

Subregional RTEP Committee – Western FirstEnergy Supplemental Projects

July 19, 2024

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

Need Number: ATSI-2024-047
Process Stage: Need Meeting – 7/19/2024

Project Driver:
Customer Service

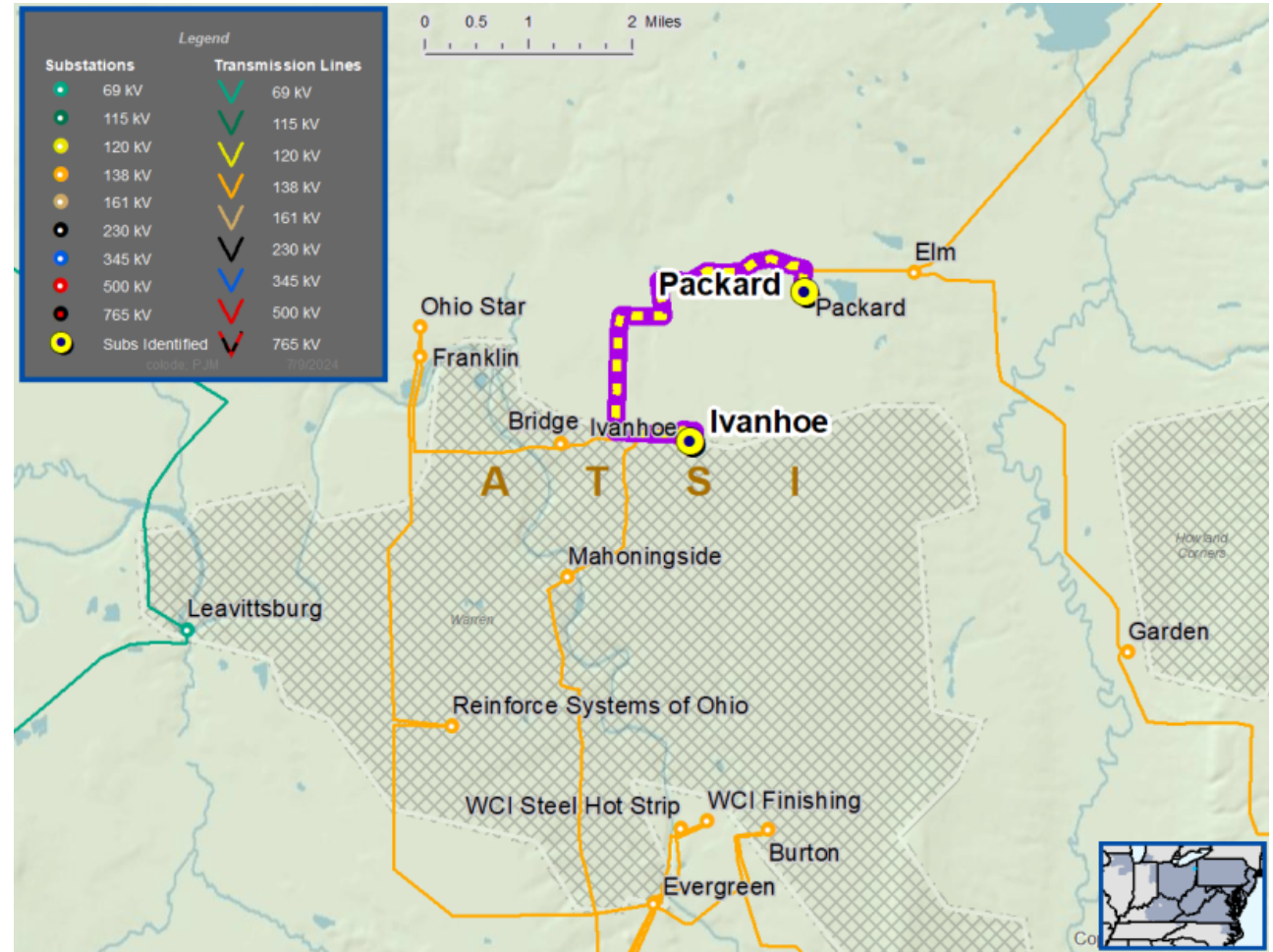
Specific Assumption Reference:

Customer 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



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

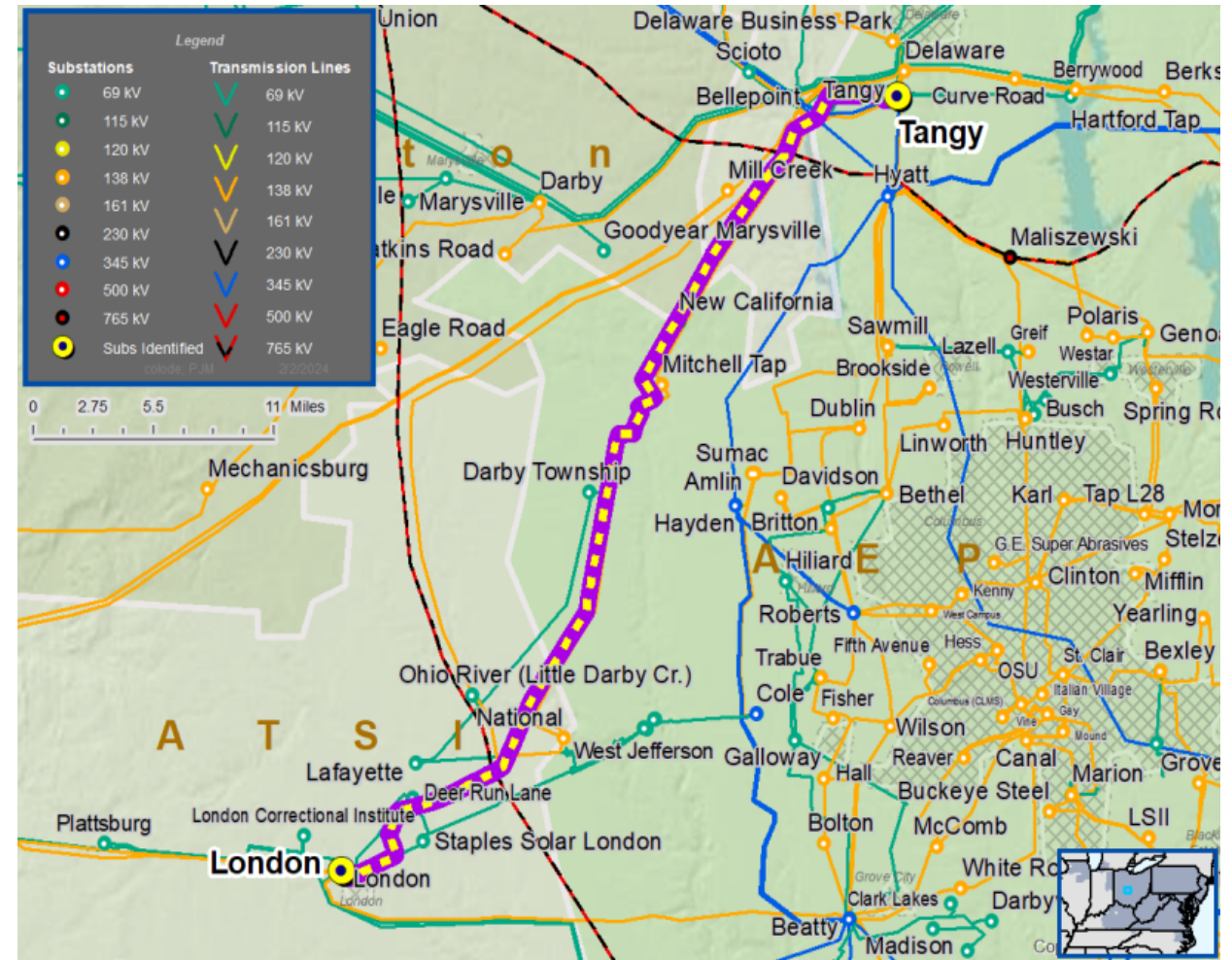
Need Number: ATSI-2024-020
Process Stage: Solution Meeting – 07/19/2024
Previously Presented: Need Meeting – 02/15/2024

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 has requested a new 138 kV delivery point near the London - Tangy 138 kV Line. The anticipated load of the new customer connection is 12 MVA.

Requested in-service date is 6/1/2024.





ATSI Transmission Zone M-3 Process London – Tangy 138 kV Line Customer Connection

Need Number: ATSI-2024-020
Process Stage: Solution Meeting – 07/19/2024

Proposed Solution:

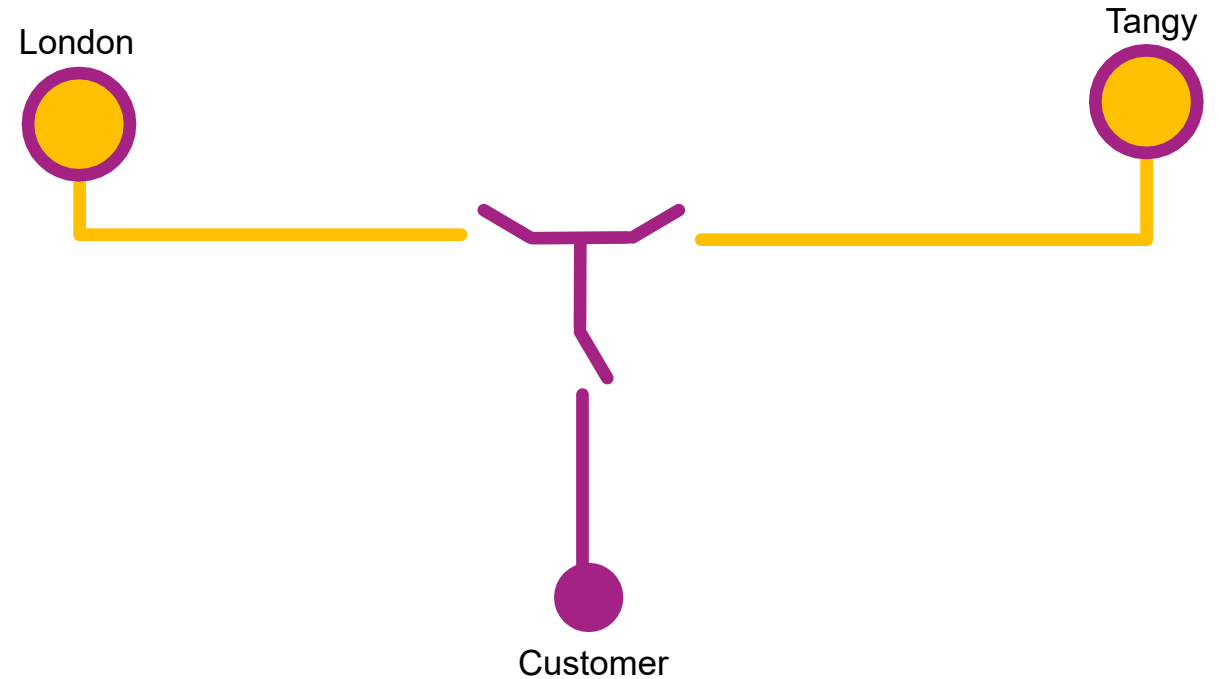
138 kV Transmission Line Tap

- Install two main-line SCADA controlled switches
- Install one tap-line SCADA controlled switch
- Construct 0.1 miles of 138 kV line extension.
- Adjust relay settings at London and Tangy substations
- Install revenue metering

Alternatives Considered:

- No reasonable alternatives to meet the customer’s request near the London - Tangy 138 kV Line.

Estimated Project Cost: \$1.6M
Projected In-Service: 6/3/2026
Status: Engineering
Model: 2023 RTEP model for the 2028 Summer (50/50)



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

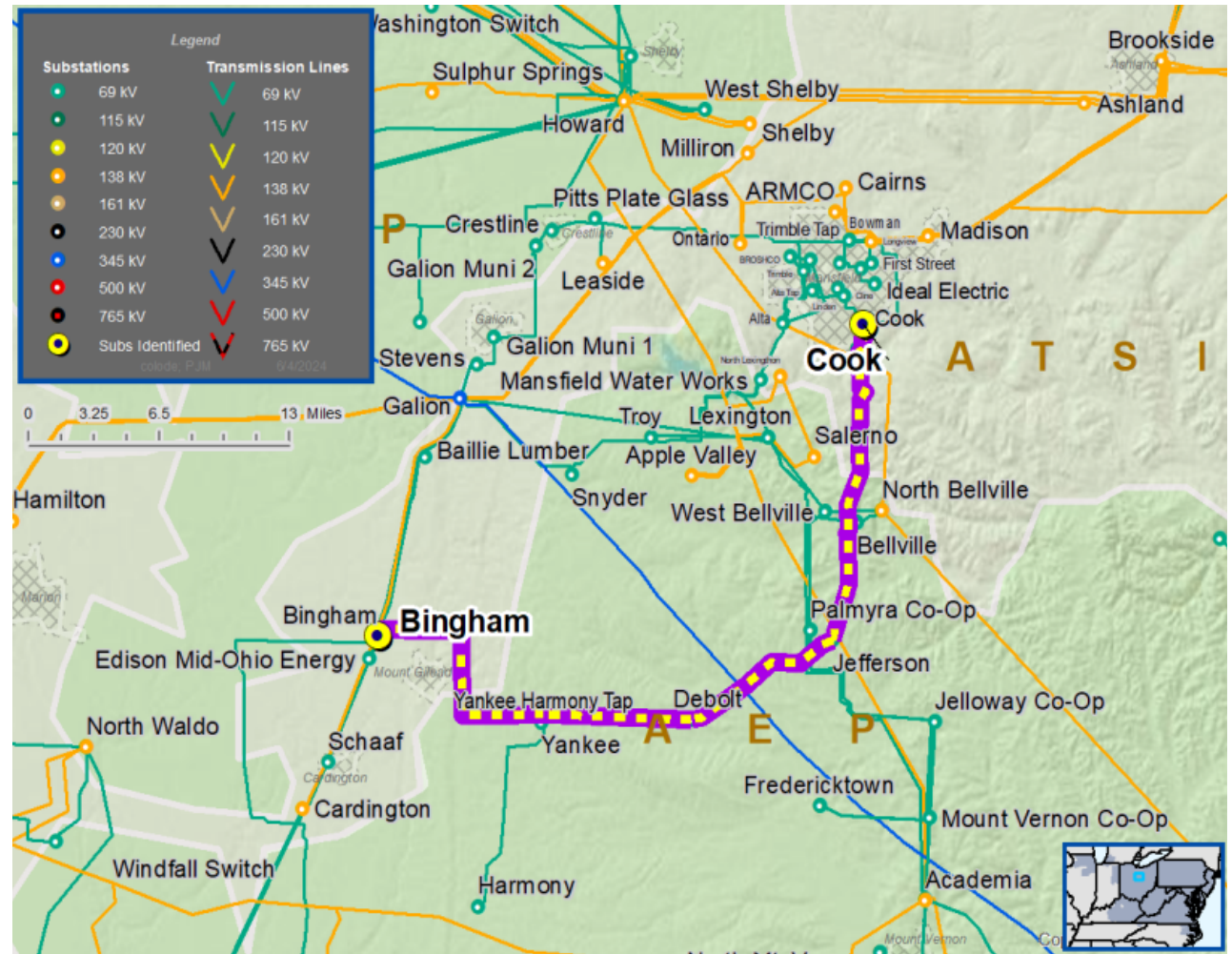
Need Number: ATSI-2024-042
Process Stage: Solution Meeting – 07/19/2024
Previously Presented: Need Meeting – 06/14/2024

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 has requested a new 69 kV service load for approximately 11 MVA near the Bingham – Cook 69 kV Line. The request is approximately two miles from Cook Substation.

Requested In-Service Date:
 June 1, 2025





ATSI Transmission Zone M-3 Process Bingham – Cook 69 kV Line Customer Connection

Need Number: ATSI-2024-042
Process Stage: Solution Meeting – 07/19/2024

Proposed Solution:

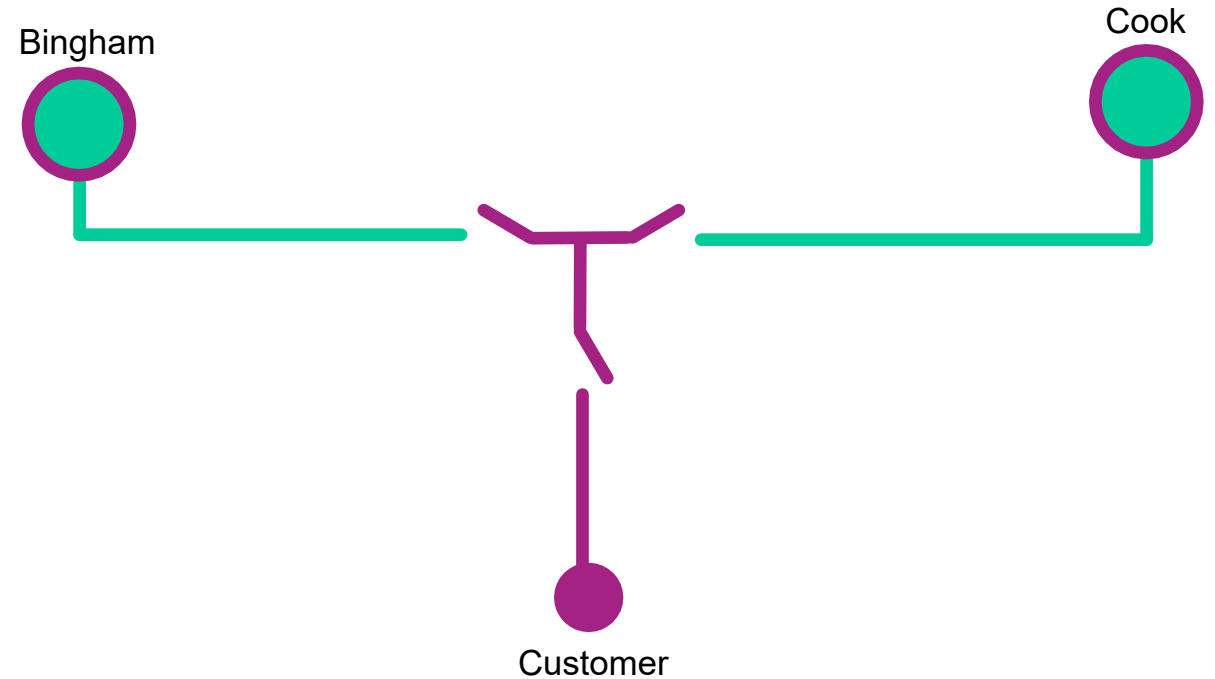
69 kV Transmission Line Tap

- Install two main-line SCADA controlled switches
- Install one tap-line SCADA controlled switch
- Construct 0.1 miles of 69 kV line extension.
- Adjust relay settings at Bingham and Cook substations
- Install revenue metering

Alternatives Considered:

- No reasonable alternatives to meet the customer’s request near the Bingham – Cook 69 kV Line.

Estimated Project Cost: \$1.21M
Projected In-Service: 12/27/2027
Status: Engineering
Model: 2023 RTEP model for the 2028 Summer (50/50)



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

Need Number: ATSI-2024-043
Process Stage: Solution Meeting – 07/19/2024
Previously Presented: Need 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 – A retail customer is requesting to retire an existing 69 kV delivery point on the Adams - Shinrock 69 kV Line. In addition, the customer is requesting a new 69 kV delivery point on the same transmission line to replace the retired delivery point which will have an anticipated load of 35 MVA. The request is approximately 500 feet from Adams Substation.

Forecasted In-Service Date:
 October 31, 2025





ATSI Transmission Zone M-3 Process Adams - Shinrock 69 kV Line Customer Connection

Need Number: ATSI-2024-043
Process Stage: Solution Meeting – 07/19/2024

Proposed Solution:

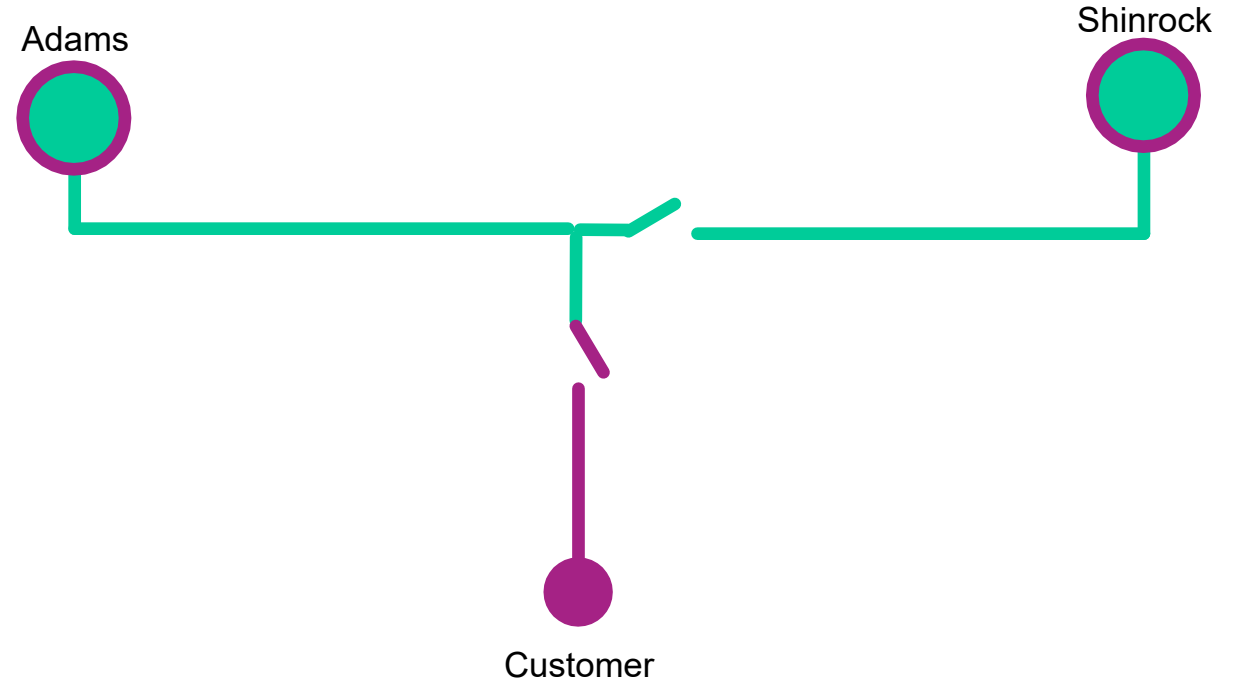
69 kV Transmission Line Tap

- Install one tap-line SCADA controlled switch
- Construct a span of 69 kV line extension.
- Adjust relay settings at Adams and Shinrock substations
- Install revenue metering

Alternatives Considered:

- No reasonable alternatives to meet the customer’s request near the Adams – Shinrock 69 kV Line.

Estimated Project Cost: \$0.15 M
Projected In-Service: 10/31/2025
Status: Engineering
Model: 2023 RTEP model for the 2028 Summer (50/50)



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

Need Number: ATSI-2024-044
Process Stage: Solution Meeting – 07/19/2024
Previously Presented: Need Meeting – 06/14/2024

Supplemental Project Driver(s):
Customer Service

Specific Assumption Reference(s):

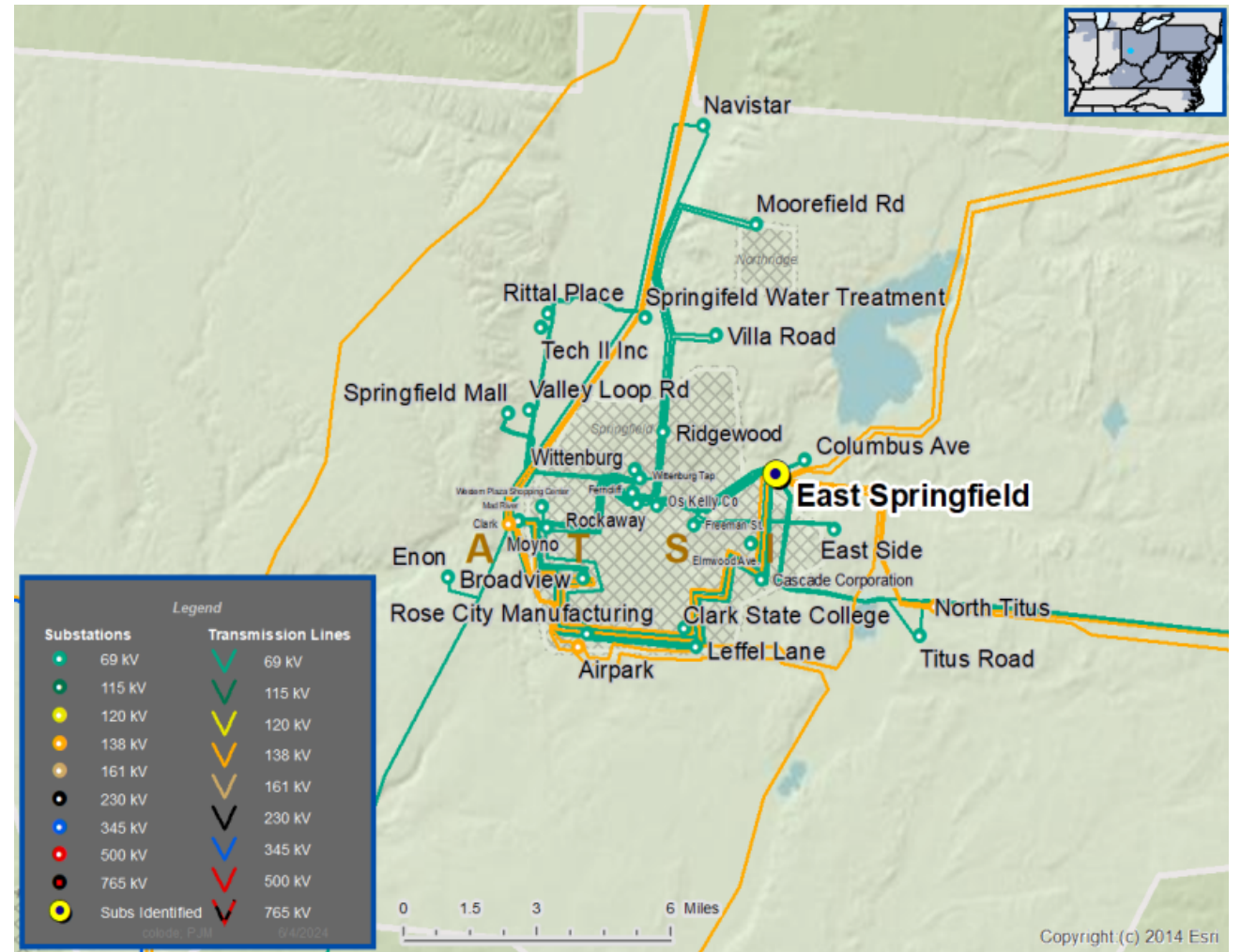
New customer connection request will be evaluated per FirstEnergy’s “Requirements for Transmission Connected Facilities” document and “Transmission Planning Criteria” document.

Problem Statement

New Customer Connection – A retail customer has requested a new 138 kV delivery point in the East Springfield area. The anticipated load of the new customer connection is 200 MVA.

Forecasted In-Service Date:

September 25, 2026





ATSI Transmission Zone M-3 Process East Springfield 138 kV Customer Connection

Need Number: ATSI-2024-044
Process Stage: Solution Meeting 07/19/2024

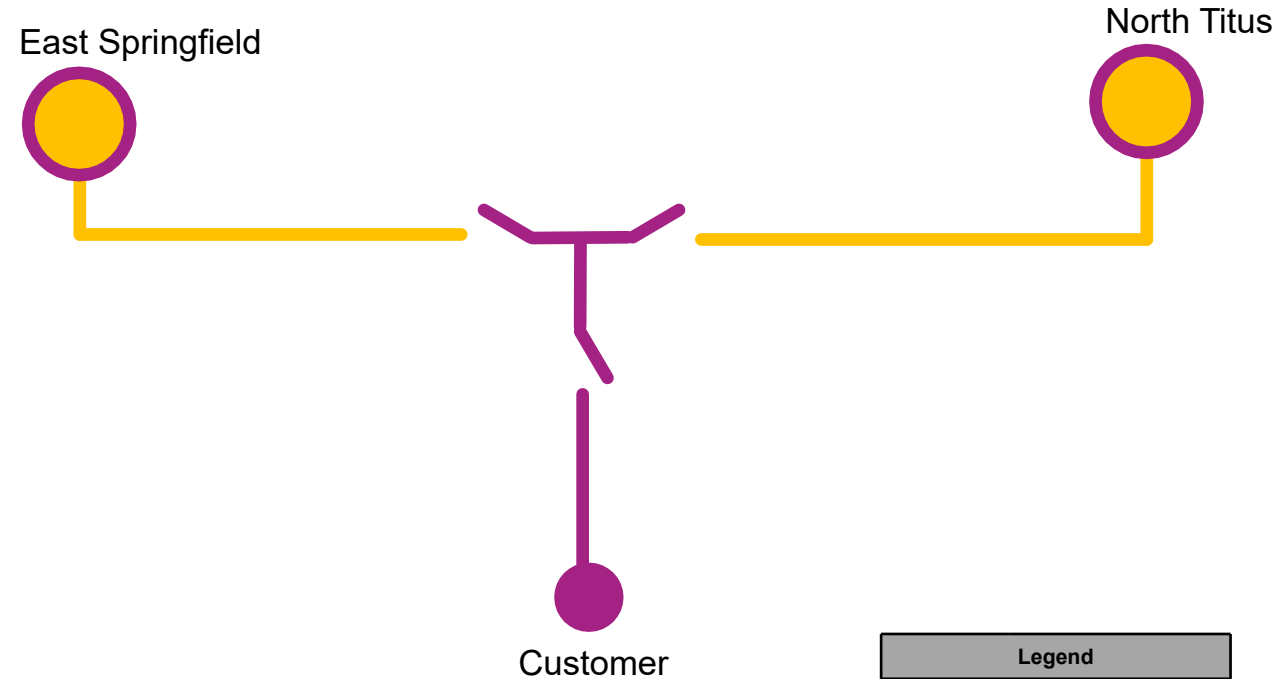
Proposed Solution:

Phase 1: 138 kV Transmission Line Tap

- Install two main-line SCADA controlled switches
- Install one tap-line SCADA controlled switch
- Construct approximately 0.1 miles of 138 kV line extension.
- Adjust relay settings at East Springfield and North Titus substations
- Install revenue metering

Estimated Project Cost: \$2.47M
Projected In-Service: 3/1/2025
Status: Engineering
Model: 2023 RTEP model for the 2028 Summer (50/50)

Phase 1: 138 kV Transmission Line Tap



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

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ATSI Transmission Zone M-3 Process East Springfield 138 kV Customer Connection

Need Number: ATSI-2024-044
Process Stage: Solution Meeting 07/19/2024

Proposed Solution:

Phase 2: 138 kV Switching Station

- Build a new 11 breaker, breaker and a half, 138 kV substation
- Loop the East Springfield – London 138 kV Line in and out of the new substation
- Remove the tap on the East Springfield – North Titus 138 kV Line and loop the line in and out of the new substation.
- Install three 30 MVAR capacitor banks at the new 138 kV substation.
- Build an additional span of 138 kV line from the new substation to the POI with the customer.
- Install a second set of revenue metering.
- Adjust relay settings at London, North Titus, and East Springfield Substations

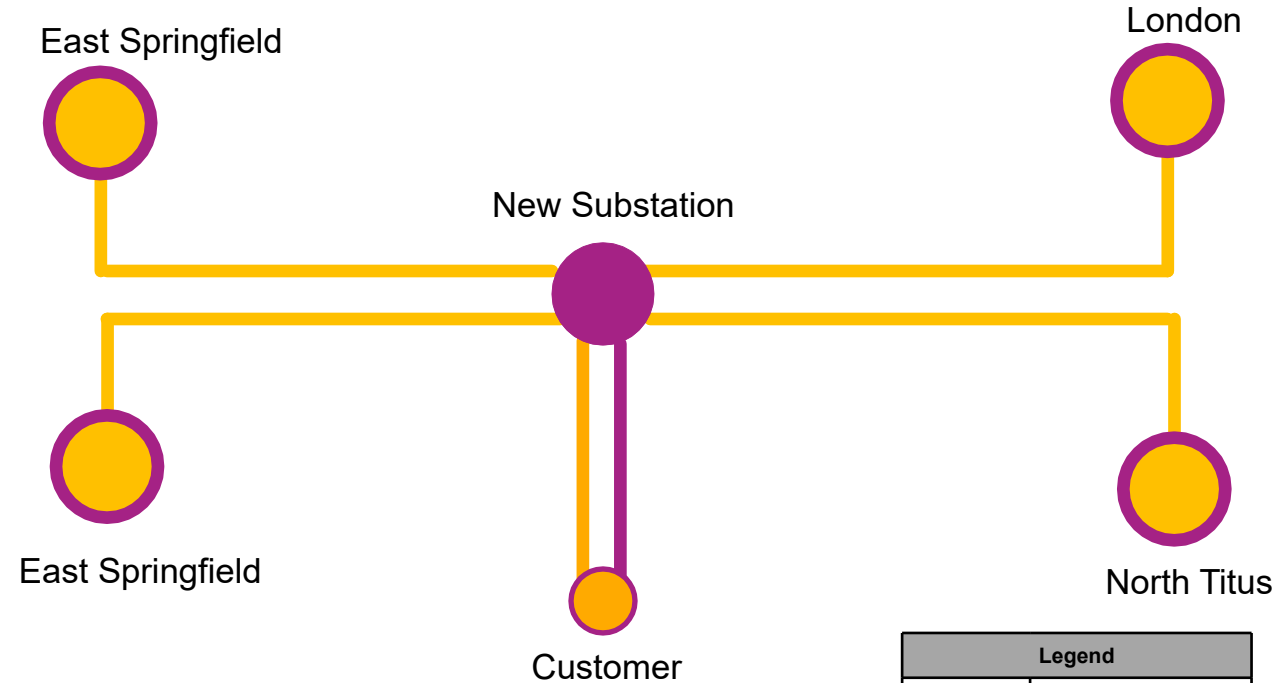
Alternatives:

- No reasonable alternatives to meet the customer’s request near East Springfield area.

Estimated Project Cost: \$23.6M
Projected In-Service: 11/1/2028
Status: Engineering
Model: 2023 RTEP model for the 2028 Summer (50/50)

Total Estimated Project Cost: \$26.07M (Phase 1 and Phase 2)

Phase 2: 138 kV Transmission Switching Station



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

Need Number: ATSI-2024-045
Process Stage: Solution Meeting – 07/19/2024
Previously Presented: Need Meeting – 06/14/2024

Supplemental Project Driver(s):
Customer Service

Specific Assumption Reference(s):

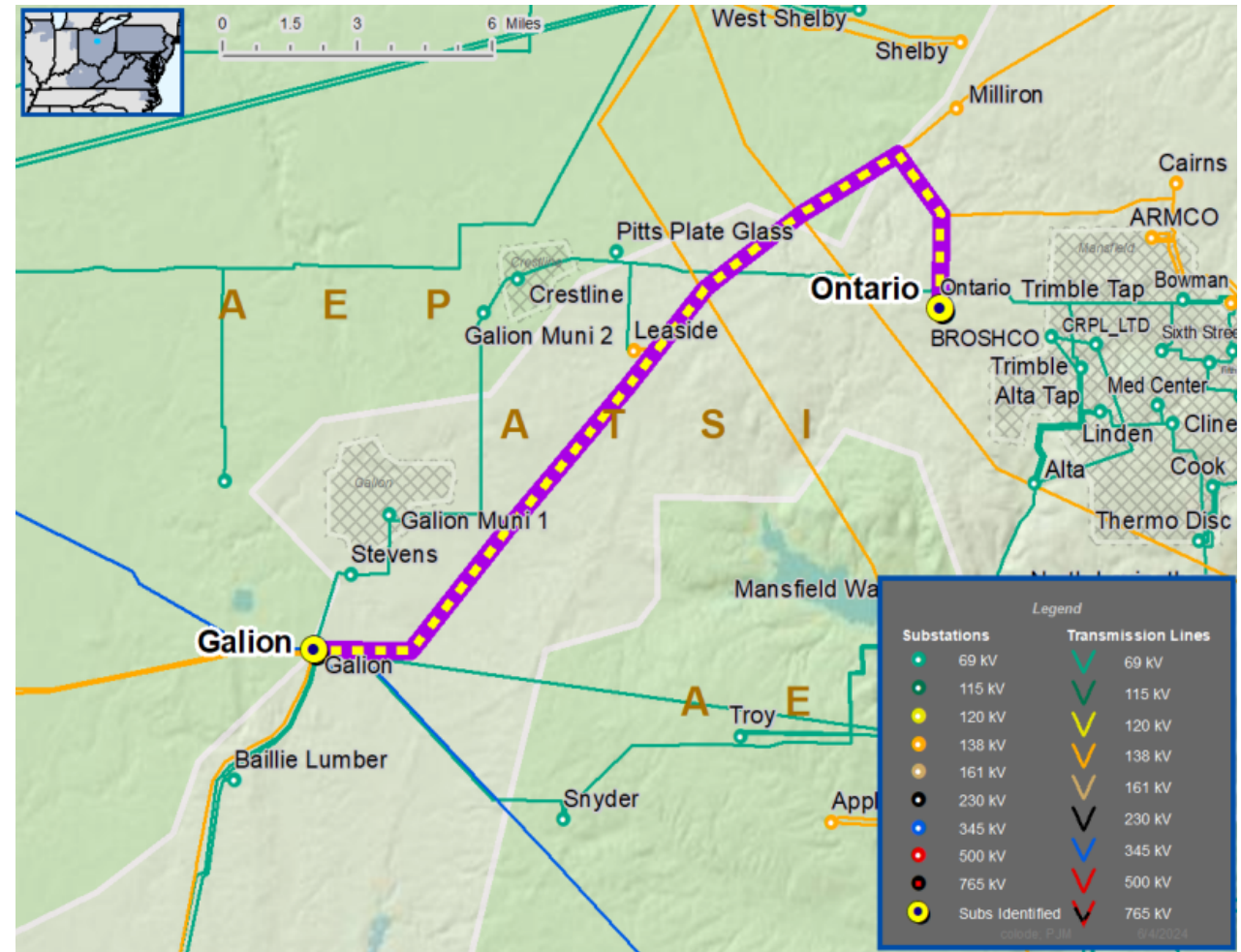
New customer connection request will be evaluated per FirstEnergy’s “Requirements for Transmission Connected Facilities” document and “Transmission Planning Criteria” document.

Problem Statement

New Customer Connection – A retail customer has requested a new 138 kV delivery point near the Galion – Ontario 138 kV Line. The anticipated load of the new customer connection is 63 MVA. The request is approximately 1,000 feet from Ontario Substation.

Forecasted In-Service Date:

December 31, 2025



ATSI Transmission Zone M-3 Process Galion – Ontario 138 kV Line Customer Connection

Need Number: ATSI-2024-045
Process Stage: Solution Meeting – 07/19/2024

Proposed Solution:

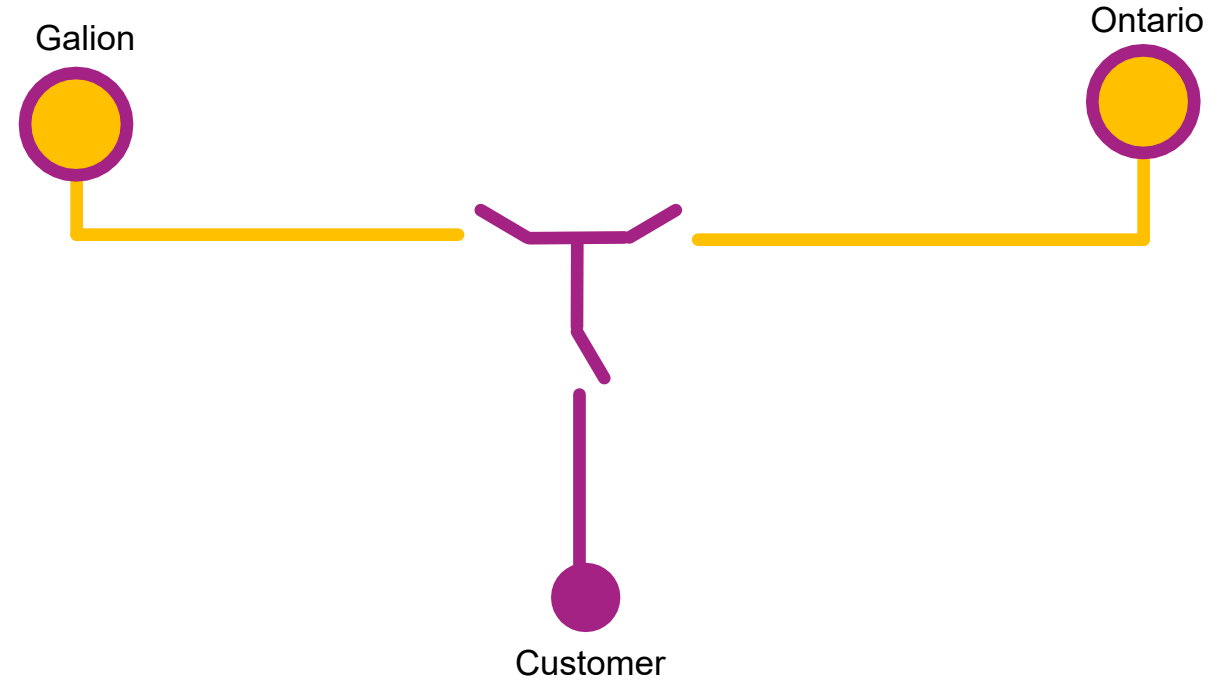
138 kV Transmission Line Tap

- Install two main-line SCADA controlled switches
- Install one tap-line SCADA controlled switch
- Construct 0.1 miles of 138 kV line extension.
- Adjust relay settings at Galion and Ontario substations
- Install revenue metering

Alternatives Considered:

- No reasonable alternatives to meet the customer’s request near the Galion – Ontario 138 kV Line.

Estimated Project Cost: \$1.04 M
Projected In-Service: 7/14/2025
Status: Engineering
Model: 2022 RTEP model for the 2027 Summer (50/50)



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

Changes to the Existing Projects

s1953: Originally presented in 01/14/2019, 3/28/2019 and 11/20/2020 SRRTEP Western meetings

Changes are marked in red

Project Driver(s):

- Operational Flexibility and Efficiency*
- Infrastructure Resilience*

Specific Assumption Reference(s)

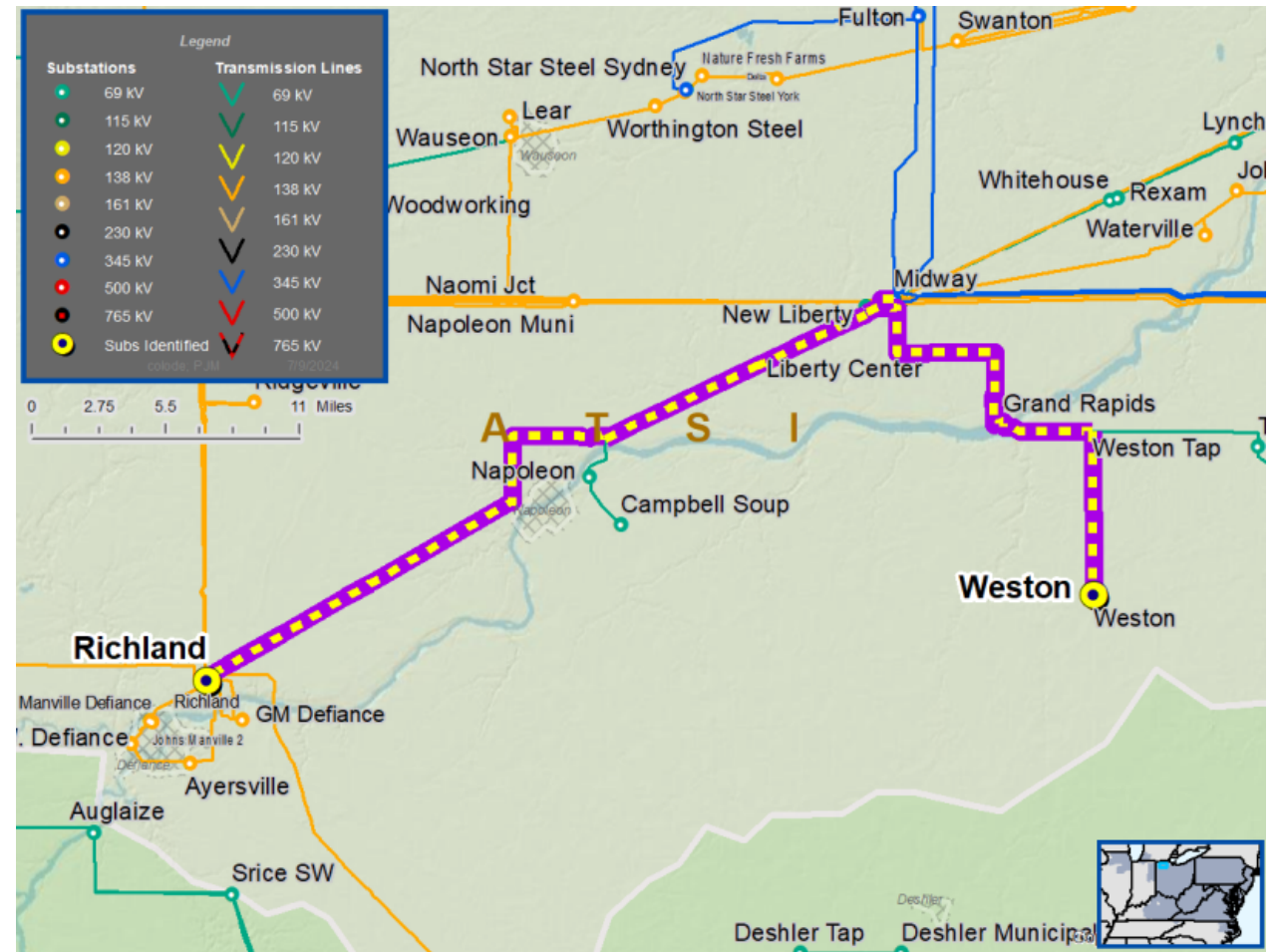
Global Considerations

- System reliability and performance
- Substation / Line equipment limits
- Reliability of Non-Bulk Electric System (Non-BES) facilities
- Load and risk in planning and operational scenarios
- Load and/or customers at risk on single transmission lines

Problem Statement

Maroe - Malinta 34.5 kV Area

- *The existing Richland - Maroe 34.5kV line is a radial line with limited capability of transferring load onto different circuits for emergency restoration and scheduling of routine maintenance.*
- *The loss of the Richland - Maroe 34.5 kV radial line results in the loss of approximately 8 MW and 2,550 customers at two (2) sub-transmission service points.*
- *The existing Weston - Malinta 34.5 kV line is a radial line with limited capability of transferring load onto a different circuits for emergency restoration and scheduling of routine maintenance.*
- *The loss of the Weston - Malinta 34.5 kV radial line results in the loss of approximately 6 MW and 1,000 customers at two (2) sub-transmission service points.*
- *The 138 / 34.5 kV transformer #1 at Richland substation is greater than 70 years old and is showing signs of end of life; including oil leaks, failing components, and increasing maintenance.*



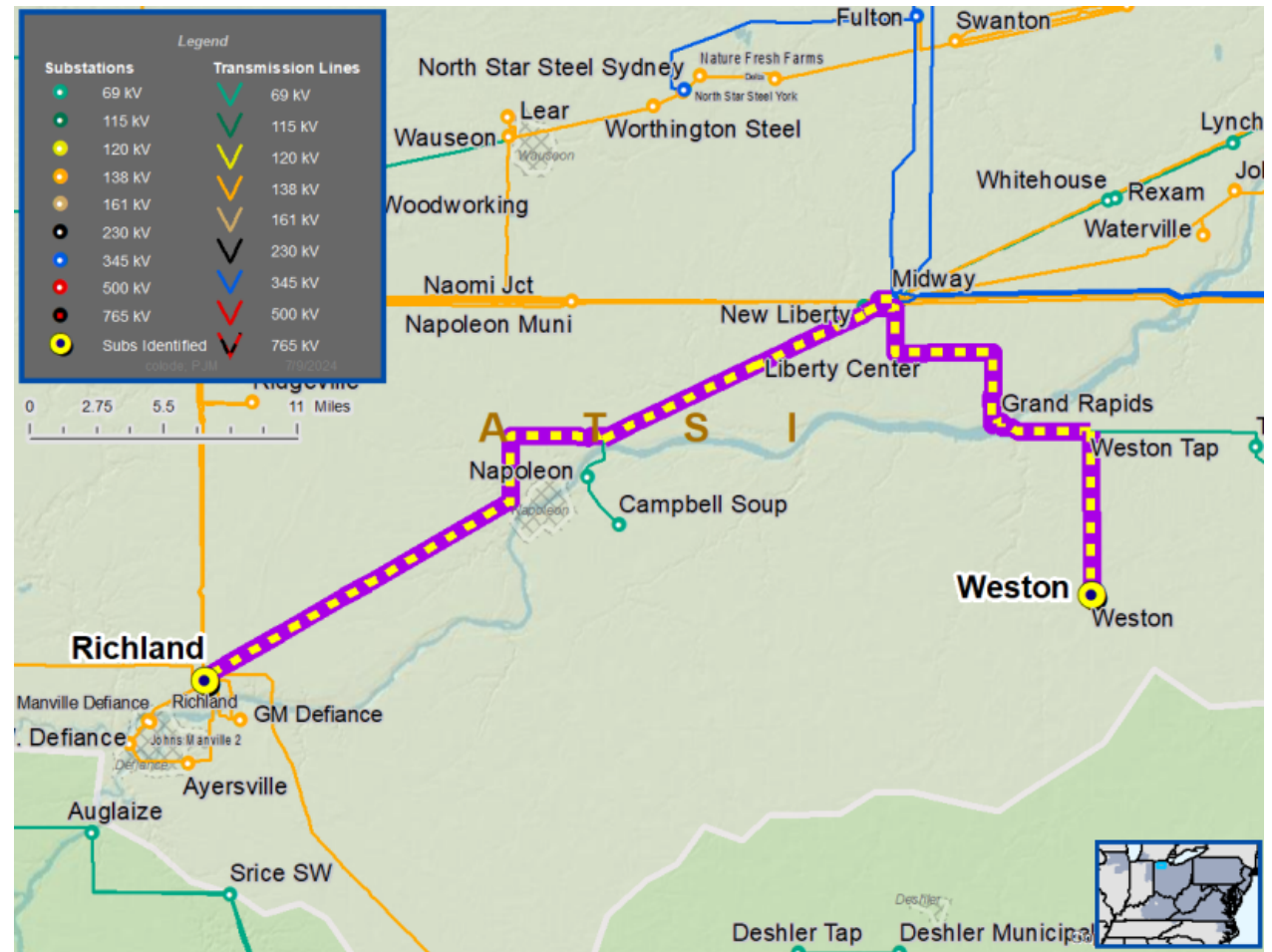
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Need Number: ATSI-2019-009 (s1953)
Process Stage: Re-Present Solution Meeting – 7/19/2024

Problem Statement (continued..)

Maroe - Malinta 34.5 kV Area

- *The 69 / 34.5 kV transformer #3 at Westin substation is greater than 74 years old and is showing signs of end of life; including oil leaks and deteriorating components.*
- *Customers taking sub-transmission service on these two radial lines have requested additional reliability and operational flexibility.*
 - *The 34.5kV radial lines cannot be networked due to insufficient short circuit current.*
 - *The Westin 69 / 34.5 kV transformer #3 (end of life) does not have the capacity to carry the entire load on a networked 34.5 kV system for a path end outage at Richland substation.*

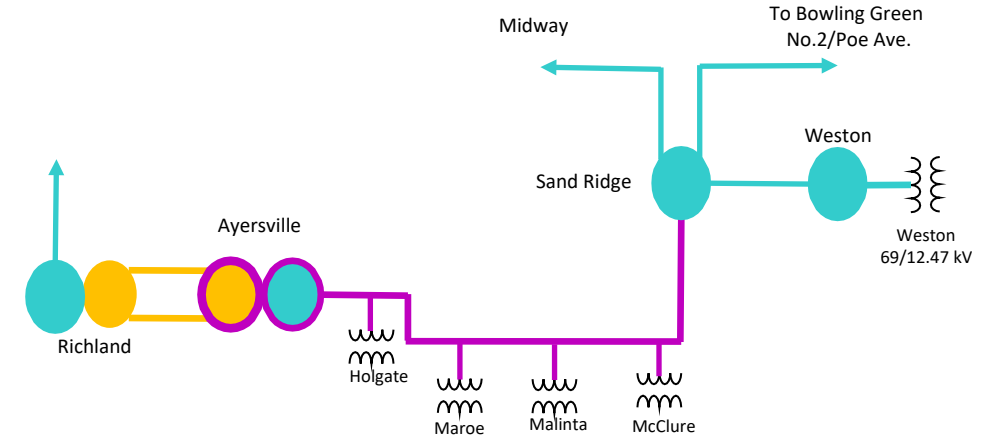


Need Number: ATSI-2019-009 (s1953)
Process Stage: Re-Present Solution Meeting – 7/19/2024

Reason for Scope Change: FE unable to secure property for the expansion of the Weston Substation due to landowner concerns. Through community engagement, FE able to secure a property 600 feet west of the existing Weston Substation to build a new four (4) breaker ring bus station (Sand Ridge).

Ayersville-Weston Sand Ridge 69 kV Line - Conversion from 34.5 kV

- **Ayersville Substation:** Install one (1) new 69 kV breaker. Install one (1) new 138 – 69 kV transformer. Install four (4) new 138 kV breakers and reconfigure the 138 kV yard to a four (4) breaker ring bus with a new 69 kV line exit to Weston Substation. Close in the N.O. switch A13404 at Ayersville to network Ayersville Substation to Richland Substation 138 kV K Bus. Remove all 34.5 kV equipment post conversion (ex: Richland 138 - 34.5 kV transformer #1 and circuit breakers).
- ~~Weston Substation: Expand Weston substation to a four (4) breaker, future six (6) breaker ring bus with 69 kV line exits for the new Ayersville line, and the Midway and Tontogany 69 kV lines. Remove all 34.5 kV equipment post conversion (ex: Weston 69/34.5 kV transformer #3, circuit breakers, ...etc.).~~
- **Sand Ridge Substation:** Build a new four (4) breaker, future six (6) breaker ring bus with 69 kV line exits for the new Ayersville line, the Midway and Bowling Green No.2 69 kV lines, and the Weston 69 kV line.
- A new 69 kV tie line from Sand Ridge Substation to Weston Substation will be constructed using the same conductor as Ayersville – Sand Ridge 69 kV proposed line rebuild.
- **Bowling Green No. 2-Midway 69 kV Line:**
 - Rebuild 5.0 miles of 69 kV transmission line from Weston Substation to the Weston tap on the Bowling Green No2 - Midway 69 kV Line as double circuit to eliminate the three-terminal line from Weston, Midway and Bowling Green No2 substations and extend both new lines and terminate into the new ring bus station (Sand Ridge).



Convert existing 34.5 kV line and delivery points to 69 kV
 Remove 34.5 kV Equipment.

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

Continued on next slide...

ATSI Transmission Zone M-3 Process Ayersville Weston Network and 69 kV Conversion Project - s1953 Scope Change

Need Number: ATSI-2019-009 (s1953)
Process Stage: Re-Present Solution Meeting – 7/19/2024

Proposed Solution:

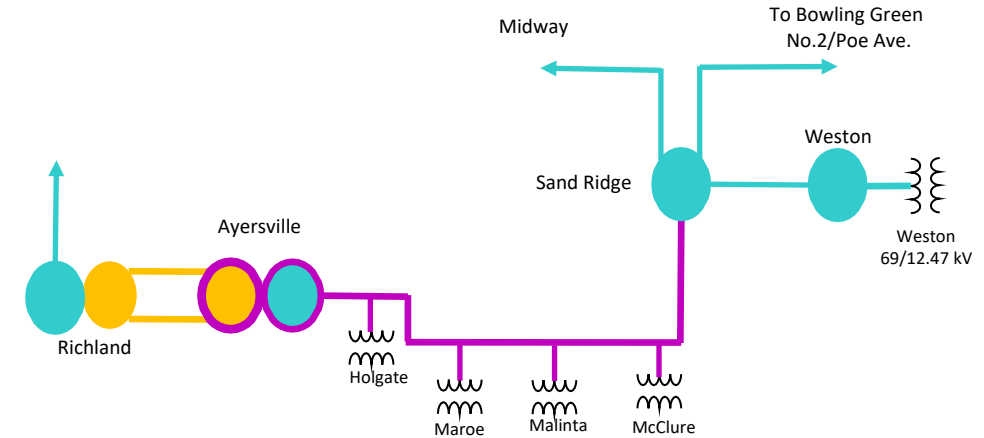
- **New Ayersville-~~Weston~~ Sand Ridge 69 kV Line:**
 - Build new 5.6 miles 69 kV line to network Ayersville-Maroe and Weston-Malinta radial lines.
 - Rebuild 0.5 miles of 138 kV transmission line as double circuit 138 kV and 69 kV to network the Maroe radial line to Ayersville Substation; de-energize and retire the 34.5 kV line section from Richland Substation.
 - Convert the existing Richland-Maroe 34.5 kV Line to 69 kV (Approximately 17 miles) and re-terminate line from Maroe Substation to Ayersville Substation; customers to upgrade existing substation equipment at Holgate Substation and Maroe Substation to 69 kV.
 - Convert the existing Weston-Malinta 34.5 kV Line to 69 kV (Approximately 13 miles) ; customers to upgrade existing substation equipment at Weston, McClure, and Malinta substations.
 - Remove all 34.5 kV equipment post conversion.
 - Install eight (8) SCADA and MOAB controlled switches on the new Ayersville-~~Weston~~ Sand Ridge 69 kV Line.

Transmission Line Ratings:

- Ayersville - ~~Weston~~ Sand Ridge 69 kV Line
 - After Proposed Solution: 111 MVA SN /134 MVA SE / 125 MVA WN / 159 MVA WE
- Sand Ridge – Weston 69 kV New Tie Line:
 - After Proposed Solution: 111 MVA SN /134 MVA SE / 125 MVA WN / 159 MVA WE

Alternatives Considered:

- Replace existing 138-34.5 kV and 69-34.5 kV transformers; rehab the existing 34.5 kV lines and maintain radial configuration; limits restoration, maintenance, and future economic growth.



Convert existing 34.5 kV line and delivery points to 69 kV
 Remove 34.5 kV Equipment.

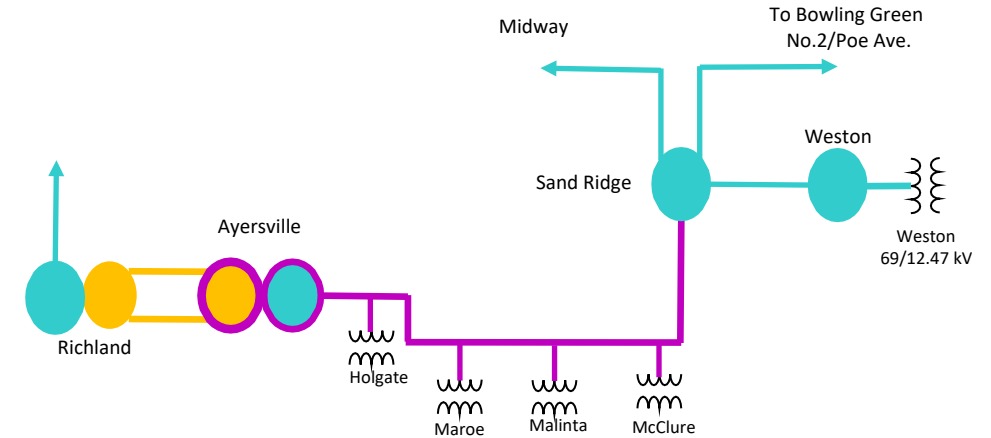
Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	



ATSI Transmission Zone M-3 Process Ayersville Weston Network and 69 kV Conversion Project - s1953 Scope Change

Need Number: ATSI-2019-009 (s1953)
Process Stage: Re-Present Solution Meeting – 7/19/2024

Estimated Project Cost: \$99.3M
Projected IS Date: 1/21/2027
Status: Engineering
Model: 2023 RTEP model for the 2028 Summer (50/50)



Convert existing 34.5 kV line and delivery points to 69 kV
 Remove 34.5 kV Equipment.

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



Questions?

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

7/09/2023– V1 – Original version posted to pjm.com