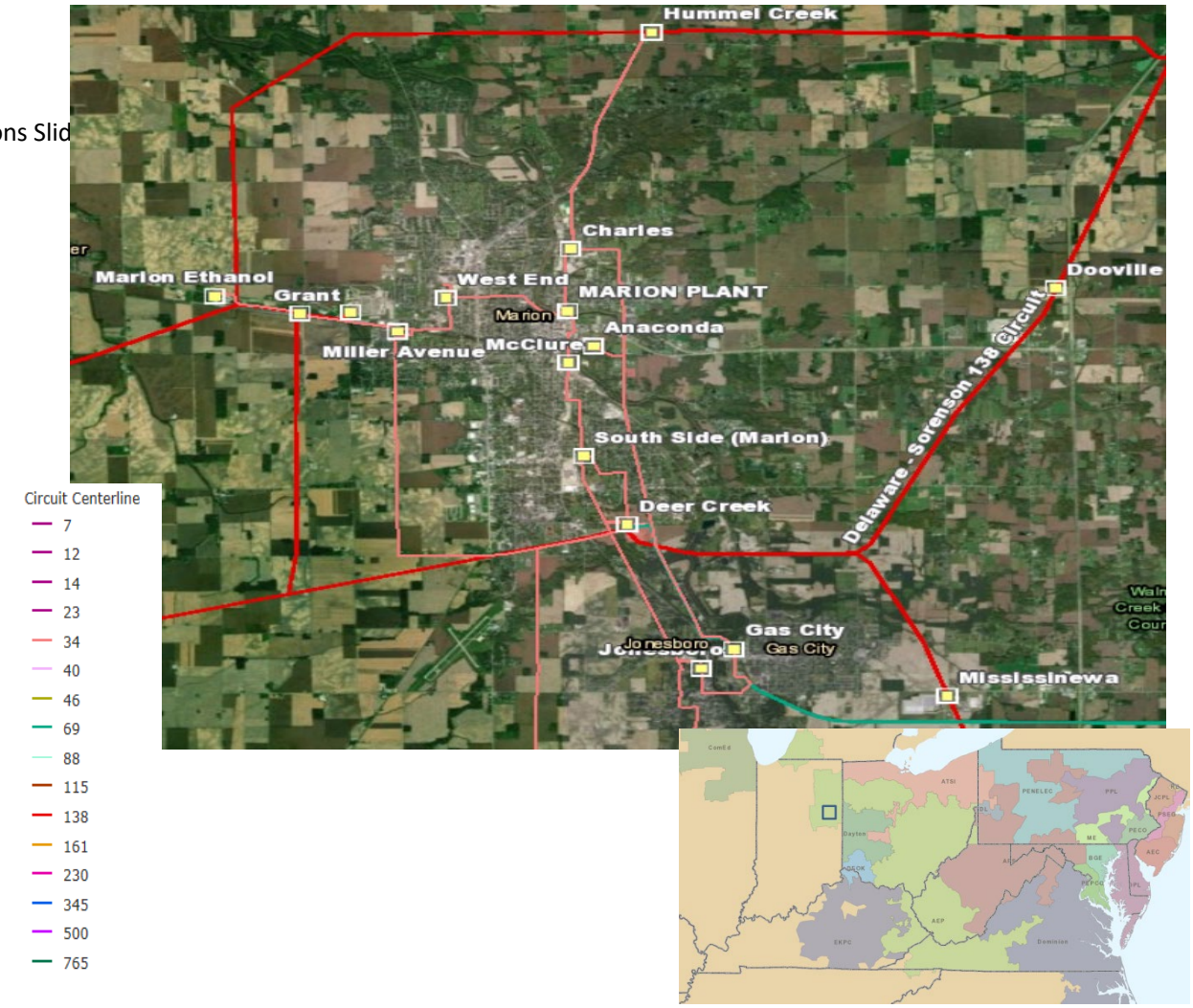




AEP Transmission Zone: Supplemental
Deer Creek – Makahoy 138kV Rebuild

Need Number: AEP-2019-IM043
Process Stage: Solution Meeting 10/25/2019
Process Chronology: Needs Meeting 1/19/2019
Supplemental Project Driver: Operational Flexibility and Efficiency
Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slid 8)
Problem Statement:
Grant Tap 138kV

- 3 terminal line outside of Grant Station.



AEP Transmission Zone: Supplemental
Deer Creek – Makahoy 138kV Rebuild

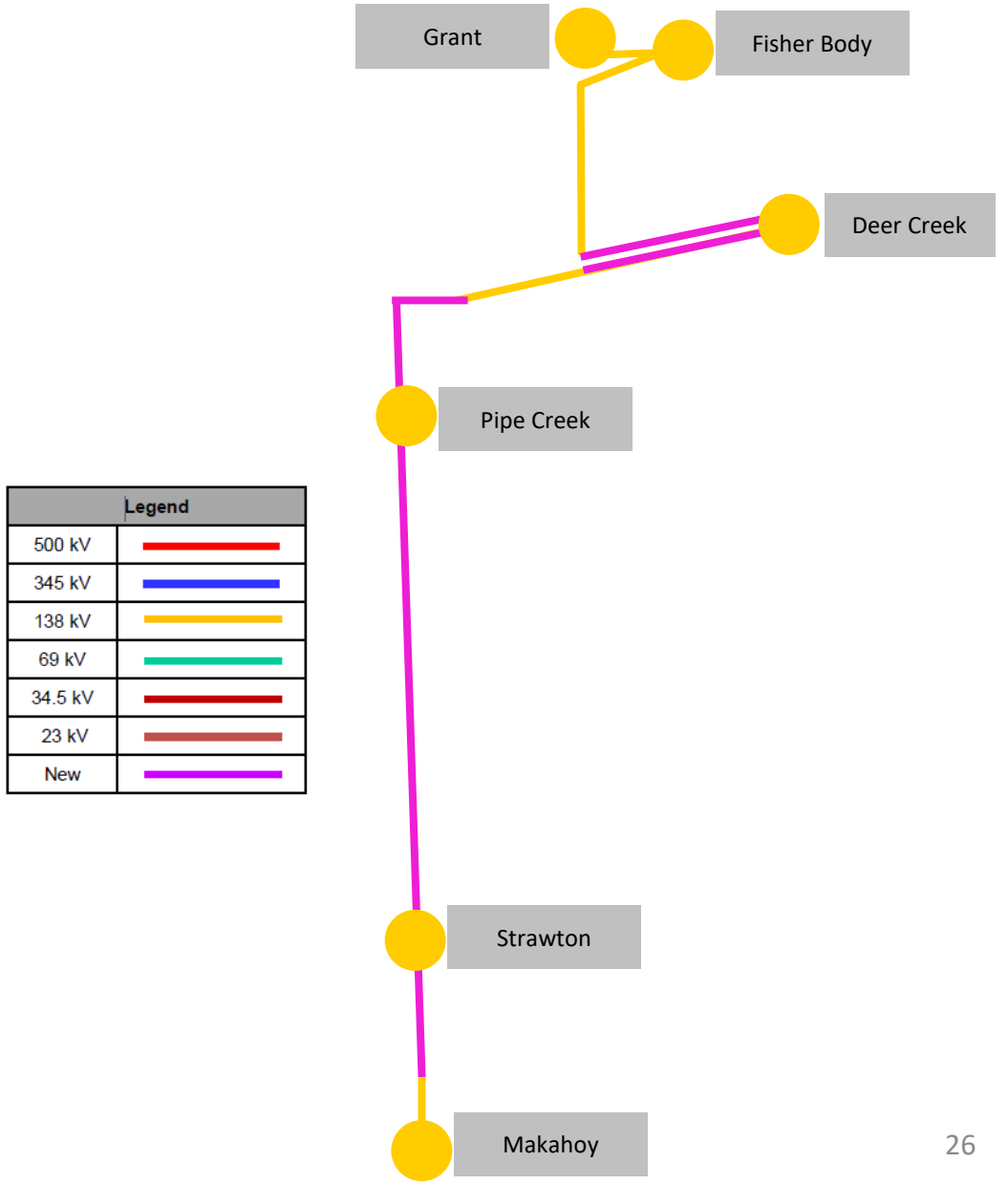
Need Numbers: AEP-2019-IM023 and AEP-2019-IM043
Process Stage: Solutions Meeting 10/25/2019

Proposed Solution:

Deer Creek – Makahoy 138kV line:
Rebuild 16.5 miles of the Deer Creek – Makahoy 138kV line using 795 ACSR Drake conductor.
Rebuild 3.9 miles of the Deer Creek – Makahoy 138kV line as double circuit using 795 ACSR Drake conductor west from Deer Creek. Operate as double circuit to allow for bringing the Grant line into Deer Creek eliminating the 3 terminal line.
Estimated Cost: $45.8M

Deer Creek Station:
Install a 138kV circuit breaker for the new line exit.
Estimated Cost: $1.3M

Total Estimated Transmission Cost: $47.1M



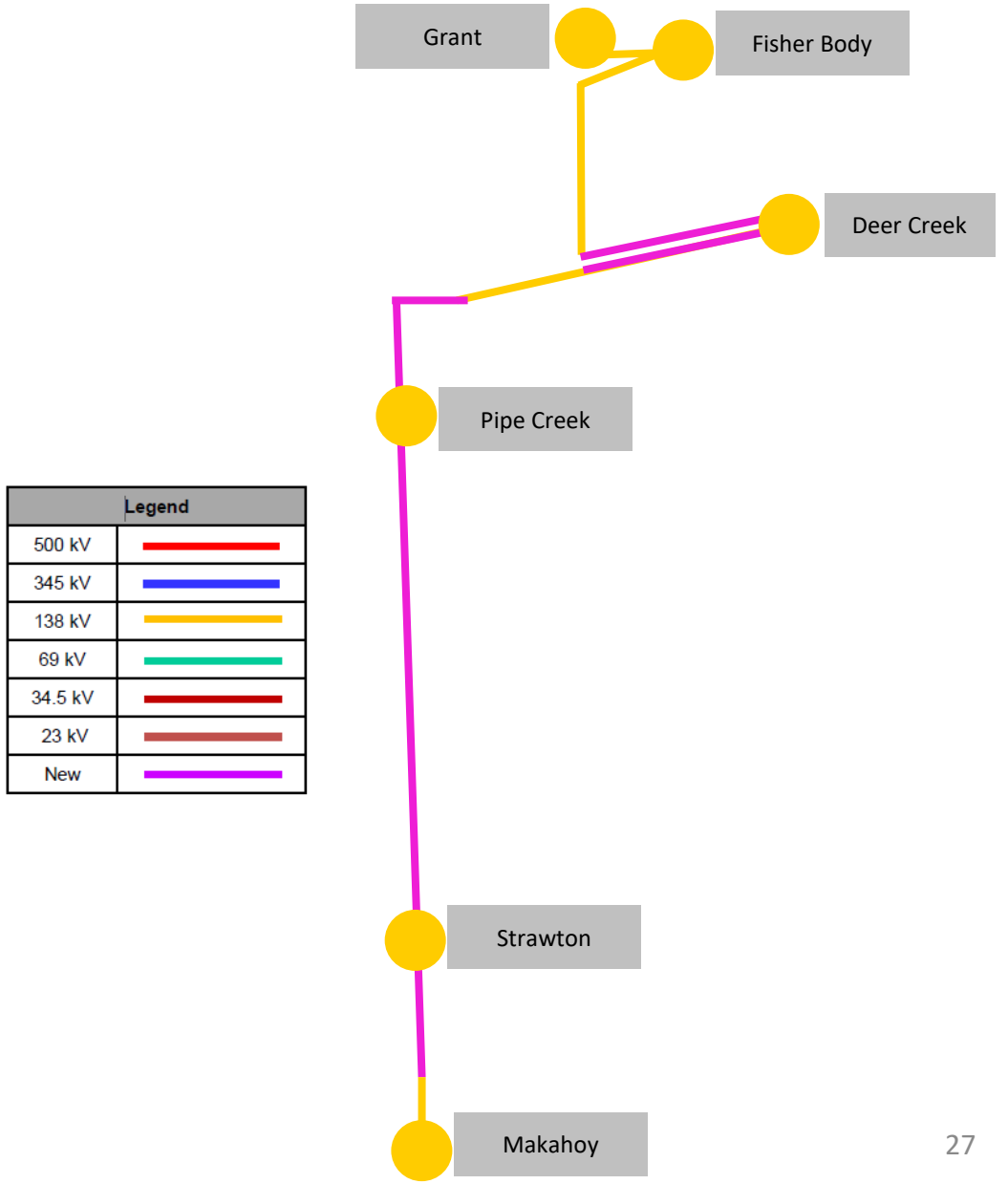
AEP Transmission Zone: Supplemental
Deer Creek – Makahoy 138kV Rebuild

Need Numbers: AEP-2019-IM023 and AEP-2019-IM043
Process Stage: Solutions Meeting 10/25/2019

Alternatives Considered:
Alternative 1:
String 3.9 miles of 138kV 556 ACSR Dove in the open position on the 138kV structures west from Deer Creek. Operate as double circuit to allow for bringing the Grant line into Deer Creek eliminating the 3 terminal line. This option is a concern since the existing towers and conductor have reached the end of life expectancy by industry standards.
Estimated Cost: $43.0M.

Alternative 2:
Building a new station with a 3 breaker ring bus configuration at the intersection between the Deer Creek - Grant – Kokomo 138kV line and the Grant 138kV Extension line (to Fisher Body) instead of utilizing a double circuit design was considered, but doesn't address the aging assets towards Deer Creek station.
Estimated Cost: $47.1M

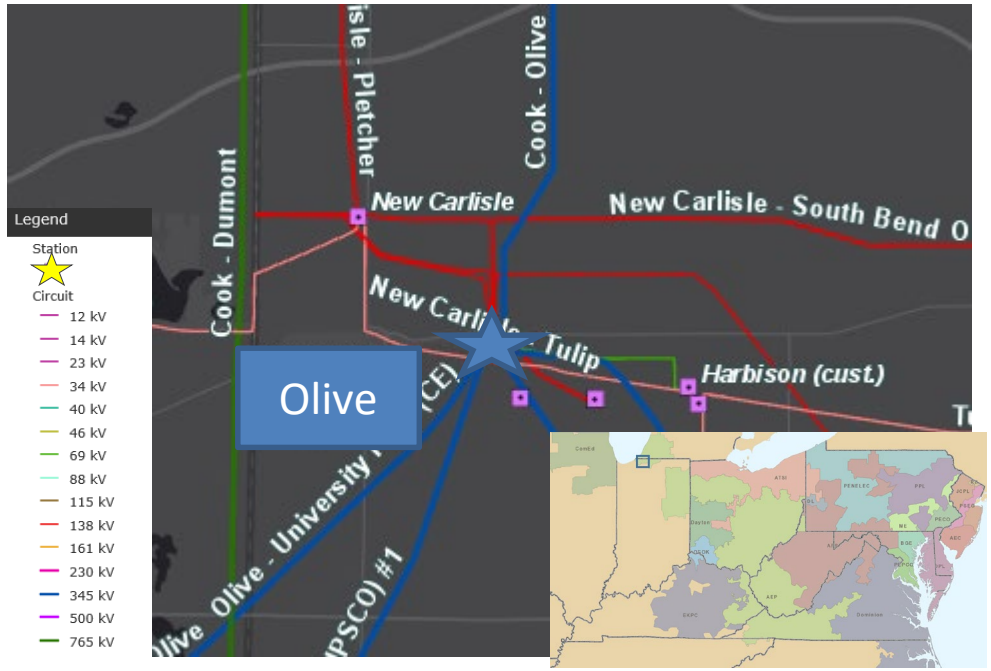
Projected In-Service: 10/01/2022
Project Status: Scoping



AEP Transmission Zone: Supplemental
NIPSCO Olive Solution

Need Number: AEP-2019-IM028
Process Stage: Solutions Meeting 10/25/2019
Process Chronology: 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 345/138/69kV station
NIPSCo has requested a new 69kv delivery point at Olive station for a ~1.5MW load.



AEP Transmission Zone: Supplemental
NIPSCO Olive Solution

Need Number: AEP-2019-IM028
Process Stage: Solutions Meeting 10/25/2019

Proposed Solution

Connect NIPSCO line to 69kV Olive Station by installing the first span and the structure from Olive and a 69kV breaker for the line.

Total Estimated Transmission Cost: $0M (Customer reimbursable)

Alternatives Considered:
No viable alternatives.

Projected In-Service: 09/14/2020
Project Status: Scoping

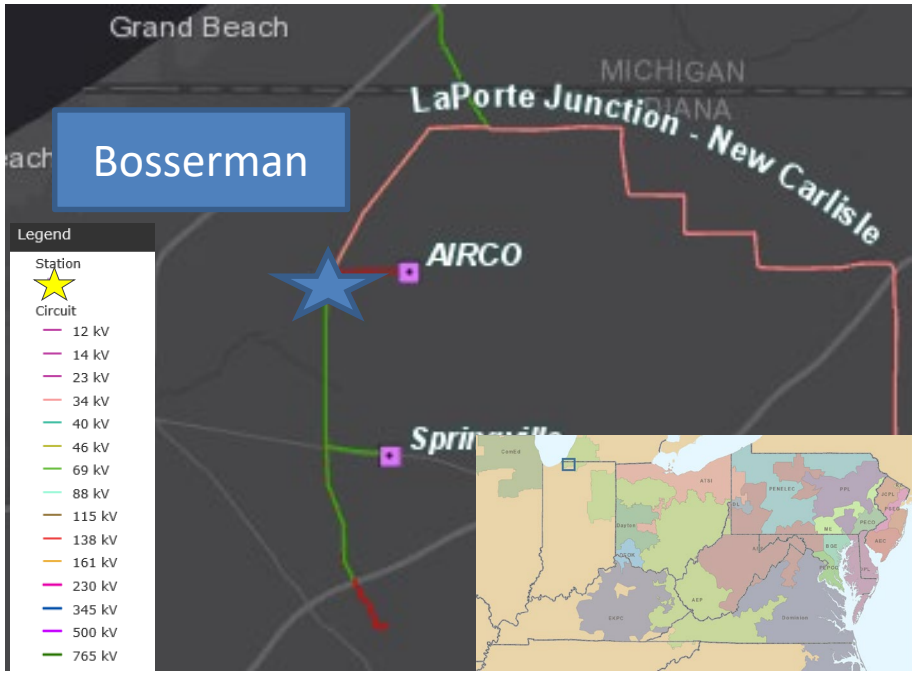
Olive

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

AEP Transmission Zone: Supplemental
NIPSCO Bosserman Solution

Need Number: AEP-2019-IM029
Process Stage: Solutions Meeting 10/25/2019
Process Chronology: 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)

Problem Statement:
Bosserman 138/69kV station:
NIPSCo has requested a new 69kV delivery point at Bosserman station for a ~1.5MW load.



AEP Transmission Zone: Supplemental NIPSCO Bosserman Solution

Need Number: AEP-2019-IM029
Process Stage: Solutions Meeting 10/25/2019

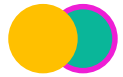
Proposed Solution

Connect NIPSCO line to 69kV Bosserman Station by installing the first span and the structure from Bosserman and a 69kV breaker for the line.

Total Estimated Transmission Cost: $0M (Customer reimbursable)

Alternatives Considered:
No viable alternatives.

Projected In-Service: 09/14/2020
Project Status: Scoping

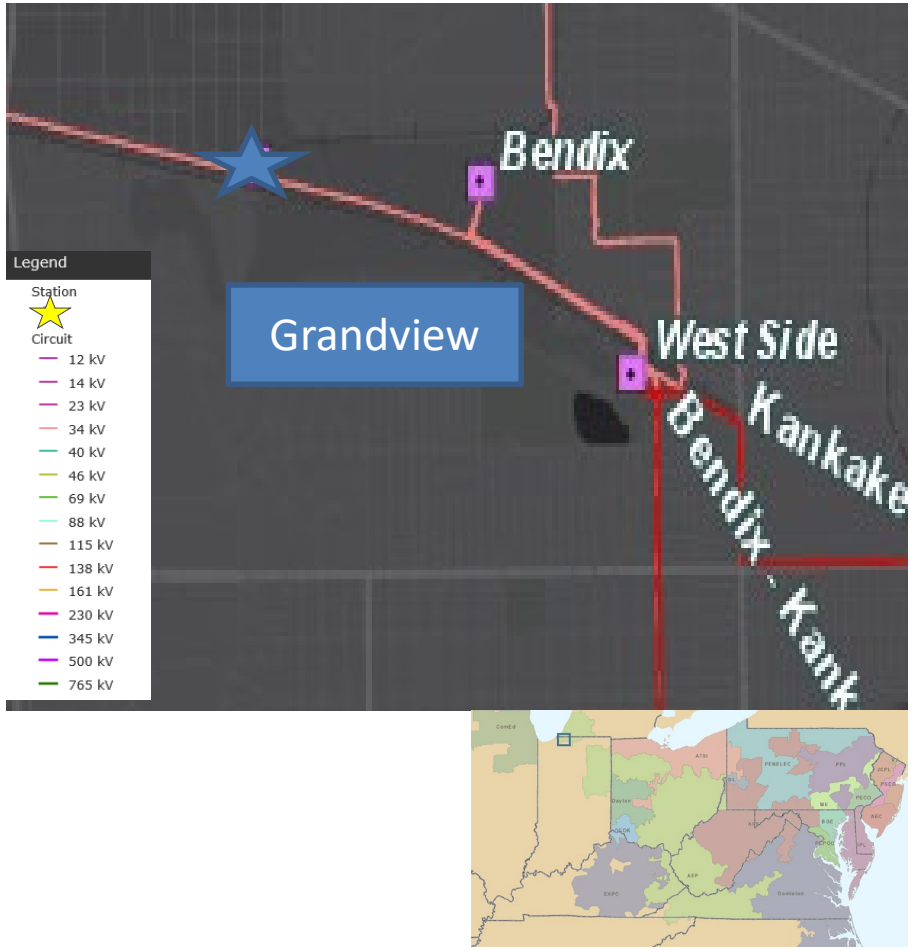


Bosserman

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

Need Number: AEP-2019-IM032
Process Stage: Solutions Meeting 10/25/2019
Process Chronology: 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)

Problem Statement:
Bendix – West Side 34.5kV line
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.



AEP Transmission Zone: Supplemental Nipsco Bendix Solution

Need Number: AEP-2019-IM032
Process Stage: Solutions Meeting 10/25/2019

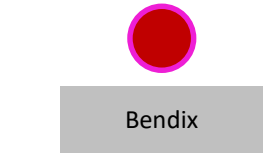
Proposed Solution

Install a three way phase-over-phase switch at Bendix station and associated line work to connect the new switch.

Total Estimated Transmission Cost: $0M (Reimbursable)

Alternatives Considered:
No viable alternatives.

Projected In-Service: 09/27/2020
Project Status: Scoping



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

AEP Transmission Zone M-3 Process
Moundsville Customer Service

Need Number: AEP-2019-OH006

Process Stage: Solutions Meeting 10/25/19

Previously Presented: Needs Meeting 03/28/19

Supplemental Project Driver: Customer Service

Specific Assumption References:

AEP Guidelines for Transmission Owner Identified Needs

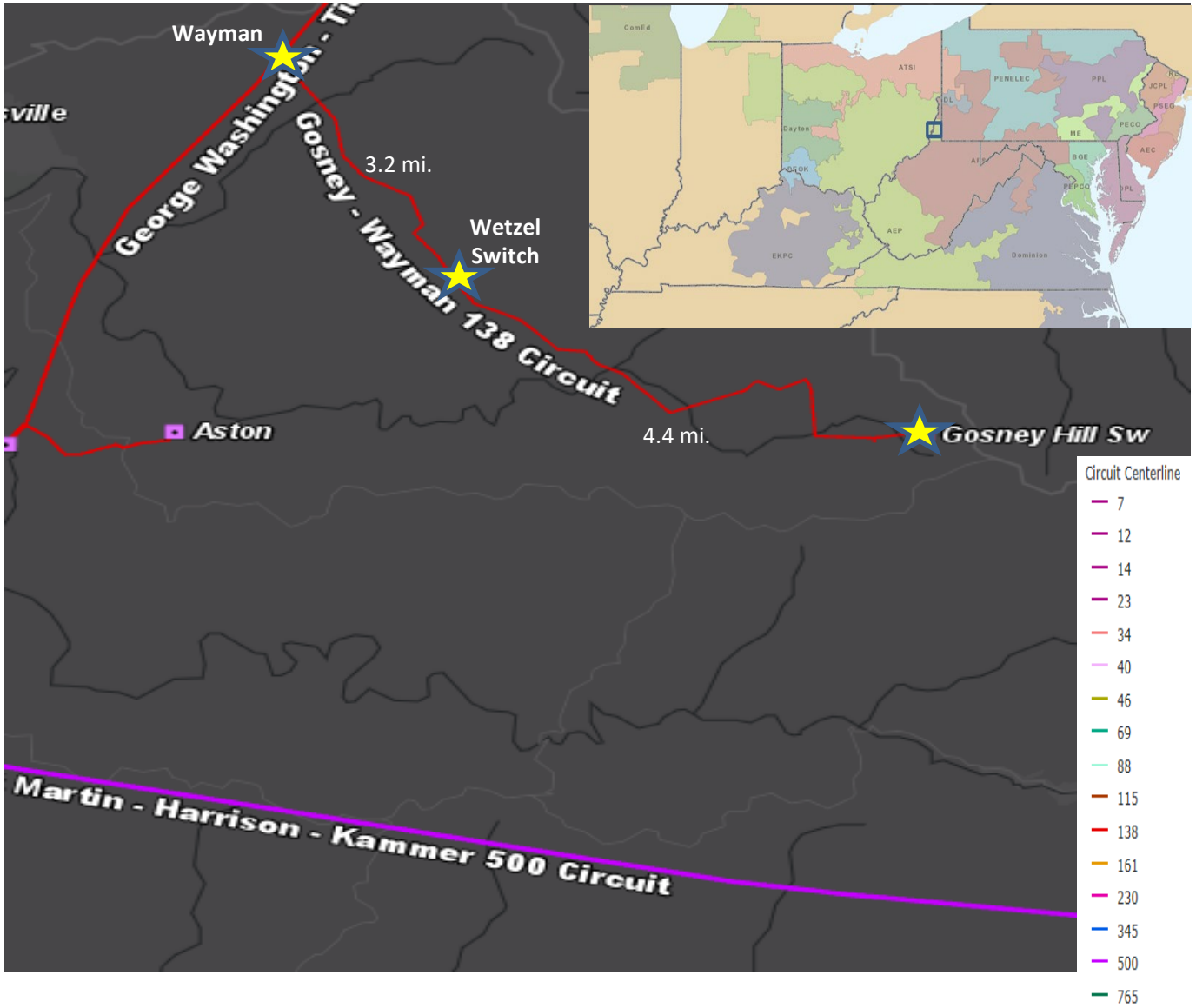
(AEP Assumptions Slide 7)

Problem Statement:

A customer has requested new service four miles east of Moundsville, West Virginia. The forecasted peak demand is 20 MVA.

Model:

2024 PJM RTEP



AEP Transmission Zone M-3 Process
Moundsville Customer Service

Need Number: AEP-2019-OH006

Process Stage: Solutions Meeting 10/25/2019

Proposed Solution:

- Tap the Wayman-Gosney Hill 138kV circuit near structure #20 and extend a 0.1-mile radial tap to the customer station. Utilize 477 ACSR conductor, single-circuit, for the radial portion. **Estimated Cost: $0.6 M**
- Modify the 138kV Wayman-Gosney transmission line on both sides of Wetzel Switch to accommodate the new 3-way switch. **Estimated Cost: $0.4 M**
- Construct a new 138kV 3-way MOAB switch called Wetzel Switch. The switch shall have SCADA functionality. The switch toward Gosney Hill will have auto-sectionalizing protection. **Estimated Cost: $0.7 M**
- Install 138kV revenue metering outside of the customer station. **Estimated Cost: $0.4 M**

Total Estimated Transmission Cost: $2.1 M

Ancillary Benefits: The new SCADA data points will improve operational capability in the area, by increasing situational awareness.

Alternatives Considered: No viable alternatives. This load cannot be served from local distribution facilities.

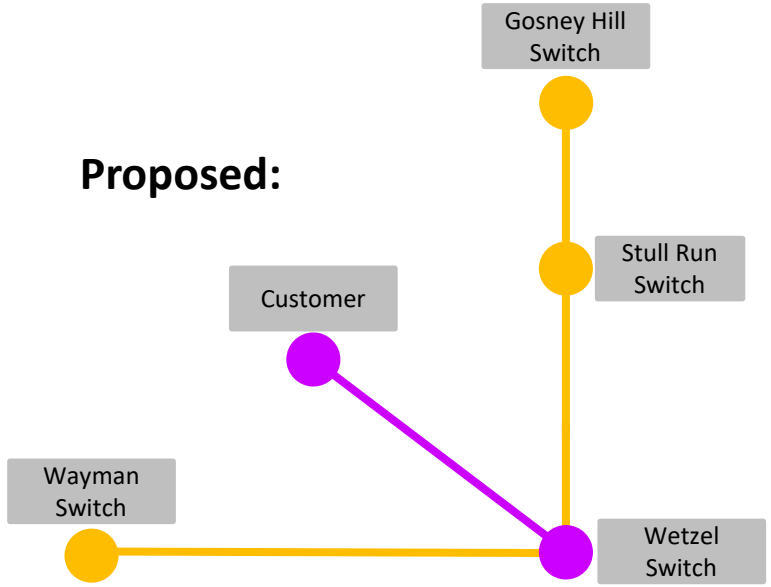
Projected In-Service: 6/19/2020

Project Status: Scoping

Existing:

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

Proposed:



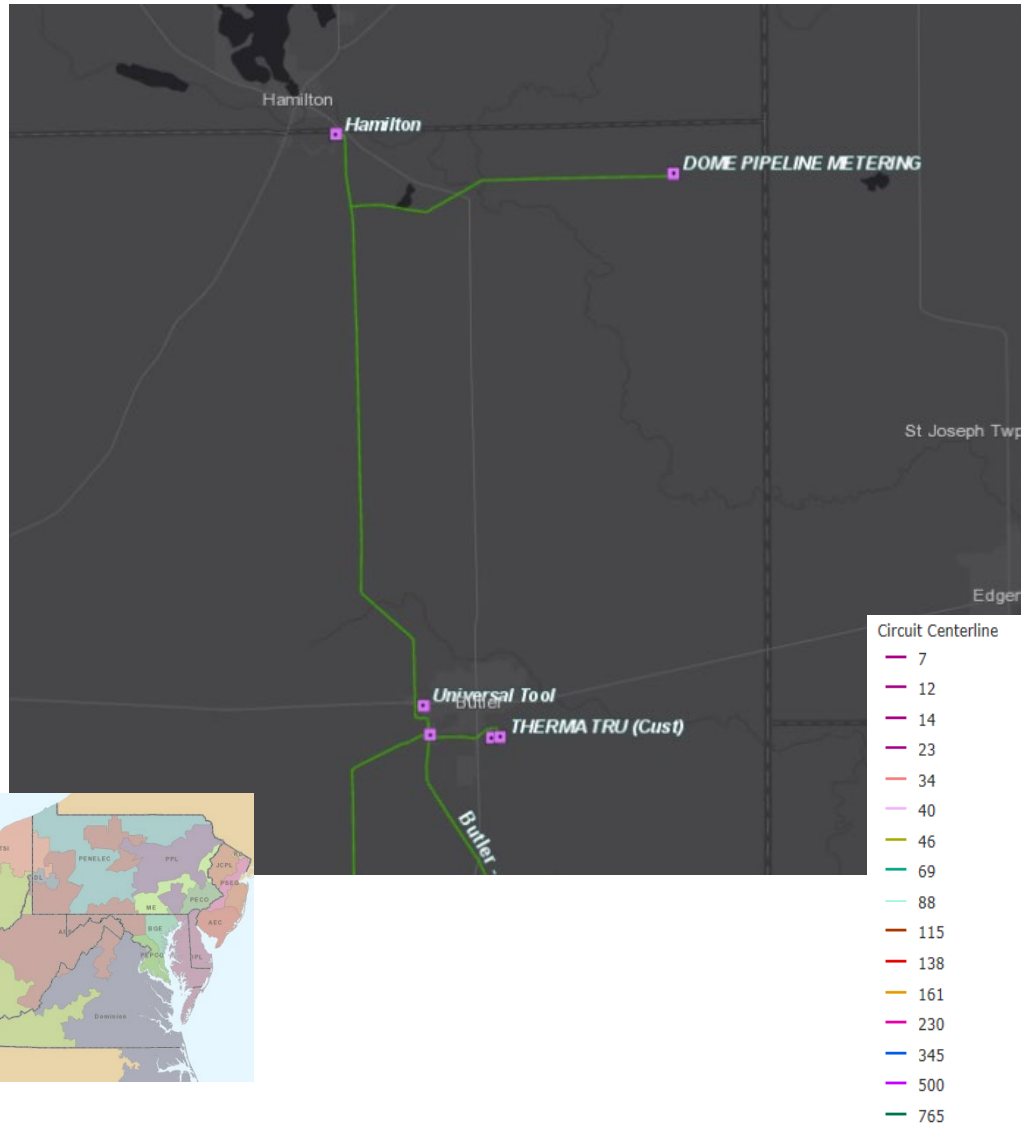
AEP Transmission Zone M-3 Process
Hamilton Area Improvements, Indiana

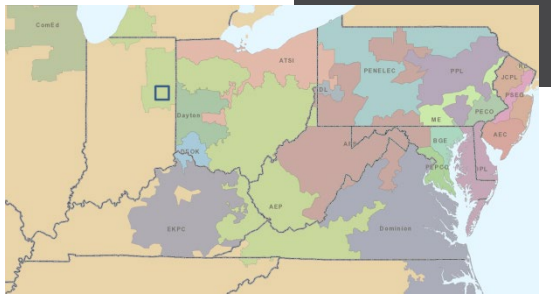
Need Number: AEP-2019-IM006
Process Stage: Solutions Meeting 10/25/2019
Previously Presented: Needs Meeting 02/20/2019
Supplemental Project Driver: Equipment Condition/Performance/Risk
Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
Problem Statement:

The load at Hamilton is 9.19 MW and its radially served from Butler station via a 7.74 miles long line. In addition to this there are significant open and closed conditions on the Butler – Hamilton 69kV Line.

Butler – Hamilton 69kV Line
- 1956 vintage wood pole line.
- 33 open conditions with the majority being structure issues.
- CMI – 5,268,522

Dome Tap 69kV Line
- 1978 vintage wood pole line.
- 14 open conditions with the majority being structural issues.





AEP Transmission Zone M-3 Process
Hamilton Area Improvements, Indiana

Need Number: AEP-2019-IM006

Process Stage: Solutions Meeting 10/25/2019

Proposed Solution:

Rebuild 0.15 miles Butler – Basket Factory Sw 69kV Section and rebuild 7.2 miles Basket Factory – Hamilton 69kV Section with 556 ACSR. **Estimated Cost: $14.3M**

Install 1.6 mile long greenfield line on the Hamilton – Muskrat Sw 69kV Section to loop Hamilton and replace roughly 0.8 miles of poles with woodpecker holes on the Hamilton – Muskrat Sw 69kV Section with 556 ACSR. **Estimated Cost: $2.9M**

Install 8.37 mile long greenfield line with 556 ACSR from Federal Sw to Muskrat Sw to provide two way service to University Tool, Hamilton and Dome Stations. **Estimated Cost: $13.0M**

Install a 0.04 mile long greenfield line with 556 ACSR to eliminate the hard tap on the Butler – Hicksville Junction 138kV Line. **Estimated Cost: $0.4M**

Relocate the line entrance at Butler Station. **Estimated Cost: $0.6M**

At Butler station, install (3) 69kV breakers and (2) Cap Banks to accommodate the line loops. **Estimated Cost: $5.5M**

Install 69kV phase over phase switch outside Universal Tool called Basket Factory Switch. **Estimated Cost: $0.5M**

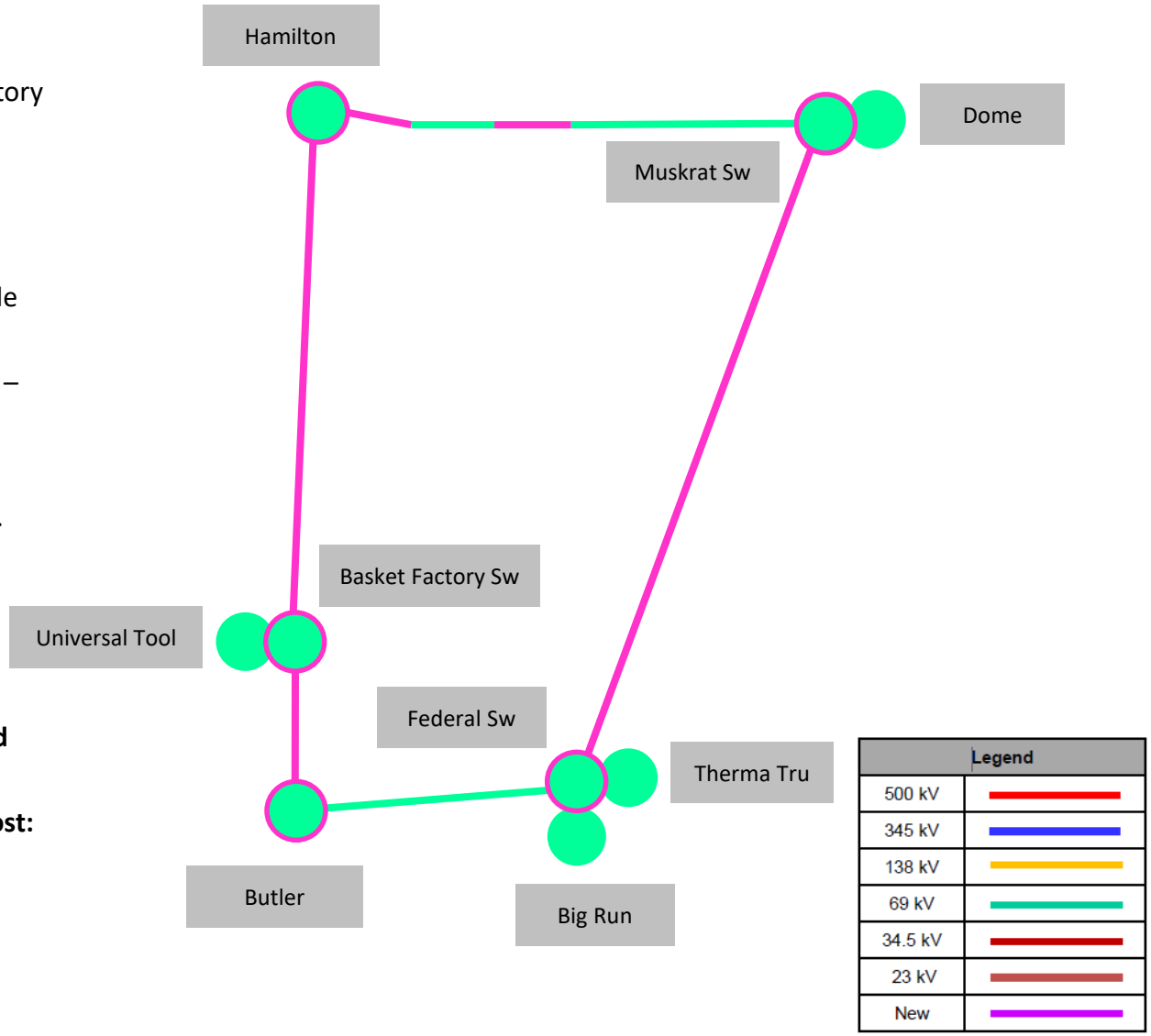
At Hamilton station, install (1) line MOAB and (1) line breaker. **Estimated Cost: $2.7M**

Install 69kV phase over phase switch outside Dome station called Muskrat Switch. **Estimated Cost: $0.3M**

Install 69kV phase over phase switch outside Therma Tru called Federal Switch **Estimated Cost: $0.6M**

Remove Metcalf tap from the Butler-North Hicksville line and reconnect the through path. **Estimated Cost: $1.0M**

Remote end relay upgrades at North Hicksville. **Estimated Cost: $1.0M**



AEP Transmission Zone M-3 Process
Hamilton Area Improvements, Indiana

Need Number: AEP-2019-IM006

Process Stage: Solutions Meeting 10/25/2019

Ancillary Benefit:
As an added benefit, Metcalf tap will be looped.

Alternatives Considered:

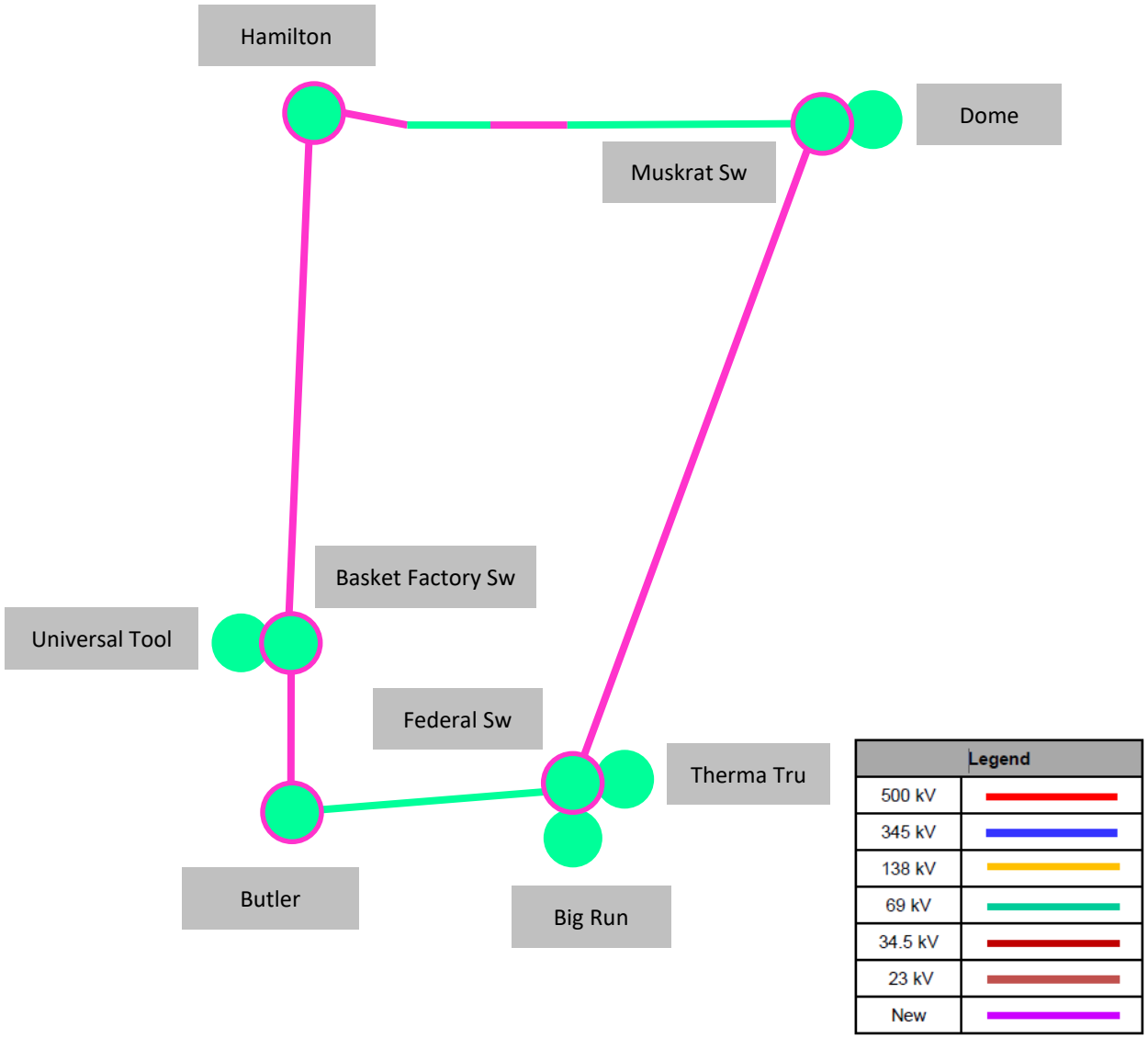
Rebuilding Butler – Hamilton 69kV Line and the Dome Tap 69kV Line as a double circuit single tower line which can now provide two way service, but damage to the structure during storm or scheduled maintenance on the line would will still disrupt the power to the customer.

Total Estimated Cost: $42.62 M

Projected In-Service: 06/22/2022

Project Status: Scoping

Note: There is a Supplemental Solution already submitted at Butler station to replace 1 69kV breaker, install 2 69kV breakers and replace the 2 69kV cap banks. That solution covers the costs of three 69kV breakers and the 69kV cap banks, but they will be coordinated with this solution:
Upgrade ID - s1590.



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

10/15/2019 – V1 – Original version posted to pjm.com

10/21/2019 – V2 – Slide #4: Updated momentary outage count

– Slide #5: Corrected the driver

10/22/2019 – V3 – Slide #12: Added location map

10/28/2019 – V4 – Slide #16: Added current WVWA load serve information