# Western Sub Regional RTEP:
# AEP Supplemental Projects

March 17, 2023

# 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
# Huntington, WV

**Need Number:** AEP-2023-AP008

**Process Stage:** Need Meeting 03/17/2023

**Project Driver:** Equipment Condition/Performance/Risk

**Specific Assumption Reference:**

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

**Problem Statement:**

**Line Name: Darrah – Owens Illinois Double Circuit Line**

Original Install Date (Age): 1954

Length of Line: 4.49 mi

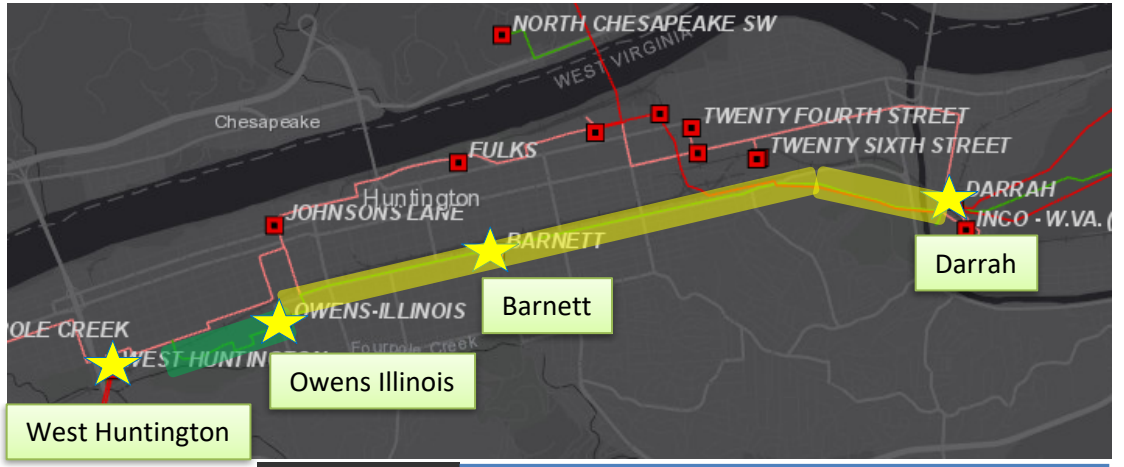
Total Structure Count: 123

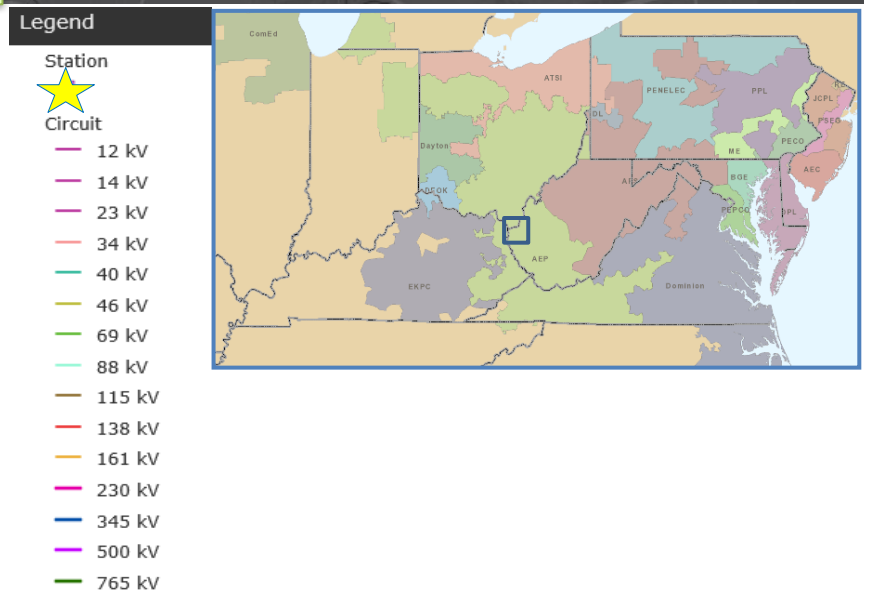
Original Line Construction Type: Wood, Steel, Lattice Steel

Conductor Type: 4/0 Copper 7, 4/0 ACSR 6/1, 1/0 Copper 7

Line Conditions:

- Currently, there are 72 structures with at least one open condition, which relates to 59% of the structures on the line. There are currently 201 structure related open conditions affecting crossarms, poles, and knee/vee braces including rot top, split, rot heart, damaged, rot shell, woodpecker, cracked, rot pocket, bowed, and broken causes. There are currently 69 shielding related open conditions affecting ground lead wires and shield wires including missing, stolen, broken and damaged causes. There are currently 22 hardware related open conditions affecting insulators, conductor hardware, and static brackets including burnt, broken, corroded, chipped, missing bolt, rust, and rust heavy causes. There are currently two forestry related open condition including a hazard tree and vines causes.



# AEP Transmission Zone M-3 Process
# Huntington, WV

**Line Name: Owens Illinois – West Huntington 69 kV Line**

Original Install Date (Age): 1945

Length of Line: 0.91

Total Structure Count: 25

Original Line Construction Type: Wood, Lattice Steel

Conductor Type: 556,500 CM ACSR 18/1

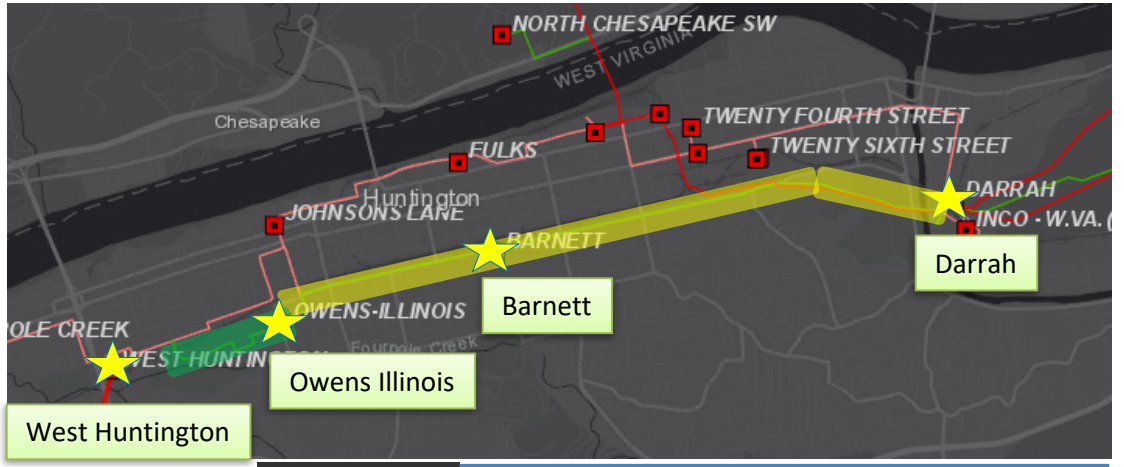
Line Conditions:

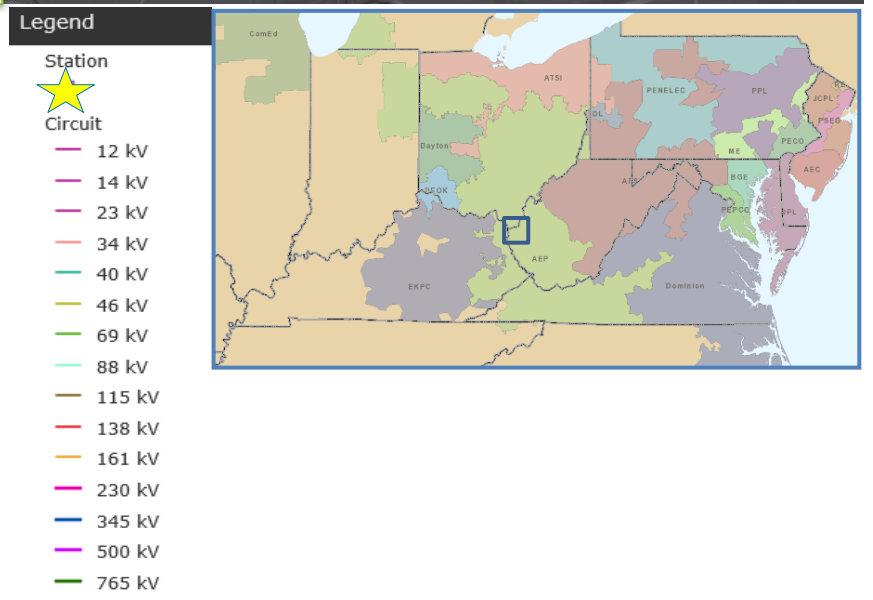
- Currently, there are 15 structures with at least one open structural condition, which relates to 60% of the structures on the line. There are currently 44 structure related open conditions specifically affecting crossarms and poles including rot top, rot heart, rot shell and rot pocket. There are currently 6 hardware related open conditions affecting guys, bayonets, and insulators including split, rust, burnt, and damaged. There are currently 41 shielding related open conditions affecting shield wires and ground lead wires including broken, damaged, missing, and stolen.

Momentary/Permanent Outages: 3 Momentary, 5 Permanent

Circuit Performance:

- Since 2017, there have been 3 momentary and 4 permanent outages on the Darrah – West Huntington 69kV Circuit. The 3 momentary outages were due to lightning and wind causes. The 4 permanent outages were due to lightning, vegetation fall-in from outside the AEP ROW, and line equipment crossarm failure causes. The permanent outages caused 8.59M minutes of interruption for customers. There has been 1 permanent outage on the Darrah – Johnsons Lane 34.5kV Circuit. The permanent outage caused 59.4 hours of total circuit outage time but no CMI to the customers on the 34.5 kV side due to a separate source into Johnsons Lane.

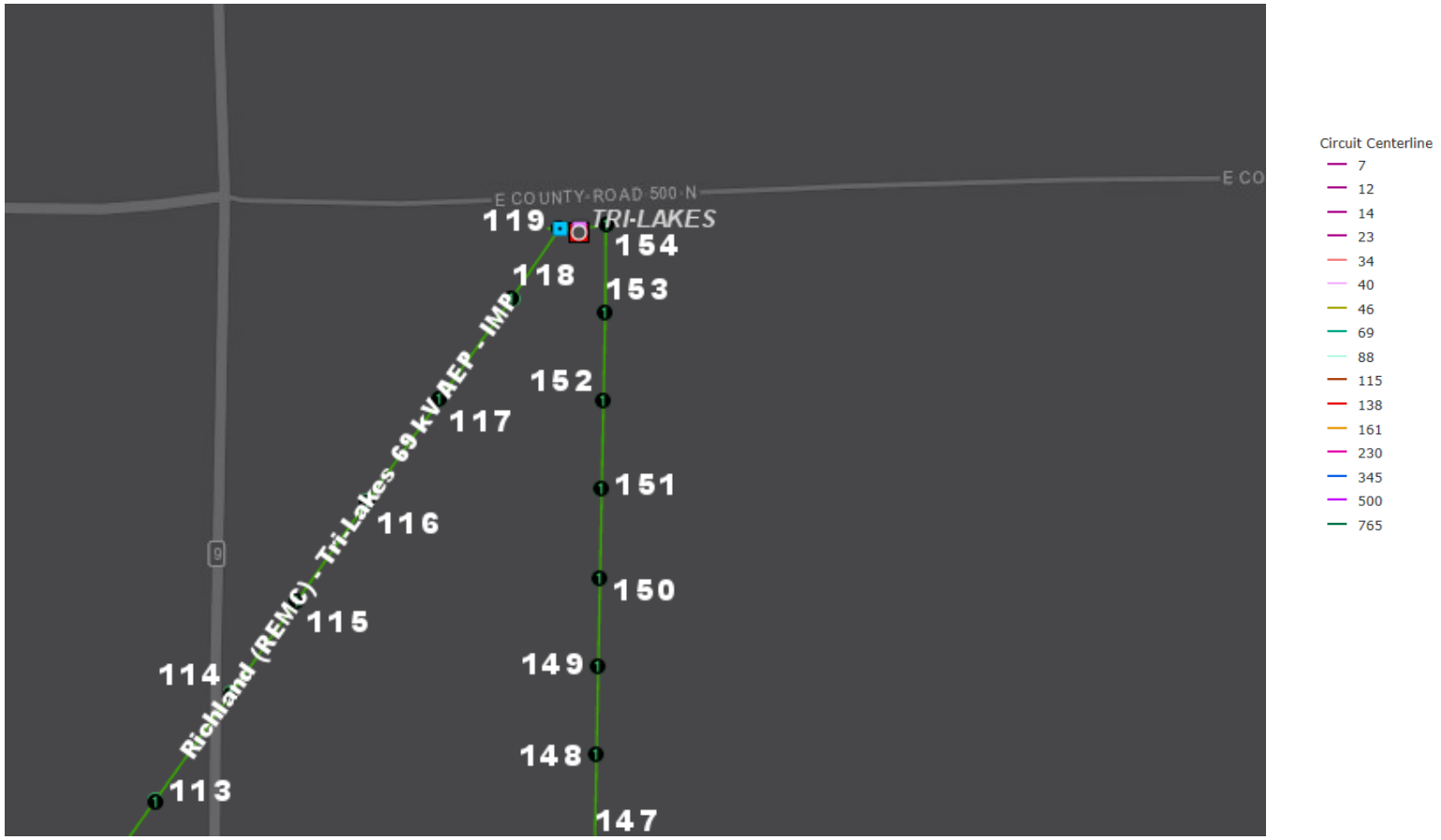


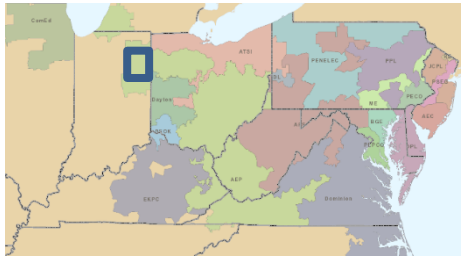



**Need Number:** AEP-2023-IM007
**Process Stage:** Needs Meeting: 03/17/2023
**Supplemental Project Driver:** Customer Need
**Specific Assumption Reference:** AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)
**Model:** 2027 RTEP
**Problem Statement:**

**Tri-Lakes 69kV Station**

I&M Distribution has requested a new delivery point or reconnection at Tri-Lakes as they plan to rebuild their station to address asset renewal needs.



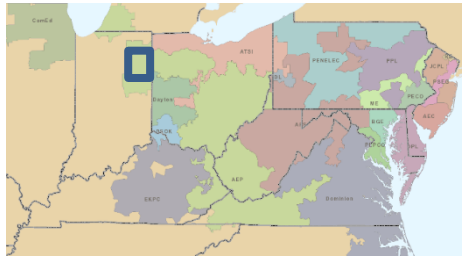



# AEP Transmission Zone M-3 Process
# Allen County, Indiana

**Need Number:** AEP-2023-IM008
**Process Stage:** Needs Meeting: 03/17/2023
**Supplemental Project Driver:** Customer Need
**Specific Assumption Reference:** AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)
**Model:** 2027 RTEP
**Problem Statement:**

**Parnell 34.5kV Station**

I&M Distribution has requested a new delivery point or reconnection at Parnell as they plan to rebuild their station due to asset renewal needs.

# AEP Transmission Zone M-3 Process
# New Albany, Ohio

**Need Number:** AEP-2023-OH042

**Process Stage:** Need 03/17/2023

**Project Driver:**

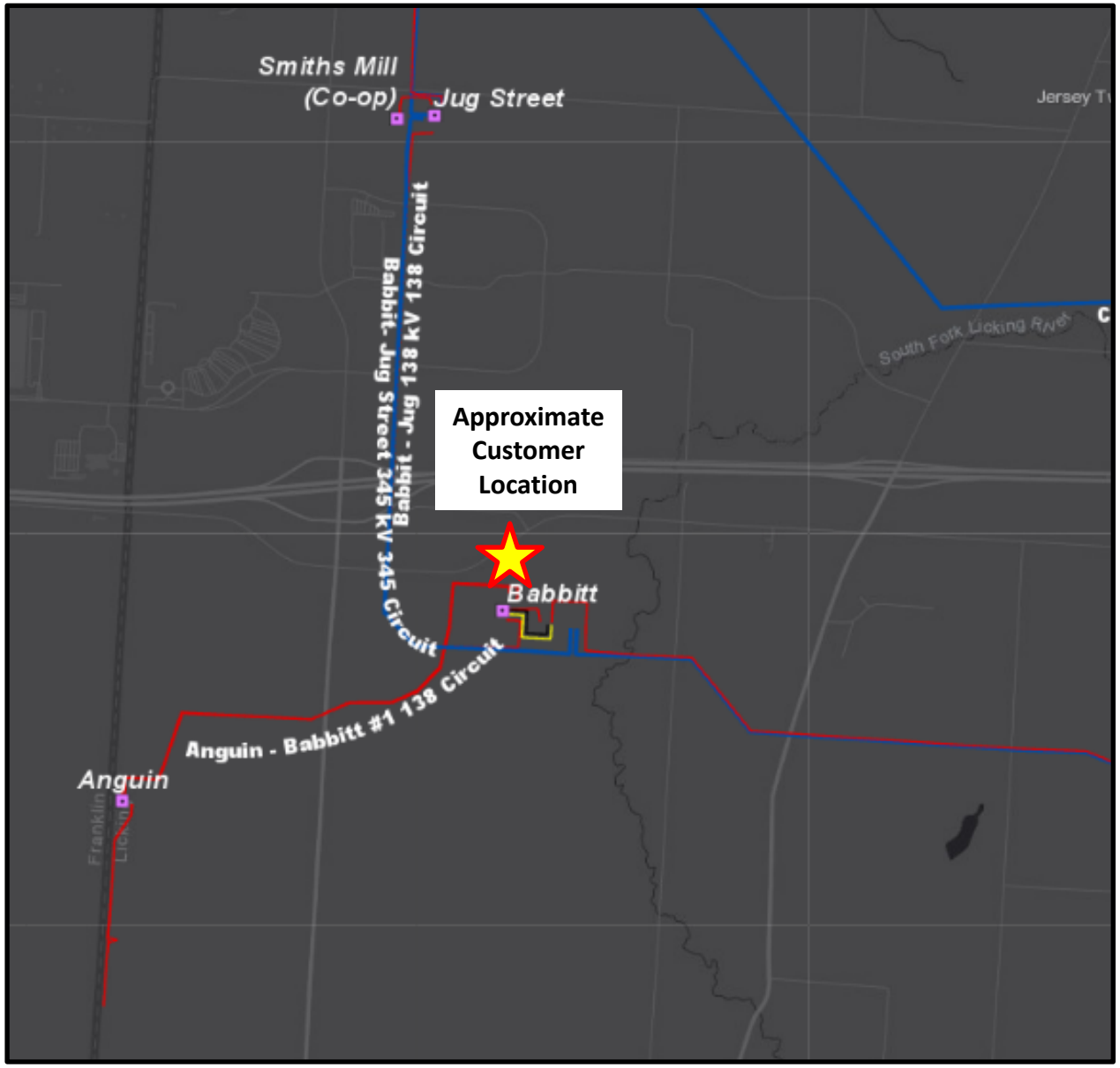
Customer Service

**Specific Assumption Reference:**

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

**Problem Statement:**

- Buckeye Power, on behalf of Licking Rural Electric Co-op (LRE), has requested service to a new delivery point in New Albany Ohio. The projected demand is 6MW in 2024 with an expected load growth of approximately 3% per year, reaching 10MW by 2030. The requested in-service date for the delivery is May 2024.



# AEP Transmission Zone M-3 Process
# Van Wert, OH

**Need Number:** AEP-2023-OH043

**Process Stage:** Need Meeting 03/17/2023

**Project Driver:**

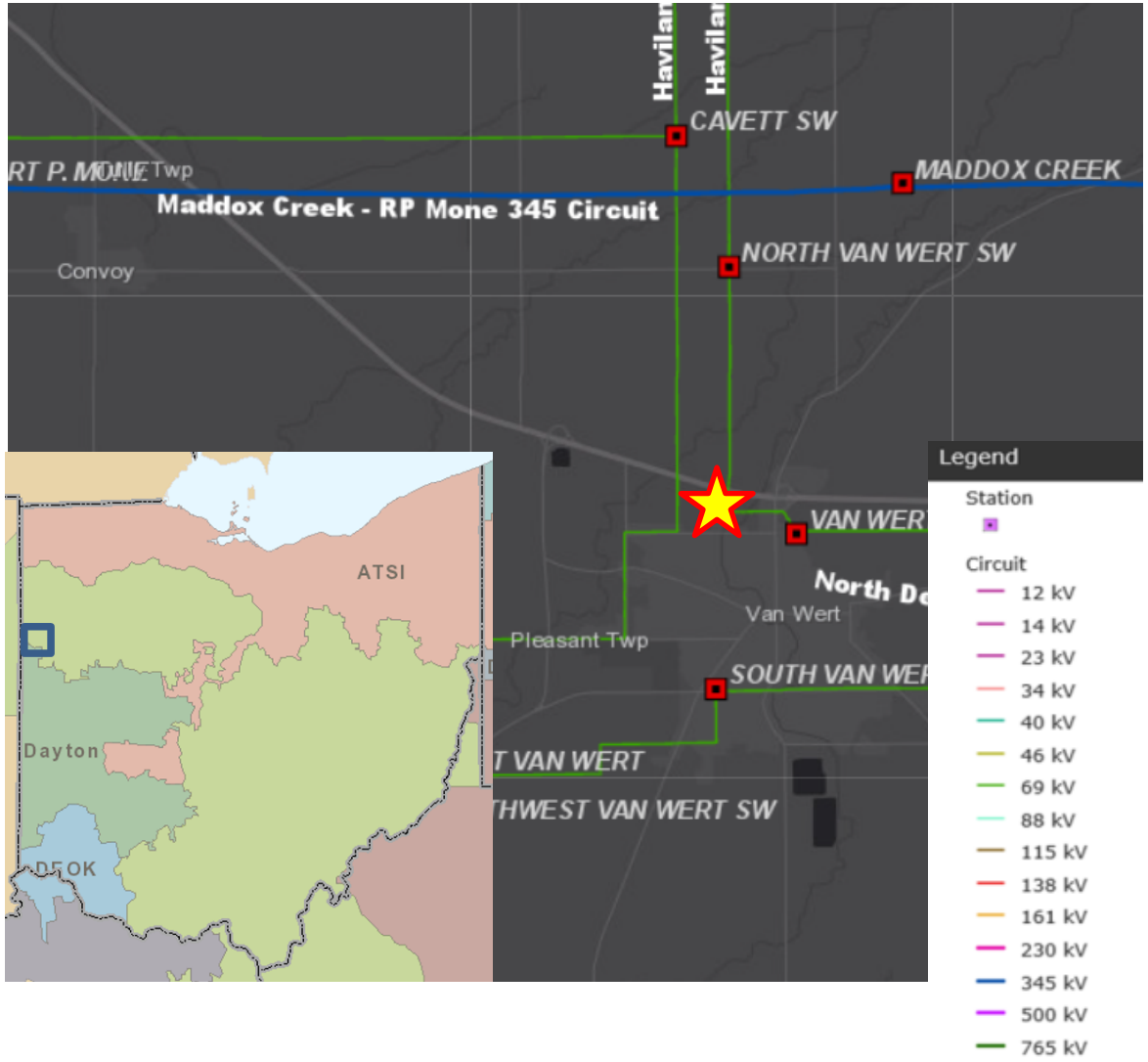
Customer Service

**Specific Assumption Reference:**

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

**Problem Statement:**

AEP Ohio has requested a new 69kV delivery in northern Van Wert. The anticipated load for the delivery is 15MVA – 7 MVA is new load requests and 8 MVA will be transferred from Van Wert station. AEP Ohio has requested an in-service date of 12/31/2024



# AEP Transmission Zone M-3 Process
# New Albany, Ohio

**Need Number:** AEP-2023-OH044

**Process Stage:** Need 03/17/2023

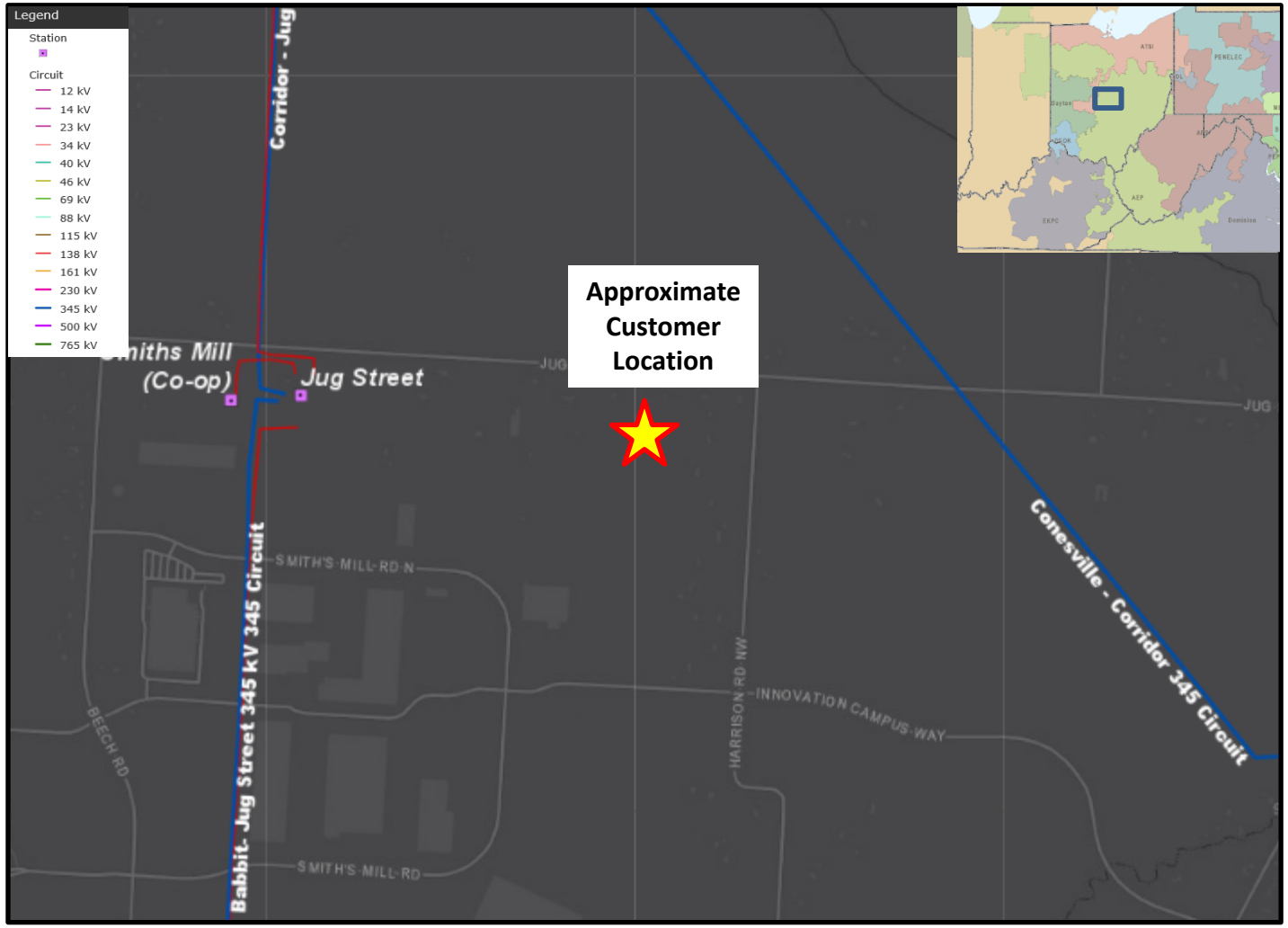
**Project Driver:** Customer Service

**Specific Assumption Reference:**

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

**Problem Statement:**

- A customer has requested service to a new delivery point in New Albany Ohio, just east of Jug Street Station.
- The projected demand for the site is 54 MW with an ultimate capacity of up to 150 MW.
- Customer requested in-service date of 12/19/2025.



# AEP Transmission Zone M-3 Process
# Lima, OH

**Need Number:** AEP-2023-OH046

**Process Stage:** Need Meeting 03/17/2023

**Project Driver:**

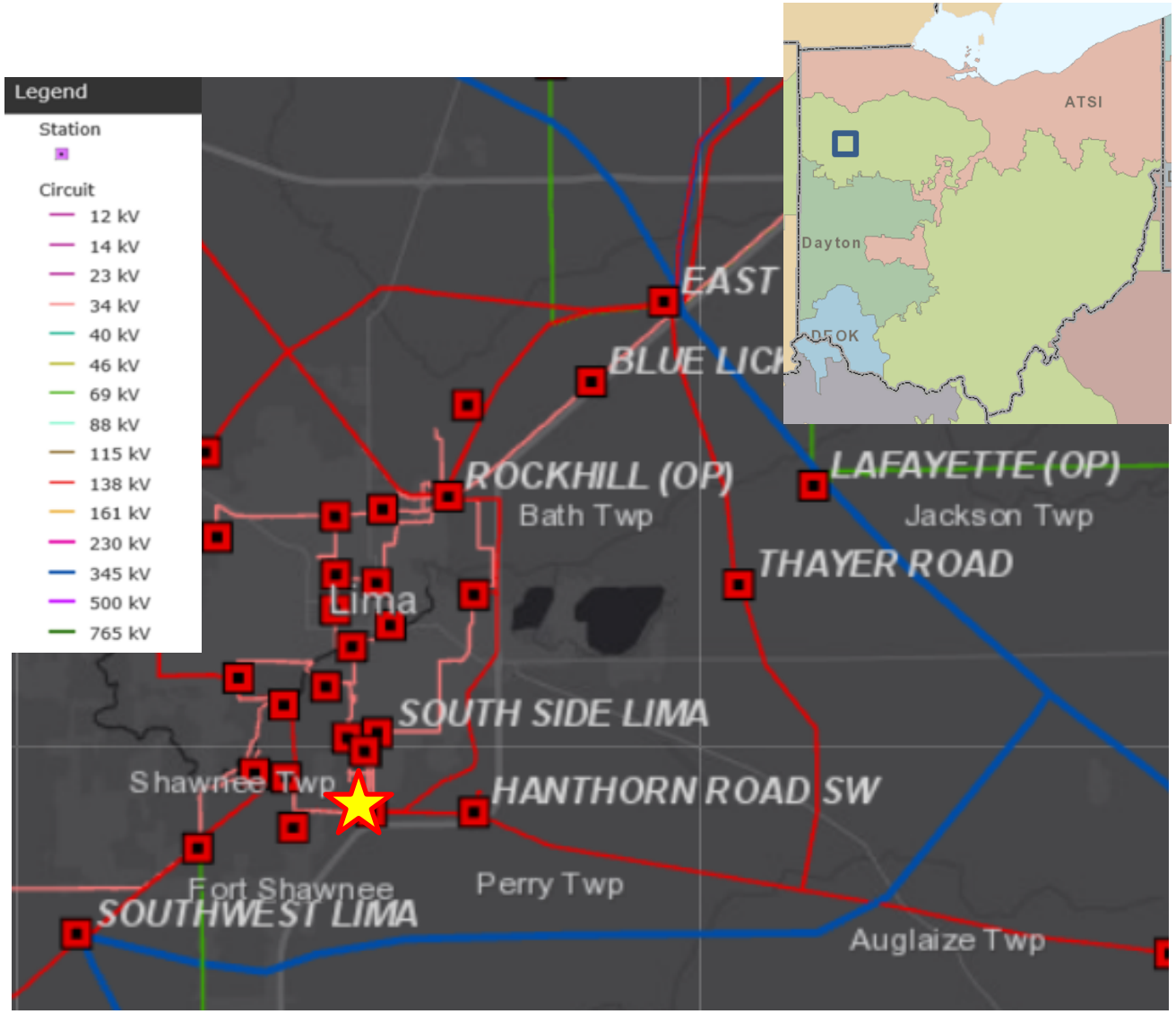
Customer Service

**Specific Assumption Reference:**

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

**Problem Statement:**

- AEP Ohio has requested a new 69kV delivery near Sterling to replace distribution equipment at 34.5 kV South Side Lima and Hover Park stations. The anticipated load is 34MVA. AEP Ohio has requested an in-service date of 12/31/2025



**Need Number:** AEP-2023-OH047

**Process Stage:** Need Meeting 3/17/2023

**Project Driver:**

Customer Service

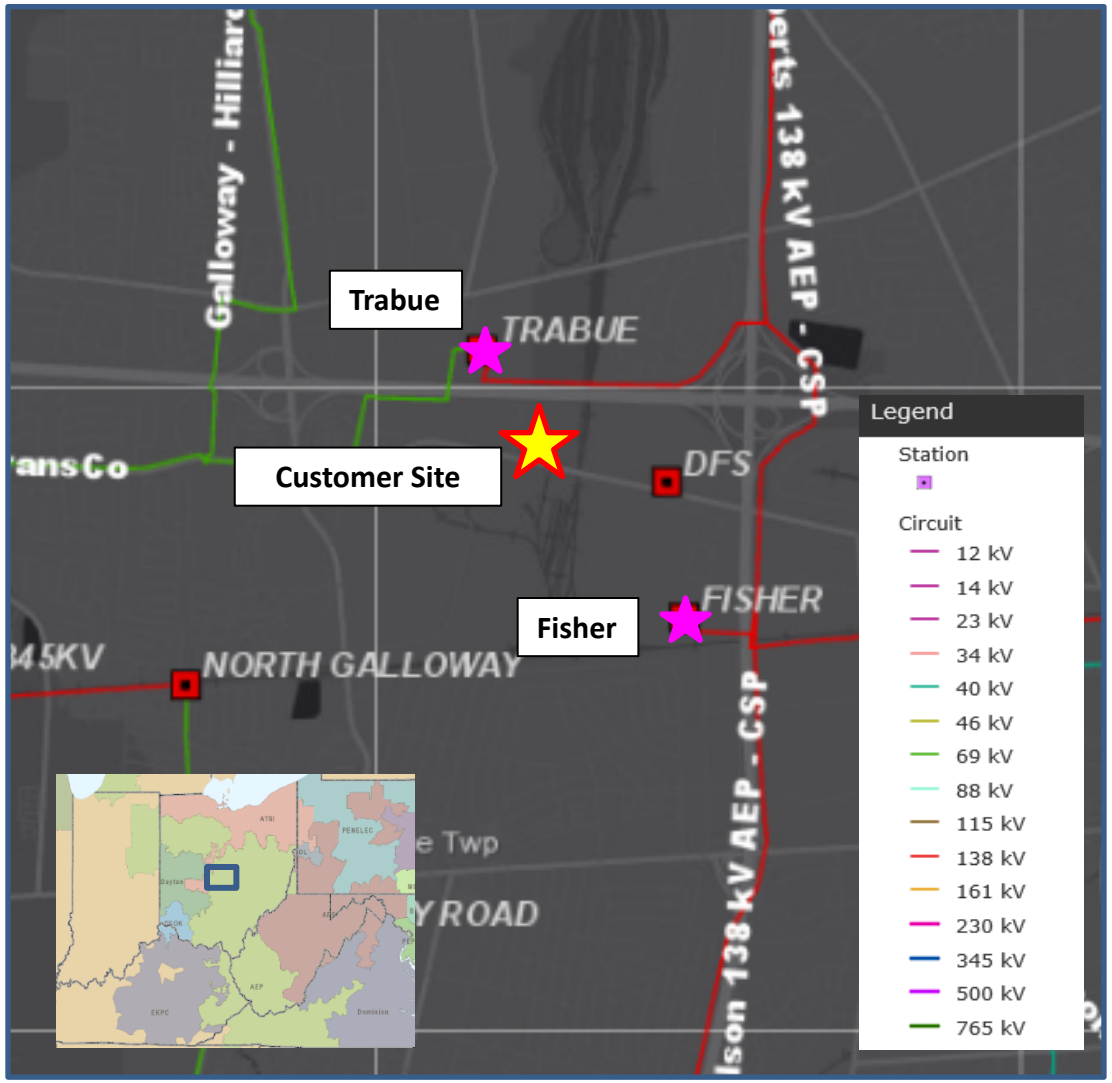
**Specific Assumption Reference:**

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

**Problem Statement:**

Customer Service:

- Four customers have requested new service at a site South of AEP's existing Trabue station in Columbus, OH.
- The customers have indicated a total peak demand of 33.5 MVA of new capacity at the site.
- The customer has a requested an in-service date of 2/29/2024.



# AEP Transmission Zone M-3 Process
# Franklin County, Ohio

**Need Number:** AEP-2023-OH048

**Process Stage:** Need Meeting 3/17/2023

**Supplemental Project Driver:**

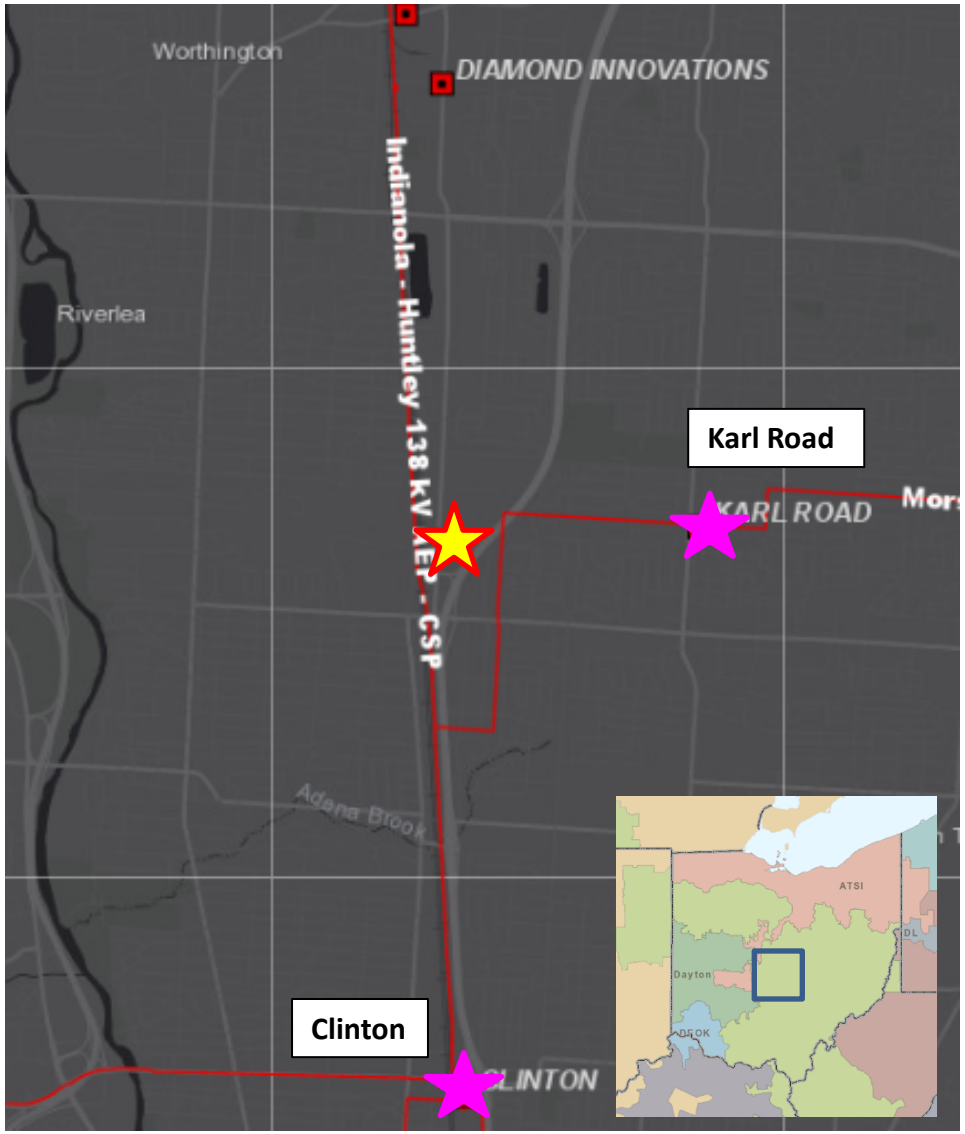
Customer Service

**Specific Assumption Reference:**

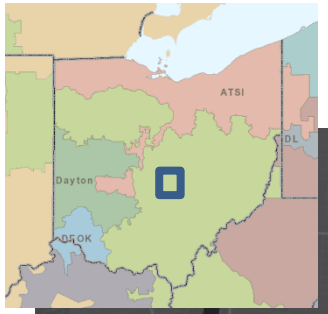
AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions slide 13)

**Problem Statement:**

- AEP Ohio has requested a new 138kV delivery point on the Clinton - Huntley - Karl 138kV Circuit by October 2025 in order to transfer approximately 25 MVA of load from Clinton and 15 MVA of load from Karl station and relieve expected transformer capacity issues at those stations driven by increasing loads in the area.



# AEP Transmission Zone M-3 Process
# Franklin County, OH




**Need Number:** AEP-2023-OH024

**Process Stage:** Need Meeting 03/17/2023

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

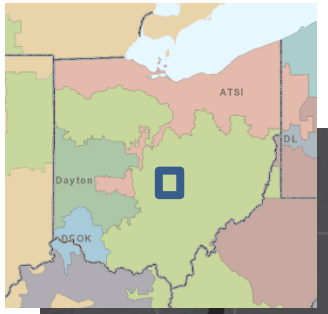
**Specific Assumption Reference:** AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

**Problem Statement:**

**Columbus Area Underground Cables**

- The existing Columbus underground 138 kV network consists of approximately 35 miles of oil-filled pipe type cables, with installation occurring the 1950s to the 1970s.
- Oil-filled pipe type underground cables come with several challenges and risks. There is a single manufacturer of oil-filled cables remaining in the US, which is going to discontinue this product due to lack of demand and cheaper available alternates that have reduced the demand for oil pipe-type cables.
- A failure or leak of any section may result in months or years of outages to the line, increasing the risk of outages to customers served in downtown Columbus.
- There was a leak on the line between Clinton and OSU in July, 2018. This circuit was out of service for two months while repairs were made.
- In 2020, a leak on the Canal Street-Mound Street cable was caused by a directional boring, requiring three weeks of outage while the damage was repaired.
- In both cases, the cable was not damaged beyond repair. A new cable would have taken at least six months to procure.
- Maintaining spare HPFF reels requires a robust oversight program because of the way the reels need to be stored, tested, and rotated on a set schedule. Because of the lack of spares, it makes the replacement of a failure a significant event.
- Visual inspection of the lines is not possible. Weekly pipe-type cable alarm reviews are completed by field personnel to ensure oil pressure is adequate and no leaks are occurring.
- AEP will not be able to replace all of these lines in the next five to seven years due to the outage constraints and heavy urban construction requirements. It will likely take decades to replace these circuits. AEP will focus on the priority circuits listed on the next slide between 2023 and 2028.

# AEP Transmission Zone M-3 Process
# Franklin County, OH




**Need Number:** AEP-2023-OH024

**Process Stage:** Need Meeting 03/17/2023

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

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

**Problem Statement Continued:**

**Columbus Area Underground Circuits (Original Install Date)**

- Canal – Gay Street 138 kV (1970s)
- Canal – Mound Street 138 kV (1950s)
- Hess – Fifth Avenue 138 kV (1950s)

# AEP Transmission Zone M-3 Process
# Franklin County, OH

# 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
# East Lima

**Need Number:** AEP-2022-OHO06

**Previously Presented:** Need Meeting 1-21-2022

**Process Stage:** Solution Meeting 3/17/2023

**Project Driver:**

Equipment Material/Condition/Performance/Risk

**Specific Assumption Reference:**

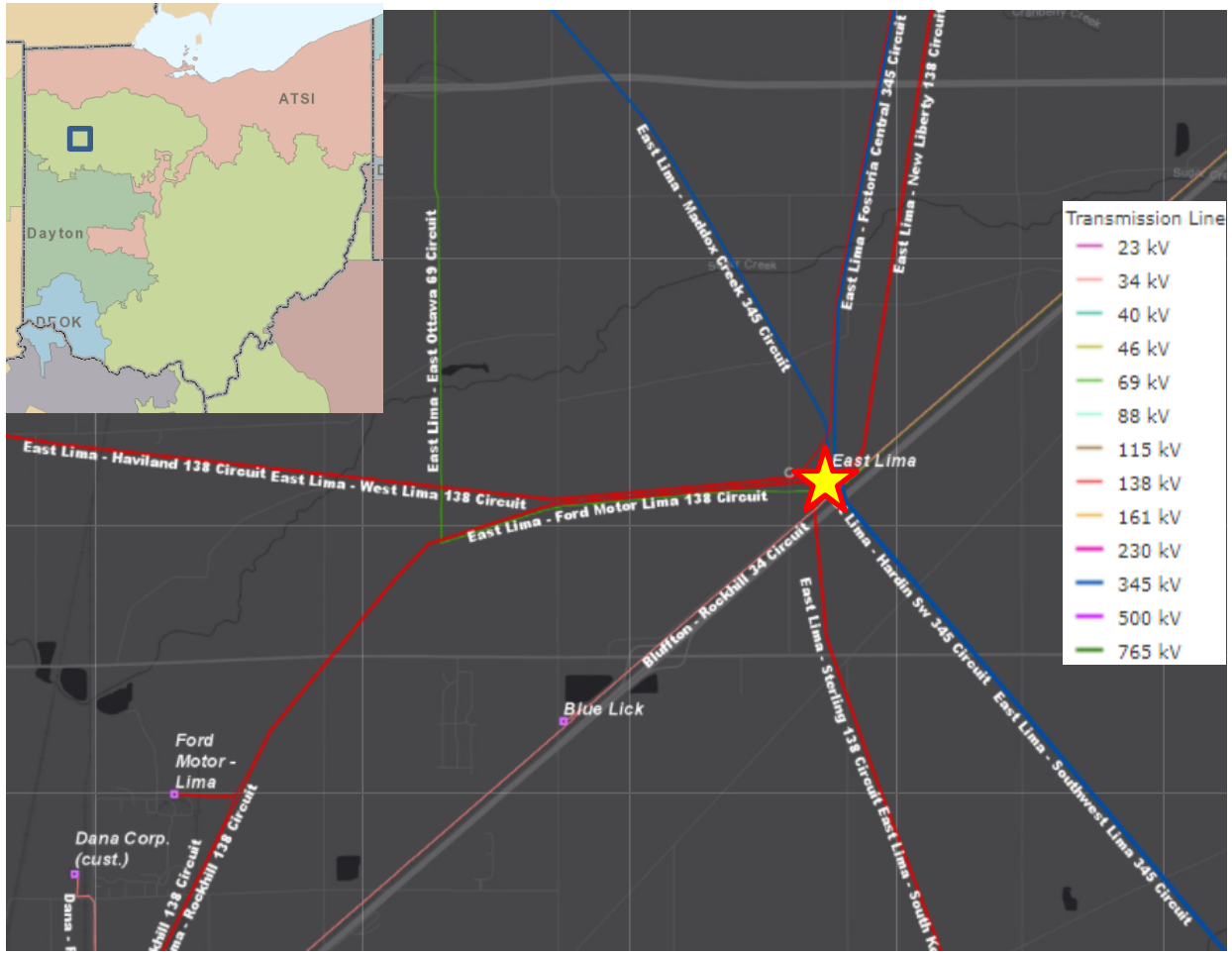
AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 13)

**Problem Statement:**

<u>East Lima 69kV:</u>

**Circuit Breakers U,V:**

- Breaker Age: U 1967, V 1967
- Interrupting Medium: (OIL)
- Fault Operations:
  - Number of Fault Operations: U 107, V 68
  - Manufacturer recommended Number of Operations: 10
- **Additional Breaker Information**: This breakers are CF-48-69-2500 type oil breaker. Manufacture support and spare parts have ended. Third party replacement parts are expensive. This model family uses the OA-3 hydraulic mechanism, which has been associated with several mis-operations across the AEP fleet.
- **Relays:** Currently, 70 of the 129 relays (54% of all station relays) are in need of replacement. 54 of these are of the electromechanical type and 2 of these are of the static type which have significant limitations with regards to spare part availability and fault data collection and retention. 14 relays are microprocessor type outside of their life expectancy
- **Overall Station Condition**: The station will need significant rehabilitation to replace vintage equipment and mitigate potential future environmental concerns.



# AEP Transmission Zone M-3 Process
# East Lima Upgrades Project

**Need Number:** AEP-2022-OHO06
**Process Stage:** Solutions Meeting 03/17/2023

**Proposed Solution:**

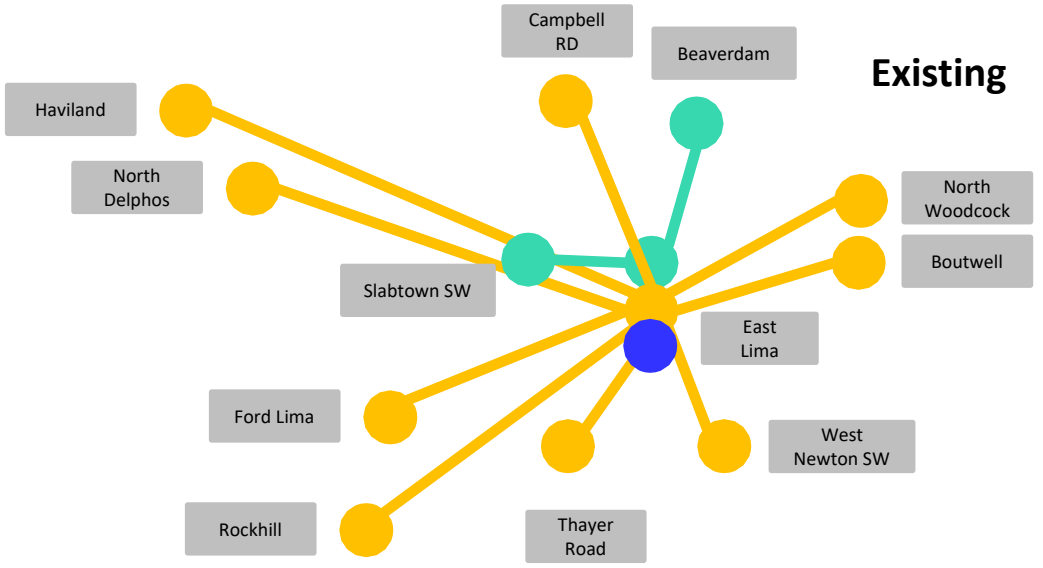
- At East Lima 69kV breakers U and V will be replaced with 3000A 40kA breakers. The 69kV disconnect switches and sub-conductors will be upgraded. A DICM will be installed to replace the old control structure. Relay and breaker control voltages will be standardized. Environmental remediation at the station will be completed per federal requirements. Remediation will include the disposal of PCB-impacted soils, concrete, and a legacy oil processing facility including associated oil piping and equipment. **Estimated Cost $11.1M**
- Upgrade relays at West Lima, Ford Lima, Yellow Creek and Woodlawn to coordinate with the new protection and communication scheme tied out of East Lima. **Estimated Cost $1.0M**

**Total Estimated Transmission Cost: $12.1M**

**Alternatives Considered:**

East Lima station is a large station with 345 and 138 kV equipment in addition to the 69 kV equipment to be replaced. Relocating or rebuilding in the clear is not a viable option due to the amount of infrastructure required to be moved.

**Projected In-Service:** 12/01/2024
**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

3/7/2022– V1 – Original version posted to pjm.com

3/10/2022– V2 – Add Slide# 13-15, Need # AEP-2023-OH024