

Subregional RTEP Committee – Western FirstEnergy Supplemental Projects

Submission of Supplemental Projects for Inclusion in the Local Plan

ATSI Transmission Zone M-3 Process Crossland – Sharon 138 kV Z-112 Line Customer Connection

Need Number: ATSI-2025-013

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

Previously Presented: Need Meeting – 04/11/2025
Solution Meeting – 07/18/2025

Supplemental Project Driver(s):
Customer Service

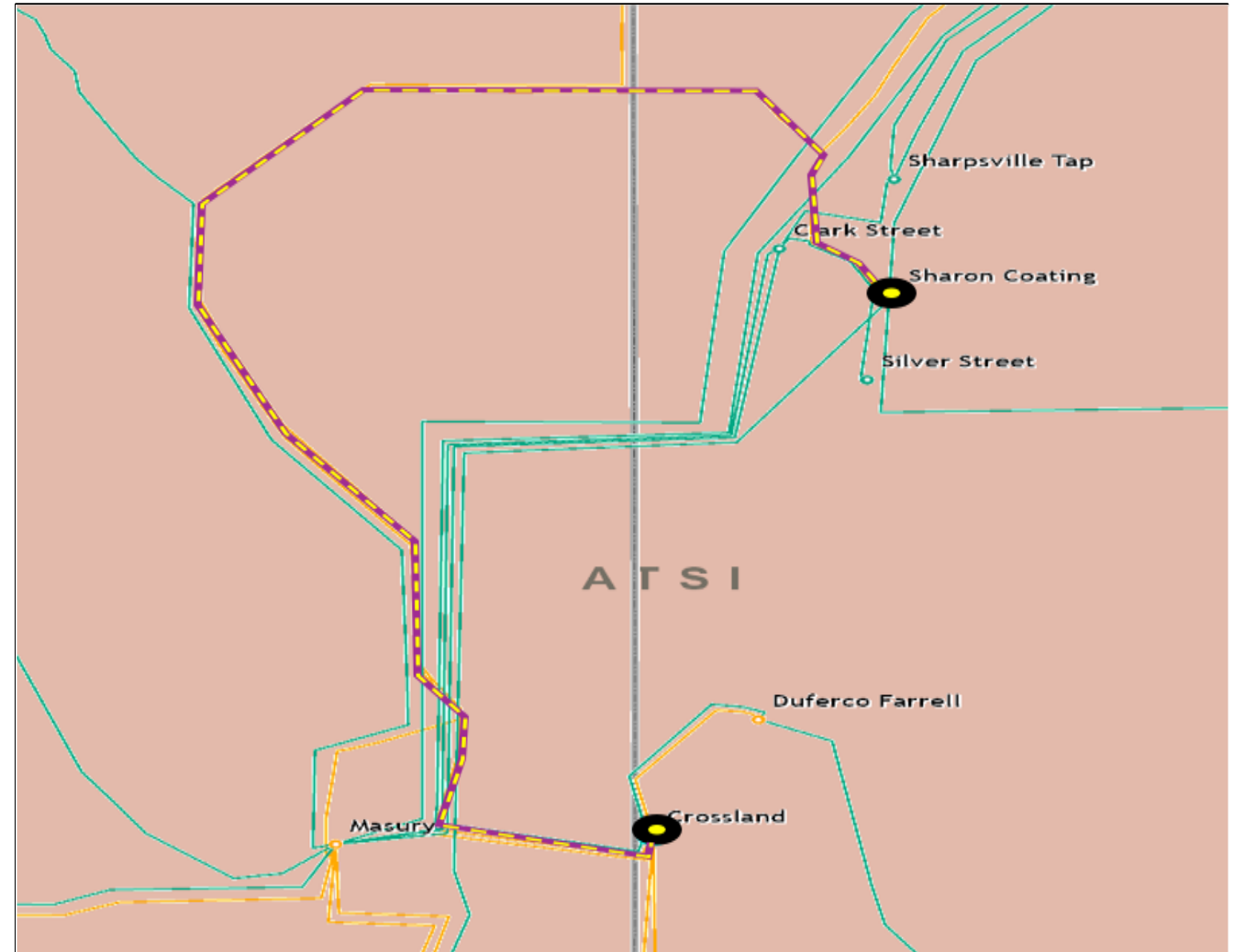
Specific Assumption Reference(s):

- New customer connection request will be evaluated based on FirstEnergy's "Requirements for Transmission Connected Facilities" document and FirstEnergy's "Transmission Planning Criteria" document

Problem Statement

- New Customer Connection – A customer requested a new 138 kV delivery point near the Crossland - Sharon 138 kV Z-112 Line. The anticipated load of the new customer connection is 80 MVA. The request is approximately 6 miles from Crossland Substation.

Requested In-Service Date:
June 11, 2027





ATSI Transmission Zone M-3 Process

Crossland – Sharon 138 kV Z-112 Line Customer Connection

Need Number: ATSI-2025-013

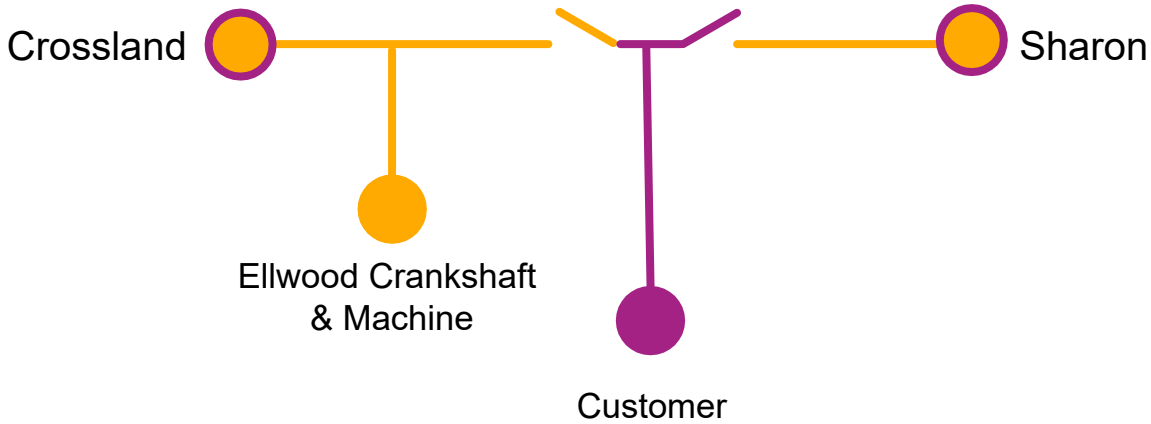
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

- Selected Solution:**
- Install one main-line switch and one tap switch
 - Construct approximately 200 feet of transmission line
 - Adjust relay settings at Crossland and Sharon substations
 - Install revenue metering

Estimated Project Costs: \$0.9M

Project In-Service Date: 6/11/2027

Supplemental ID: s3768.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

ATSI Transmission Zone M-3 Process Homer – Wellington 69 kV Line Customer Connection

Need Number: ATSI-2025-014

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

Previously Presented: Need Meeting – 04/11/2025
Solution Meeting – 07/18/2025

Supplemental Project Driver(s):
Customer Service

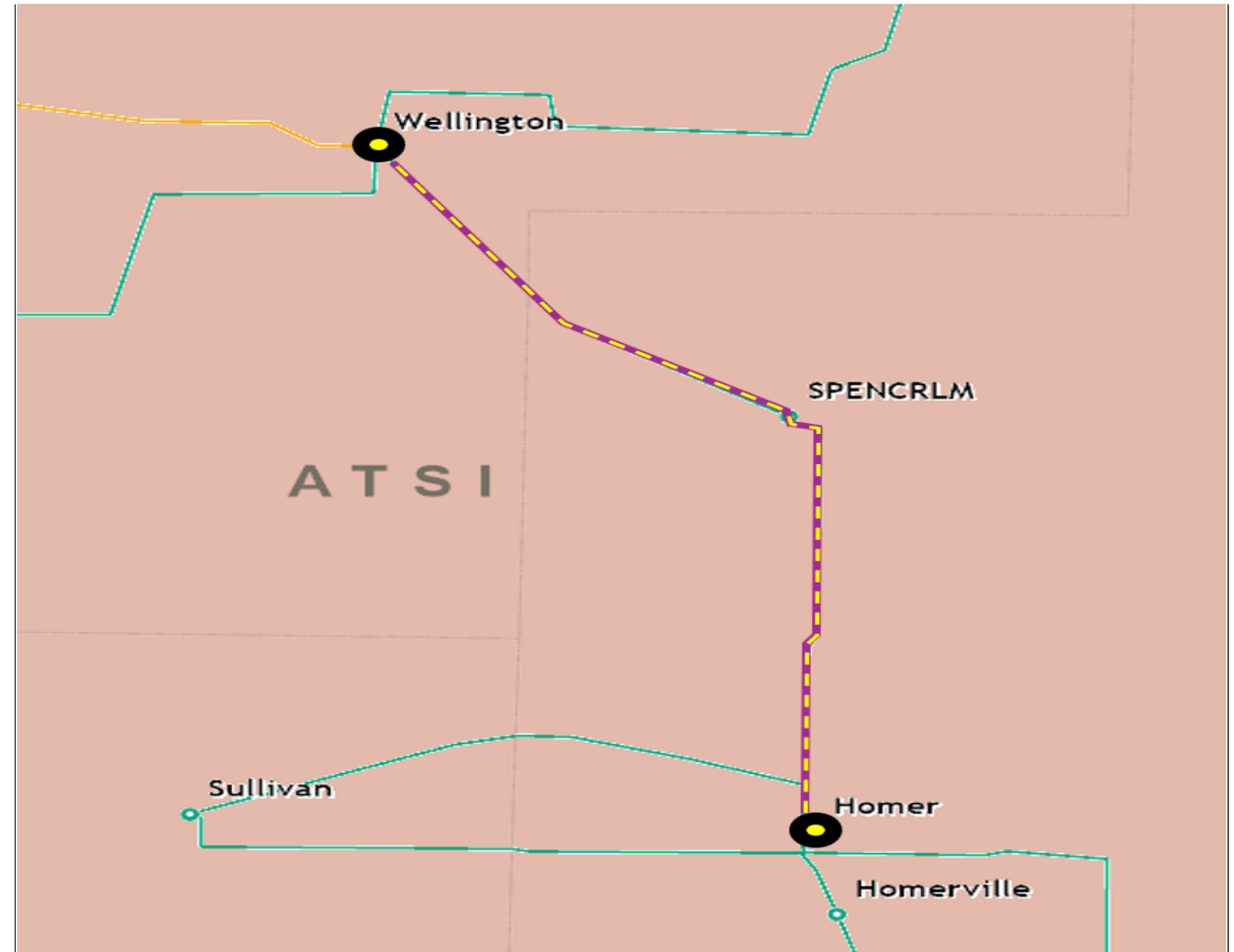
Specific Assumption Reference(s):

- New customer connection request will be evaluated based on FirstEnergy's "Requirements for Transmission Connected Facilities" document and FirstEnergy's "Transmission Planning Criteria" document

Problem Statement

- New Customer Connection – A customer requested a new 69 kV delivery point near the Homer – Wellington 69 kV Line. The anticipated load of the new customer connection is 6.5 MVA. The request is approximately 5.8 miles from Homer Substation.

Requested In-Service Date:
March 14, 2026





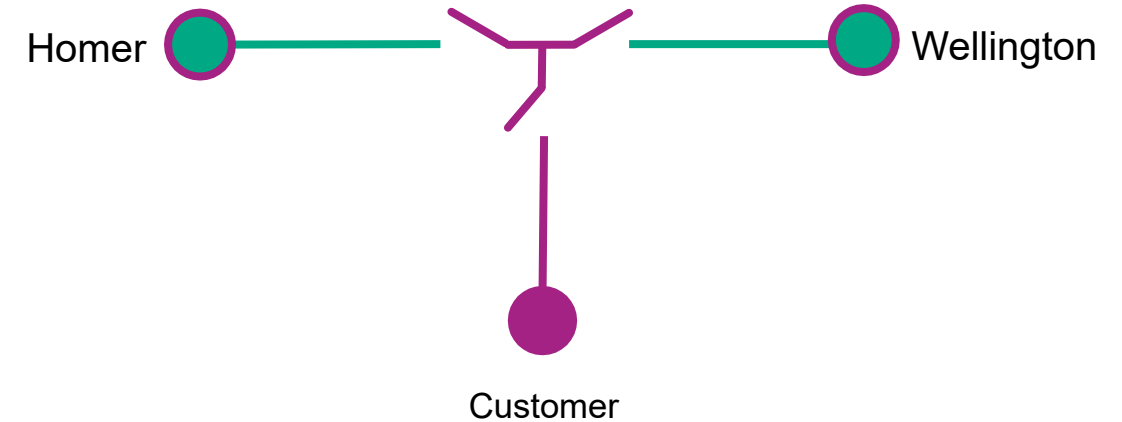
ATSI Transmission Zone M-3 Process Homer – Wellington 69 kV Line Customer Connection

Need Number: ATSI-2025-014
Process Stage: Submission of Supplemental Projects for Inclusion
in the Local Plan – 03/02/2026

Selected Solution:

- Install two main-line switches and one tap switch
- Construct approximately 0.1 miles of 69 kV transmission line
- Adjust relay settings at Homer and Wellington substations
- Install revenue metering

Estimated Project Costs: \$0.9M
Project In-Service Date: 3/15/2026
Supplemental ID: s3769.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2024-078

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

Previously Presented: Need Meeting - 12/13/2024
Solution Meeting - 08/15/2025

Supplemental Project Driver(s):

Equipment Material Condition, Performance and Risk

Specific Assumption Reference(s):

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits
- System Condition Projects

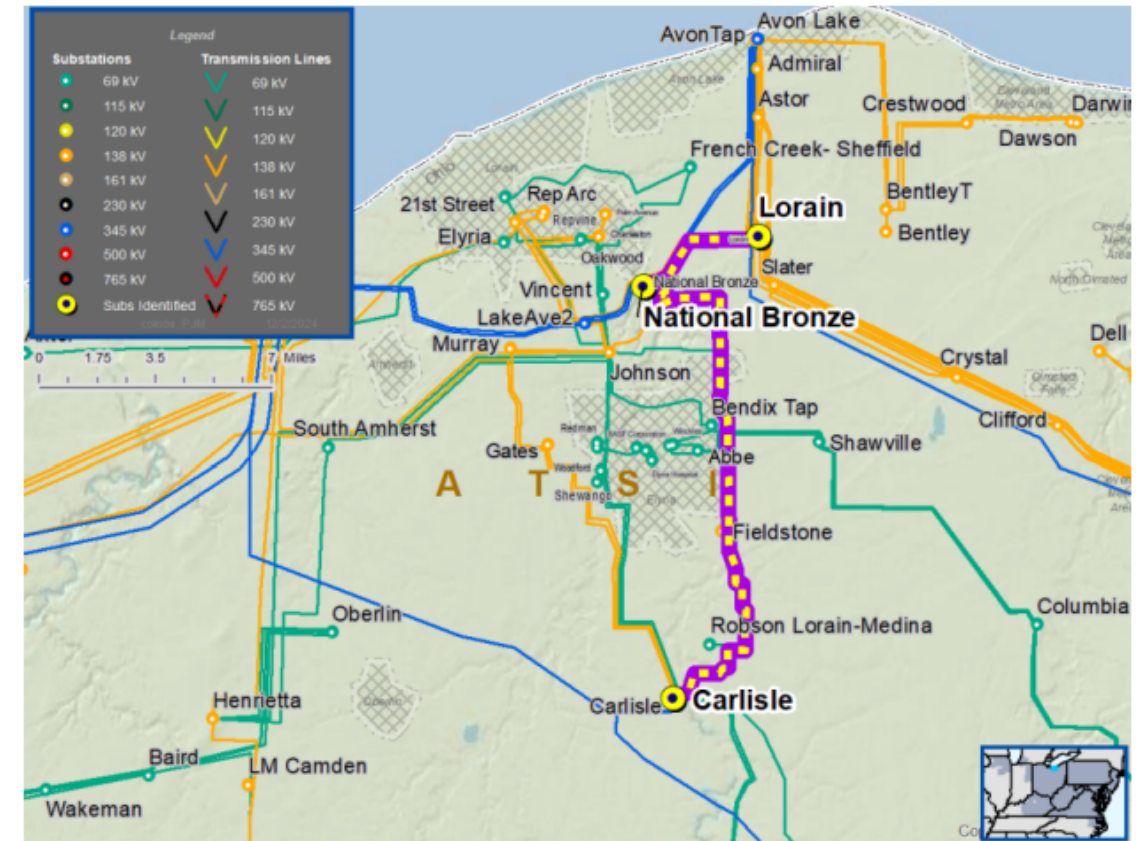
Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
- Proper operation of the protection scheme requires all the separate components perform adequately during a fault.
- In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.
- Transmission line ratings are limited by terminal equipment.

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Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE / WN / WE)	Existing Conductor Rating (SN / SE / WN / WE)
ATSI-2024-078	Carlisle- National Bronze Tap 138 kV Line	233 / 282 / 263 / 333	233 / 282 / 263 / 333
	National Bronze Tap- Lorain 138 kV Line	224 / 293 / 309 / 316	273 / 332 / 309 / 316



Need Number: ATSI-2024-078
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

Selected Solution:

Carlisle Substation

- Replace line relays, CCVTs, line arresters, line trap and disconnect switches.

Lorain Substation

- Replace line relays, CCVT, wave trap, and disconnect switches.

Transmission Line Ratings:

Carlisle-National Bronze Tap 138 kV Line

- Existing Line Rating 233 / 282 / 263 / 333 MVA (SN/SE/WN/SE)
- New Line Rating 233 / 282 / 263 / 333 MVA (SN/SE/WN/SE)

National Bronze Tap-Lorain 138 kV Line

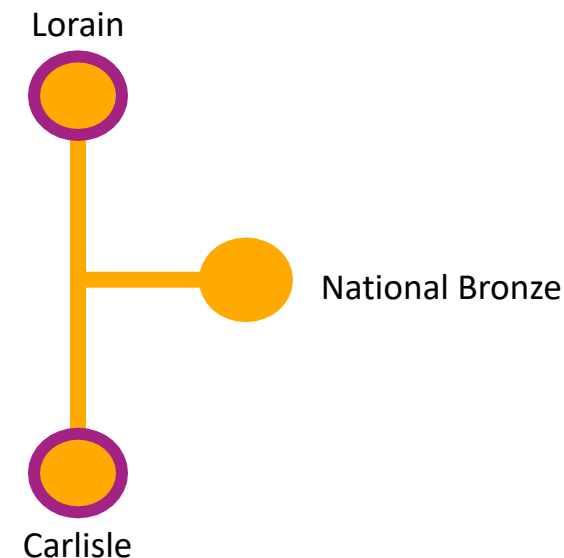
- Existing Line Rating 224 / 293 / 309 / 316 MVA (SN/SE/WN/SE)
- New Line Rating 273 / 332 / 309 / 393 MVA (SN/SE/WN/SE)

Estimated Project Cost: \$3.58M

Projected In-Service: 12/31/2027

Supplemental ID: s3774.1

ATSI Transmission Zone M-3 Process Carlisle-Lorain 138 kV Line Relay Misoperation



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2024-047

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

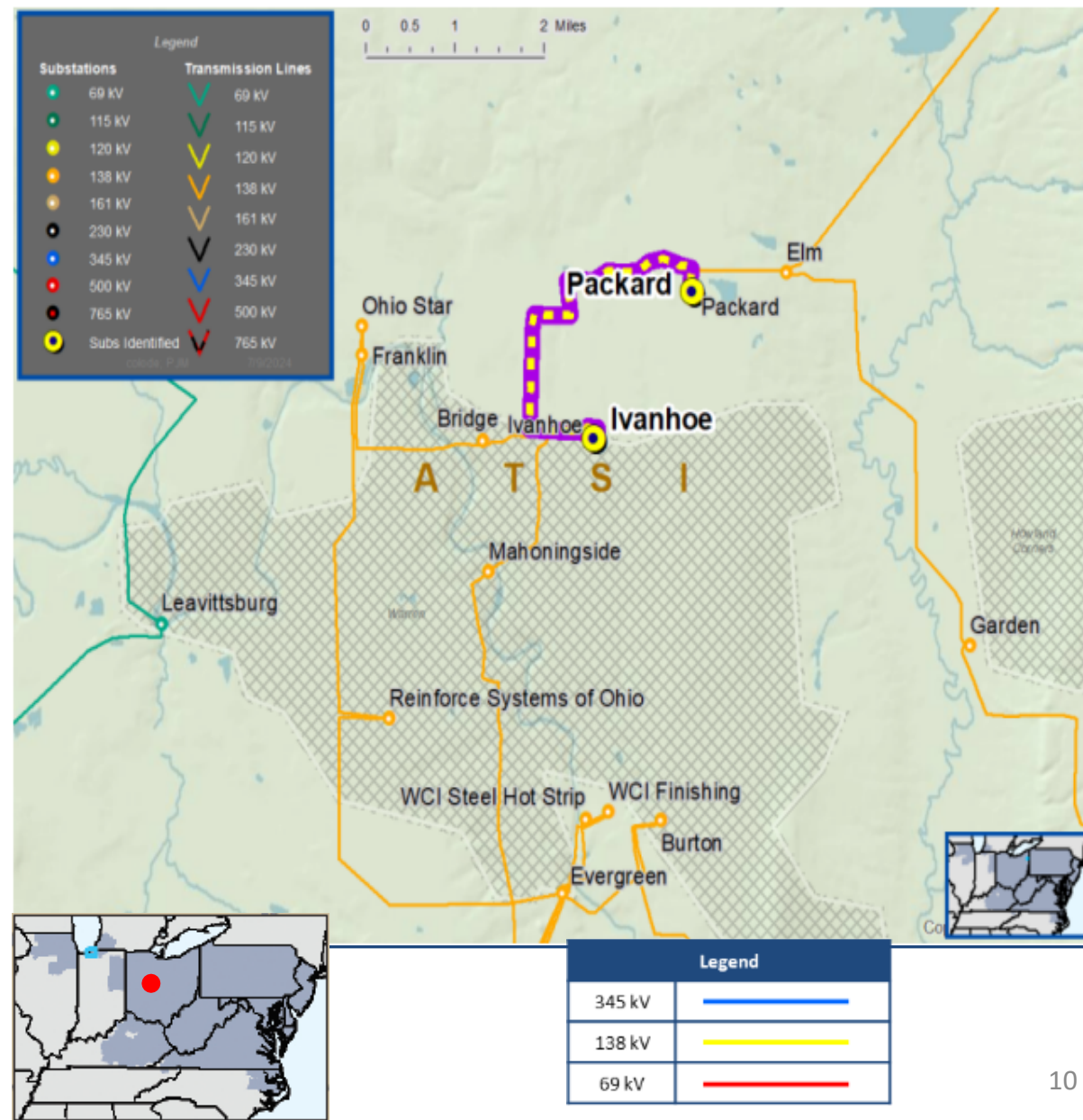
Previously Presented: Need Meeting – 7/19/2024
Solution Meeting – 8/15/2025

Supplemental Project Driver(s):
Customer Service

Specific Assumption Reference(s):
Customer connection request will be evaluated per FirstEnergy’s “Requirements for Transmission Connected Facilities” document and “Transmission Planning Criteria” document.

Problem Statement:
New Customer Connection – A customer has requested a new 138 kV delivery point near the Ivanhoe – Packard 138 kV Line. The anticipated load of the new customer connection is approximately 10 MVA. The requested delivery point location is approximately one mile from Packard Substation

Requested in-service date is 12/31/2025



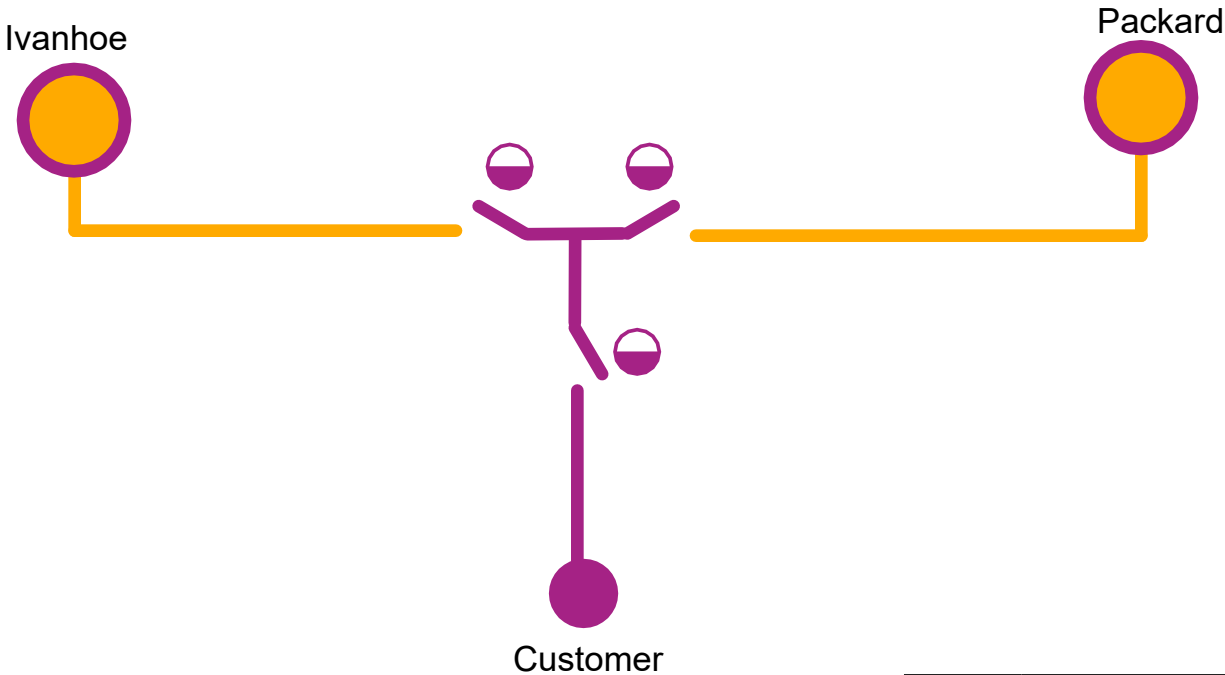


ATSI Transmission Zone M-3 Process Ivanhoe – Packard 138 kV Customer

Need Number: ATSI-2024-047
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

- Selected Solution:**
138 kV Transmission Line Tap
- Install two main-line SCADA controlled switches.
 - Install one tap-line SCADA controlled switch.
 - Construct 0.2 miles of 138 kV line extension.
 - Adjust relay settings at Ivanhoe and Packard substations.
 - Install revenue metering.

Estimated Project Cost: \$1.92M
Projected In-Service: 7/28/2028
Supplemental ID: s3775.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2023-011

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

Previously Presented: Need Meeting – 6/16/2023
Solutions Meeting – 09/19/2025

Supplemental Project Driver(s):
Operational Flexibility and Efficiency
Equipment Material Condition, Performance and Risk
Infrastructure Resilience

Specific Assumption Reference(s):

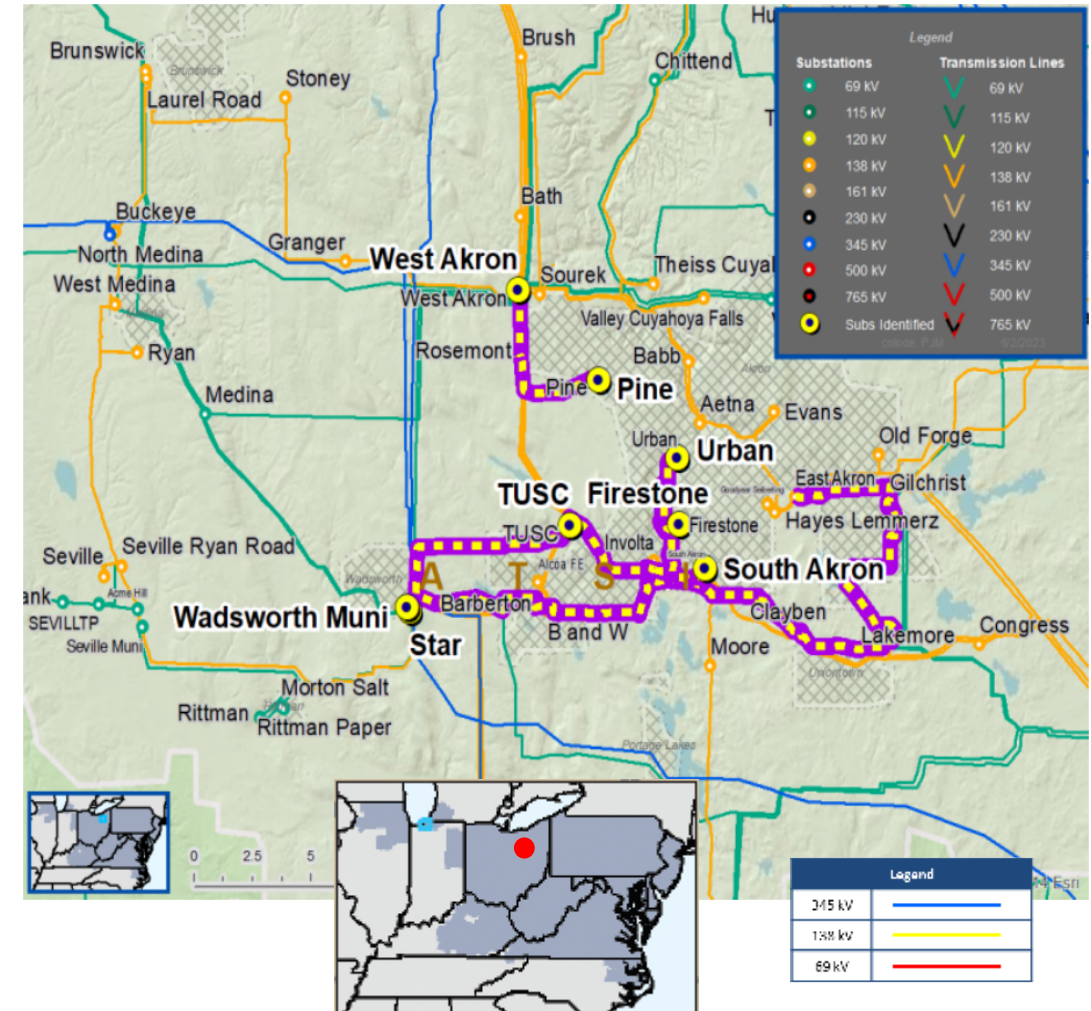
Global Considerations

- System reliability and performance
- Load at risk in planning and operational scenarios

Add/Expand Bus Configuration

- Loss of substation bus adversely impacts transmission system performance
- Eliminate simultaneous outages to multiple networked elements under N-1 analysis
- Accommodate future transmission facilities
- Capability to perform system maintenance

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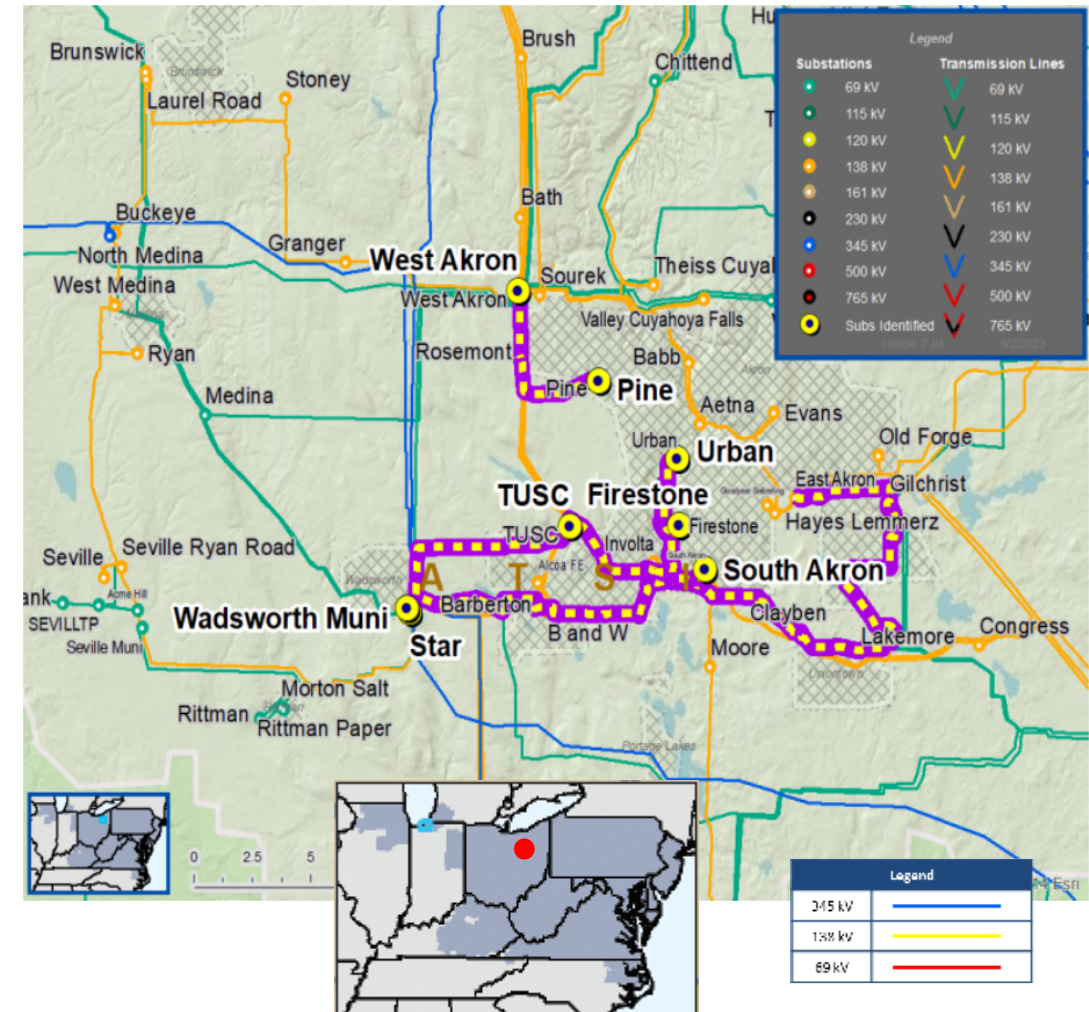
Need Number: ATSI-2023-011

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

Previously Presented: Need Meeting – 6/16/2023
Solutions Meeting – 09/19/2025

Problem Statement:

- An N-1-1 outage will result in approximately 29,100 customers at risk and cause a consequential load loss of approximately 119 MW.
- An N-1-1 outage will result in approximately 9,360 customers at risk and cause a consequential load loss of approximately 38 MW and cause a backfeed condition from the Akron 23 kV system.
- Since 2014, the following lines have a combined total of seven momentary outages and six sustained outages:
 - Star - Urban 138 kV Line experienced three outages: 1 momentary. 2 sustained
 - Star - Wadsworth 138 kV Line experienced two outages: 1 momentary. 1 sustained
 - Pine - West Akron 138 kV Line experienced one outage: 0 momentary. 1 sustained
 - Star – Tusc 138 kV Line experienced no outages
 - Firestone - South Akron 138 kV Line experienced one outage: 0 momentary, 1 sustained
 - Firestone - Urban 138 kV Line experienced six outages: 5 momentary, 1 sustained





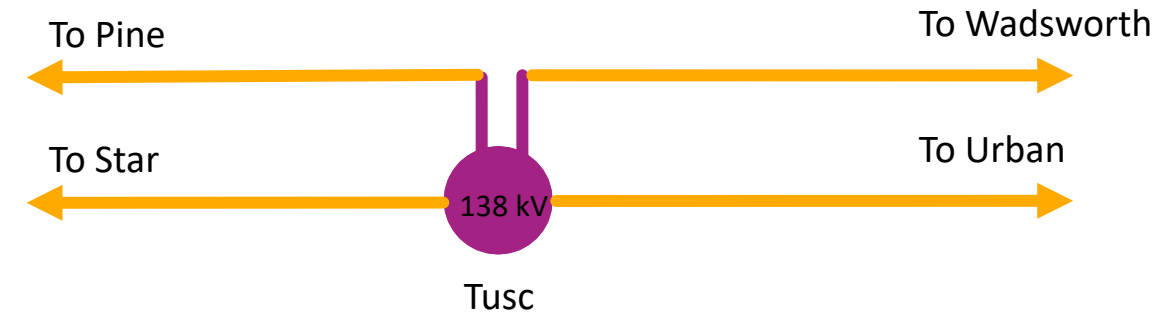
ATSI Transmission Zone M-3 Process Tusc Substation

Need Number: ATSI-2023-011
Process Stage: Submission of Supplemental Projects for Inclusion
in the Local Plan – 03/02/2026

Selected Solution:

- Expand the existing 138 kV bus at Tusc Substation from a four-breaker ring bus into a six-breaker ring bus.
- Loop the Pine-Wadsworth 138 kV Line in/out of the Tusc Substation ring bus
- The project will split the Pine-Wadsworth 138 kV Line to create the following two lines:
 - Tusc - Wadsworth 138 kV Line (~8 miles)
 - Pine - Tusc 138 kV Line (~7 miles)
- Adjust relays at the terminal ends.

Estimated Project Cost: \$16.72M
Projected IS Date: 12/31/2027
Supplemental ID: s3779.1



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



Need Number: ATSI-2025-021

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

Previously Presented: Need Meeting – 07/18/2025
Solution Meeting – 09/19/2025

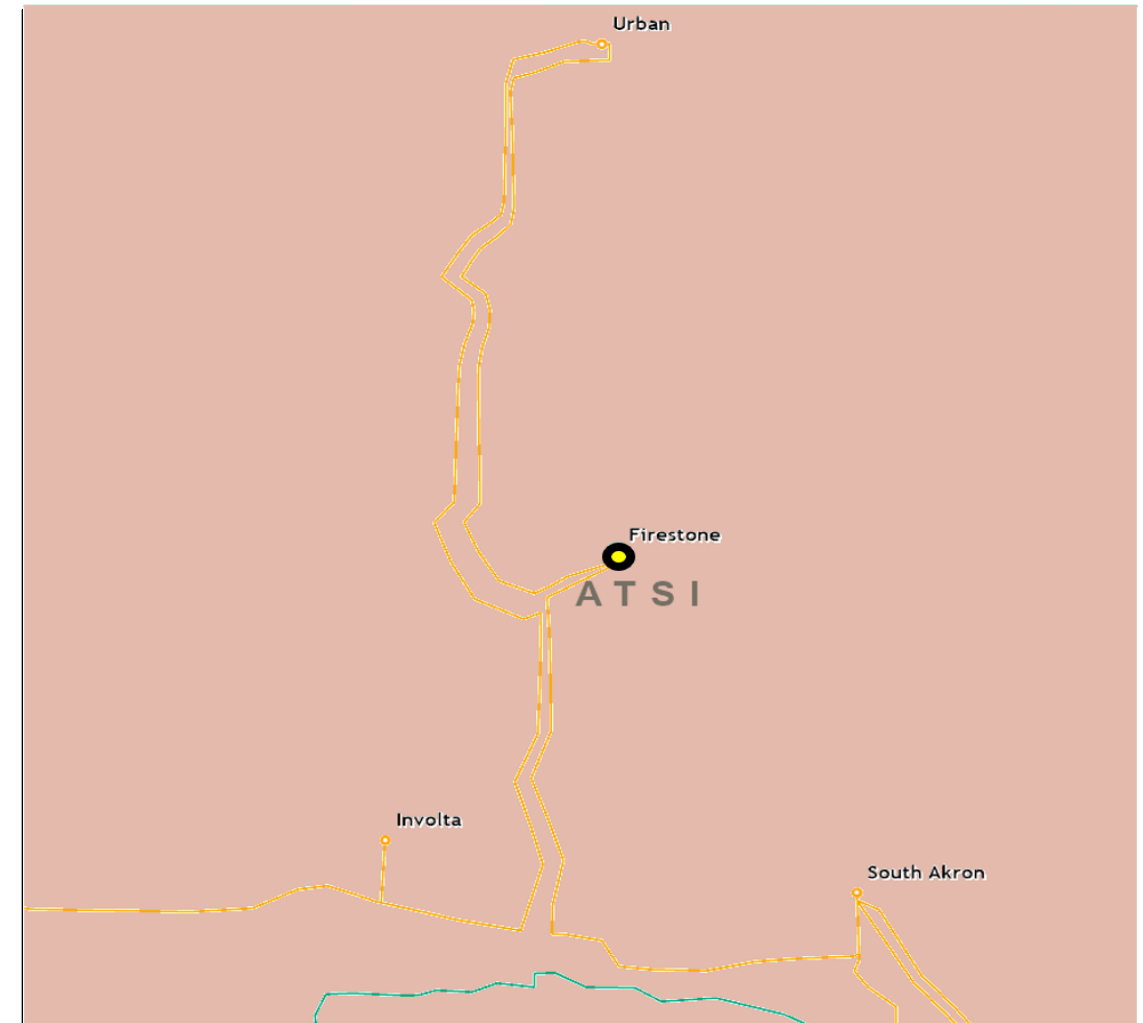
Project Driver(s):
Operational Flexibility and Efficiency
Equipment Performance and Risk
Infrastructure Resilience

Specific Assumption Reference(s):
System Performance Global Factors

- Load at risk in planning and operational scenarios
- Substation/line equipment limits
- Add/Expand Bus Configuration
- Loss of substation bus adversely impacts transmission system performance
- Eliminate simultaneous outages to multiple networked elements under N-1 analysis
- Capability to perform system maintenance

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ATSI Transmission Zone M-3 Process Firestone Substation



Need Number: ATSI-2025-021

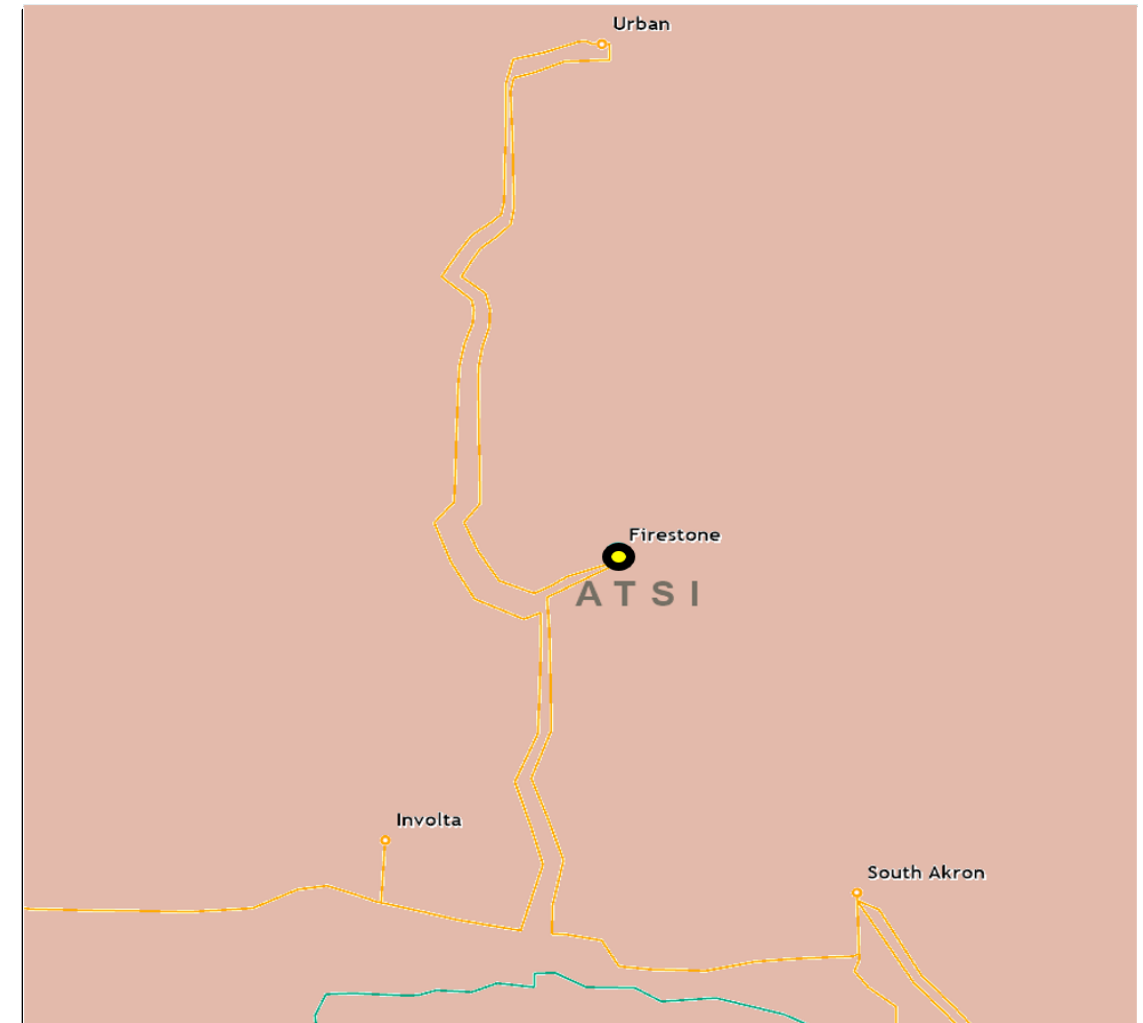
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 03/02/2026

Previously Presented: Need Meeting – 07/18/2025
Solution Meeting – 09/19/2025

Problem Statement:

- Firestone Substation's 138 kV bus is a partial ring bus configuration with three breakers and two normally open switches.
 - With the current configuration, breaker maintenance on the transformer tie circuit breaker will interrupt the network path on the South Akron – Urban 138 kV Line. This interruption of the South Akron-Urban 138 kV Line results in a single ten-mile-long radial feed to Urban Substation.

ATSI Transmission Zone M-3 Process Firestone Substation





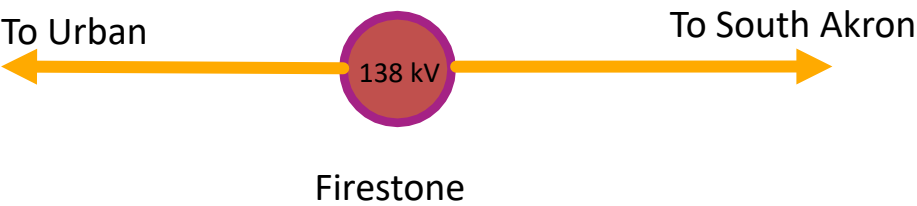
ATSI Transmission Zone M-3 Process Firestone Substation

Need Number: ATSI-2025-021
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

- Convert the Firestone three-breaker ring bus into a four-breaker ring bus by installing an additional circuit breaker to the existing substation layout.

Estimated Project Cost: \$0.3M
Projected IS Date: 2/16/2026
Supplemental ID: s3780.1



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

ATSI Transmission Zone M-3 Process

Lemoyne Substation Upgrades for MISO Tranche 2.1

Need Number: ATSI-2025-004

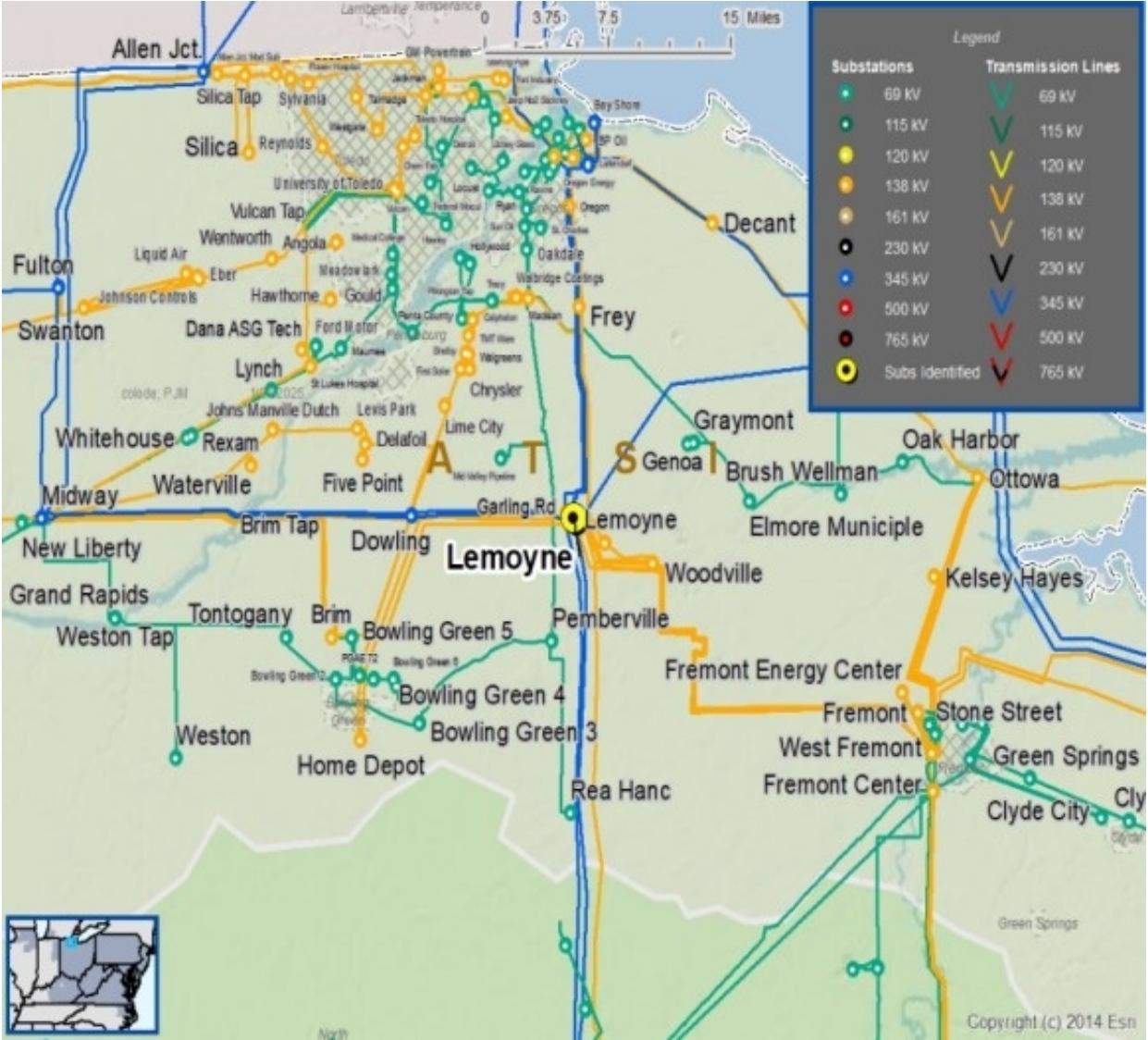
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/6/2026

Previously Presented: Need Meeting – 02/04/2025
Solution Meeting – 03/04/2025 & 12/12/2025

Project Driver:
Other

Specific Assumption Reference:
Other (External Public Utility)

- Problem Statement:**
- As part of its Long-Range Transmission Planning process (LRTP), MISO identified transmission overload and congestion issues through the Midwest region of the MISO transmission system that indicated a need for a MISO high voltage regional transmission backbone in the 10-year and 20-year planning horizons.
 - In September 2024, MISO posted its draft 2024 MISO Transmission Expansion Plan (MTEP24) Appendix A for all facilities in the LRTP Tranche 2.1 Portfolio. The Appendix A facility-level details identified transmission facility work in PJM impacting the ATSI zone that is needed to accommodate the portfolio of MISO projects. MISO indicated assignment to PJM Transmission Owners for work in PJM associated with addressing MISO Appendix A identified transmission facility work in PJM.



ATSI Transmission Zone M-3 Process

Lemoyne Substation Upgrades for MISO Tranche 2.1

Need Number: ATSI-2025-004
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/6/2026

- Proposed Solution:**
- At Lemoyne Substation: Replace line relaying.
 - Install new 20-mile ADSS fiber line from Lemoyne Substation to Toledo Edison regional services territory boundary.

- Proposed Solution due to PJM's Do No Harm Analysis:**
- Construct a new Greenfield – Ottawa 138 kV Line (~23 miles).
 - At Ottawa Substation: Convert the ring bus configuration to breaker and a half by installing three circuit breakers and associated disconnects.
 - At Greenfield Substation: Install one circuit breaker and associated disconnects.

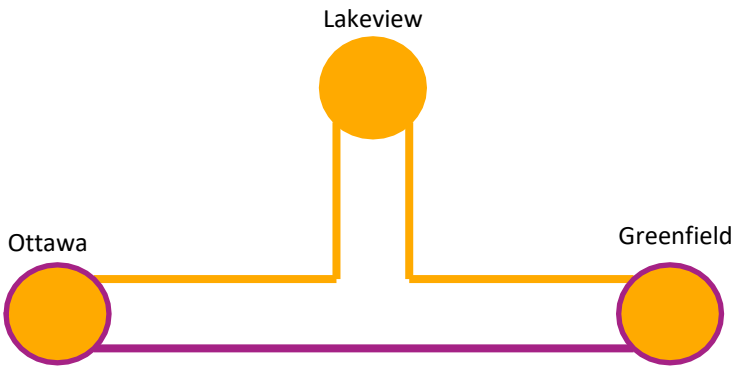
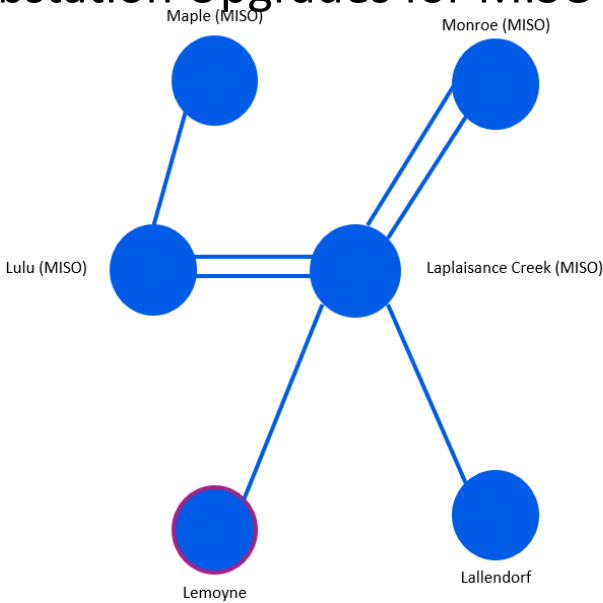
- Transmission Line Ratings:**
- Greenfield – Ottawa 138 kV Line
- Before Proposed Solution: N/A
 - After Proposed Solution: 448 / 516 / 448 / 543 MVA (SN/SE/WN/WE)

- Alternatives Considered:**
- Alternatives considered as part of the MISO LRTP process: MTEP24 Chapter 2 - Regional Long Range Transmission Planning
- Rebuild Lakeview – Greenfield 138 kV Line using a higher rated conductor
 - Rebuild Ottawa – Lakeview 138 kV Line using a higher rated conductor
 - This option was not chosen due to the amount of power flowing through a single 138 kV line.

Estimated Project Cost: \$100.86M [\$15.6 M (Direct Connection - ATSI scope)
\$85.26 M (DNH Reinforcements)]

Projected IS Date: 6/1/2032

Supplemental ID: s3844.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

ATSI Transmission Zone M-3 Process

Lallendorf Substation Upgrades for MISO Tranche 2.1

Need Number: ATSI-2025-005

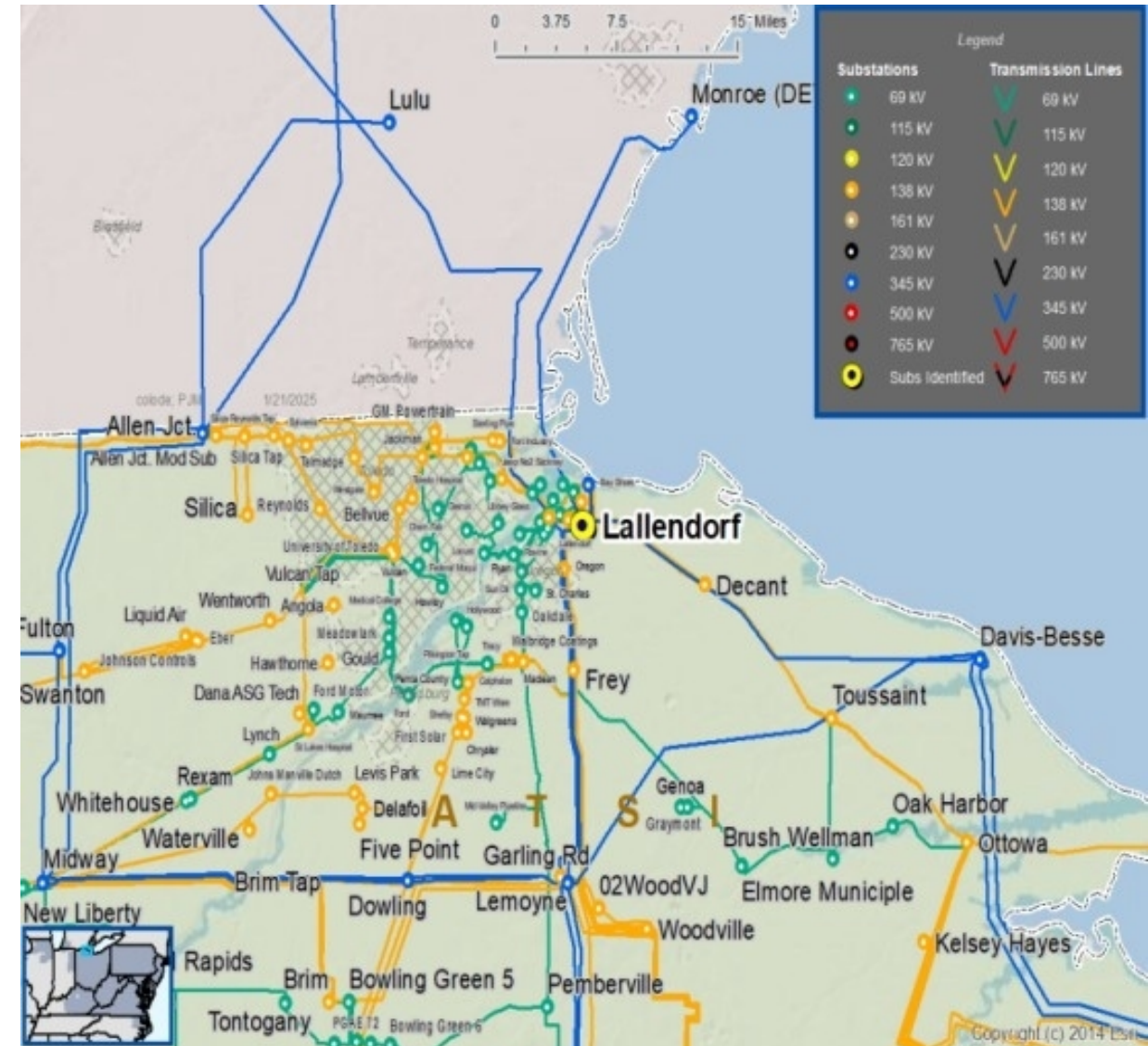
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/6/2026

Previously Presented: Need Meeting – 02/04/2025
Solution Meeting – 03/04/2025 & 12/12/2025

Project Driver:
Other

Problem Statement:

- As part of its Long-Range Transmission Planning process (LRTP), MISO identified transmission overload and congestion issues through the Midwest region of the MISO transmission system that indicated a need for a MISO high voltage regional transmission backbone in the 10-year and 20-year planning horizons.
- In September 2024, MISO posted its draft 2024 MISO Transmission Expansion Plan (MTEP24) Appendix A for all facilities in the LRTP Tranche 2.1 Portfolio. The Appendix A facility-level details identified transmission facility work in PJM impacting the ATSI zone that is needed to accommodate the portfolio of MISO projects. MISO indicated assignment to PJM Transmission Owners for work in PJM associated with addressing MISO Appendix A identified transmission facility work in PJM.



ATSI Transmission Zone M-3 Process

Lallendorf Substation Upgrades for MISO Tranche 2.1

Need Number: ATSI-2025-005

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/6/2026

Proposed Solution:

- At Lallendorf Substation: Substation: Replace line relaying.
- Install new seven-mile ADSS fiber line from Lallendorf Substation to Toledo Edison regional services territory boundary.

Proposed Solution due to PJM’s Do No Harm Analysis:

- At Allen Junction Substation, replace disconnect switches, breaker leads, metering, and transmission line drops.

Transmission Line Ratings:

Allen Junction – Morocco 345 kV Line

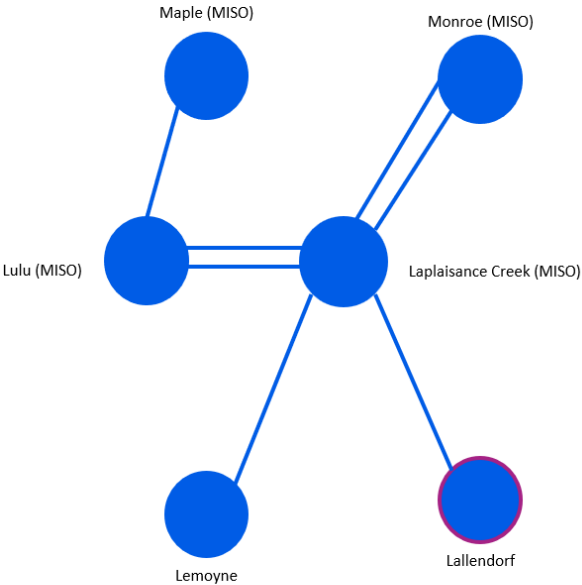
- Before Proposed Solution: 1517 / 1793 / 1759 / 1793 MVA (SN/SE/WN/WE)
- After Proposed Solution: 1868 / 2249 / 2340 / 2535 MVA (SN/SE/WN/WE)

Alternatives Considered: Alternatives considered as part of the MISO LRTP process: MTEP24 Chapter 2 - Regional Long Range Transmission Planning

Estimated Project Cost: \$7.21 [\$5.9 M (Direct Connection - ATSI scope)
\$1.31 M (DNH Reinforcements)]

Projected IS Date: 6/1/2032

Supplemental ID: s3845.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2024-054

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

Previously Presented: Solution Meeting - SRRTEP-W – 11/14/2025
Need Meeting - SRRTEP-W – 06/14/2024

Project Driver:

Equipment Condition/Performance/Risk, Infrastructure Resilience, Operational Flexibility and Efficiency

Specific Assumption Reference:

System Performance Projects Global Considerations

- System reliability and performance
- Load at risk in planning and operational scenarios
- Capability to perform system maintenance

Problem Statement:

The Ashtabula – Ashtabula East 138 kV Line is 0.30 miles long and serves one distribution substation. - Maintenance work cannot be preformed on certain sections of the Ashtabula – Ashtabula East 138 kV Line without an outage to the Ashtabula East Substation. - Ashtabula East Substation serves approximately 16 MW of load and 36,000 customers. - Since 2015, the Ashtabula – Ashtabula East 138 kV Line has experienced two unscheduled sustained outages.



Need Number: ATSI-2024-054
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

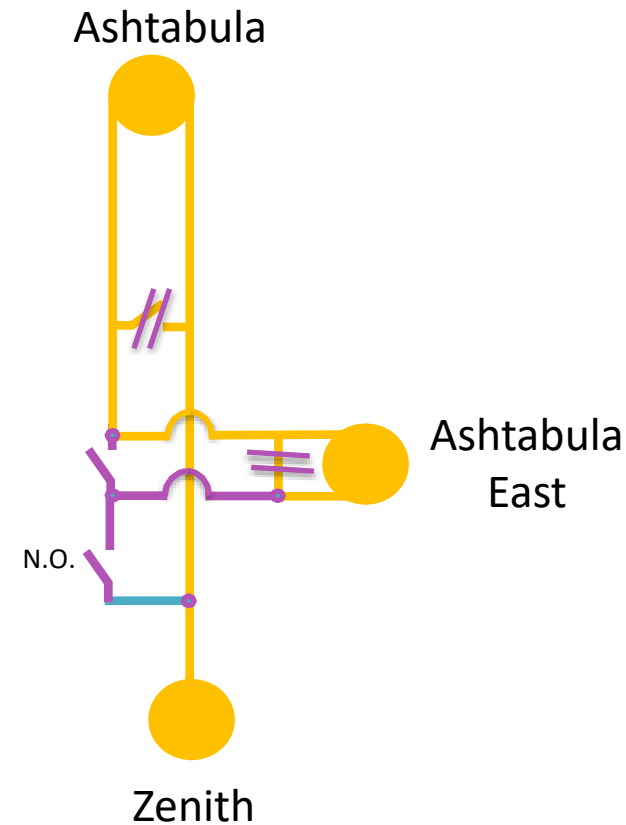
Proposed Solution:

- Reconfigure the feeds into the Ashtabula East and the ties to the Ashtabula - Zenith 138 kV line to allow for improved operational flexibility during maintenance.
- Eliminate/Retire the existing tie and switches between the Ashtabula East and Zenith 138 kV lines.
- Eliminate the existing tap located outside of the Ashtabula East Substation.
- Construct approximately 0.1 miles of new 138 kV line.
- Install two 138 kV switches; one switch will be operated normally opened.

Alternatives Considered:

Maintain existing configuration with elevated risk of customer outages at Ashtabula East under maintenance conditions.

Estimated Project Cost: \$4.79M
Projected In-Service: 12/18/2026
Supplemental ID: s3872.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2022-009

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

Previously Presented: Solution Meeting - SRRTEP-W – 11/14/2025
Need Meeting - SRRTEP-W – 09/19/2022

Project Driver:

Equipment Condition/Performance/Risk, Infrastructure Resilience

Specific Assumption Reference:

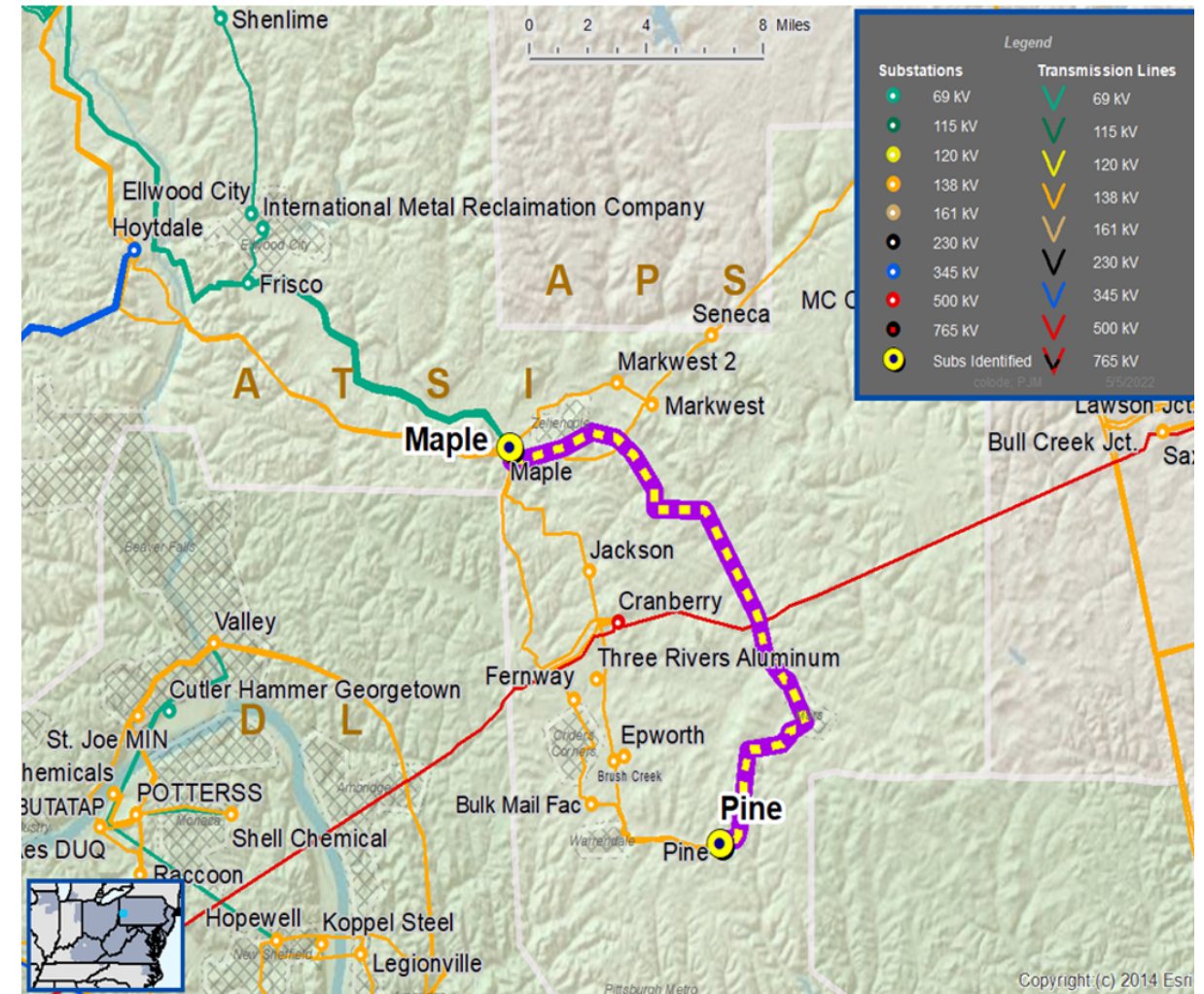
Global Factors

- Aged or deteriorated wood pole transmission line structures
- Negatively impact customer outage frequency and/or durations
- Demonstrate an increasing trend in maintenance findings and/or costs
- Transmission line ratings are limited by terminal equipment
- End of Life

Problem Statement:

The Maple-Pine 69 kV (~19 miles) Transmission Line:

- The 69 kV line section from Maple through structure 110 (~10 miles) including taps and switches (119 structures in total) is over 50 years old.
- A recent aerial CVI found 71 structures (60%) had 136 defects including rotten poles, cracked poles, woodpecker damage and other misc. hardware deficiencies.
- 5 switches along the stretch are aged and obsolete (A-6041, A-6042, A-194, A-195, A-219).
- There have been eight (8) total unscheduled interruptions since 2017: three sustained and five momentary outages.



Need Number: ATSI-2022-009
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

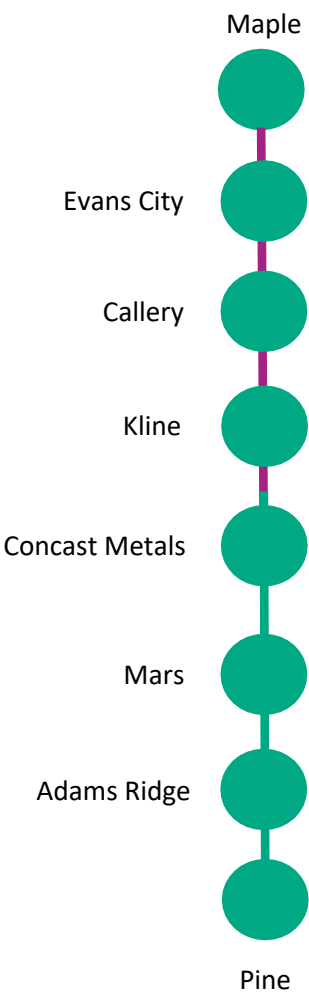
Proposed Solution:

- Rebuild the Maple - Pine 69 kV Line from Maple through structure 110 (~10 miles).
- Replace five disconnect switches (A-6041, A-6042, A-194, A-195, A-219).
- Maple - Evans City 69 kV Line:
 - Before Proposed Solution: 141 / 171 / 160 / 203 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 154 / 188 / 175 / 223 MVA (SN/SE/WN/WE)
- Evans City - Callery 69 kV Line:
 - Before Proposed Solution: 141 / 171 / 160 / 203 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 154 / 188 / 175 / 223 MVA (SN/SE/WN/WE)
- Callery - Kline 69 kV Line:
 - Before Proposed Solution: 141 / 171 / 160 / 203 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 154 / 188 / 175 / 223 MVA (SN/SE/WN/WE)
- Kline - Concast Metals 69 kV Line:
 - Before Proposed Solution: 141 / 171 / 160 / 203 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 154 / 188 / 175 / 223 MVA (SN/SE/WN/WE)
- Kline - Mars 69 kV Line:
 - Before Proposed Solution: 141 / 171 / 160 / 203 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 154 / 188 / 175 / 223 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain existing condition with elevated risk of failure due to equipment deterioration.

Estimated Project Cost: \$36.68M
Projected In-Service: 05/19/2028
Supplemental ID: s3873.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

ATSI Transmission Zone M-3 Process Cloverdale – Harmon 138 kV Line Customer Connection

Need Number: ATSI-2024-041
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026
Previously Presented: s3499.1 Project Cancellation – 11/14/2025
 Need Meeting – 05/17/2024
 Solution Meeting – 06/14/2024

Supplemental Project Driver(s):

Customer Service

Specific Assumption Reference(s):

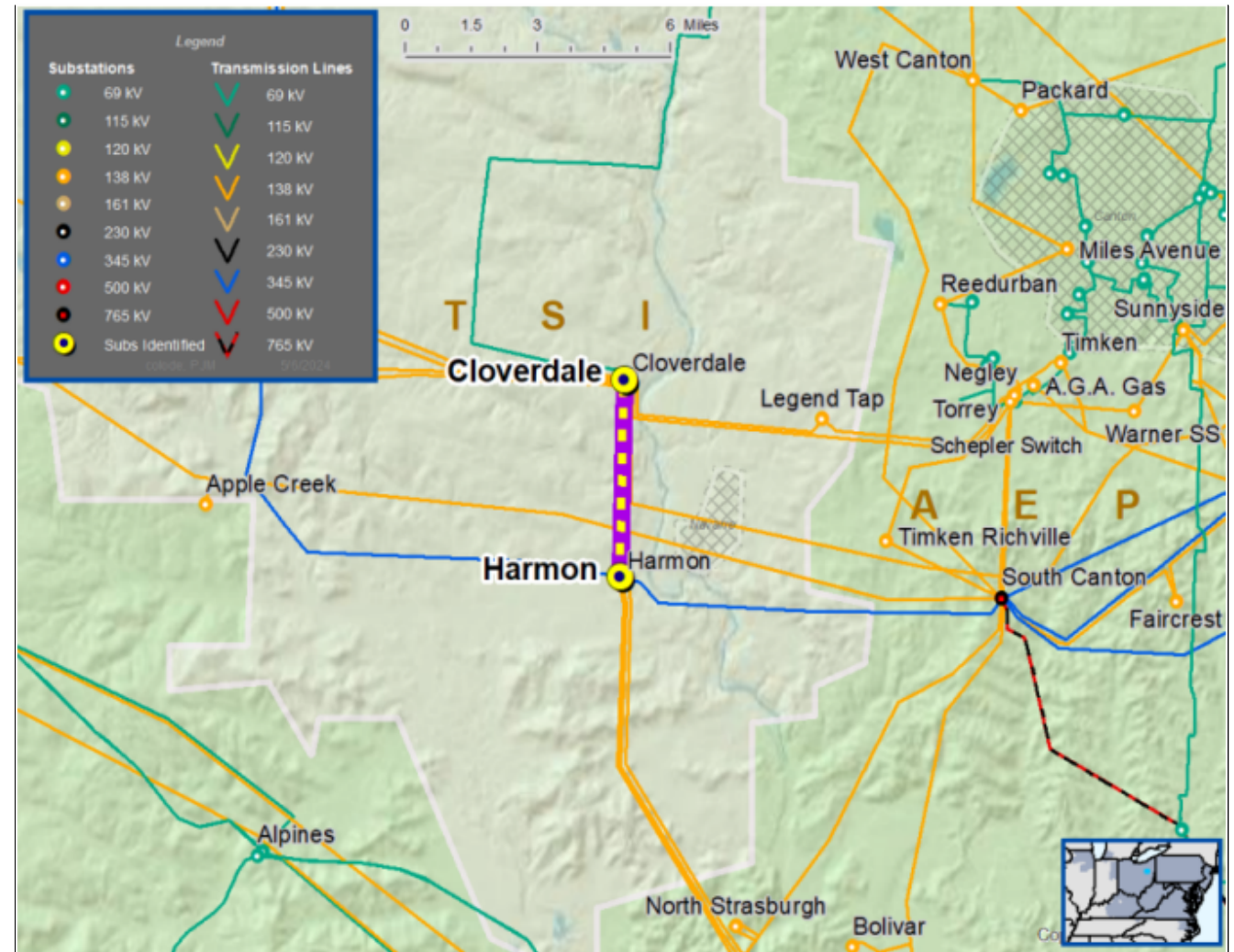
New customer connection request will be evaluated per FirstEnergy's "Requirements for Transmission Connected Facilities" document and "Transmission Planning Criteria" document.

Problem Statement

New Customer Connection – Ohio Edison distribution requested 138 kV service for load of approximately 11 MVA near the Cloverdale - Harmon 138 kV Line. The service request location is approximately 1 mile from Cloverdale Substation.

Requested In-Service Date:

December 31, 2025



Need Number: ATSI-2024-041
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

Justification for Cancellation:

Due to the customer's decision to cancel their project, the associated transmission connection is no longer required.

Proposed Solution:

138 kV Transmission Line Tap

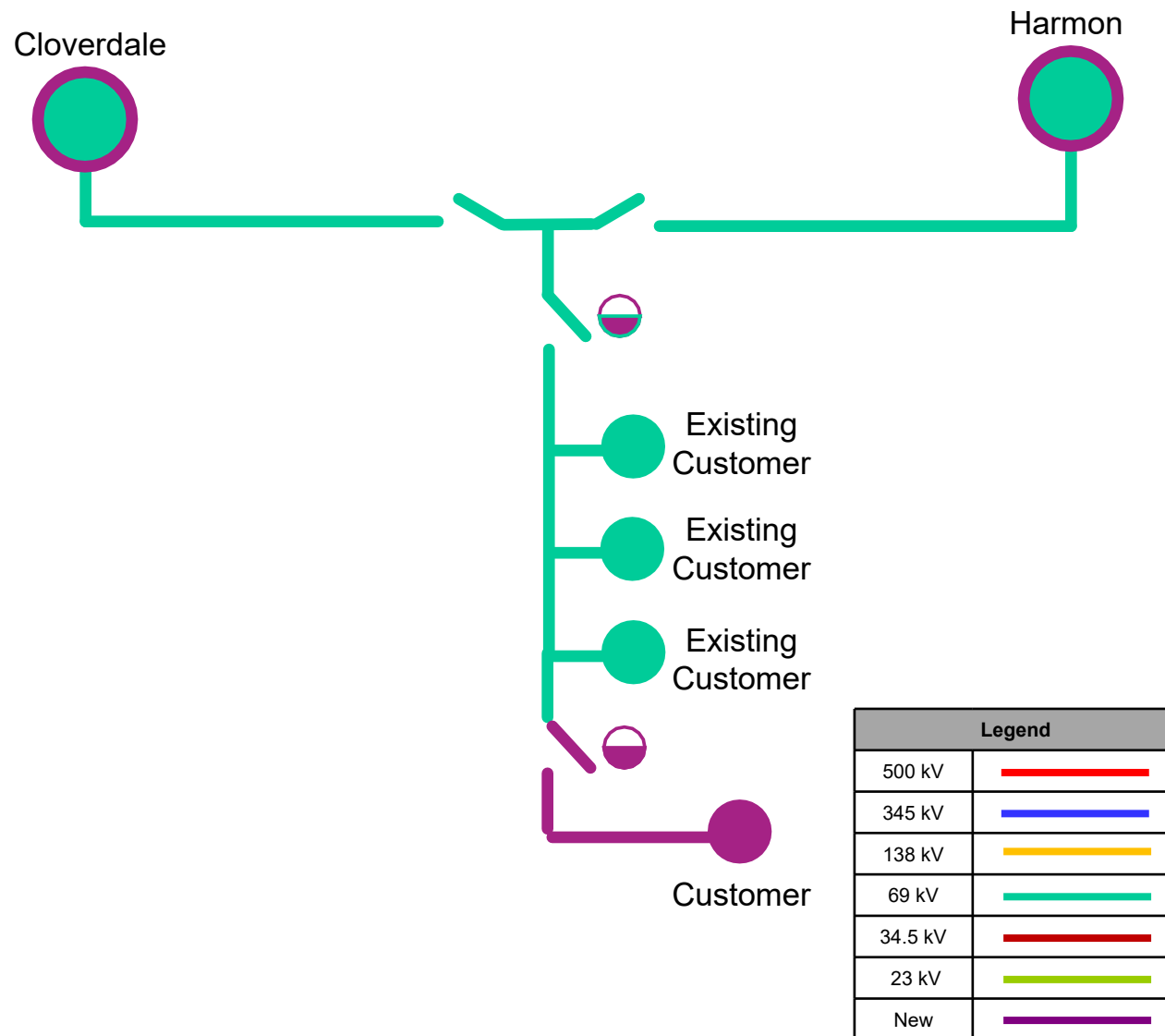
- Install one tap-line SCADA controlled switch
- Install SCADA controlled on existing main-line switch
- Construct 0.6 miles of 336 kcmil 26/7 ASCR transmission line
- Adjust relay settings at Cloverdale and Harmon substations
- Install revenue metering

Alternatives Considered:

- No feasible alternatives to meet customer's request near the Cloverdale - Harmon 138 kV Line.

Estimated Project Cost: \$0.8M
Projected In-Service: 12/31/2027
Supplemental ID: s3499.1 9 **(Cancellation)**

ATSI Transmission Zone M-3 Process Cloverdale – Harmon 138 kV Line Customer Connection



Need Number: ATSI-2022-031

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

Previously Presented: Solution Meeting SRRTEP-W - 12/12/2025
Need Meeting - 11/18/2022

Project Driver:

Equipment Condition/Performance/Risk

Infrastructure Resilience

Operational Flexibility and Efficiency

Specific Assumption Reference:

Global Considerations

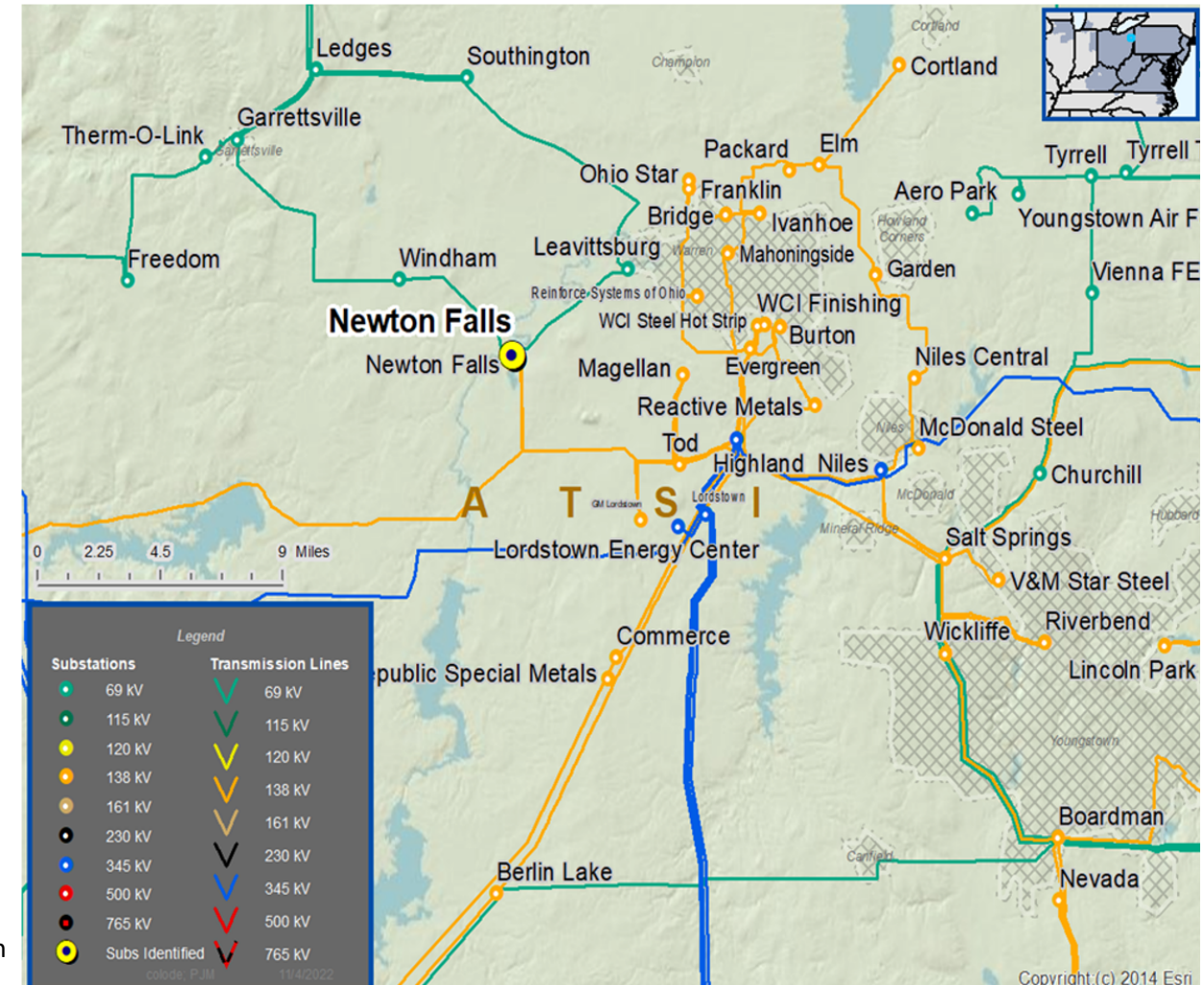
- System reliability and performance
- Load at risk in planning and operational scenarios Add/Expand Bus Configuration
- Loss of substation bus adversely impacts transmission system performance
- Eliminate simultaneous outages to multiple networked elements under N-1 analysis
- Accommodate future transmission facilities
- Capability to perform system maintenance Build New Transmission Line

Problem Statement:

The Newton Falls 138/69 kV Substation is served via two 138 kV lines, loss of one of those 138 kV lines results in the isolation of the 138-69 kV transformer.

The majority of the Newton Falls 69 kV area is operated as normally radial out of the Newton Falls substation. An N-1-1 outage will result in the loss of the 69 kV and 23 kV system loads. An N-1 outage results in the outage of approximately 25,000 customers and 69 MW of load.

Since 2018: The Hanna-Newton Falls 138 kV Line has experienced one (1) sustained outage. The GM Lordstown-Newton Falls 138 kV Line has experienced three (3) sustained outages.



Need Number: ATSI-2022-031

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

Proposed Solution:

- Convert Newton Falls Substation 138 kV yard into a six-breaker ring bus by installing three new 138 kV breakers.
- Build a new Whitman Station, a four-breaker 138 kV ring bus, near Reinforcements Systems of Ohio
- Cut into the Evergreen - Ivanhoe 138 kV Line 4.5 miles from Evergreen Substation and loop into the new Whitman Station four-breaker ring bus by constructing 0.6 miles of new transmission line.
- Construct five miles of new 138 kV line from Newton Falls Substation to the new four-breaker Whitman Station.
- Remote end upgrades at Bridge, Ohio Star Forge, Ivanhoe, Evergreen, and Franklin substations.

Transmission Line Ratings:

- Before Proposed Solution:
 - Evergreen - Ivanhoe 138 kV Line: 190 / 225 / 226 / 258 MVA (SN/SE/WN/WE)
- After Proposed Solution:
 - Evergreen - Whitman 138 kV Line: 200 / 242 / 226 / 286 MVA (SN/SE/WN/WE)
 - Whitman - Ivanhoe 138 kV Line: 200 / 242 / 226 / 286 MVA (SN/SE/WN/WE)
 - Whitman - Newton Falls 138 kV Line: 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

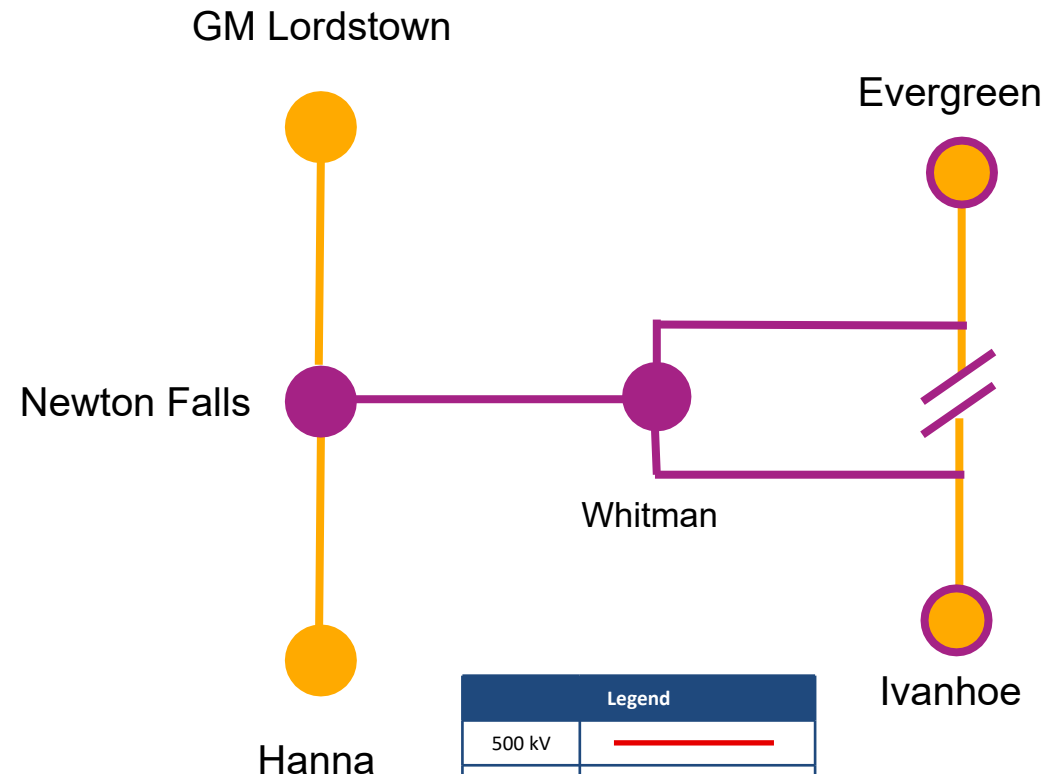
Alternatives Considered:

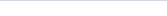
Maintain existing condition with elevated risk of customer outages under contingency scenarios.

Estimated Project Cost: \$51.52M

Projected In-Service: 12/21/2028

Supplemental ID: s3877.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2019-059

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

Previously Presented: Solution Meeting SRRTEP-W - 12/12/2025
Need Meeting - 07/24/2019

Project Driver:

Equipment Condition/Performance/Risk

Specific Assumption Reference:

Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors System Performance Projects
- Substation/line equipment limits

Problem Statement:

Line sections are exhibiting deterioration, increasing maintenance needs.

Transmission line is approaching end of life.

Transmission line ratings are limited by terminal equipment.

McDowell – Sharon (Y-300) 69 kV Line (18.8 Miles):

Transmission Line / Substation Locations: McDowell – Dept. of Corrections Existing Line Rating (SN / SE): 47 / 48 Existing Conductor Rating (SN / SE): 57 / 56 Limiting Terminal Equipment: Relay Length of Line (miles): 6.0 Identified Structures (end of life / total): 195 / 235 (83% Failure Rate) Failure reasons: Woodpecker holes, decay and age.

Transmission Line / Substation Locations: Dept. of Corrections – Mercer Forge Existing Line Rating (SN / SE): 47 / 56 Existing Conductor Rating (SN / SE): 47 / 56 Limiting Terminal Equipment: - Length of Line (miles): 1.0 Identified Structures (end of life / total): 195 / 235 (83% Failure Rate) Failure reasons: Woodpecker holes, decay and age.

Transmission Line / Substation Locations: Mercer Forge – Reznor Tap Existing Line Rating (SN / SE): 47 / 56 Existing Conductor Rating (SN / SE): 47 / 56 Limiting Terminal Equipment: - Length of Line (miles): 0.3 Identified Structures (end of life / total): 195 / 235 (83% Failure Rate) Failure reasons: Woodpecker holes, decay and age.

Transmission Line / Substation Locations: Reznor Tap – Mercer Tap Existing Line Rating (SN / SE): 47 / 56 Existing Conductor Rating (SN / SE): 47 / 56 Limiting Terminal Equipment: - Length of Line (miles): 1.1 Identified Structures (end of life / total): 195 / 235 (83% Failure Rate) Failure reasons: Woodpecker holes, decay and age.

Transmission Line / Substation Locations: Mercer Tap – Sharon 69kV Existing Line Rating (SN / SE): 72 / 72 Existing Conductor Rating (SN / SE): 80 / 96 Limiting Terminal Equipment: Relay Length of Line (miles): 10.4 Identified Structures (end of life / total): 195 / 235 (83% Failure Rate) Failure reasons: Woodpecker holes, decay and age.

**Map Not Shown
Multiple Locations**

Need Number: ATSI-2019-059

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

Proposed Solution:

- Rebuild the Sharon - McDowell 69 kV Line, including tap structures and lines up to customer facilities (19.2 miles total).
- Upgrade terminal equipment at Sharon and McDowell substations, including station conductor, relays, CCVTs, and disconnect switches.
- Replace line switches A-161 & A-179 (4 miles from McDowell Substation).

Sharon - Mercer 69 kV Line (no ratings change):

- Before Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)
- After Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)

Mercer - Reznor Thomas 69 kV Line:

- Before Proposed Solution: 47 / 56 / 53 / 67 MVA (SN/SE/WN/WE)
- After Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)

Reznor Thomas - Mercer Forge 69 kV Line:

- Before Proposed Solution: 47 / 56 / 53 / 67 MVA (SN/SE/WN/WE)
- After Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)

Mercer Forge - Department of Corrections 69 kV Line:

- Before Proposed Solution: 47 / 56 / 53 / 67 MVA (SN/SE/WN/WE)
- After Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)

Department of Corrections - McDowell 69 kV Line:

- Before Proposed Solution: 47 / 56 / 53 / 67 MVA (SN/SE/WN/WE)
- After Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)

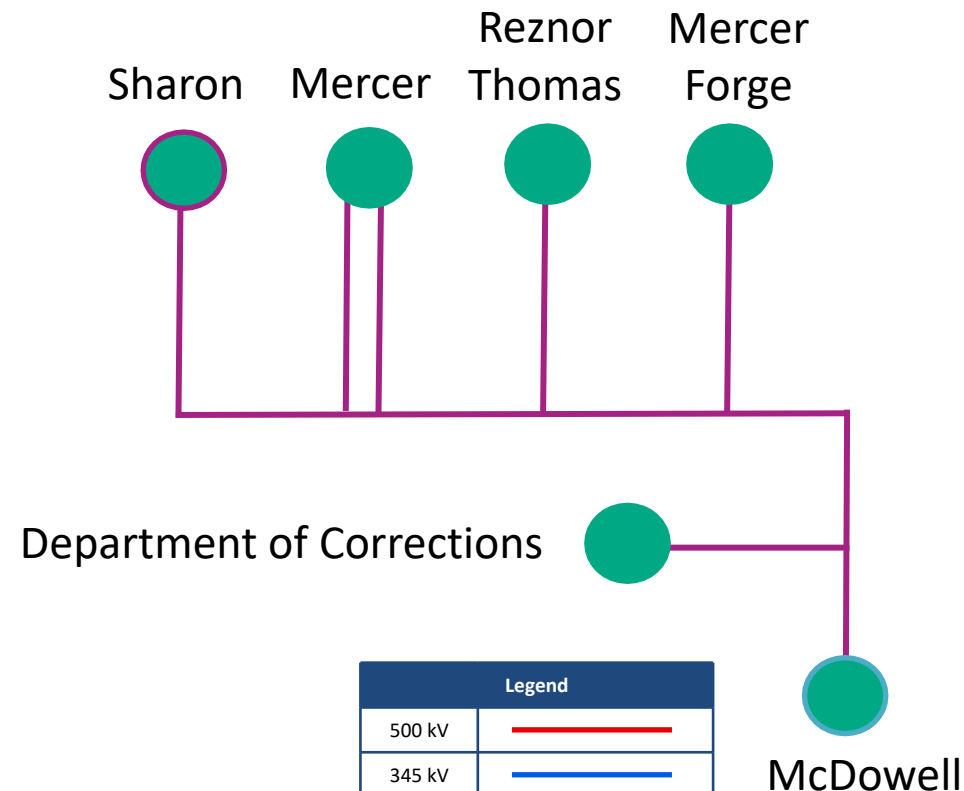
Alternatives Considered:

Maintain existing condition with elevated risk of failure and customer outages.

Estimated Project Cost: \$63.7M

Projected In-Service: 12/31/2030

Supplemental ID: s3878.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2025-035

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

Previously Presented: Solution Meeting SRRTEP-W - 12/12/2025
Need Meeting 11/14/2025

Project Driver:
Equipment Condition/Performance/Risk

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance
- Substation/Line equipment limits
- Transmission line switches
- Limited availability of spare parts and/or vendor technical support

Problem Statement:

Manually operated switches A-66 and A-67 on the Black River - Willow Creek 69 kV Line are 50 years old and approaching end of life. Replacement components are difficult to source leading to non-standard repairs.

The obsolete 2-way design and assembly of these switches is subject to dimensional changes in the supporting structure such as warping or deflection. These concerns may result in mis-operation with the potential for unintended arcing.

The line is currently limited by terminal equipment.

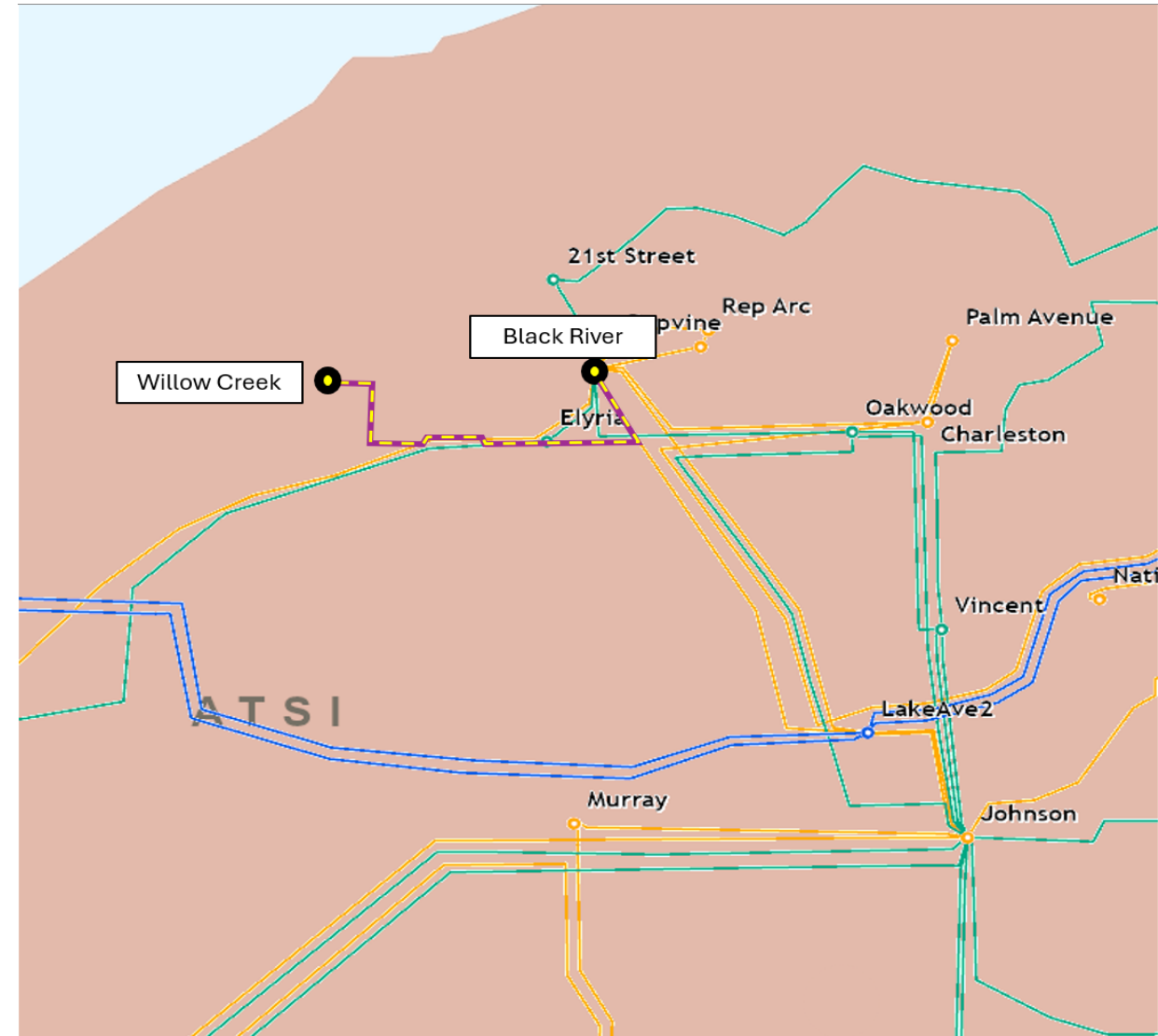
Thirty-Sixth Street Tap - Willow Creek Tap 69 kV Line:

- Existing Line Ratings: 82 / 103 / 108 / 124 MVA (SN/SE/WN/WE)
- Existing Conductor Ratings: 100 / 121 / 113 / 143 MVA (SN/SE/WN/WE)

Black River Tap - Willow Creek Tap 69 kV Line:

- Existing Line Ratings: 82 / 103 / 108 / 124 MVA (SN/SE/WN/WE)
- Existing Conductor Ratings: 100 / 121 / 113 / 143 MVA (SN/SE/WN/WE)

ATSI Transmission Zone M-3 Process Black River - Willow Creek 69 kV



Need Number: ATSI-2025-035

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 7/29/2026

Proposed Solution:

- Replace manually operated switches A-66 and A-67 on the Black River - Willow Creek 69 kV Line.
- New switches will be equipped with SCADA controlled motor operators
- Replace the existing structure with independent steel structures for the switches.

Black River Tap - Willow Creek Tap 69 kV Line:

- Before Proposed Solution: 82 / 103 / 108 / 124 MVA (SN/SE/WN/WE)
- After Proposed Solution: 100 / 121 / 113 / 143 MVA (SN/SE/WN/WE)

Alternatives Considered:

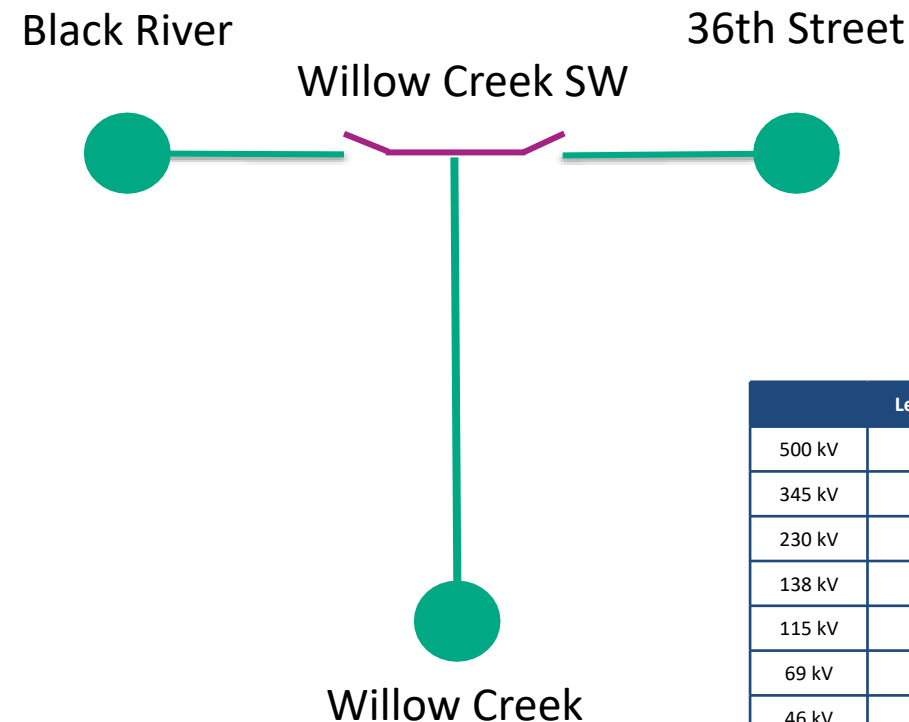
Maintain existing condition with elevated risk of equipment failure due to deteriorated conditions

Estimated Project Cost: \$1.53M

Projected In-Service: 12/31/2026

Supplemental ID: s3879.1

ATSI Transmission Zone M-3 Process Black River - Willow Creek 69 kV



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

ATSI Transmission Zone M-3 Process Cascade (Cedar Street) 69 kV Line

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 8/5/2026

s3495.1: Originally presented in 2/18/2022, 6/14/2024 & 01/16/2026 SRRTEP Western meetings.

Changes are marked in red

Supplemental Project Driver(s):
Equipment Material Condition, Performance and Risk

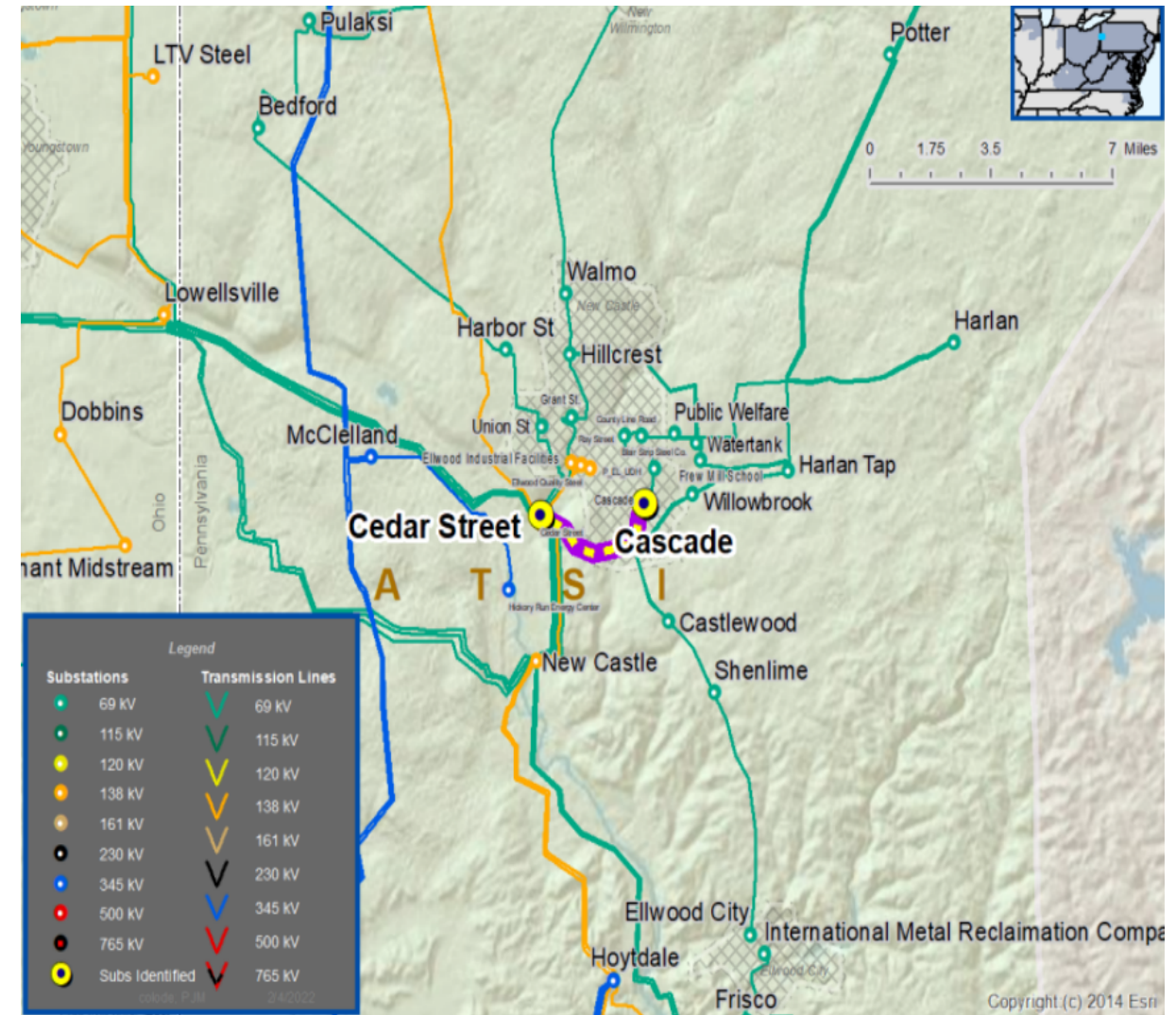
Specific Assumption Reference(s):
Line Condition Rebuild / Replacement

- Aged or deteriorated wood pole transmission line structures
- Negatively impact customer outage frequency and/or durations
- Demonstrate an increasing trend in maintenance findings and/or costs
- Transmission line ratings are limited by terminal equipment

Problem Statement:

Cascade 69 kV (~18.3 miles) transmission line:

- The average age of structures on this line are 55 years old.
- The Cascade (Cedar Street) 69 kV line is exhibiting an upward trend in both minor and major maintenance required with 108 open priority conditions.
- Recent inspections show a structure reject rate of 38% (117 of 307). The primary reasons for reject were cracked and deteriorated wood poles, woodpecker holes, and failed insulators.
- 3 out of the 11 line switches on the Cascade (Cedar Street) 69 kV line are obsolete and no longer meet established design standards.
- The Cascade (Cedar Street) 69 kV line has experienced 14 unscheduled outages in the past five years (5 sustained)





Need Number ATSI-2022-001
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 8/5/2026

Proposed Solution:

Cascade (Cedar Street) 69 kV Line

- Reconductor the Cascade (Cedar Street) 69 kV Line with ~~336 ACSR 36/7 conductor~~ **556 ACSR 26/7 conductor**, approximately 18.3 miles.

Transmission Line Ratings:

▪ **Cedar St- Cascade 69kV Line**

- Before Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE

~~After Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE~~

- After Proposed Solution: 111 MVA SN / 134 MVA SE / 125 MVA WN / 159 MVA WE**

▪ **Blair Strip Steel- Cascade 69kV Line**

- Before Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE

~~After Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE~~

- After Proposed Solution: 111 MVA SN / 134 MVA SE / 125 MVA WN / 159 MVA WE**

▪ **Blair Strip Steel- Ray St 69kV Line**

- Before Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE

~~After Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE~~

- After Proposed Solution: 111 MVA SN / 134 MVA SE / 125 MVA WN / 159 MVA WE**

▪ **Ray St- YDC- West Tap 69kV Line**

- Before Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE

~~After Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE~~

- After Proposed Solution: 111 MVA SN / 134 MVA SE / 125 MVA WN / 159 MVA WE**

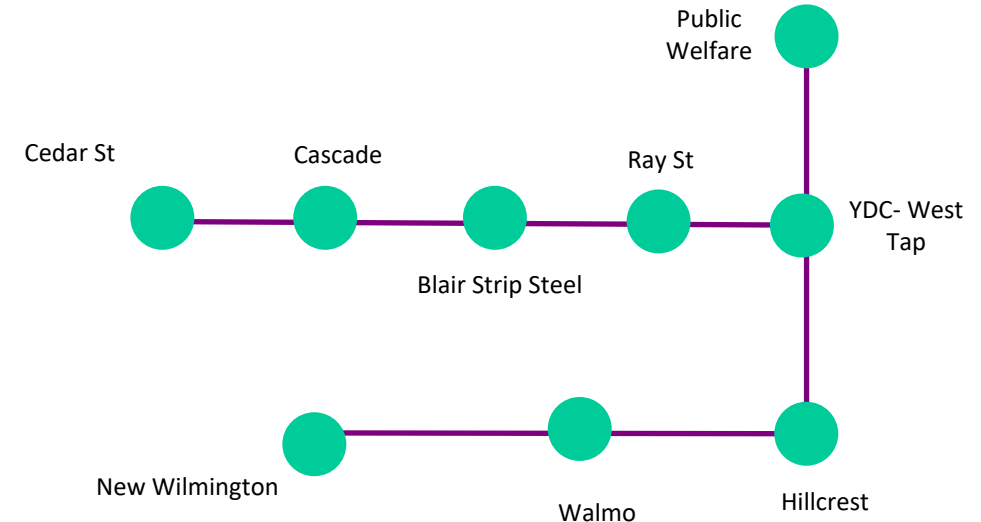
▪ **Public Welfare- YDC- West Tap 69kV Line**

- Before Proposed Solution: 47 MVA SN / 56 MVA SE / 53 MVA WN / 67 MVA WE

~~After Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE~~

- After Proposed Solution: 111 MVA SN / 134 MVA SE / 125 MVA WN / 159 MVA WE**

ATSI Transmission Zone M-3 Process Cascade (Cedar Street) 69 kV Line



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



Need Number ATSI-2022-001
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 8/5/2026

Transmission Line Ratings:

▪ **Hillcrest- YDC- West Tap 69kV Line**

- Before Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE
- ~~After Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE~~
- **After Proposed Solution: 111 MVA SN / 134 MVA SE / 125 MVA WN / 159 MVA WE**

▪ **Hillcrest- Walmo 69kV Line**

- Before Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE
- ~~After Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE~~
- **After Proposed Solution: 111 MVA SN / 134 MVA SE / 125 MVA WN / 159 MVA WE**

▪ **New Wilmington- Walmo 69kV Line**

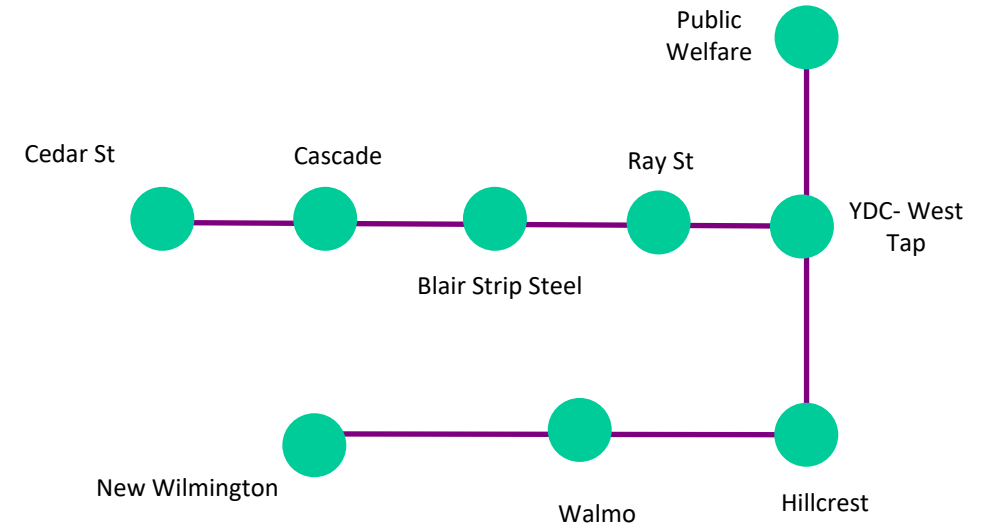
- Before Proposed Solution: 47 MVA SN / 48 MVA SE / 53 MVA WN / 53 MVA WE
- ~~After Proposed Solution: 80 MVA SN / 96 MVA SE / 90 MVA WN / 114 MVA WE~~
- **After Proposed Solution: 111 MVA SN / 134 MVA SE / 125 MVA WN / 159 MVA WE**

Alternatives Considered:

- Maintain existing condition and elevated risk of mis-operations

Estimated Project Cost: \$34.7 M
Projected In-Service: 3/31/2028
Supplemental ID: s3495.1

ATSI Transmission Zone M-3 Process Cascade (Cedar Street) 69 kV Line



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

ATSI Transmission Zone M-3 Process Cedar Street - Lowellville South 69 kV Line

Need Number: ATSI-2024-017
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 8/5/2026
Previously Presented: Solution Meeting SRRTEP-W - 03/19/2026
 Need Meeting 02/16/2024

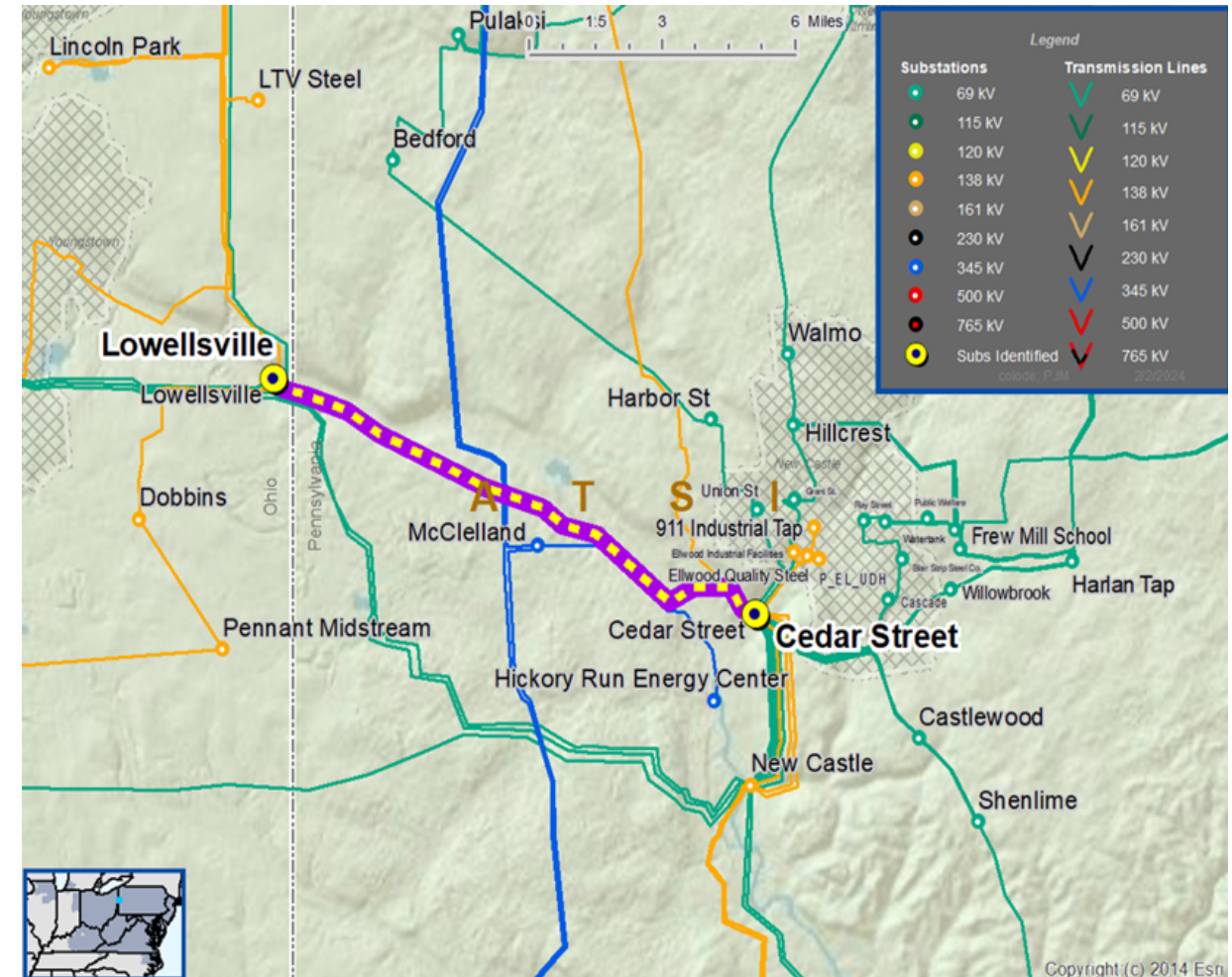
Project Driver:
 Equipment Material Condition, Performance & Risk, Infrastructure Resilience

Specific Assumption References:

Global Factors - Aged or deteriorated wood pole transmission line structures -
 Negatively impact customer outage frequency and/or durations - Demonstrate an increasing trend in maintenance findings and/or costs - Transmission line ratings are limited by terminal equipment.

Problem Statement:

The Cedar St - Lowellville South 69 kV Line was constructed in 1960 and is approximately 9.5 miles in length. This line was constructed utilizing wood poles with a total of 100 structures.
 Assessment found 89 of 101 wood poles had defects that could negatively affect reliability. Defects included decay, top rot and multiple woodpecker holes.
 Since 2019, the Cedar St - Lowellville South 69 kV Line had three sustained outages.



ATSI Transmission Zone M-3 Process Cedar Street - Lowellville South 69 kV Line

Need Number: ATSI-2024-017
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 8/5/2026

Proposed Solution:

Cedar Street - Lowellville South 69 kV Line:

- Rebuild the Cedar St - Lowellville South 69 kV Line using new conductor (9.6-miles). Upgrade disconnect switches, station conductor, and relays at Cedar St and Lowellville stations.

Transmission Line Ratings:

- Before Proposed Solution: 65 / 68 / 72 / 72 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

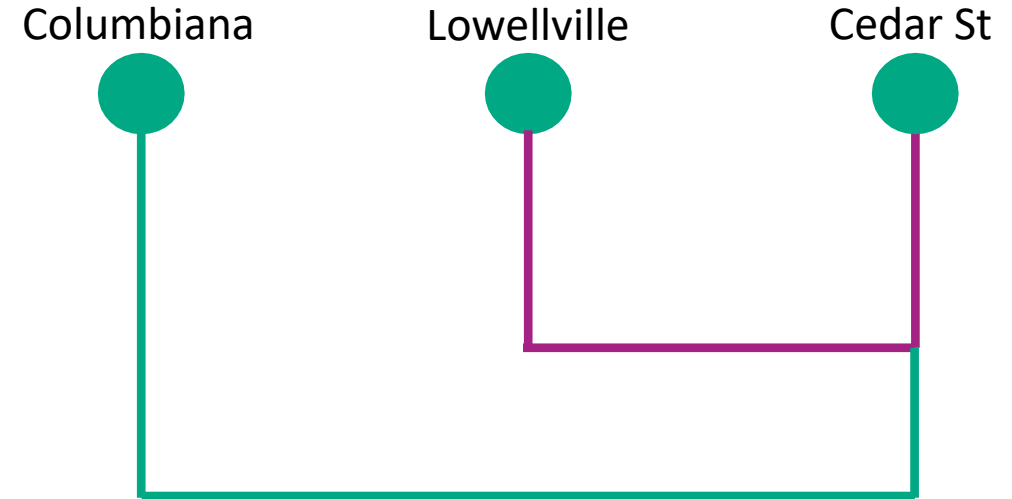
Transmission Conductor Ratings:

- Before Proposed Solution: 65 / 68 / 87 / 87 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain existing line with elevated risk of customer outages and reliability events.

Estimated Project Cost: \$30.79 M
Projected In-Service: 10/05/2029
Supplemental ID: s3890.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2023-024

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 8/5/2026

Previously Presented: Solution Meeting SRRTEP-W - 03/19/2026
Need Meeting 10/20/2023

Project Driver:
Equipment Material Condition, Performance & Risk, Infrastructure Resilience, Operational Flexibility and Efficiency

Specific Assumption References:

Global Considerations

- System reliability and performance
- Load at risk in planning and operational scenarios

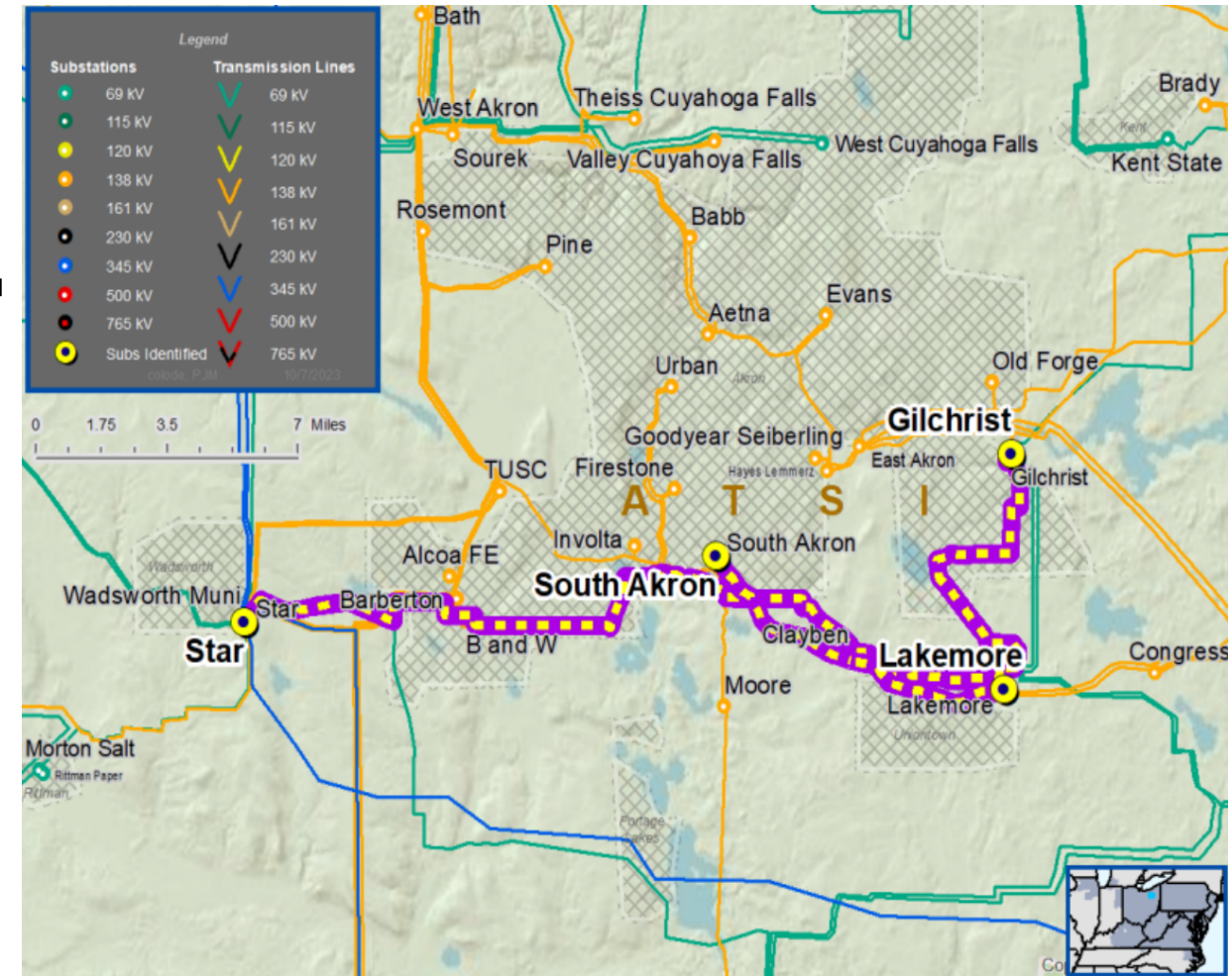
Add/Expand Bus Configuration

- Loss of substation bus adversely impacts transmission system performance
- Eliminate simultaneous outages to multiple networked elements under N-1 analysis
- Accommodate future transmission facilities
- Capability to perform system maintenance

Problem Statement:

The Gilchrist – Star 69 kV Line is approximately 26 miles and serves four (4) delivery points. A line fault will cause approximately 45 MW consequential loss of load and approximately 15,100 customers at risk. Since 2020, the Gilchrist – Star 69 kV Line has experienced a total of 2 momentary outages and 4 sustained outages. The Lakemore – South Akron 138 kV Line is approximately 8 miles and serves (1) delivery point.

A line fault will cause approximately 47 MW consequential loss of load and approximately 5,000 customers at risk. Since 2020, the Lakemore – South Akron 138 kV Line has experienced a 1 sustained outage.





Need Number:

ATSI-2023-024

Process Stage:

Submission of Supplemental Projects for Inclusion
in the Local Plan – 8/5/2026

Proposed Solution:

North Clayben 138 kV and 69 kV Ring Bus:

Build a new substation (North Clayben) as a 138/69 kV substation adjacent to the Clayben Substation, a 138-12.4 kV substation.

- Build a three breaker 69 kV ring bus.
- Build a four breaker 138 kV ring bus.
- Loop the Lakemore-South Akron (future Glenmount) 138 kV Line in/out of the new substation.
- Loop the Gilchrist-Star 69 kV Line in/out of the new substation.

Re-terminate the Clayben Substation distribution high side into the 138 kV breaker position in the new substation.

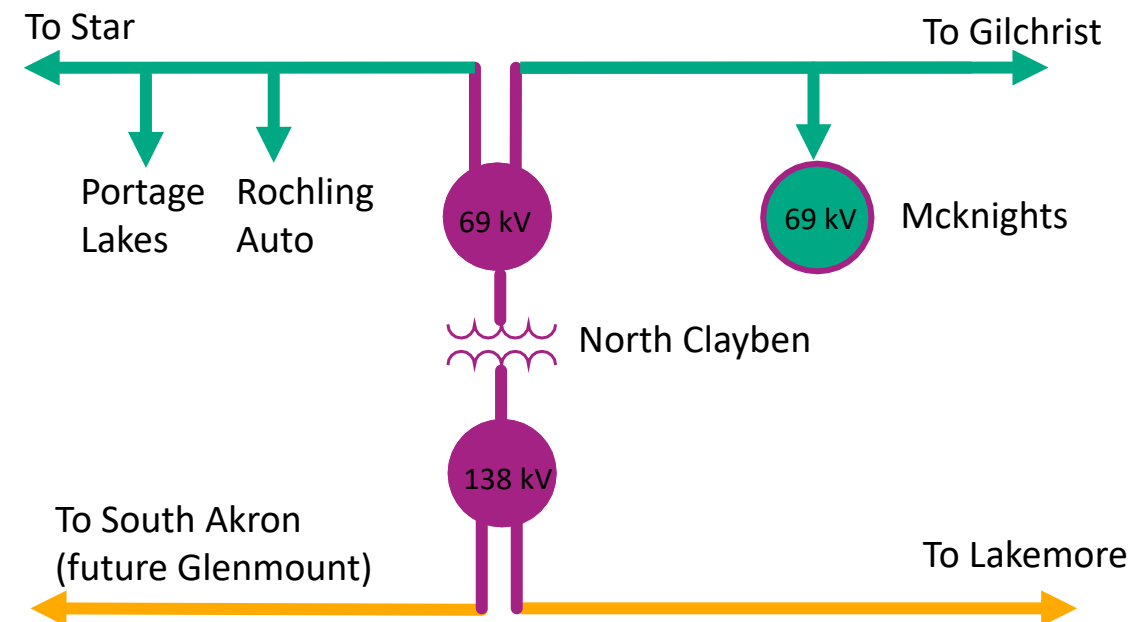
Add automatic sectionalizing to McKnights Substation.

The line project will separate the Gilchrist-Star 69 kV Line and Lakemore-South Akron (future Glenmount) 138 kV line, and create the following lines:

- North Clayben-Gilchrist 69 kV Line ~9.8 miles
- North Clayben-Star 69 kV Line ~14.8 miles
- North Clayben-Lakemore 138 kV Line ~4.1 miles
- North Clayben-South Akron (future Glenmount) 138 kV Line ~4.0 miles

Continued on next page...

ATSI Transmission Zone M-3 Process Akron/Summit County Area



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	



Need Number: ATSI-2023-024
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 8/5/2026

Proposed Solution (Cont’):

Transmission Line Ratings:

North Clayben - Rochling Auto 69 kV Line

- Before Proposed Solution: N/A
- After Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)

North Clayben - Mcknights 69 kV Line

- Before Proposed Solution: N/A
- After Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)

North Clayben - Lakemore 138 kV Line

- Before Proposed Solution: N/A
- After Proposed Solution: 157 / 196 / 198 / 255 MVA (SN/SE/WN/WE)

North Clayben - South Akron (future Glenmount) 138 kV Line

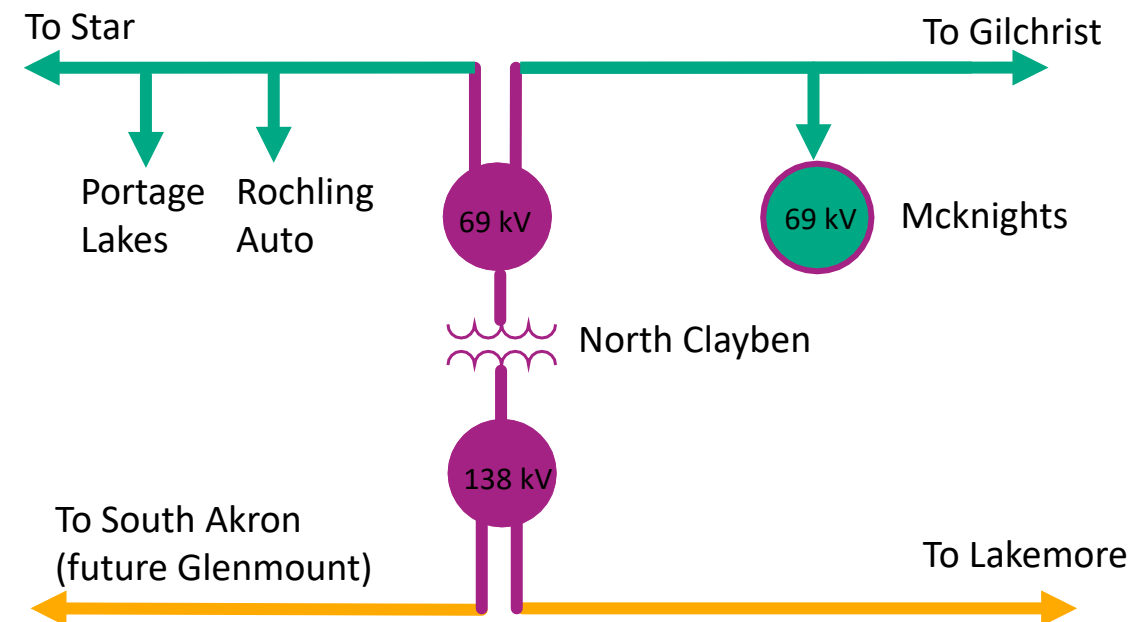
- Before Proposed Solution: N/A
- After Proposed Solution: 157 / 196 / 198 / 255 MVA (SN/SE/WN/WE)

Alternatives Considered:

Expand Lakemore Substation into 138/69/12.4 kV substation and loop Gilchrest-Star 69 kV Line into Lakemore Substation

Estimated Project Cost: \$36.49M
Projected In-Service: 06/01/2029
Supplemental ID: s3891.1

ATSI Transmission Zone M-3 Process Akron/Summit County Area



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

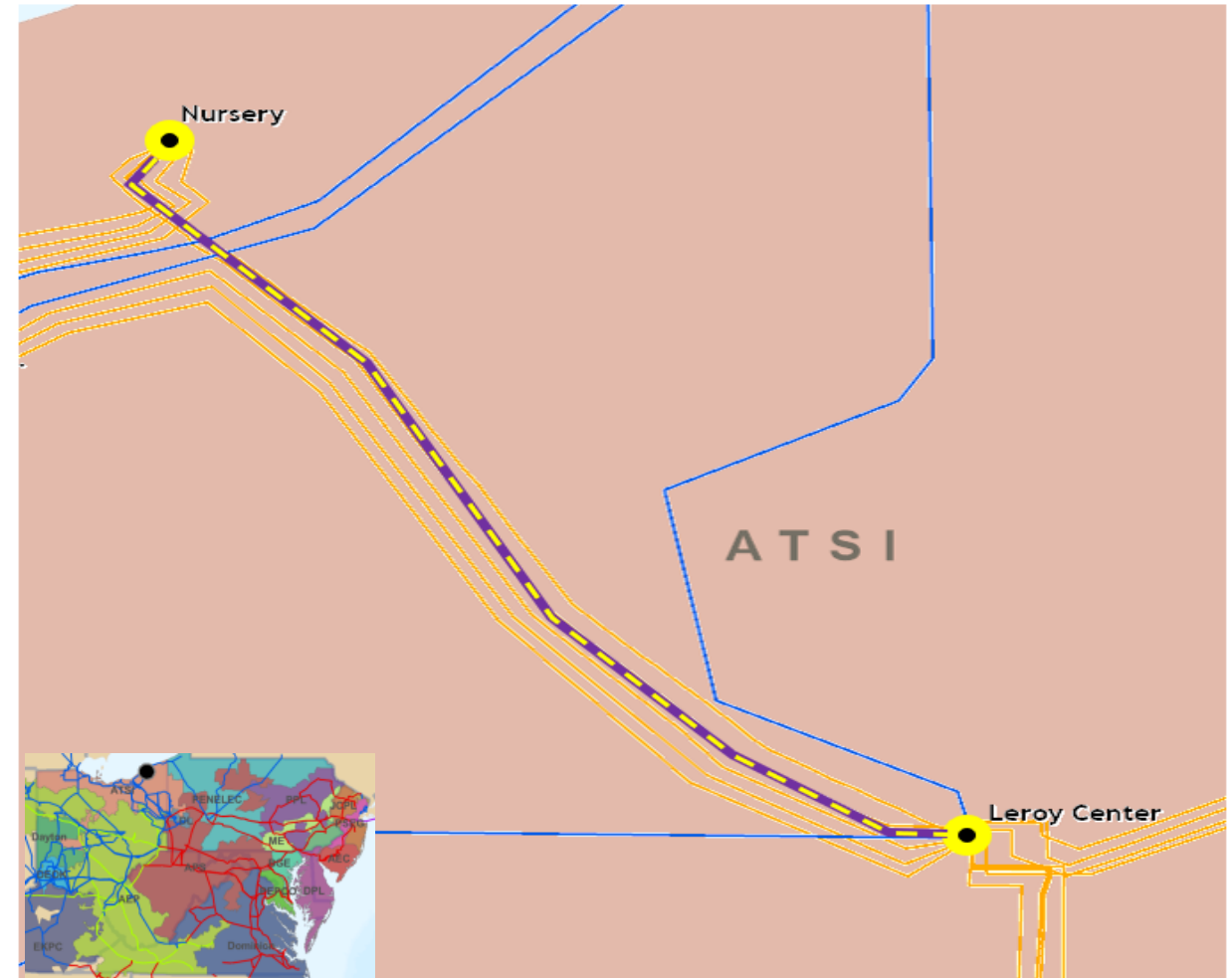
Project Driver:
Equipment Condition/Performance/Risk
Infrastructure Resilience
Operational Flexibility and Efficiency

- System reliability and performance
- Load at risk in planning and operational scenarios

The Grand River – Leroy Center No. 1 138 kV Line is approximately 11 miles long and supplies three wholesale delivery points (including Nursery Substation.)

Based on the 2024 Series 2029 RTEP Summer Case, an N-1 contingency results in the outage of the Nursery No. 1 and No. 3 138-36 kV transformers due to a shared a common bus. The Nursery No. 2 138-36 kV transformer consequentially loads to 145% of its Summer Emergency (SE) rating.

... Continued on next page ...



Need Number: ATSI-2025-003
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Proposed Solution:
 Convert Nursery Substation 138 kV yard to breaker-and-a-half configuration. Reterminate the existing 138-36 kV transformers and Queen 138-13.2 kV transformer into the new 138 kV bus.

Loop the existing Grand River - Leroy Center 138 kV No. 1 Line into the Nursery Substation 138 kV yard. Cut the Grand River - Leroy Center 138 kV No. 1 Line between structures 1172-W and 1172-C and cut the Grand River - Leroy Center 138 kV No. 2 Line extension on structure 1172-W and reterminate it on structure 1172-C. This will create Grand River - Nursery 138 kV and Nursery - Leroy Center 138 kV.

Transmission Line Ratings Before Proposed Solution:

Existing Painesville Muni Tap-Nursery Tap 138 kV Q15 Transmission Line and Conductor Ratings:
278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

Existing Nursery Tap-Nursery 138 kV Q15 Transmission Line and Conductor Ratings:
278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

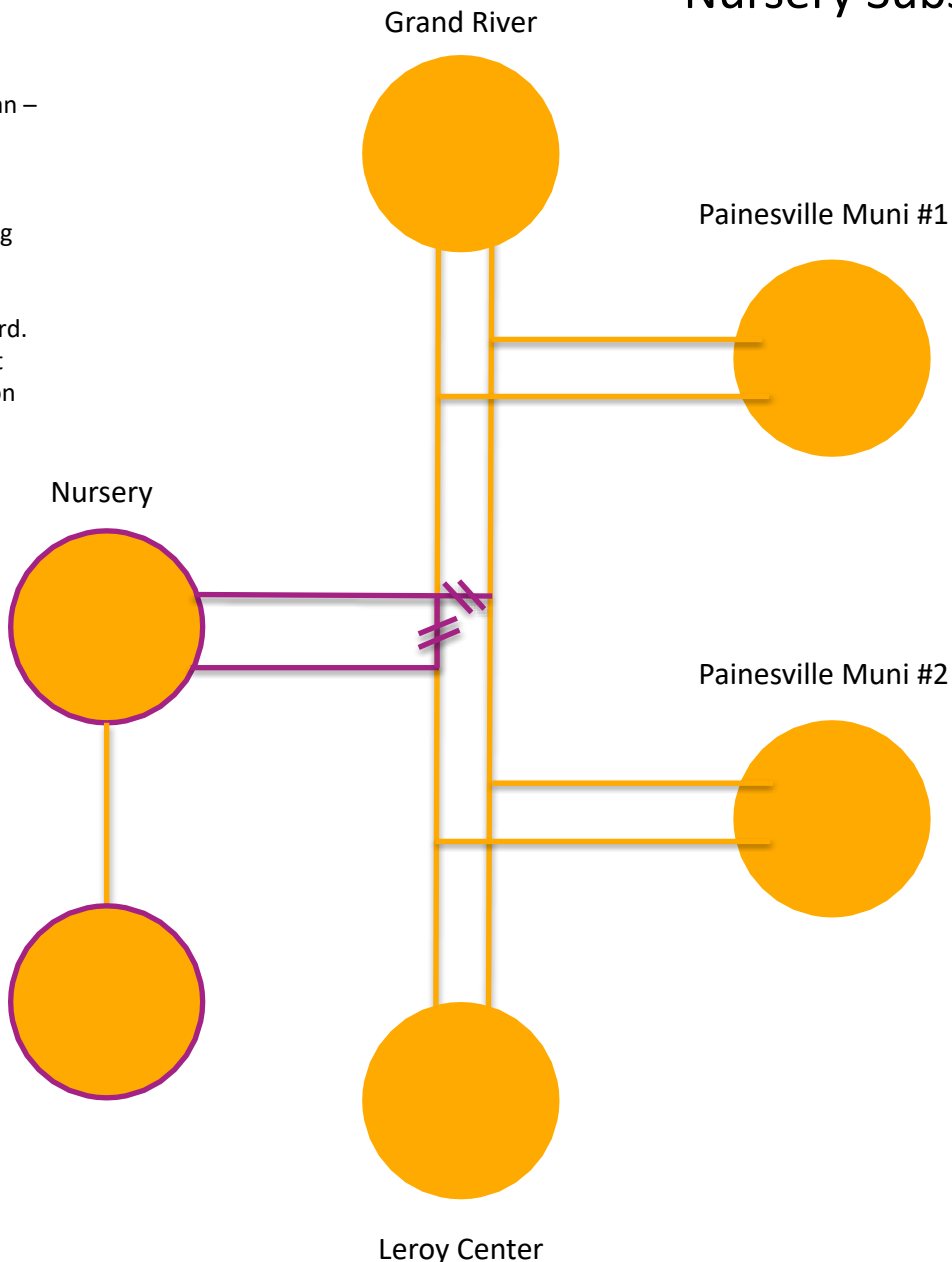
Existing Nursery Tap-Painesville Muni 2 Tap 138 kV Q15 Transmission Line and Conductor Ratings:
273 / 332 / 309 / 393 MVA (SN/SE/WN/WE)

Existing Painesville Muni Tap-Nursery Tap 138 kV Q16 Transmission Line and Conductor Ratings:
278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

Existing Nursery Tap-Nursery 138 kV Q16 Transmission Line and Conductor Ratings:
278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

Existing Nursery Tap-Painesville Muni 2 Tap 138 kV Q16 Transmission Line and Conductor Ratings:
273 / 332 / 309 / 393 MVA (SN/SE/WN/WE)

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Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2025-003
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Proposed Solution:
 Transmission Line Ratings After Proposed Solution:

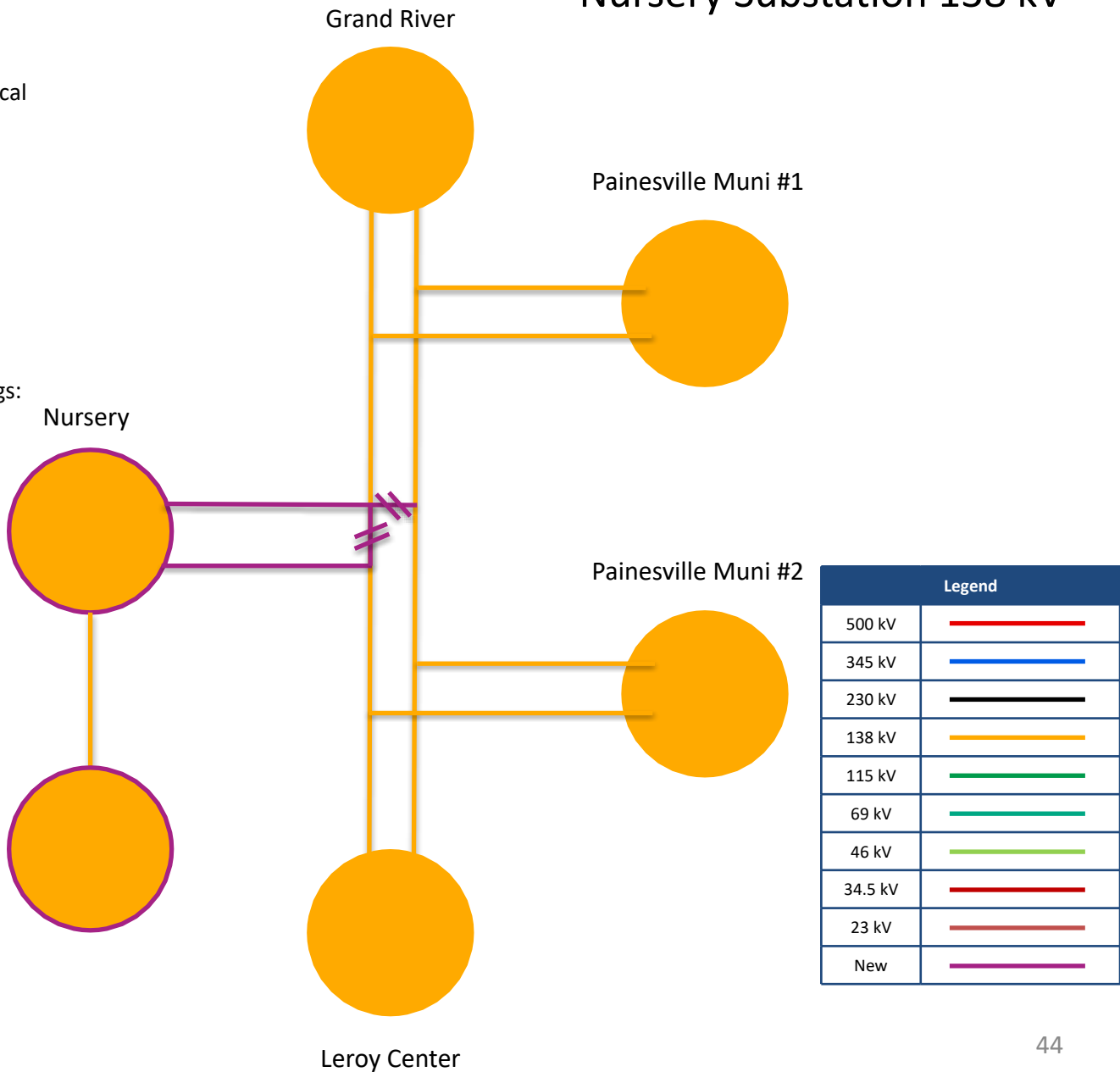
Proposed Painesville Muni Tap-Painesville Muni Tap 2 138 kV Q16 Transmission Line and Conductor Ratings:
 273 / 332 / 309 / 393 MVA (SN/SE/WN/WE)

Proposed Painesville Muni Tap-Nursery 138 kV Q15 Transmission Line and Conductor Ratings:
 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

Proposed Nursery-Painesville Muni 2 Tap 138 kV Q15 Transmission Line and Conductor Ratings:
 273 / 332 / 309 / 393 MVA (SN/SE/WN/WE)

Alternatives Considered:
 Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: \$25.58M
Projected In-Service: 04/28/2028
Supplemental ID: s3940.1



Need Number: ATSI-2025-038
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026
Previously Presented: Solution Meeting SRRTEP-W - 04/15/2026
 Need Meeting 12/12/2025

Project Driver:
Equipment Condition/Performance/Risk

Specific Assumption References:

System Performance Projects Global Factors

- System reliability and performance

Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment
- Communication technology

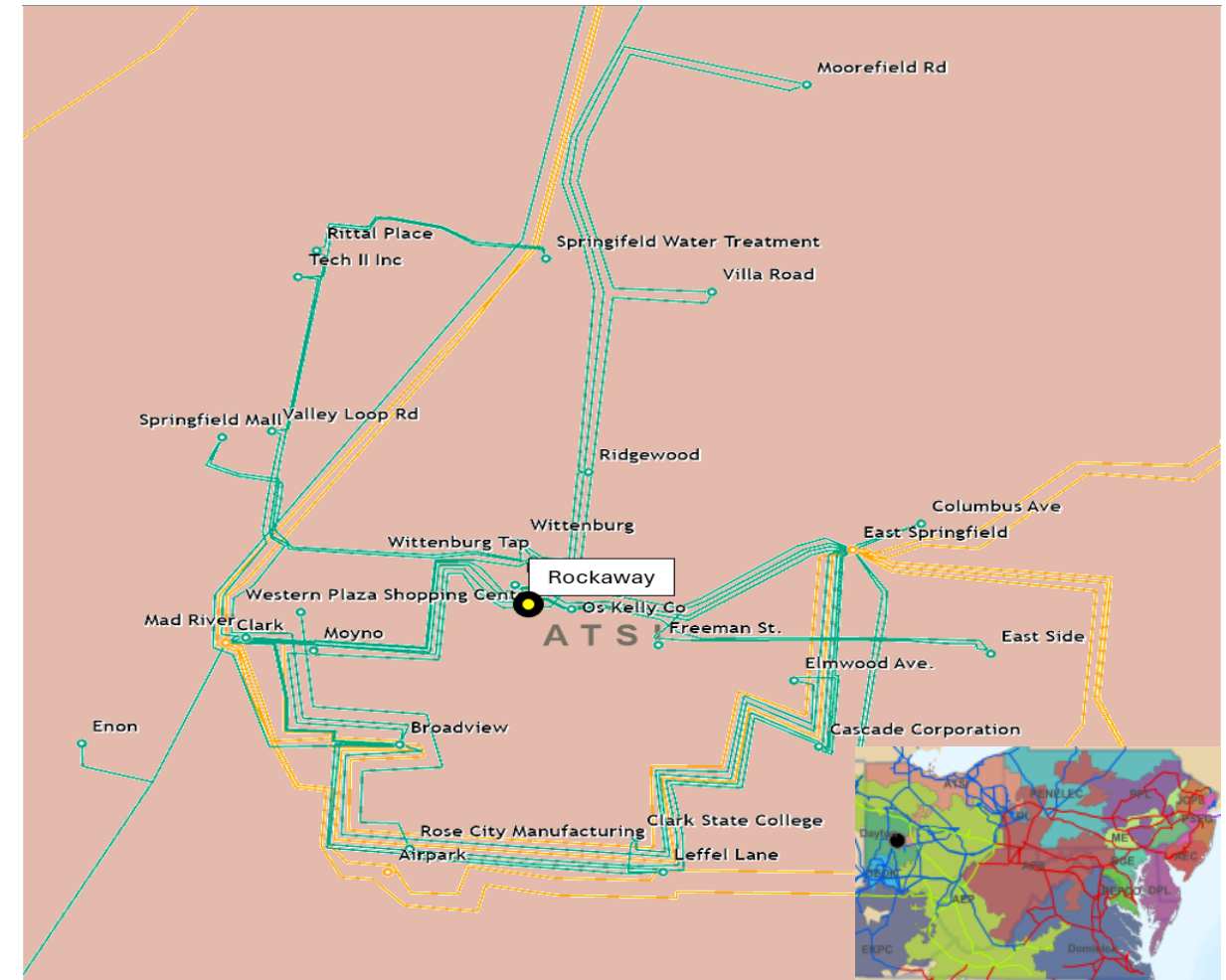
System Condition Projects

- Increasing negative trend in maintenance finds and/or cost
- Limited availability of spare parts, software obsolescence and/or compatibility, or vendor technical support
- Expected service life (at or beyond) or obsolescence
- Circuit breakers and other fault interrupting devices

Problem Statement:

The existing Rockaway Substation 69 kV oil circuit breakers 20, 21 and 22 and associated disconnect switches are 70 years old and approaching end of life. Replacement components are difficult to source leading to non-standard repairs.

FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation. Proper operation of the protection scheme requires all the separate components perform adequately during a fault. In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.



Need Number: ATSI-2025-038
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Problem Statement (Cont’):

Transmission line ratings are limited by terminal equipment.

Rockaway - OS Kelly 69 kV Line:

- Existing line rating: 62 / 62 / 62 / 62 MVA (SN/SE/WN/WE)
- Existing conductor rating: 76 / 92 / 87 / 111 MVA (SN/SE/WN/WE)

Rockaway - Springfield Medical 69 kV Line:

- Existing line rating: 76 / 92 / 87 / 111 MVA (SN/SE/WN/WE)
- Existing conductor rating: 76 / 92 / 87 / 111 MVA (SN/SE/WN/WE)

Proposed Solution:

Replace breakers B-20, B-21 and B-22 and associated disconnect switches at Rockaway Substation.

Transmission Line Ratings

Rockaway - OS Kelly 69 kV Line:

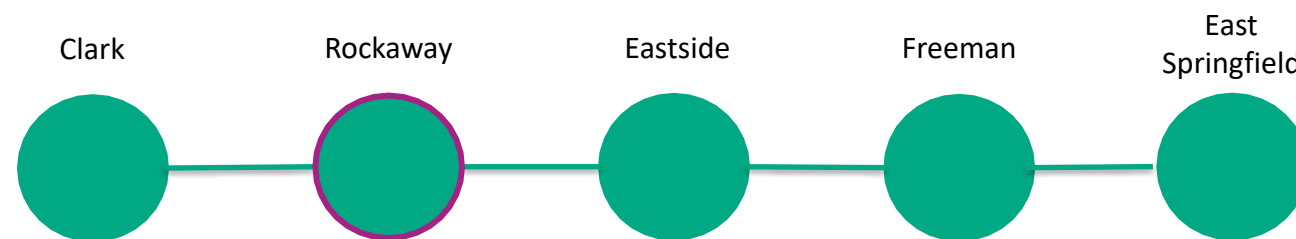
Before Proposed Solution: 62 / 62 / 62 / 62 MVA (SN/SE/WN/WE)

After Proposed Solution: 76 / 92 / 87 / 111 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of failure due to equipment condition.

Estimated Project Cost: \$3.43M
Projected In-Service: 06/22/2028
Supplemental ID: s3941.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2025-039
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026
Previously Presented: Solution Meeting SRRTEP-W - 04/15/2026
 Need Meeting 12/12/2025

Project Driver:
Equipment Condition/Performance/Risk

Specific Assumption References:

System Performance Projects Global Factors

- System reliability and performance

Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment
- Communication technology

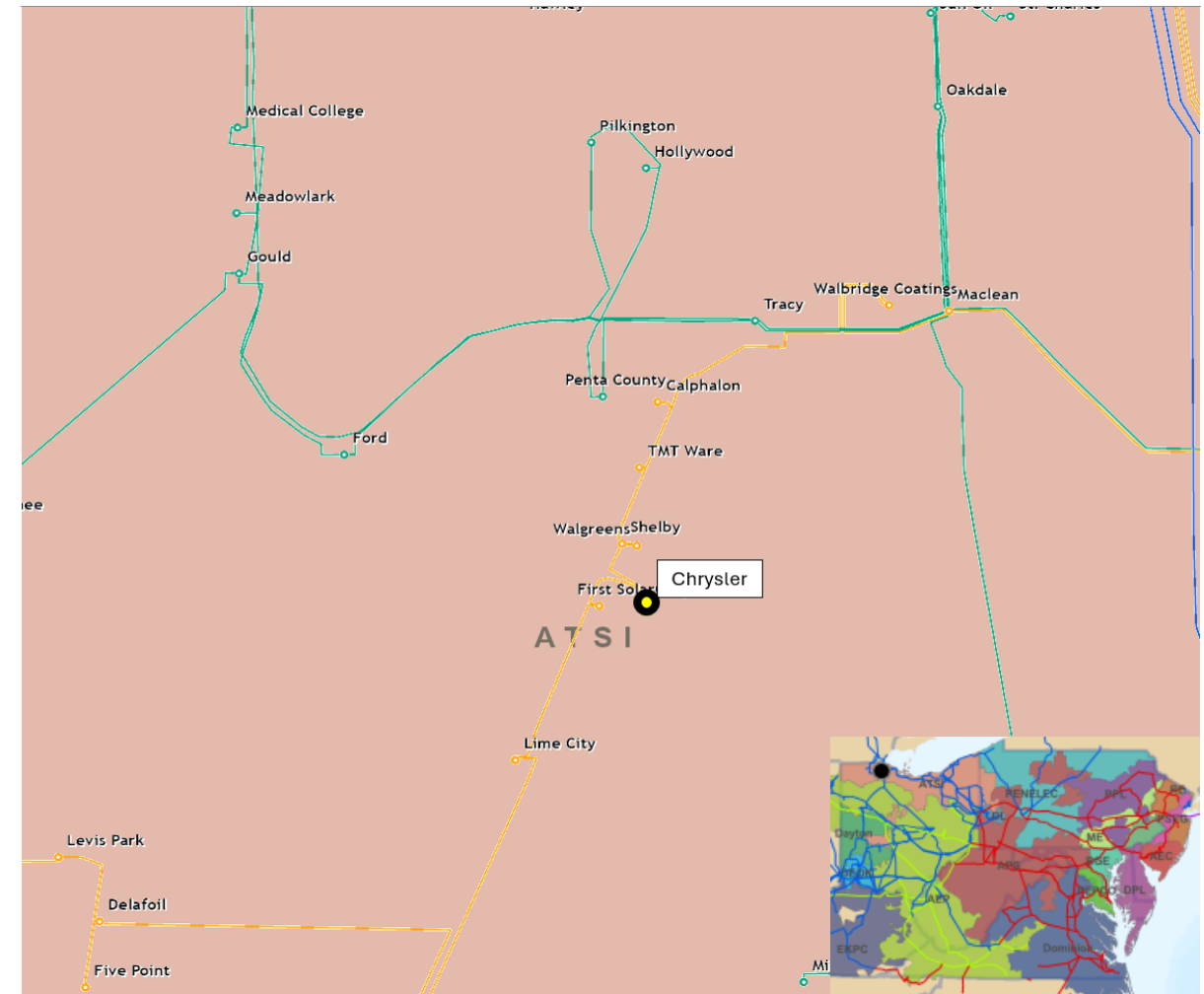
System Condition Projects

- Increasing negative trend in maintenance finds and/or cost
- Limited availability of spare parts, software obsolescence and/or compatibility, or vendor technical support
- Expected service life (at or beyond) or obsolescence
- Circuit breakers and other fault interrupting devices

Problem Statement:

The existing Chrysler Substation 138 kV oil circuit breakers B13290, B13291, and B1392 and associated disconnect switches are 59 years old and approaching end of life. Replacement components are difficult to source leading to non-standard repairs.

FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation. Proper operation of the protection scheme requires all the separate components perform adequately during a fault. In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.



Need Number: ATSI-2025-039
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Problem Statement (Cont’):

Transmission line ratings are limited by terminal equipment.

Chrysler - Shelby 138 kV Line:

- Existing line rating: 278 / 343 / 327 / 396 MVA (SN/SE/WN/WE)
- Existing conductor rating: 278 / 343 / 327 / 420 MVA (SN/SE/WN/WE)

Chrysler - First Solar 138 kV Line:

- Existing line rating: 288 / 346 / 333 / 396 MVA (SN/SE/WN/WE)
- Existing conductor rating: 288 / 353 / 333 / 427 MVA (SN/SE/WN/WE)

Proposed Solution:

At Chrysler Station, replace three 138 kV breakers (B13290, B13291 and B13292), eight 138 kV disconnect switches, two CCVT’s, and wavetraps/tuners.

Transmission Line Ratings:

Chrysler-Shelby 138 kV Line

- Before Proposed Solution: 278 / 343 / 327 / 396 MVA (SN/SE/WN/WE)
- After Proposed Solution: 278 / 343 / 327 / 420 MVA (SN/SE/WN/WE)

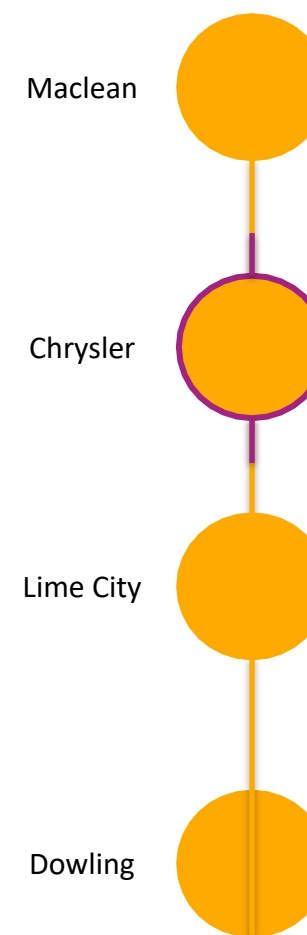
Chrysler-First Solar 138 kV Line

- Before Proposed Solution: 288 / 346 / 333 / 396 MVA (SN/SE/WN/WE)
- After Proposed Solution: 288 / 353 / 333 / 427 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of failure due to equipment condition.

Estimated Project Cost: \$2.76M
Projected In-Service: 12/31/2028
Supplemental ID: s3942.1



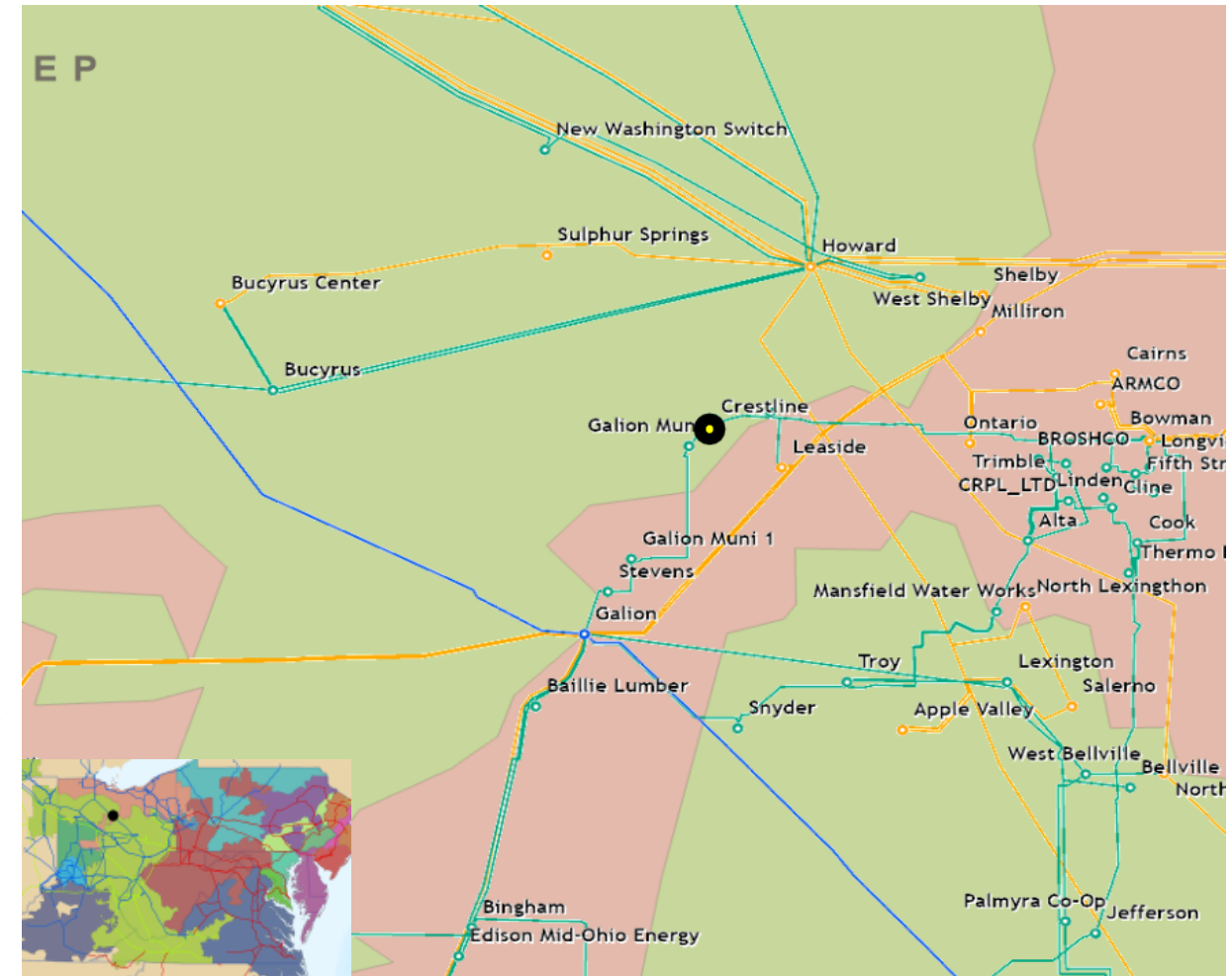
Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2026-003
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026
Previously Presented: Solution Meeting SRRTEP-W - 04/15/2026
 Need Meeting 01/16/2026

Project Driver:
Equipment Condition/Performance/Risk

Specific Assumption References:
 System Performance Global Factors
 ■ System reliability/performance
 Substation Condition Rebuild/Replacement
 ■ Age/condition of substation equipment

Problem Statement:
 The Crestline 69 kV 12.6 MVAR capacitor bank is tapped on the Leaside - Stevens 69 kV Line. In Summer 2024, the capacitor bank tripped several times. The capacitor bank was field inspected and found to have condition issues such as failed cans and bad fuse holders.

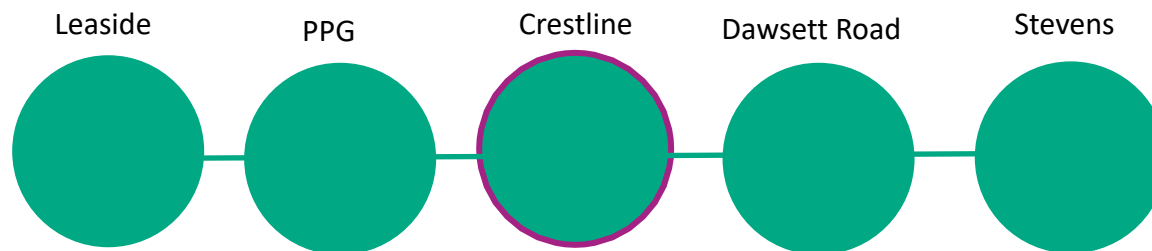


Need Number: ATSI-2026-003
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Proposed Solution:
 Retire the capacitor bank, breaker B65, switch D65, and associated relays at Crestline Station

Alternatives Considered:
 Maintain equipment in existing condition with elevated risk of failure due to equipment condition.

Estimated Project Cost: \$0.44M
Projected In-Service: 04/16/2027
Supplemental ID: s3943.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2026-013
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026
Previously Presented: Solution Meeting SRRTEP-W - 04/15/2026
 Need Meeting 01/16/2026

Project Driver:
Equipment Condition/Performance/Risk

Specific Assumption References:
 System Performance Global Factors

- System reliability/performance
- Substation/Line equipment limits

Substation Condition Rebuild/Replacement

- Age/condition of substation equipment
- Circuit breakers and other fault interrupting devices

Problem Statement:
 The existing Pemberville 69 kV breakers 7286 and 7287 are 61 years old and are approaching end of life. Replacement components for oil circuit breakers are difficult to source leading to non-standard repairs.

The lines are currently limited by terminal equipment.

Pemberville - Maclean 69 kV Line:

- Existing Line Ratings: 116 / 143 / 143 / 164 MVA (SN/SE/WN/WE)
- Existing Conductor Ratings: 139 / 169 / 158 / 201 MVA (SN/SE/WN/WE)

Pemberville - Hancock Wood Tap 69 kV Line:

- Existing Line and Conductor Ratings: 100 / 121 / 113 / 143 MVA (SN/SE/WN/WE)

Hancock Wood Tap - Bowling Green No. 4 69 kV Line:

- Existing Line Ratings: 79 / 79 / 79 / 79 MVA (SN/SE/WN/WE)
- Existing Conductor Ratings: 79 / 95 / 89 / 113 MVA (SN/SE/WN/WE)

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Need Number: ATSI-2026-013
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Proposed Solution:
At Pemberville Station, replace two 69 kV breakers (7286 and 7287), four disconnect switches, and line relays.

Transmission Line Ratings:

Pemberville-Maclean 69 kV Line

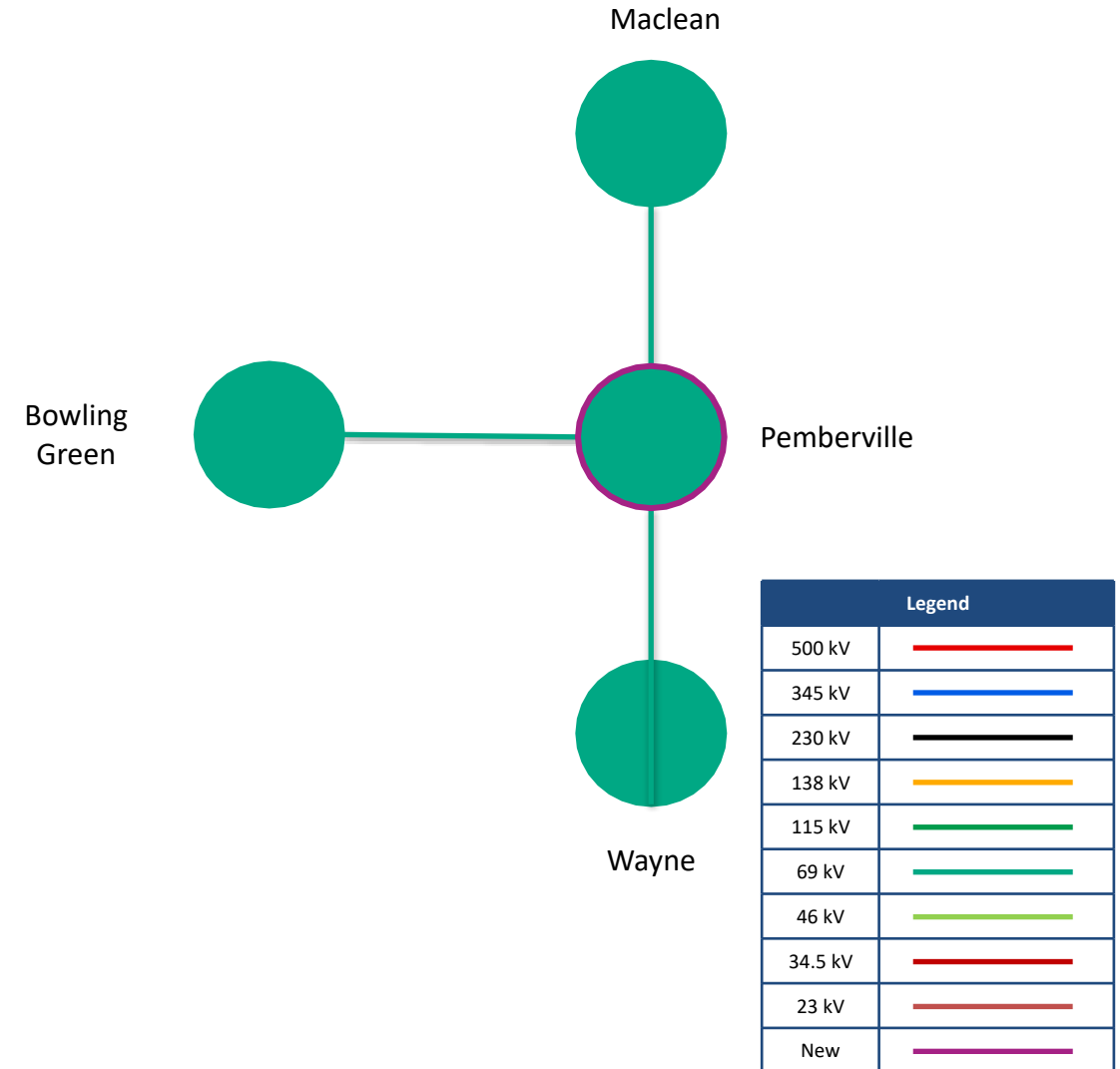
- Before Proposed Solution: 116 / 143 / 143 / 143 MVA (SN/SE/WN/WE)
- After Proposed Solution: 139 / 169 / 158 / 201 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of failure due to equipment condition.

Estimated Project Cost: \$3.46M
Projected In-Service: 12/31/2027
Supplemental ID: s3944.1

ATSI Transmission Zone M-3 Process Pemberville Station



Need Number: ATSI-2026-002
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Previously Presented: Solution Meeting SRRTEP-W - 05/15/2026
 Need Meeting 01/16/2026

Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

- System Performance Global Factors
- System reliability/performance
- Substation/Line equipment limits
- Substation Condition Rebuild/Replacement
- Age/condition of substation equipment
- Circuit breakers and other fault interrupting devices

Problem Statement:

The existing Bulk Mail Facility 138 kV breaker B4 is 61 years old and is approaching end of life. The breaker using a pneumatic system for closing energy. The system has frequent air leaks and are difficult to maintain. Due to frequent air leaks, there is a risk the breaker is unable to close due to low pneumatic pressure.

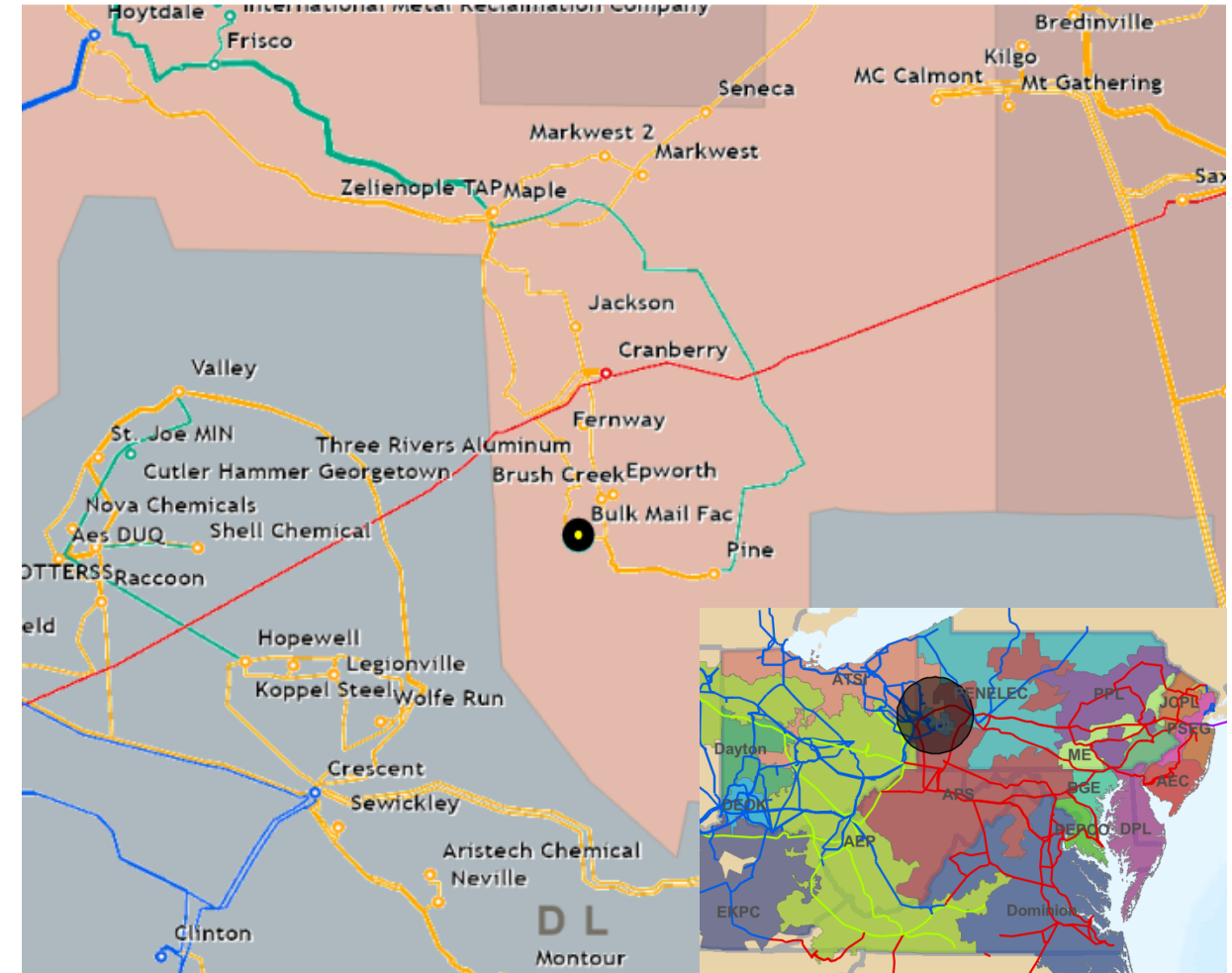
Transmission line ratings are limited by terminal equipment.

Bulk Mail Facility - Fernway Tap 138 kV Line

- Existing Line Ratings: 232 / 287 / 287 / 287 MVA (SN/SE/WN/WE)
- Existing Conductor Rating: 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

Bulk Mail Facility - Pine 138 kV Line

- Existing Line Ratings: 232 / 287 / 287 / 287 MVA (SN/SE/WN/WE)
- Existing Conductor Rating: 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)



Need Number: ATSI-2026-002
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Proposed Solution:
 Replace 138 kV breaker B-4 and three switches at Bulk Mail Facility Station.
 Transmission Line Ratings:
 Bulk Mail Facility-Pine 138 kV Line

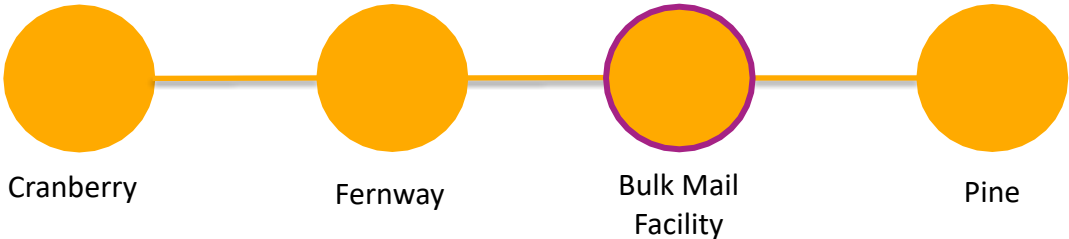
- Before Proposed Solution: 232 / 287 / 287 / 287 MVA (SN/SE/WN/WE)
- After Proposed Solution: 265 / 316 / 326 / 361 MVA (SN/SE/WN/WE)

 Bulk Mail Facility-Fernway 138 kV Line

- Before Proposed Solution: 232 / 287 / 287 / 287 MVA (SN/SE/WN/WE)
- After Proposed Solution: 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

Alternatives Considered:
 Maintain equipment in existing condition with elevated risk of failure due to equipment condition.

Estimated Project Cost: \$1.69M
Projected In-Service: 12/31/2027
Supplemental ID: s3945.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2026-005

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Previously Presented: Solution Meeting SRRTEP-W - 05/15/2026
Need Meeting 01/16/2026

Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance
- Substation/Line equipment limits

Substation Condition Rebuild/Replacement

- Age/condition of substation equipment
- Circuit breakers and other fault interrupting devices

Problem Statement:

The existing Dixie Substation 69 kV breakers B6903, B6904 and B6923 are 60 years old and are approaching end of life. Replacement components for oil circuit breakers are difficult to source in quantity leading to non-standard repairs. The associated disconnect switches and metering PTs/CTs are also past their expected service life.

The lines are currently limited by terminal equipment.

Existing Transmission Line Ratings:

Dixie - Teledyne 69 kV Line:

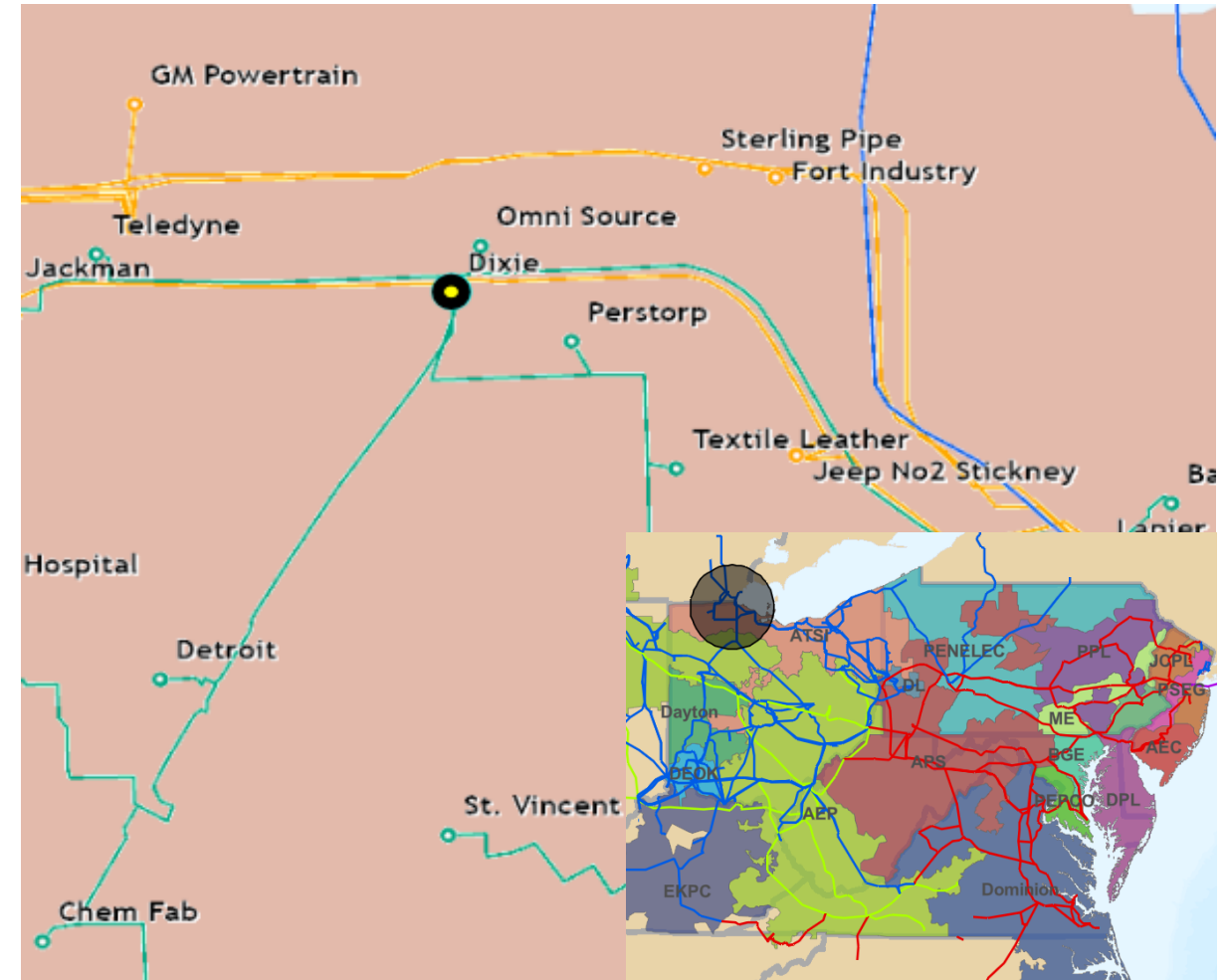
- Existing Line Ratings: 107 / 136 / 129 / 164 MVA (SN/SE/WN/WE)
- Existing Conductor Ratings: 111 / 136 / 129 / 164 MVA (SN/SE/WN/WE)

Dixie - Omni 69 kV Line:

- Existing Line Ratings: 107 / 138 / 140 / 166 MVA (SN/SE/WN/WE)
- Existing Conductor Ratings: 121 / 148 / 140 / 179 MVA (SN/SE/WN/WE)

Dixie - Perstorp Polyols 69 kV Line:

- Existing Line Ratings: 107 / 134 / 139 / 154 MVA (SN/SE/WN/WE)
- Existing Conductor Ratings: 139 / 171 / 164 / 210 MVA (SN/SE/WN/WE)



Need Number: ATSI-2026-005

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Proposed Solution:
At Dixie Substation, replace three 69 kV breakers (B6903, B6904, and B6923), seven disconnect switches, 69 kV bus PTs, station conductor, strain bus and brown insulators, and relays for the line towards Jeep.

Transmission Line Ratings:

Dixie-Perstorp 69 kV Line

- Before Proposed Solution: 107 / 134 / 139 / 154 MVA (SN/SE/WN/WE)
- After Proposed Solution: 139 / 171 / 164 / 210 MVA (SN/SE/WN/WE)

Dixie-Teledyne 69 kV Line

- Before Proposed Solution: 107 / 136 / 129 / 164 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 136 / 129 / 164 MVA (SN/SE/WN/WE)

Dixie-Omni 69 kV Line

- Before Proposed Solution: 107 / 138 / 140 / 166 MVA (SN/SE/WN/WE)
- After Proposed Solution: 121 / 148 / 140 / 179 MVA (SN/SE/WN/WE)

Transformer Ratings:

Dixie No. 6 138/69 kV Transformer

- Before Proposed Solution: 187 / 241 / 267 / 298 MVA (SN/SSTE/WN/WSTE)
- After Proposed Solution: 305 / 305 / 383 / 383 MVA (SN/SSTE/WN/WSTE)

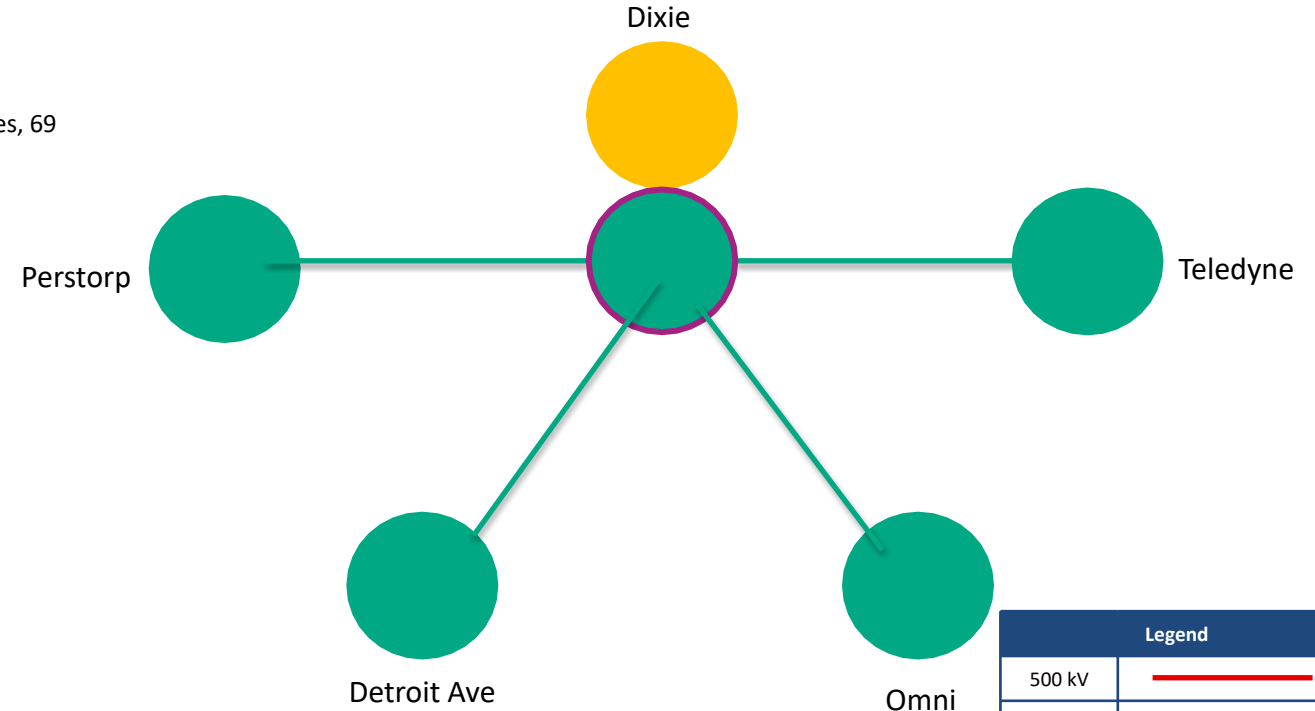
Alternatives Considered:

Maintain equipment in existing condition with elevated risk of failure due to equipment condition.

Estimated Project Cost: \$3.43M

Projected In-Service: 12/31/2027

Supplemental ID: s3946.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2021-021
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026
Previously Presented: Solution Meeting SRRTEP-W - 07/17/2026
 Need Meeting 10/15/2021
Project Driver: Equipment Condition/Performance/Risk, Operational Flexibility and Efficiency

Specific Assumption Reference:

Global Considerations

- System Reliability and Performance
- Substation/line equipment limits
- Reliability of Non-BES Facilities
- Load at risk in planning and operational scenarios.
- Load and/or customers at risk on single transmission lines

Add/Expand Bus Configuration

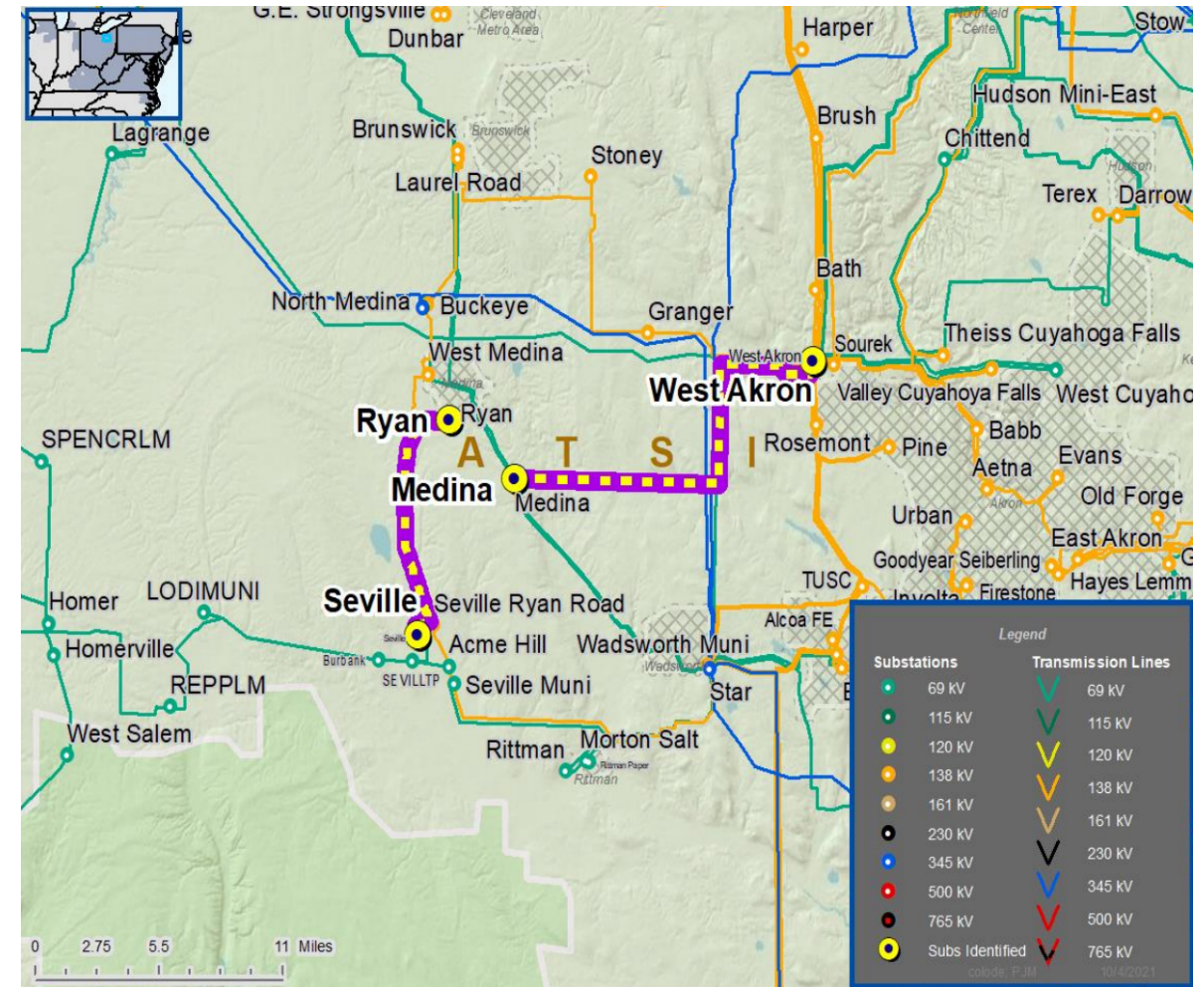
- Loss of substation bus adversely impacts transmission system performance
- Eliminate simultaneous outages to multiple networked elements under N-1 analysis

Network Radial line

- Network Radial Line

Problem Statement:

An n-1 at Medina Substation results in the loss of approximately 59 MW and 8,451 customers. An N-1-1 outage causes low voltage (88% of nominal 69 kV voltage) and a total loss of load combined with a N-1 causes outage of approximately 59 MW and 8,451 customers.



*** Continued on next page***

Need Number: ATSI-2021-021
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Problem Statement (CONT'):

An N-1-1 outage results in a total load loss affecting approximately 46 MW and 11,971 customers. The Medina Industries (Medina) 69 kV Line is a radial line. The line serves eight delivery points, approximately 27 MW of load and 1,057 customers.

Lack of operational flexibility during maintenance outages.

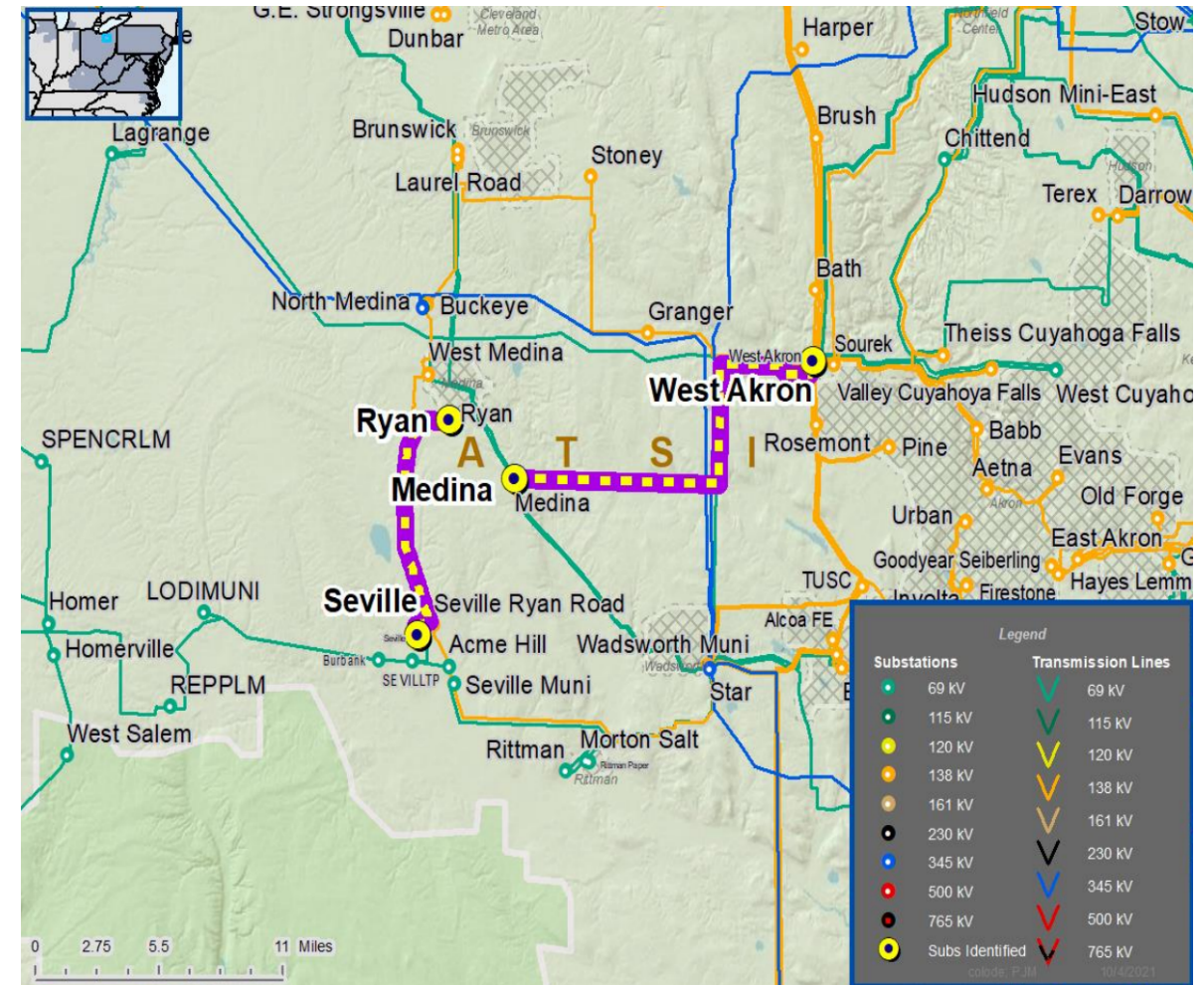
Customer complaints during outage on the radial line due to lack of alternate source to serve the customers.

High industrial customer growth area.

Past five-year outage history (2017-2021):

- Medina-Star 69 kV Line, one (1) momentary outage and two (2) sustained outages.
- Medina Industries (Medina) 69 kV Line, three (3) momentary and three (3) sustained outages.
- Medina-West Akron 69 kV Line, two (2) momentary and three (3) sustained outages.
- Abbe-Medina 69 kV Line, six (6) momentary outage and six (6) sustained outages.
- Ryan-Seville 138 kV Line, one (1) sustained outage. - North Medina-West Medina 138 kV Line, one (1) sustained outage.
- Ryan-West Medina 138 kV Line, one (1) sustained outage.
- Seville-Star 138 kV Line, one (1) momentary outage and one (1) sustained outages.

ATSI Transmission Zone M-3 Process Medina/Seville Area



Need Number: ATSI-2021-021
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Proposed Solution:

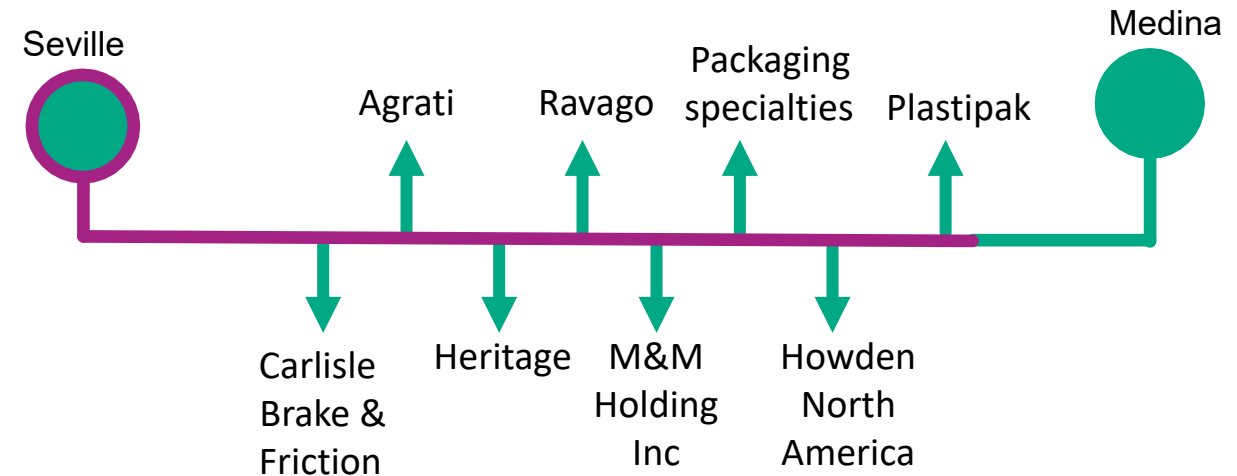
Phase I:

Medina-Medina Industries-Seville 69 kV Line Upgrade Project

- Build a new ~7.5 miles 69 kV line with new conductor to extend the Medina industries 69 kV line from/at Carlisle Brake & Friction to Seville Substation and terminate the line at Seville Substation. Line will be built in a separate ROW from Ryan-Seville 138 kV Line. This phase will create the Medina-Seville 69 kV Line. The new line construction will be from Seville Substation to Carlisle Brake & Friction Tap.
- Rebuild the existing Medina Industries radial 69 kV line (~3.3 miles) from str# 373 to 17D with new conductor. The rebuild construction will be from Carlisle Brake & Friction Tap to just east of Plastipak Tap.
- Convert the 69 kV yard at Seville Substation into a five-breaker ring bus.
- Add switches at all Medina-Seville 69 kV Line main line tap points.

*** Continued on next page***

Phase 1: Medina-Seville 69 kV Line



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2021-021
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

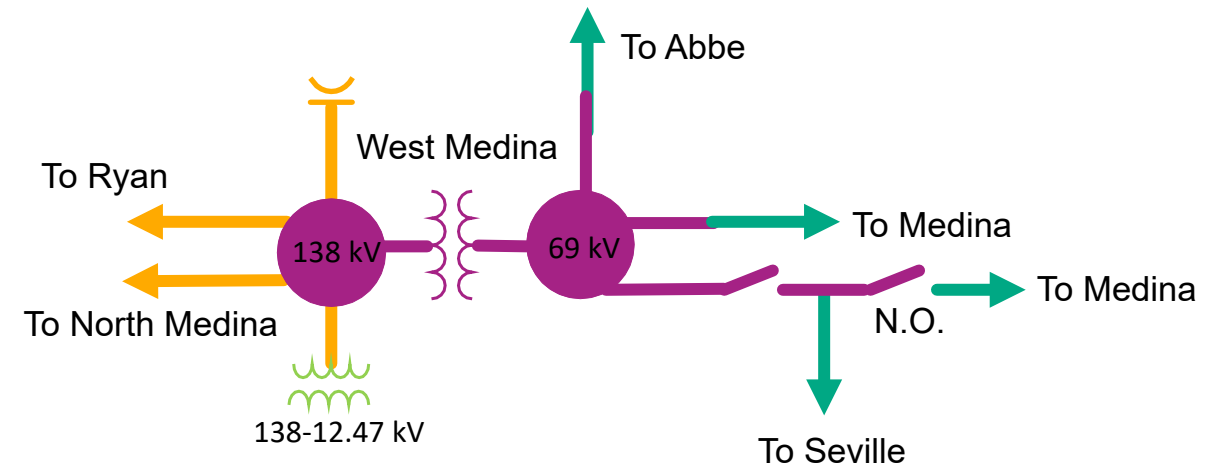
Proposed Solution (CONT'):

Phase 2:

West Medina Substation Project

- Convert 138 kV yard at West Medina Substation into a five-breaker ring bus.
- Add a new 69 kV four-breaker ring bus at West Medina Substation.
- Add a 138/69 kV Transformer at West Medina Substation.
- Add high side distribution transformer breaker at West Medina Substation.
- Loop the Abbe - Medina 69 kV Line into the 69 kV ring bus at West Medina Substation, creating the Abbe-West Medina 69 kV Line and Medina-West Medina 69 kV Line.
- Rebuild the Abbe-Medina 69 kV Line from str# 373 to str# 369/368 (~0.2 miles) as a double circuit 69 kV line with new conductor, to reroute the Medina - Seville 69 kV Line into the 69 kV yard at the West Medina Substation. This will create the Seville-West Medina 69 kV Line. (The Medina-Seville 69 kV line will be operated normally open at str#373A/374).
- Reroute the Medina-Seville 69 kV Line from the Medina Substation into the 69 kV ring bus into the West Medina Substation using the newly built line from str# 373 to str# 369/368.
- Add a 1200A switch at str# 373/372 on the Seville-West Medina 69 kV Line.
- Add a 1200A normally open switch at str# 373A/374 on the Medina-Seville 69 kV Line.

Phase 2: West Medina 138-69 kV Substation Project



Legend	
500 kV	—
345 kV	—
230 kV	—
138 kV	—
115 kV	—
69 kV	—
46 kV	—
34.5 kV	—
23 kV	—
New	—

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ATSI Transmission Zone M-3 Process Medina/Seville Area

Need Number: ATSI-2021-021
Process Stage: Submission of Supplemental Projects for Inclusion
in the Local Plan – 9/23/2026

Proposed Solution (CONT’):

Phase 3:

Medina 69 kV Breaker-and-a-Half Project

- Convert the 69 kV yard at West Medina Substation into a breaker-and-a-half configuration.

Transmission Line Rating Changes:

Medina-Seville 69 kV Line:

Industry Tap-Medina 69 kV Branch:

- Before Proposed Solution: 45 / 46 / 51 / 51 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

Industry Tap-Plastipk Tap 69 kV Branch:

- Before Proposed Solution: 45 / 54 / 51 / 65 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

Plastipk Tap - TLT Babck Tap 69 kV Branch:

- Before Proposed Solution: 45 / 54 / 51 / 65 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

Par-Pkg Spec Tap-TLT Babck Tap 69 kV Branch:

- Before Proposed Solution: 45 / 54 / 51 / 65 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

Par-Pkg Spec Tap - Ravago Tap 69 kV Branch:

- Before Proposed Solution: 47 / 56 / 53 / 67 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

***** Continued on next page*****

Phase 3: Medina 69 kV Breaker and Half Project

Bubble Diagram is not needed for this project
since there is no topology change.

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	



ATSI Transmission Zone M-3 Process Medina/Seville Area

Need Number: ATSI-2021-021
Process Stage: Submission of Supplemental Projects for Inclusion
in the Local Plan – 9/23/2026

Proposed Solution (CONT’):

Heritage Tap-Ravago Tap 69 kV Branch:

- Before Proposed Solution: 47 / 56 / 53 / 67 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

Carlisle Brake & Friction Tap-Heritage Tap 69 kV Branch:

- Before Proposed Solution: 47 / 56 / 53 / 67 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

Carlisle Brake & Friction Tap - Seville 69 kV Branch:

- Before Proposed Solution: N/A
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

West Medina 138/69 kV Transformer Circuit:

- Before Proposed Solution: N/A
- After Proposed Solution: 175 / 184 / 210 / 228 MVA (SN/SE/WN/WE)

Industry Tap-West Medina 69 kV Branch:

- Before Proposed Solution: N/A
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

Sun Oil Tap-West Medina 69 kV Branch:

- Before Proposed Solution: N/A
- After Proposed Solution: 100 / 121 / 113 / 143 MVA (SN/SE/WN/WE)

Medina Tap-West Medina 69 kV Branch:

- Before Proposed Solution: N/A
- After Proposed Solution: 100 / 121 / 113 / 143 MVA (SN/SE/WN/WE)

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SRRTEP Committee: Western – FirstEnergy Supplemental 07/17/2026

Phase 3: Medina 69 kV Breaker and Half Project

Bubble Diagram is not needed for this project
since there is no topology change.

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	



ATSI Transmission Zone M-3 Process Medina/Seville Area

Need Number: ATSI-2021-021
Process Stage: Submission of Supplemental Projects for
Inclusion in the Local Plan – 9/23/2026

Alternatives Considered:

- Convert Medina Substation 69 kV yard into a breaker and half configuration
- At Medina Substation build a 138 kV four (4) breaker ring bus- Install 138/69 kV transformer at Medina Substation
- Convert Ryan Substation 138 kV yard into a four breaker ring bus- Build ~1.4 miles of 138 kV transmission line from Medina to Ryan substation
- Extend the Medina-Medina Industries 69 kV Line to Seville Substation by building ~ 7.5 miles of new 69 kV line.
- Convert the Seville Substation 69 kV proposed four breaker ring bus into a five (5) breaker ring bus
- Upgrade all 600 A switches on the Medina-Medina Industries 69 kV Line with 1200 A switches
- Add a new 1200 A switch at all main line tap points

Estimated Project Cost: Phase 1:\$41.43M
Phase 2:\$34.05M
Phase 3:\$22.35M
Projected In-Service: Phase 1: 12/31/2028
Phase 2: 5/31/2029
Phase 3: 9/30/2029
Supplemental ID: s3947.1

Phase 3: Medina 69 kV Breaker and Half Project

Bubble Diagram is not needed for this project
since there is no topology change.

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2024-072
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026
Previously Presented: Solution Meeting SRRTEP-W - 07/17/2026
 Need Meeting 10/18/2024
Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance

Line Condition Rebuild / Replacement

- Aged or deteriorated transmission line structures
- Negatively impact customer outage frequency and/or durations
- Demonstrate an increasing trend in maintenance findings and/or costs

Problem Statement:

The Black River – Shinrock 69 kV Line is approaching end of life. It is approximately 23 miles long with 474 wood pole transmission line structures.

Per recent inspections, the line is exhibiting deterioration.

- 87% of wood pole structures were installed in 1974.
- 13% of wood pole structures were installed in 1956.
- 44% of structures have shell rot.

Since 2019, there has been four sustained unscheduled outages on the line.

Transmission Line / Substation Locations: Black River – Black River Tap 69 kV Line

Existing Line Rating MVA (SN / SE / WN / WE): 100 / 121 / 113 / 143

Existing Conductor Rating MVA (SN / SE / WN / WE): 100 / 121 / 113 / 143

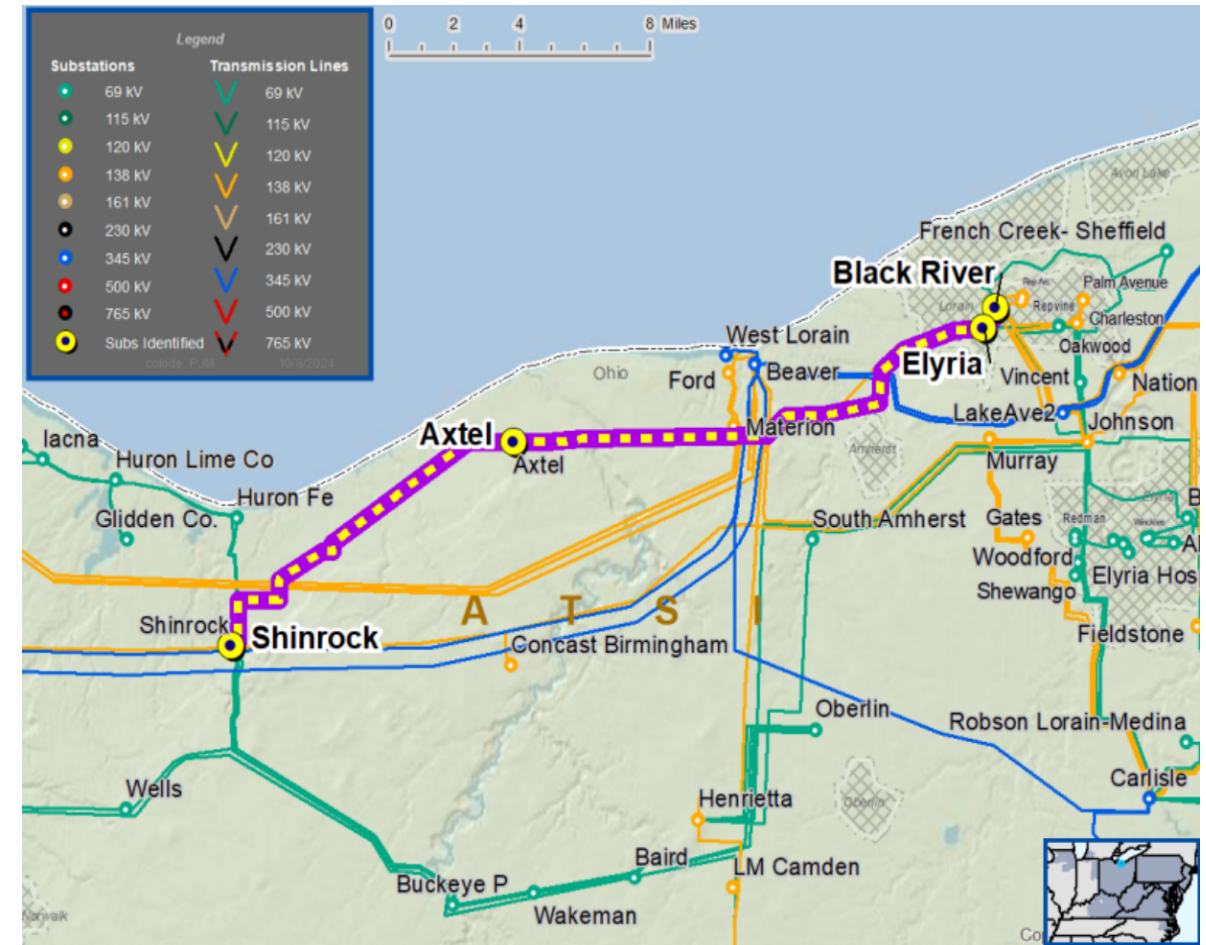
Transmission Line / Substation Locations: Black River Tap – Washington Tap 69 kV Line

Existing Line Rating MVA (SN / SE / WN / WE): 100 / 121 / 113 / 143

Existing Conductor Rating MVA (SN / SE / WN / WE): 100 / 121 / 113 / 143

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SRRTEP Committee: Western – FirstEnergy Supplemental 07/17/2026



Need Number: ATSI-2024-072
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Problem Statement (CONT’):

Transmission Line / Substation Locations: Elyria Waterworks Tap – Washington Tap 69 kV Line

Existing Line Rating MVA (SN / SE / WN / WE): 80 / 96 / 90 / 114

Existing Conductor Rating MVA (SN / SE / WN / WE): 80 / 96 / 90 / 114

Transmission Line / Substation Locations: Baumhart – Elyria Waterworks Tap 69 kV Line

Existing Line Rating MVA (SN / SE / WN / WE): 80 / 96 / 90 / 114

Existing Conductor Rating MVA (SN / SE / WN / WE): 80 / 96 / 90 / 114

Transmission Line / Substation Locations: Axtel – Baumhart 69 kV Line

Existing Line Rating MVA (SN / SE / WN / WE): 80 / 96 / 90 / 114

Existing Conductor Rating MVA (SN / SE / WN / WE): 80 / 96 / 90 / 114

Transmission Line / Substation Locations: Axtel – Shinrock 69 kV Line

Existing Line Rating MVA (SN / SE / WN / WE): 80 / 96 / 90 / 114

Existing Conductor Rating MVA (SN / SE / WN / WE): 80 / 96 / 90 / 114

Transmission Line / Substation Locations: Black River Tap – Willow Creek Tap 69 kV Line

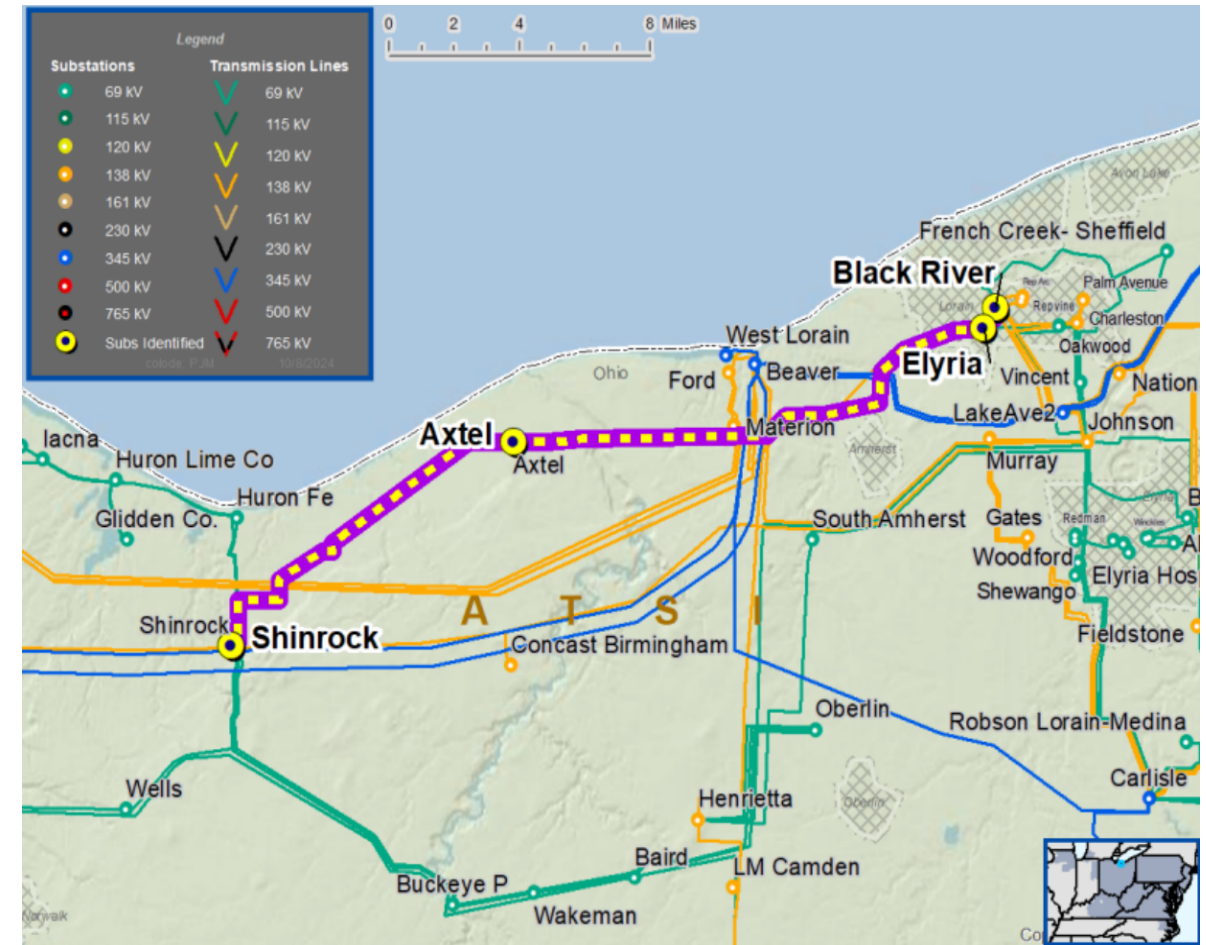
Existing Line Rating MVA (SN / SE / WN / WE): 82 / 103 / 108 / 124

Existing Conductor Rating MVA (SN / SE / WN / WE): 100 / 121 / 113 / 143

Transmission Line / Substation Locations: Washington Tap – Washington 69 kV Line

Existing Line Rating MVA (SN / SE / WN / WE): 45 / 54 / 51 / 65

Existing Conductor Rating MVA (SN / SE / WN / WE): 45 / 54 / 51 / 65



Need Number: ATSI-2024-072

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Proposed Solution:

Reconductor the Black River-Shinrock 69 kV Line from Str. 113=39 to Str. 244=41 (~22.56 miles). Rebuild the section from Shinrock Substation to Str. 113=39 with double circuit structures, this will rebuild a section of the Shinrock-Greenfield 69 kV Line as well (~1 mile). The section from Str. 244=41 to Black River Substation will not be reconducted due to being reconducted recently. Also reconductor the taps to Baumhart (~0.1 miles), Elyria City Pumping (~0.2 miles), and Washington (~0.4 miles).

Transmission Line Ratings:

Black River Tap-Washington Tap 69 kV Line

- Before Proposed Solution: 100 / 121 / 113 / 143 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

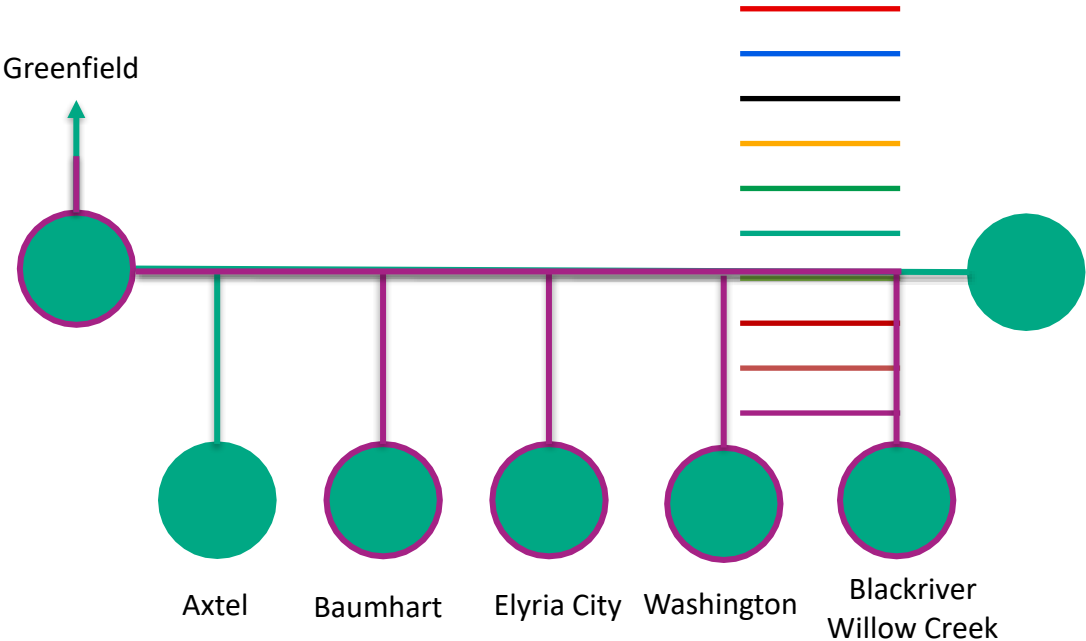
Elyria Waterworks Tap-Washington Tap 69 kV Line

- Before Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

Baumhart-Elyria Waterworks Tap 69 kV Line

- Before Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)
- After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

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Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: ATSI-2024-072
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/23/2026

Proposed Solution:

- Axtel-Baumhart 69 kV Line
- Before Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

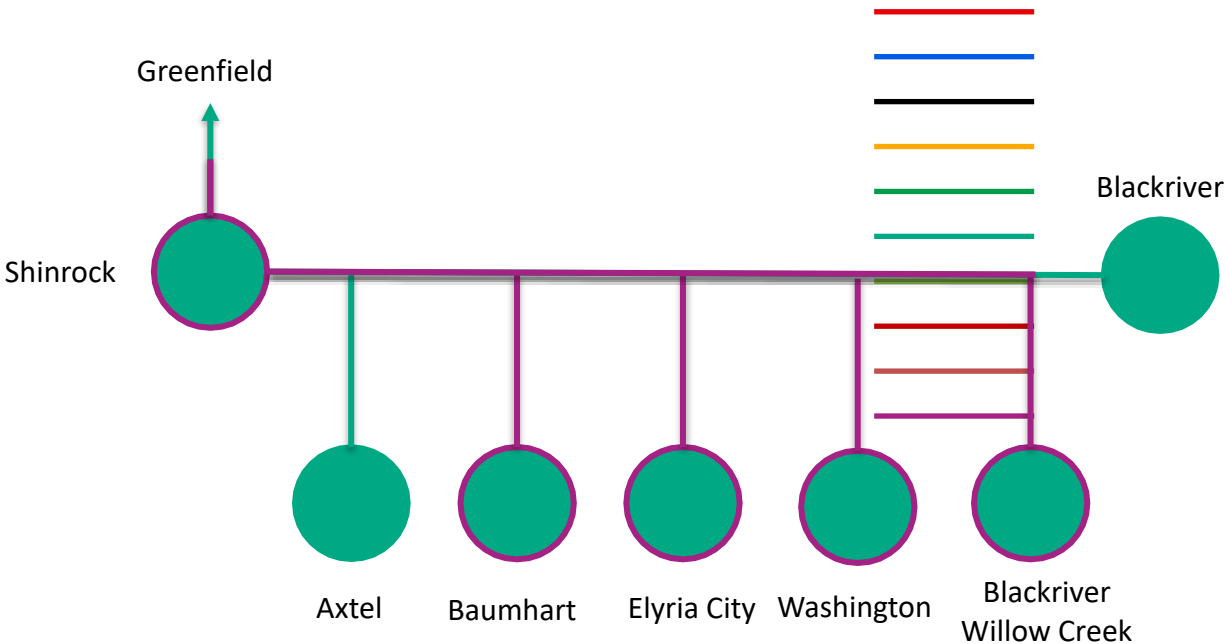
- Axtel-Shinrock 69 kV Line
- Before Proposed Solution: 80 / 96 / 90 / 114 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

- Washington-Washington Tap 69 kV Line
- Before Proposed Solution: 45 / 54 / 51 / 65 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 111 / 134 / 125 / 159 MVA (SN/SE/WN/WE)

Alternatives Considered:

Continue to maintain line in its existing condition with increased maintenance costs and risk of a reliability event due to its deteriorated condition.

Estimated Project Cost: \$67.65M
Projected In-Service: 12/31/2029
Supplemental ID: s3948.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

AMPT Projects in AEP Transmission Zone M3 Process Orrville, OH

Need Number: AMPT-2023-004

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 9/23/2026

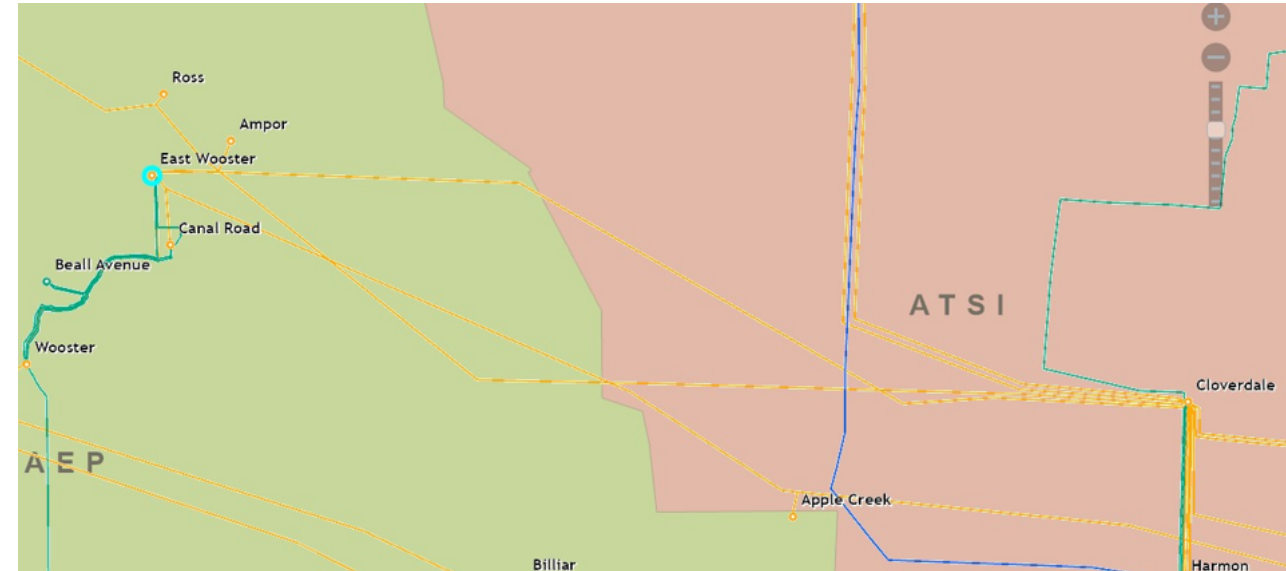
Previously Presented: Solution Meeting – 9/19/2025, Need Meeting – 3/17/2023

Supplemental Project Driver(s): Customer Service, Operational Flexibility and Efficiency

Specific Assumption Reference(s): AMPT Transmission Facilities Interconnection Requirements Document

Problem Statement:

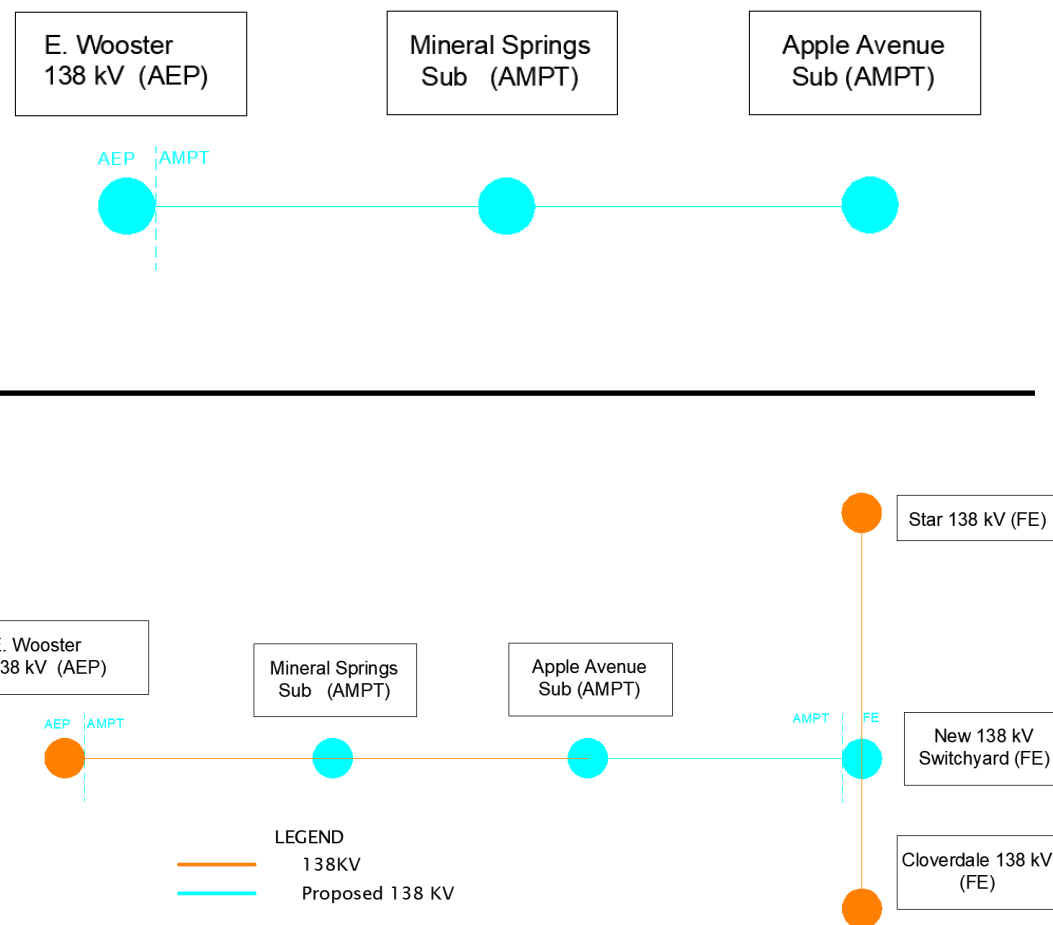
The City of Orrville has two substations, which are served by a single circuit 138kV line approximately 8.92 miles in length, from AEP's East Wooster substation. The city load is 60 MW at peak. A single contingency outage of the 8.92-mile East Wooster-Orrville 138kV line, the "P" breaker at East Wooster sub, or the 138kV straight bus at East Wooster, will interrupt the entire Orrville municipal system. Orrville has no other transmission source, so a bolted fault on the existing 138kV source will leave all of Orrville out of service until the failed facility can be repaired.





Supplemental Project Driver(s): Customer Service, Operational Flexibility and Efficiency

AEP East Wooster substation: Existing metering on the E Wooster-Orrville line (today's line name) is limited to 69 MVA, due to revenue metering at E Wooster sub. AEP to replace revenue metering at E Wooster, with Interconnection metering. CT's will be rated for higher than the 138kV line capacity. **(\$3832.6)**





AMPT Projects in AEP Transmission Zone M3 Process Orrville, OH

Need Number: AMPT-2023-004

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 9/23/2026

Previously Presented: Solution Meeting – 9/19/2025

Supplemental Project Driver(s): Customer Service, Operational Flexibility and Efficiency

Alternatives Considered:

Providing a 2nd source from the Star-Cloverdale line is the most economically feasible alternative. The Brookside-Cloverdale line is approximately the same distance away from Orrville, but would entail a more difficult line siting project due to crossing through more populated suburban areas. Rebuilding the existing E Wooster-Orrville 138kV line for double circuit would still expose the city of Orrville to a complete outage for a P7 (DCTL) loss of the new DCTL line, with no restoration of load until line repairs are made.

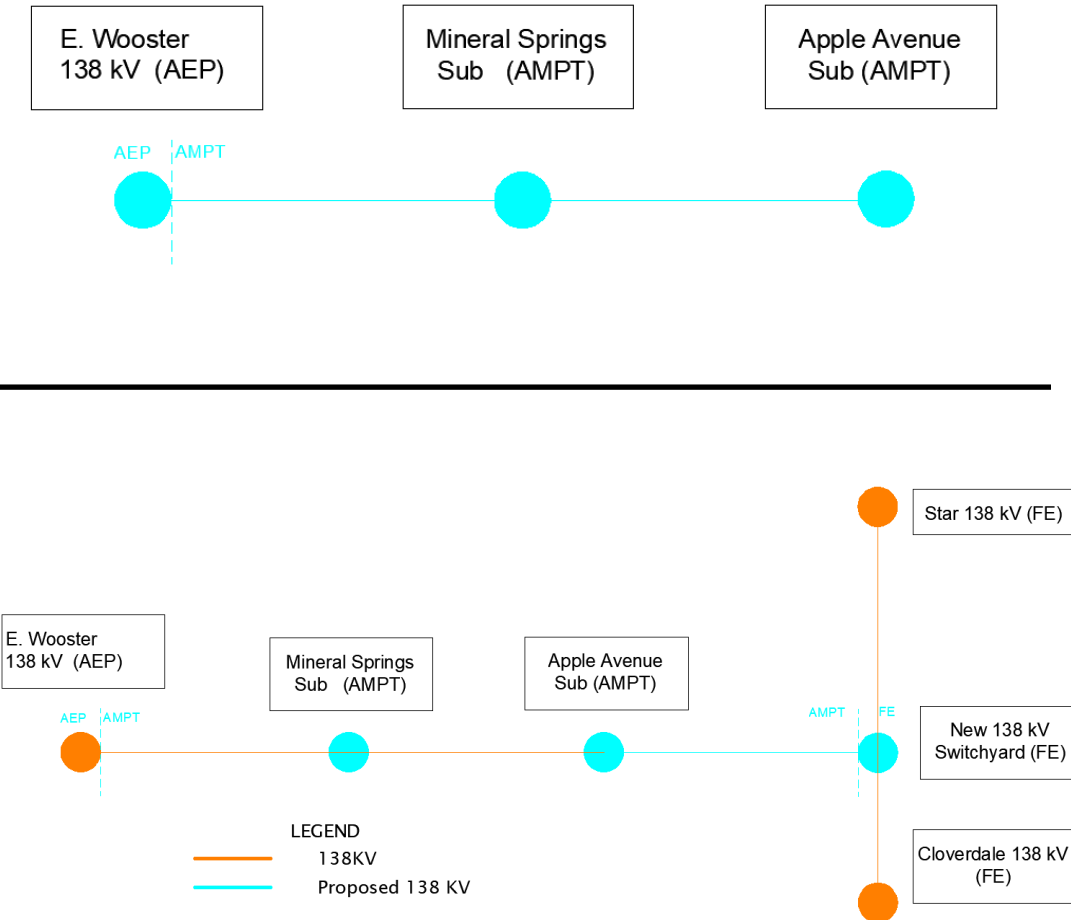
Total Estimated Transmission Cost: \$68.741M

Projected In-Service: 8/30/2030

Supplemental Project ID: s3832.1 (AMPT), s3832.2 (ATSI), s3832.3 (AMPT), s3832.4 (AMPT), s3832.5 (AMPT), s3832.6 (AEP)

Project Status:

- Engineering



Need Number: AMPT-2025-005

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 09/23/2026

Previously Presented: Solution Meeting SRRTEP-W - 01/16/2026
Need Meeting – 06/13/2025

Project Driver:

Equipment Condition/Performance/Risk
Operational Flexibility and Efficiency

Specific Assumption References:

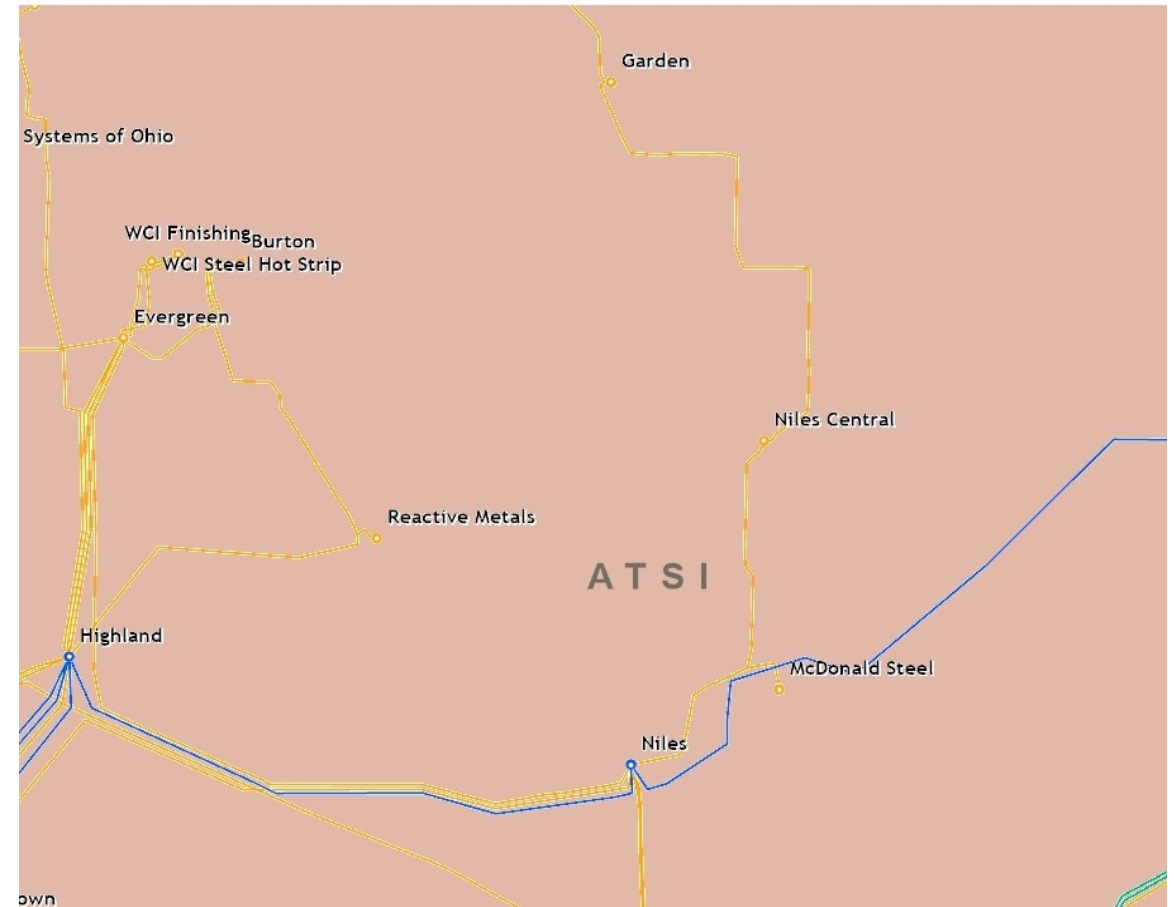
- AMPT's Transmission Facilities Interconnection Requirements document
- AMPT Transmission 2025 Local Planning Assumptions

Problem Statement:

At AMPT's Niles Central 138 kV substation, a single breaker failure of the 138 kV tiebreaker results in the loss of all load within the Niles municipality. Existing legacy electromechanical relays are in need of replacement to reduce the risk of misoperations. The dead-end foundations for the 138 kV lines at Niles Central substation are corroding and at risk of failure. Niles Central serves 63 MW of load, approximately 12,600 customers. The sub was constructed in 1975, and the R&C facilities are 50 years old.

AMPT Transmission Zone M3 Process

Niles Central 138 kV substation





AMPT Transmission Zone M3 Process

Niles Central 138 kV substation

Need Number: AMPT-2025-005

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 09/23/2026

Proposed Solution:

Niles Central Substation:

- Reconfigure the existing Niles Central 138 kV station into a four (4) circuit breaker ring bus by installing one (1) new 138 kV circuit breaker and relocate the existing 138 kV CB "B-20" to create a new line terminal towards Niles (ATSI).
- Expand the two existing in-line bus configurations to create a ring bus configuration.
- Install five (5) new 138 kV circuit switchers on the high-side of the distribution transformers to ensure a transformer fault does not take out a portion of the 138 kV ring bus.
- Demolish switches, busses, and trenching due to age of these pieces of equipment.
- Upgrade the vintage protection systems (including new control house) to meet modern utility standards. **(Estimated Cost: \$11.7 M)**

McDonald Steel - Niles Central 138 kV Line:

- Reroute the existing McDonald Steel - Niles Central 138 kV line to terminate in a new position in the Niles Central 138 kV ring bus.
- Upgrade remote end relays and/or relay settings. **(Estimated Cost: \$2.4 M)**

Alternatives Considered:

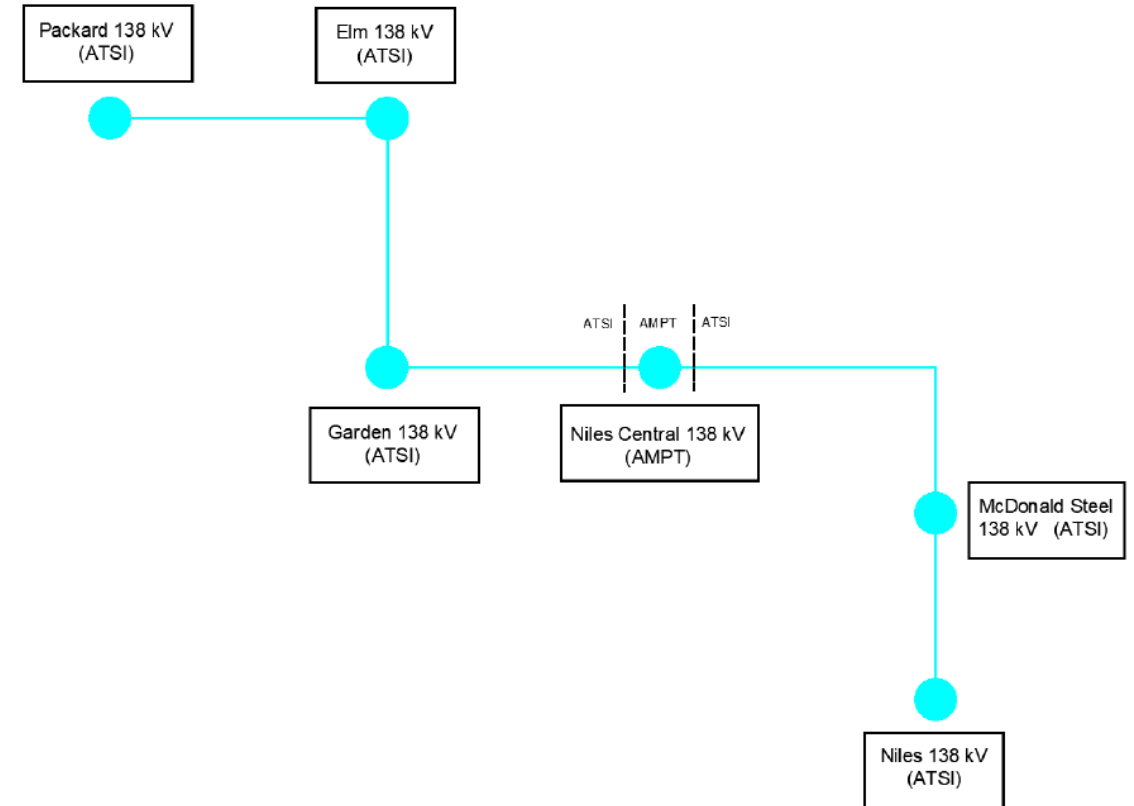
Rebuild entire 138 kV station as a new greenfield station. Not chosen due to cost.

Estimated Project Cost: \$14.1M

Projected In-Service: 08/01/2028

Supplemental Project ID: s3888.1 (AMPT) & s3888.2 (ATSI)

Project Status: Pre-Engineering



Need Number: AMPT-2025-004

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 08/14/2026

Previously Presented: Solution Meeting SRRTEP-W – 02/13/2026
Need Meeting - 09/23/2026

Project Driver:

Equipment Condition/Performance/Risk
Infrastructure Resilience
Operational Flexibility and Efficiency
Other

Specific Assumption References:

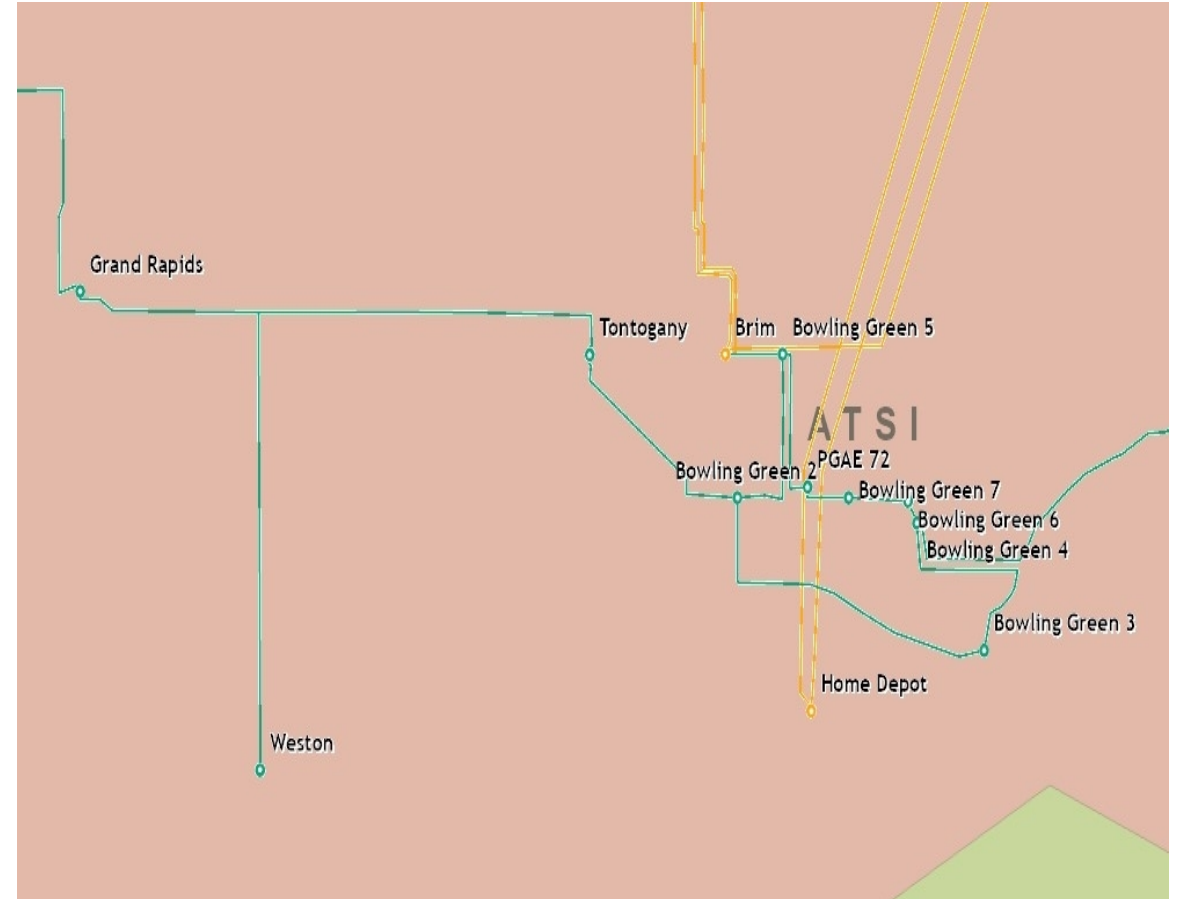
- AMPT's Transmission Facilities Interconnection Requirements document
- AMPT Transmission 2025 Local Planning Assumptions

Problem Statement:

The AMPT owned portion of the Poe Road - Tontogany 69 kV line is 250 MCM Copper overhead conductor, is approximately 60 years old and nearing its end of life. 30 of the 58 structures are 50-60 year old wood structures.

AMPT Transmission Zone M3 Process

Poe Road - Tontogany 69 kV line





Need Number: AMPT-2025-004

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan - 09/23/2026

Proposed Solution:

Poe Road - Tontogany 69 kV Line:

- AMPT to rebuild 2.75 miles of the AMPT owned portion of the Poe Road - Tontogany 69 kV line from the Poe Road substation to the AMPT/FE point of interconnection. **Estimated Cost: \$6.06 M**

Poe Road - Tontogany 69 kV Line Relay Settings Update:

- FE to update relay settings at Sand Ridge substation. **Estimated Cost: \$0.076 M**

Transmission Cost Estimate: \$6.136 M

Alternatives Considered:

Leave aging transmission line infrastructure as is with elevated risk of failure

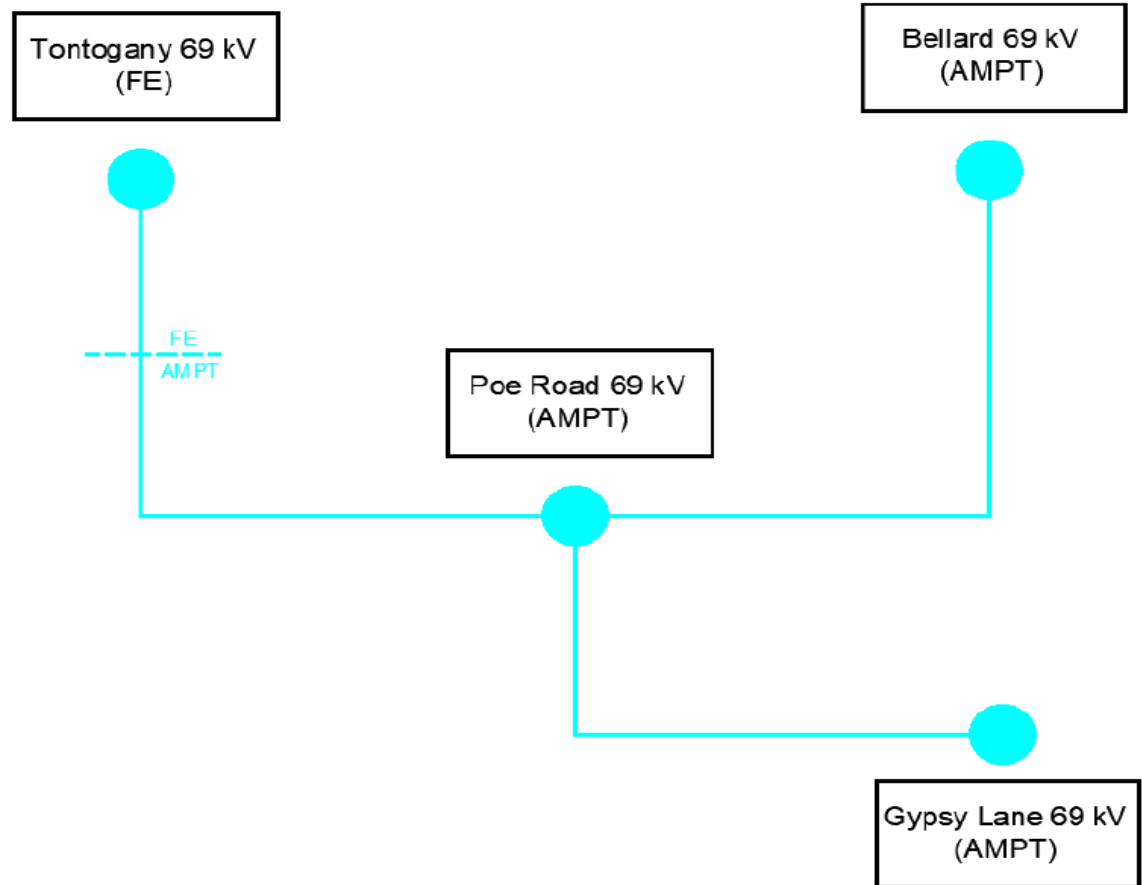
Projected In-Service: 11/30/2028

Supplemental Project ID: s3889.1 (AMPT) & s3889.2 (ATSI)

Project Status: Pre-Engineering

AMPT Transmission Zone M3 Process

Poe Road - Tontogany 69 kV line





Revision History

03/02/2026 – V1 – Original Slides posted

03/04/2026 – V2 – Correction of Need Number in slides 15, 16, & 17 from ATSI-2024-021 to ATSI-2025-021.

07/06/2026 – V3 – Added ATSI-2025-004 & ATS-2025-005

07/29/2026 –V4 – Added ATSI-2024-054, ATSI-2022-009, ATSI-2024-041 (CANCELLATION), ATSI-2022-031, ATSI-2019-059 & ATSI-2025-035

08/05/2026 –V4 – Added s3495.1 (represent), s3890.1 and s3891.1

09/23/2026 – V5 – Added s3940.1, s3941.1, s3942.1, s3943.1, s3944.1, s3945.1, s3946.1, s3947.1, s3948.1, s3832.2, s3888.2 & s3889.2