Subregional RTEP Committee – Western
FirstEnergy Supplemental Projects

September 19, 2025

Needs

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

ATSI Transmission Zone M-3 Process
Harper – West Akron 138 kV Line

Need Number: ATSI-2025-023

Process Stage: Need Meeting – 9/19/2025

Supplemental Project Driver(s):

Equipment Material Condition, Performance and Risk

Infrastructure Resilience

Specific Assumption Reference(s):

System Performance Global Factors

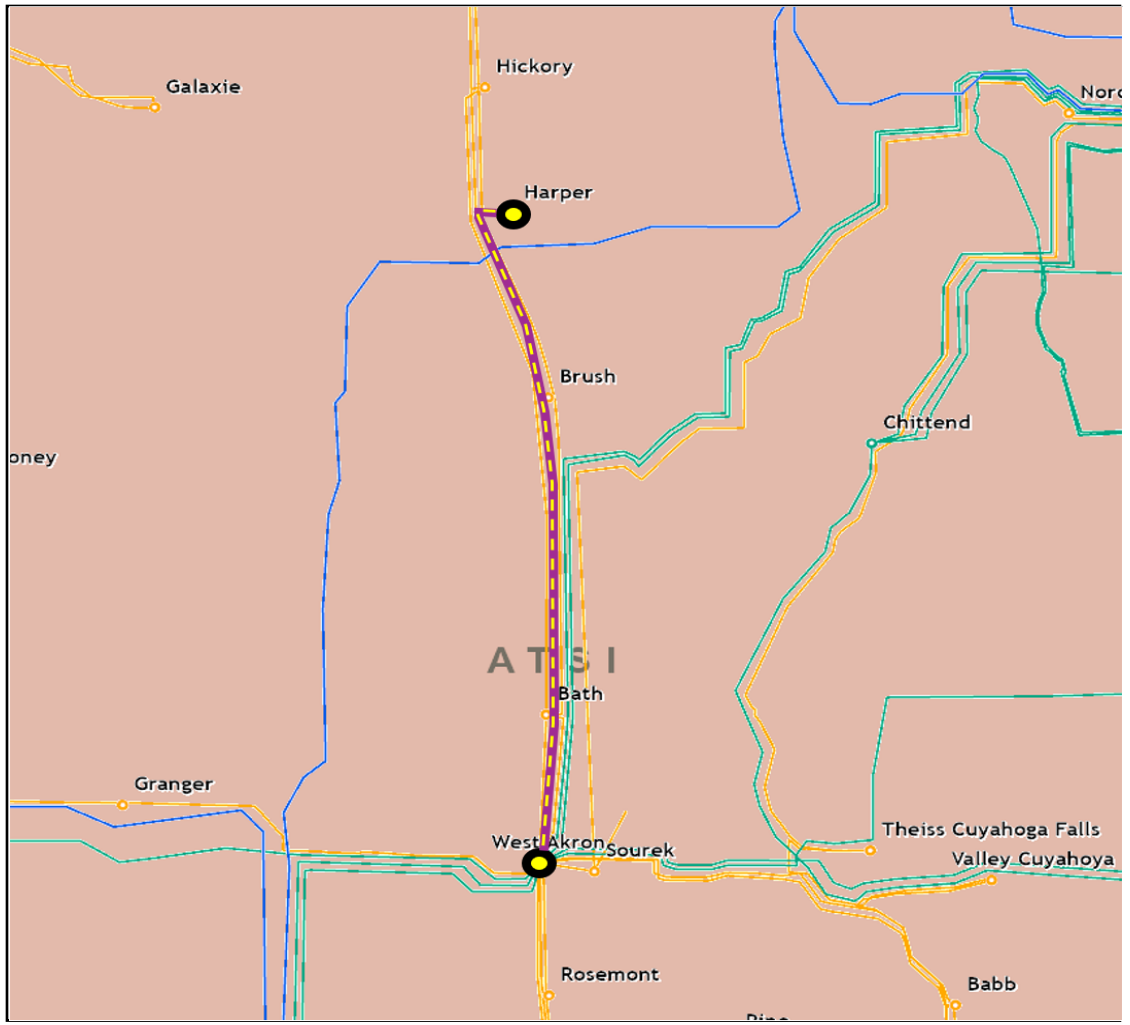
- System Reliability and Performance
- Load at risk in planning and operational scenarios
- Age/condition of transmission line conductors and hardware
- Increase line loading limits

Problem Statement:

- The Harper – West Akron 138 kV Line is approximately 10 miles in length with mixed conductor types. The line serves approximately 71 MW and 2,800 customers. The line contains vintage 1920's conductor and hardware.
- Since 2022 there have been two sustained 138 kV line outages.
- Based on a 2024 Series 2029 RTEP Summer Case with the Perry generator offline followed by a loss of two 345 kV lines, the line approaches 100% of its summer emergency rating.

Existing Line Ratings: 143/146/161/161 MVA (SN/SE/WN/WE)

Model: 2024 Series 2029 Summer RTEP 50/50



ATSI Transmission Zone M-3 Process
Carlisle – Johnson 138 kV Line

Need Number: ATSI-2025-025

Process Stage: Need Meeting – 09/19/2025

Supplemental Project Driver(s):

Customer Services

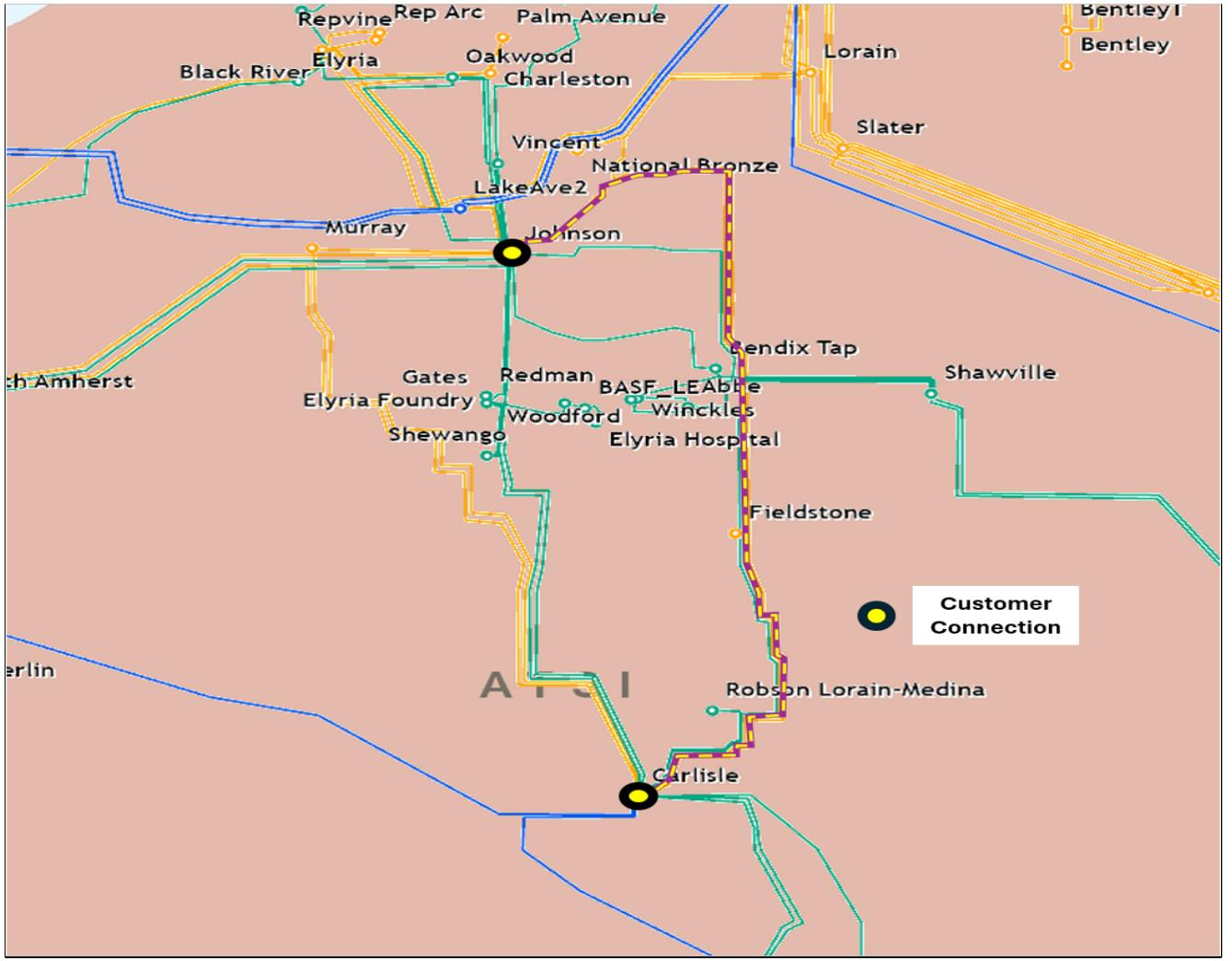
Specific Assumption Reference(s):

- 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 Carlisle – Johnson 138 kV Line. The anticipated load of the new customer connection is 12 MVA. The request is 1.3 miles from the Carlisle – Johnson 138 kV Line.

Model: 2023 Series 2028 Summer RTEP 50/50



Solutions

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

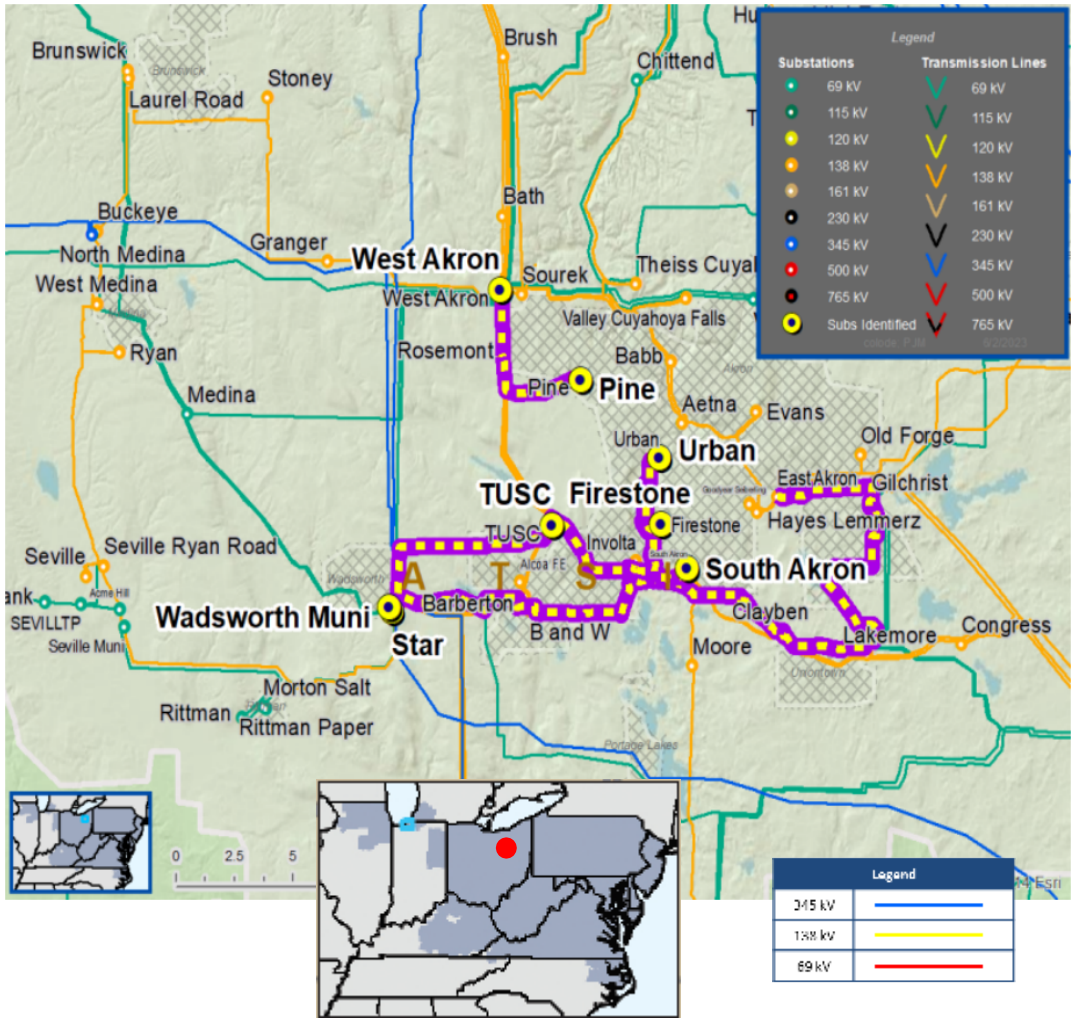
ATSI Transmission Zone M-3 Process
Tusc Substation

Need Number: ATSI-2023-011
Process Stage: Solutions Meeting – 09/19/2025
Previously Presented: Need Meeting – 6/16/2023

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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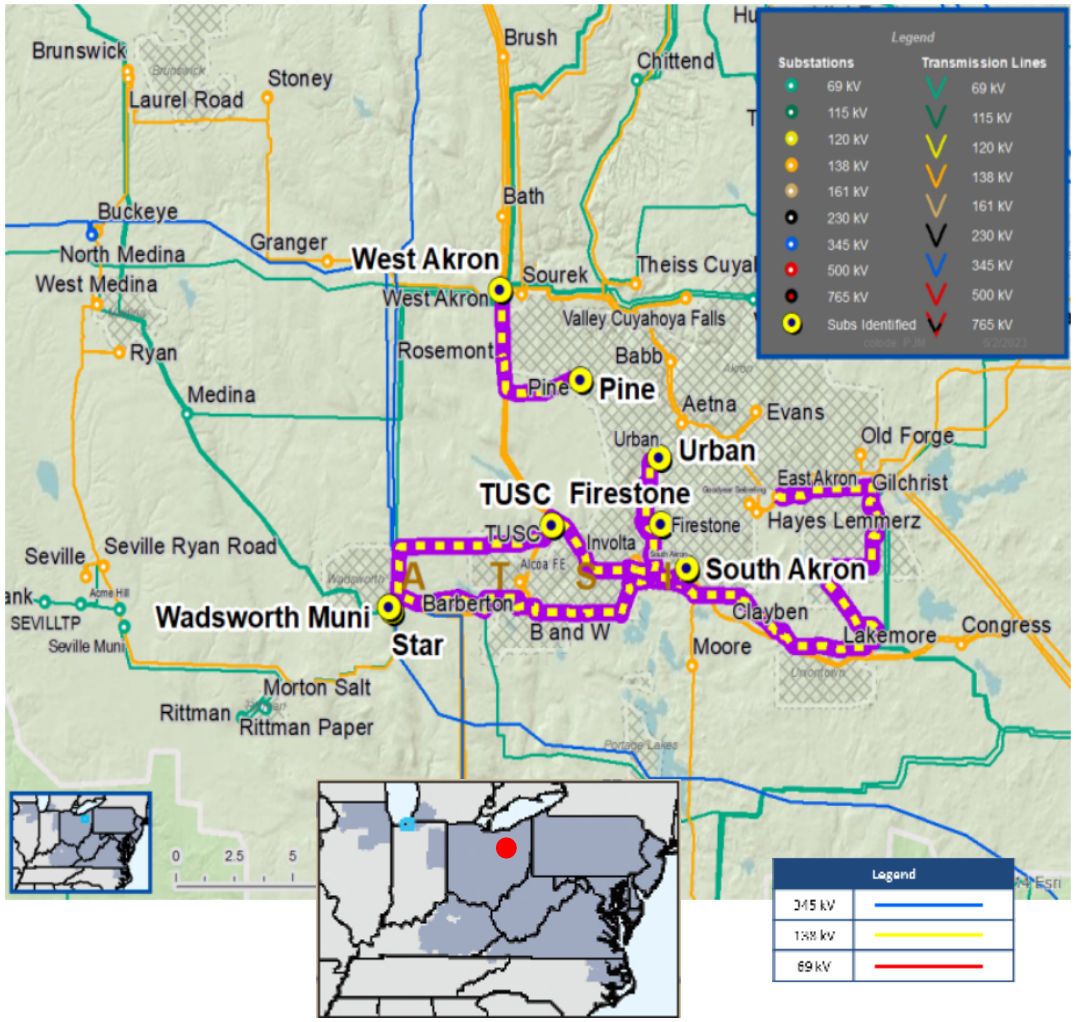
ATSI Transmission Zone M-3 Process
Tusc Substation

Need Number: ATSI-2023-011
Process Stage: Solutions Meeting – 09/19/2025
Previously Presented: Need Meeting – 6/16/2023

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



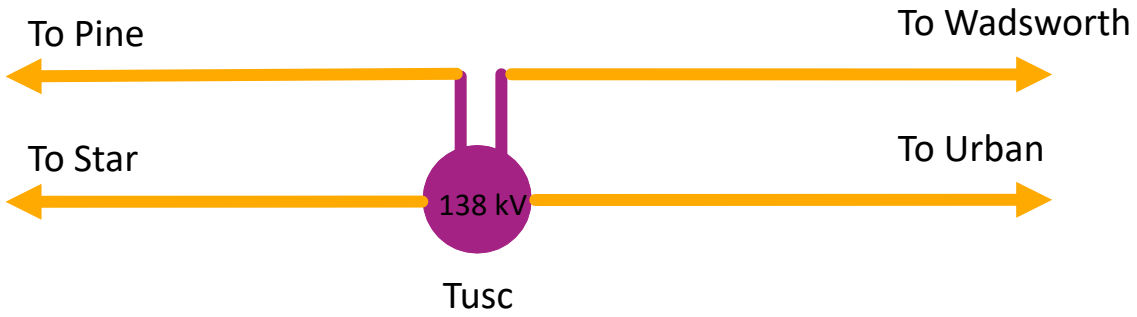
ATSI Transmission Zone M-3 Process
Tusc Substation

Need Number: ATSI-2023-011

Process Stage: Solutions Meeting – 09/19/2025

Proposed 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.



Alternatives Considered:

- Maintain existing condition with risk of consequential load loss under contingency scenarios.

Estimated Project Cost: $16.72M

Projected IS Date: 12/31/2027

Status: Conceptual

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

ATSI Transmission Zone M-3 Process
Firestone Substation

Need Number: ATSI-2025-021

Process Stage: Need Meeting – 07/18/2025
Need Represent Meeting – 9/19/2025

Project Driver(s):

Operational Flexibility and Efficiency

Equipment Performance and Risk

Infrastructure Resilience

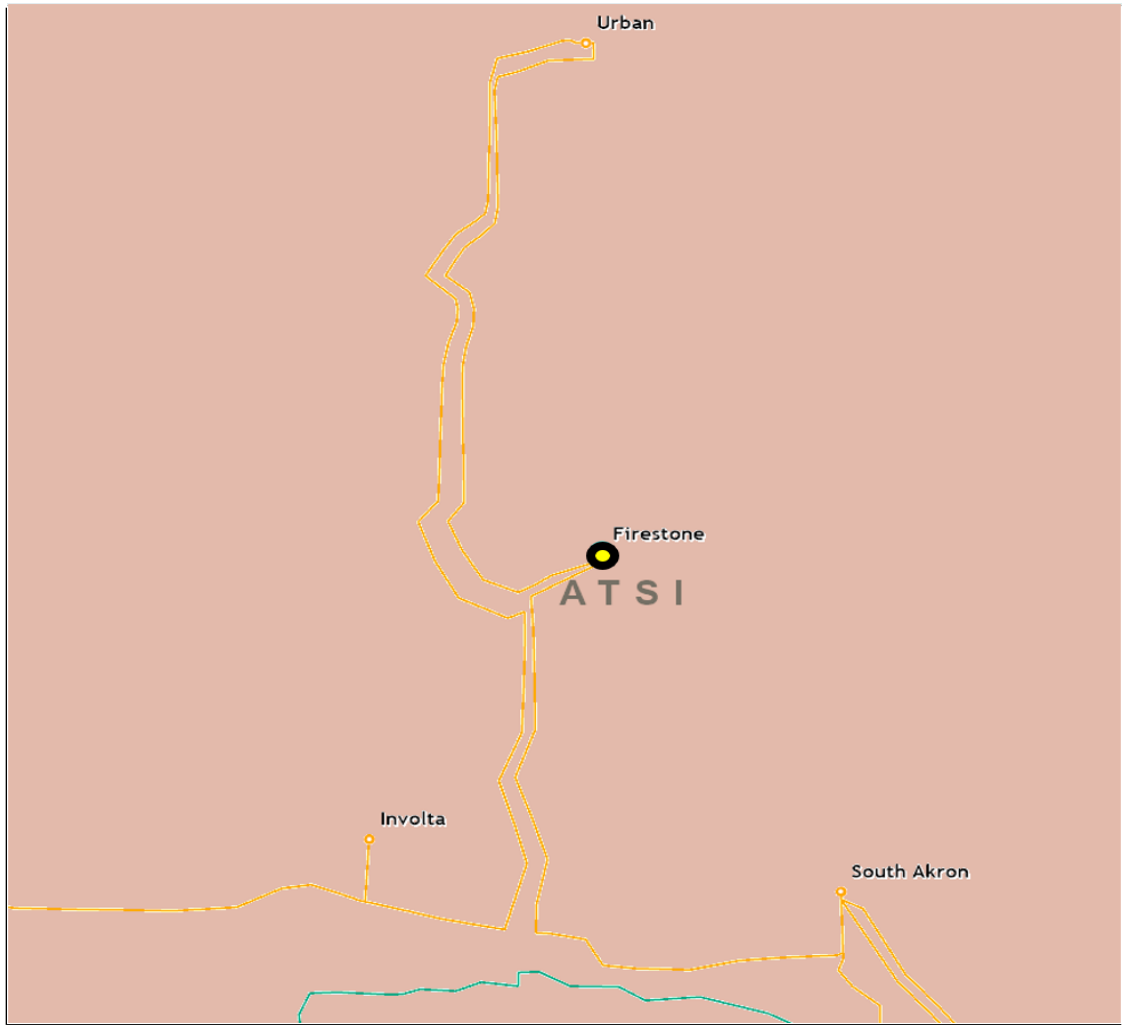
Specific Assumption Reference(s):

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

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.
- ~~A failure of the bus tie circuit breaker will result in an outage of the entire 138 kV bus and substation, including two distribution transformers. This contingency impacts an industrial customer and results in a total load loss of 7 MVA~~
- ~~This contingency also interrupts the South Akron-Urban 138 kV Line resulting in a single ten-mile-long radial feed to Urban Substation.~~



ATSI Transmission Zone M-3 Process
Firestone Substation

Need Number: ATSI-2025-021

Process Stage: Solutions Meeting – 09/19/2025

Proposed 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.

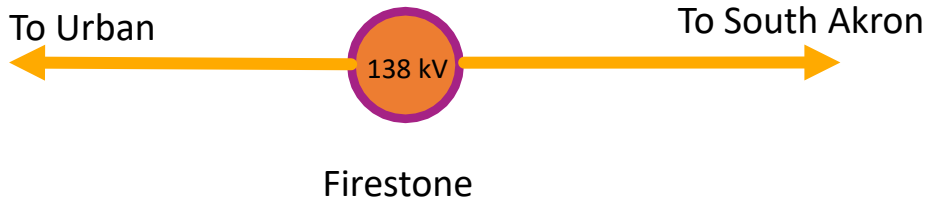
Alternatives Considered:

- Other options for reconfiguring the substation top reduce operational constraints was considered. However, this option was deemed infeasible due to the real estate constraints.

Estimated Project Cost: $0.3M

Projected IS Date: 2/16/2026

Status: Conceptual



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

Appendix

High Level M-3 Meeting Schedule

Assumptions

Activity	Timing
Posting of TO Assumptions Meeting information	20 days before Assumptions Meeting
Stakeholder comments	10 days after Assumptions Meeting

Needs

Activity	Timing
TOs and Stakeholders Post Needs Meeting slides	10 days before Needs Meeting
Stakeholder comments	10 days after Needs Meeting

Solutions

Activity	Timing
TOs and Stakeholders Post Solutions Meeting slides	10 days before Solutions Meeting
Stakeholder comments	10 days after Solutions Meeting

Submission of Supplemental Projects & Local Plan

Activity	Timing
Do No Harm (DNH) analysis for selected solution	Prior to posting selected solution
Post selected solution(s)	Following completion of DNH analysis
Stakeholder comments	10 days prior to Local Plan Submission for integration into RTEP
Local Plan submitted to PJM for integration into RTEP	Following review and consideration of comments received after posting of selected solutions

Revision History

9/08/2025– V1 – Original version posted to pjm.com