

Subregional RTEP Committee – Western FirstEnergy Supplemental Projects



Submission of Supplemental Projects for Inclusion in the Local Plan

Need Number: AEP-2019-OH034
Process Stage: Submission of Supplemental Project for Inclusion in the Local -1/4/2024
Previously Presented: Need Meeting 6/17/2019
 Solutions Meeting 3/18/2022

Supplemental Project Driver: Operational Flexibility, and Customer Service

Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions slide 8)

Problem Statement:

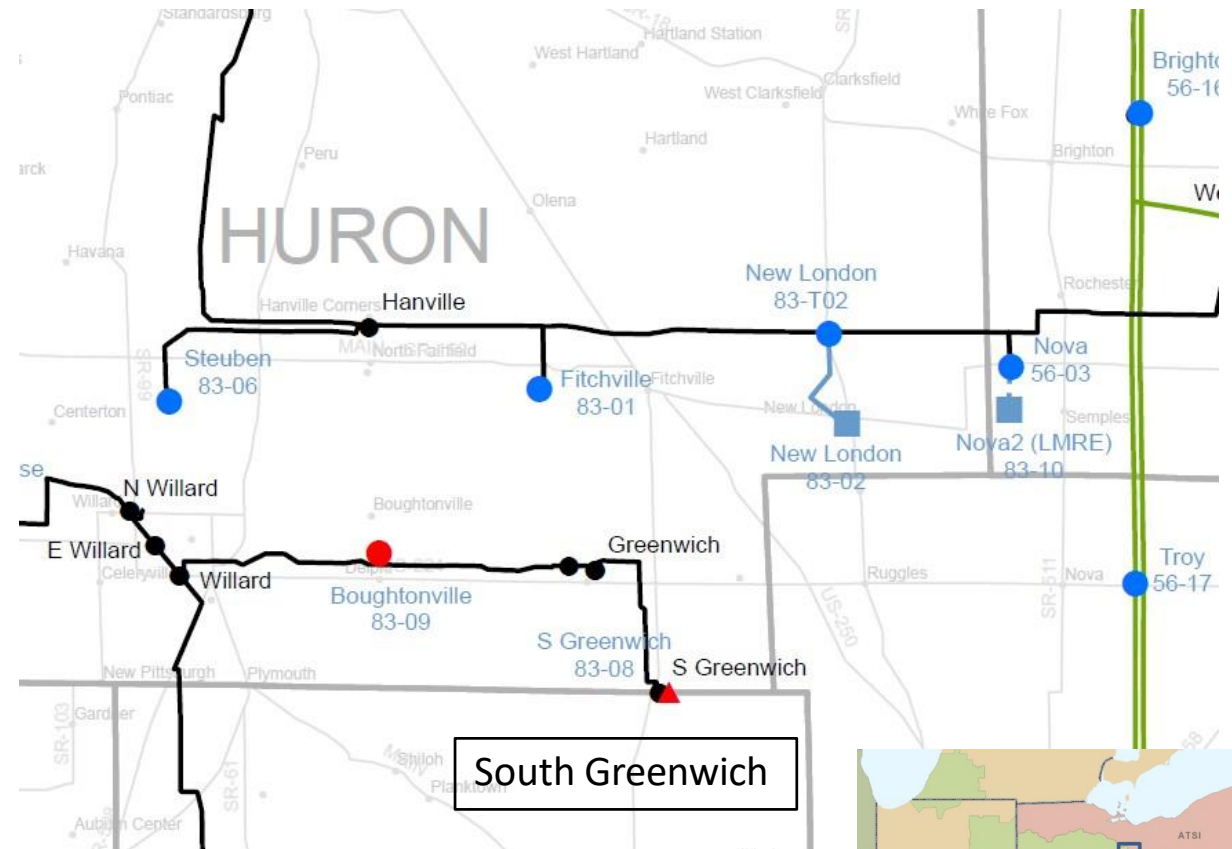
South Greenwich-Willard (vintage 1964)

- Length: 15.22 Miles
- Original Construction Type: Wood
- Original Conductor Type: 4/0 ACSR 6/1 (Penguin)
- Momentary/Permanent Outages: 13 in the past 5 years
- Number of open conditions: 77

Open conditions include: Damaged Insulator, Structure, Guy Wire, Ground

- Lead Wire, & Shield Wire

Radial service severely restricts the ability to perform routine maintenance and restoration activities. The maintenance of radial transmission lines often requires costly temporary facilities or other labor-intensive measures involving energized work because a maintenance outage to such radial loads is generally not feasible.





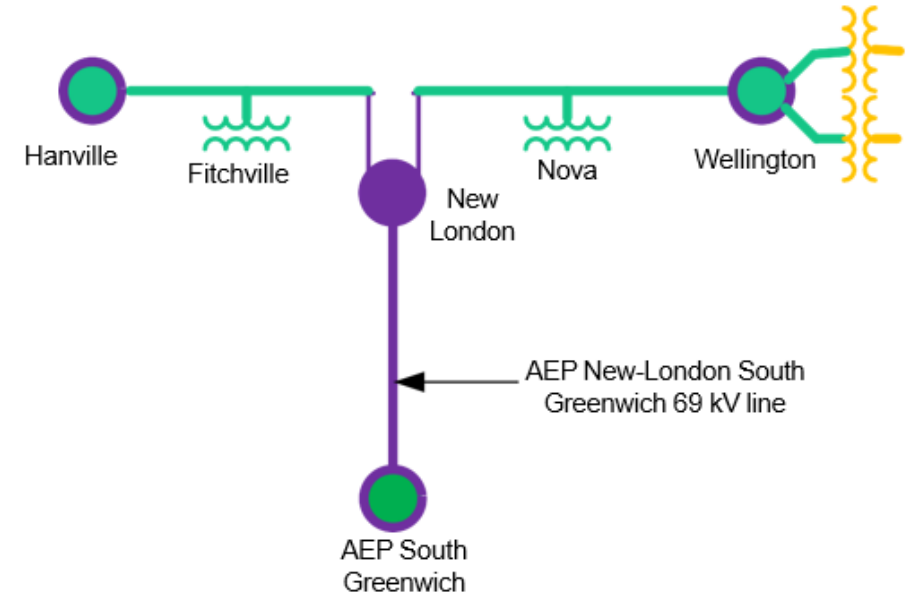
ATSI Transmission Zone M-3 Process New New London 69 kV Project

Need Number: AEP-2019-OH034
Process Stage: Submission of Supplemental Project for Inclusion in the Local - 1/4/2024

Solution:

ATSI Scope:

- Build a new four breaker 69 kV ring bus substation adjacent to the Fireland's New London distribution substation
- Acquire the Fireland 69 kV tap (~2 miles) and rebuild as a double circuit into the new ring bus and loop in/out the Hanville-Wellington 69 kV line.
- Serve the Firelands New London distribution substation from the new ring bus substation.
- Transfer the existing Firelands New London revenue metering from the existing location (line) into the Firelands New London distribution substation at the transformer high side within the zone of protection.
- Install new 69 kV tie line revenue metering equipment at the new ring bus substation exit to South Greenwich (AEP)
- Upgrade/adjust relaying at Hanville and Wellington
- Upgrade terminal equipment at Wellington



Legend	
500 kV	Red line
345 kV	Blue line
138 kV	Yellow line
69 kV	Green line
34.5 kV	Red line
23 kV	Yellow line
New	Purple line

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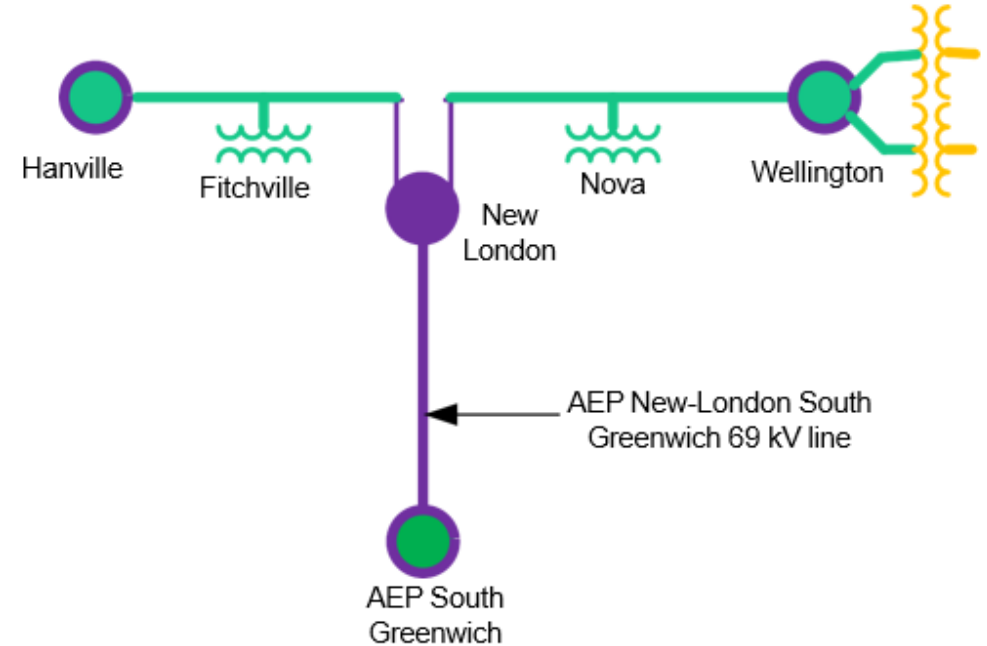
ATSI Transmission Zone M-3 Process New New London 69 kV Project

Need Number: AEP-2019-OH034
Process Stage: Submission of Supplemental Project for Inclusion in the Local -1/4/2024

Transmission Line Ratings:

- Hanville-New London 69 kV Line
 - Before Proposed Solution: N/A
 - After Proposed Solution: 100 MVA SN / 121 MVA SE
- New London-Wellington 69 kV Line
 - Before Proposed Solution: N/A
 - After Proposed Solution: 100 MVA SN / 121 MVA SE
- New London-South Greenwich (AEP) 69 kV line
 - Before Proposed Solution: N/A
 - After Proposed Solution: (AEP) 102 MVA SN / (AEP) 142 MVA SE

Estimated ATSI Project Cost: \$10.0M
Projected In-Service: 9/3/2025
Supplemental Project ID: s2748.8



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

Need Number: ATSI-2023-005
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024
Previously Presented: Need Meeting – 5/19/2023
 Solution Meeting – 7/21/2023

Project Driver(s):
Customer Service

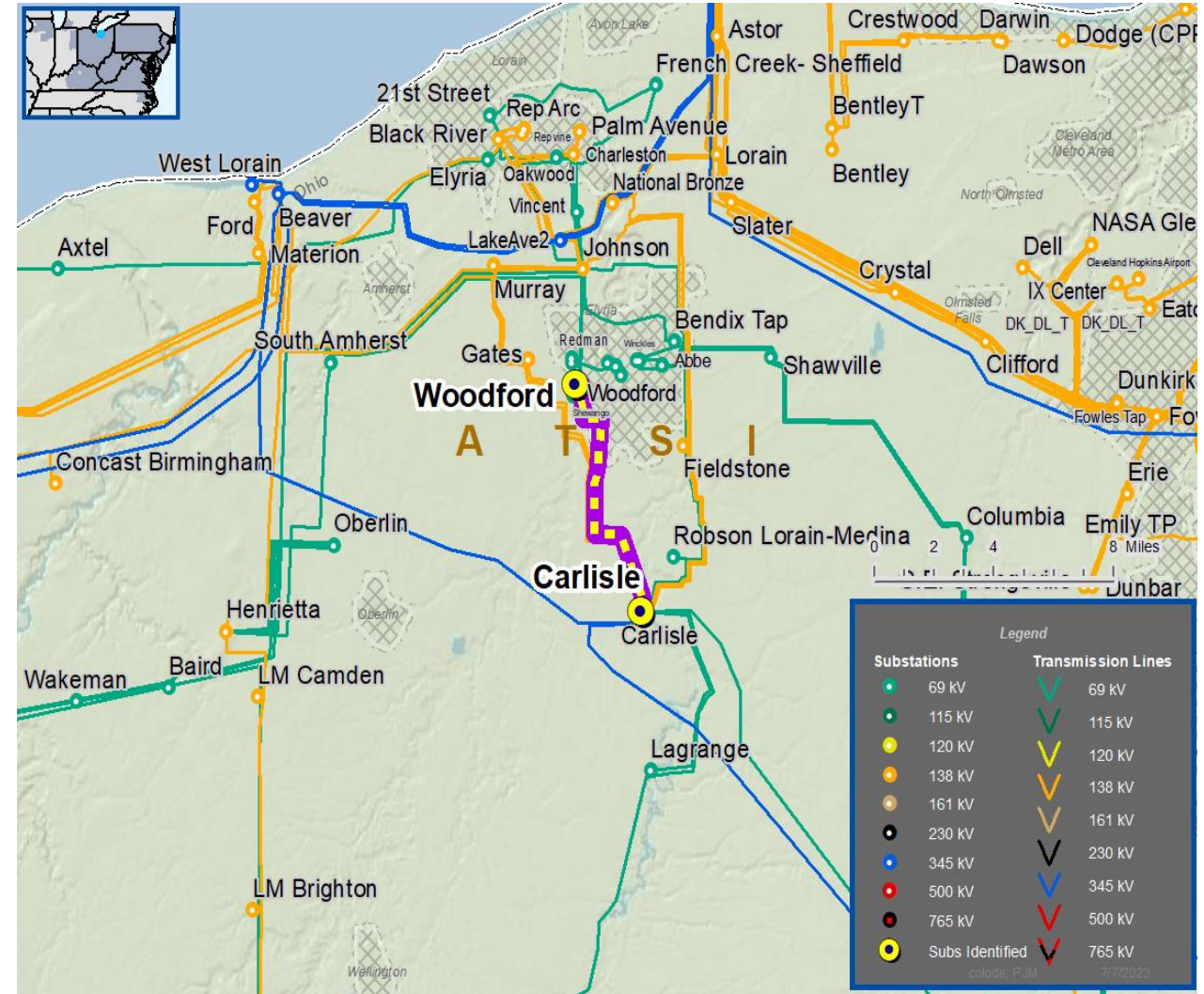
Specific Assumption Reference(s)

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

Problem Statement

Customer Connection – Customer is requesting to reconnect service at an existing 69 kV delivery point on the Carlisle – Woodford 69 kV Line. The anticipated load of the new customer connection is 6 MVA.

Requested in-service date is 11/17/2023





ATSI Transmission Zone M-3 Process Carlisle - Woodford 69 kV Line Customer Connection

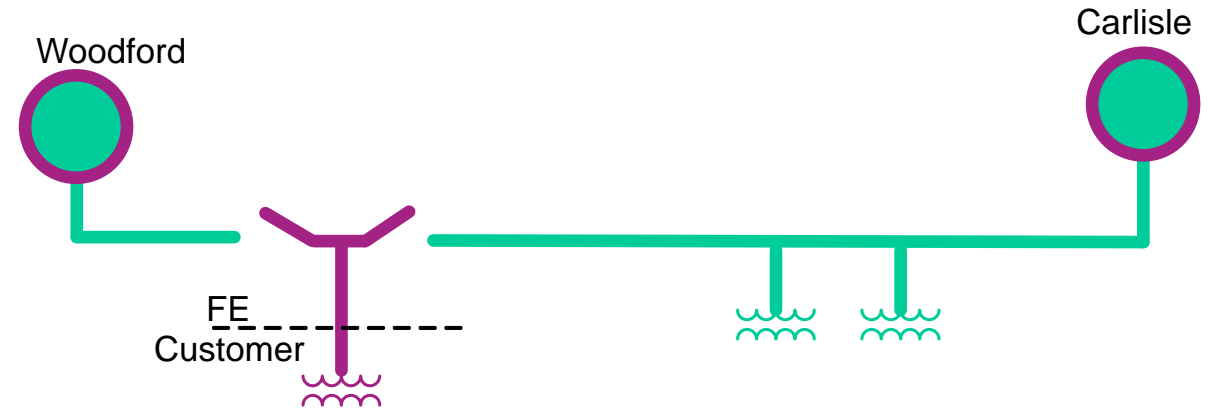
Need Number: ATSI-2023-005
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Selected Solution:

69 kV Transmission Line Tap Reconnection

- Install two main-line SCADA controlled switch
- Install one tap-line SCADA controlled switch

Estimated Project Cost: \$1.3M
Projected In-Service: 11/17/2023
Supplemental Project ID: s3129.1



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

Need Number: ATSI-2023-006

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

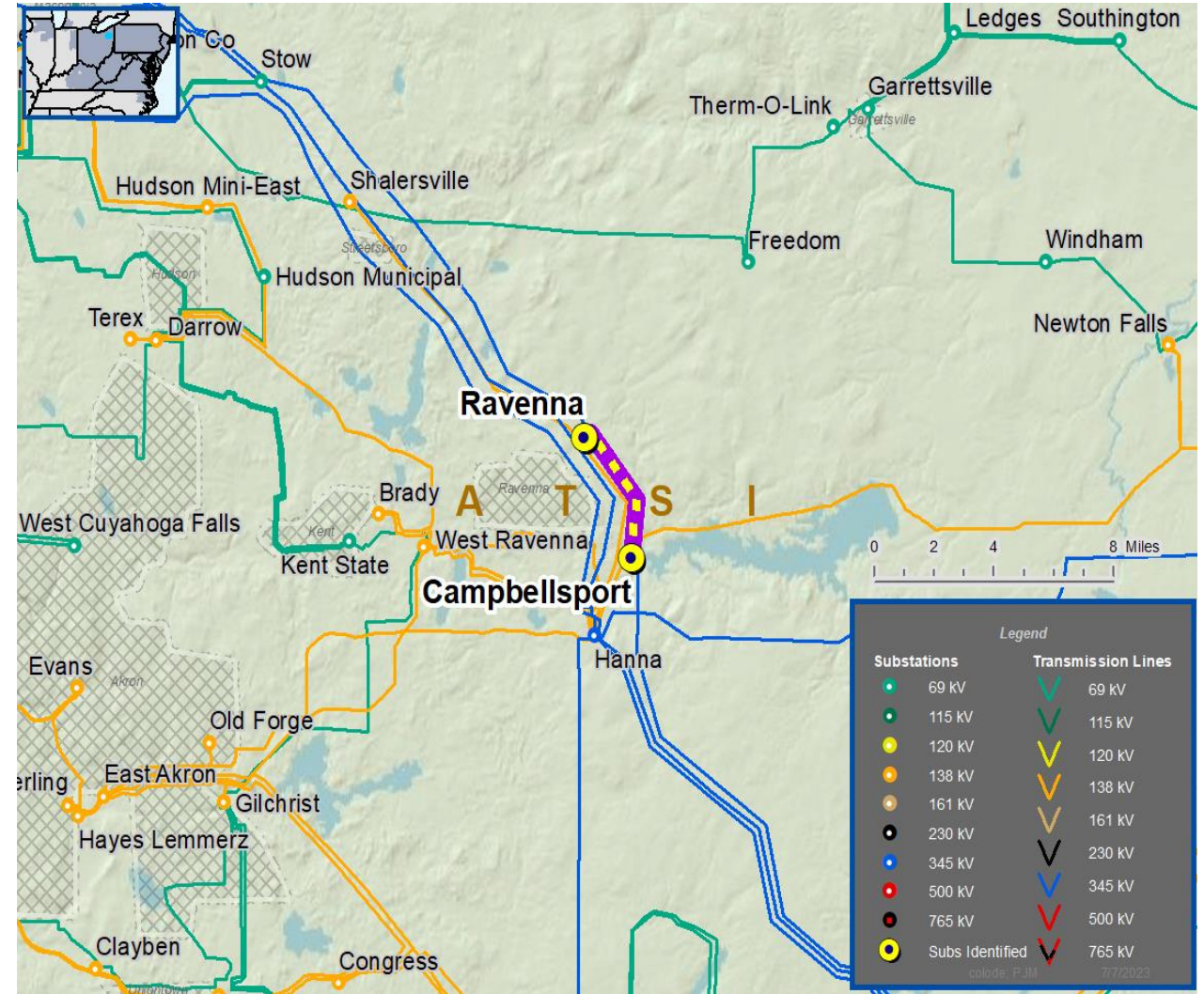
Previously Presented: Need Meeting – 05/19/2023
Solution Meeting – 7/21/2023

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 – Customer requested 69 kV transmission service for approximately 9.6 MVA of total load near the Campbellsport – Ravenna No 1 69 kV Line.

Requested In-Service Date:
April 28, 2024



ATSI Transmission Zone M-3 Process Campbellsport – Ravenna No 1 69 kV Line New Customer

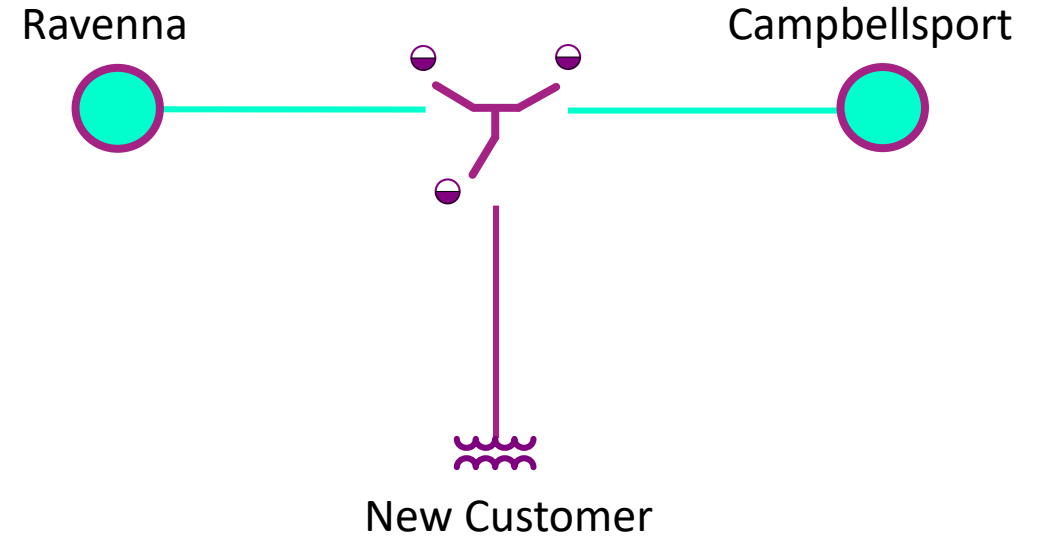
Need Number: ATSI-2023-006
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Selected Solution:

69 kV Transmission Line Tap

- Install three SCADA controlled load-break switches
- Construct approximately 0.4 miles of transmission line using 477 kcmil ACSR 26/7 conductor from tap point to Customer substation
- Relay settings revised at Ravenna and Campbellsport

Estimated Project Cost: \$0.8M
Projected In-Service: 04/08/2024
Supplemental Project ID: s3130.1



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

ATSI Transmission Zone M-3 Process

Napoleon – Campbell Soup 69 kV Line Customer Connection

Need Number: ATSI-2023-007

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Previously Presented: Need Meeting – 06/16/2023
Solution Meeting – 8/18/2023

Supplemental Project Driver(s):
Customer Service

Specific Assumption Reference(s):

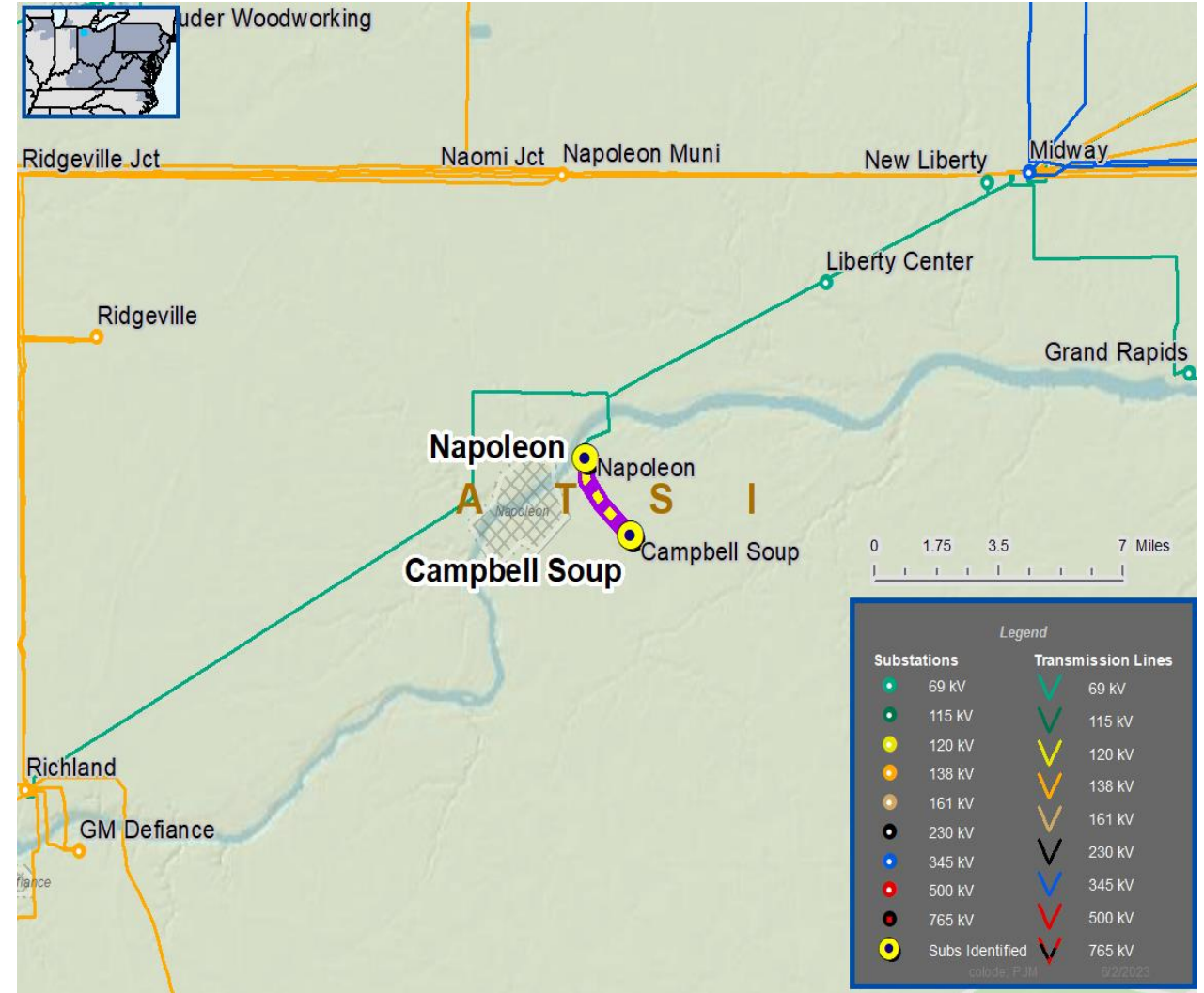
New customer connection request will be evaluated per FirstEnergy’s “Requirements for Transmission Connected Facilities” document and “Transmission Planning Criteria” document.

Problem Statement

Customer Connection – Customer is requesting to retire an existing 69 kV delivery point on the Napoleon – Campbell Soup 69 kV Line. In addition, the customer is requesting a new 69 kV delivery point along the same transmission line to replace the retired delivery point which will have an anticipated load of 25 MVA.

Requested In-Service Date:

03/31/2024





ATSI Transmission Zone M-3 Process Napoleon – Campbell Soup 69 kV Line Customer Connection

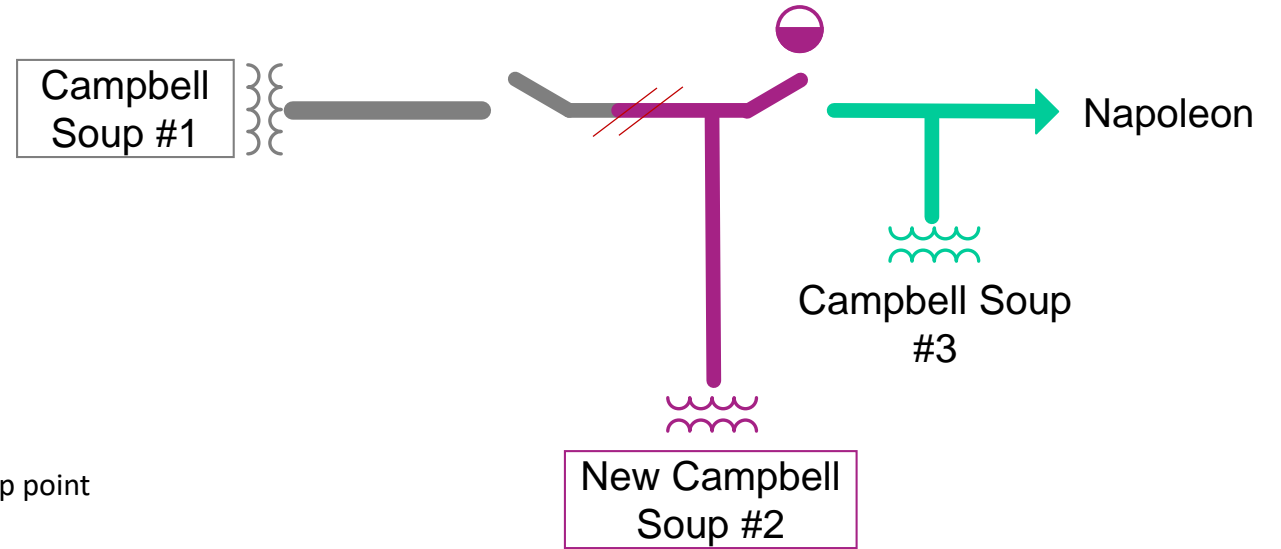
Need Number: ATSI-2023-007
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Selected Solution:

69 kV Transmission Line Tap

- Install one SCADA controlled transmission line switch
- Construct approximately 1-2 spans of transmission line using 336.4 26/7 ACSR from tap point to the customer substation
- Retire and remove all distribution owned assets from Campbell Soup #1 substation along with transmission line portion from new interconnection to existing substation.

Estimated Project Cost: \$0.0M
Projected In-Service: 3/31/2024
Supplemental Project ID: s3132.1



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

Need Number: ATSI-2023-022
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024
Previously Presented: Need Meeting – 8/18/2023
 Solution Meeting – 10/20/2023

Supplemental Project Driver(s):
 Customer Service

Specific Assumption Reference(s):

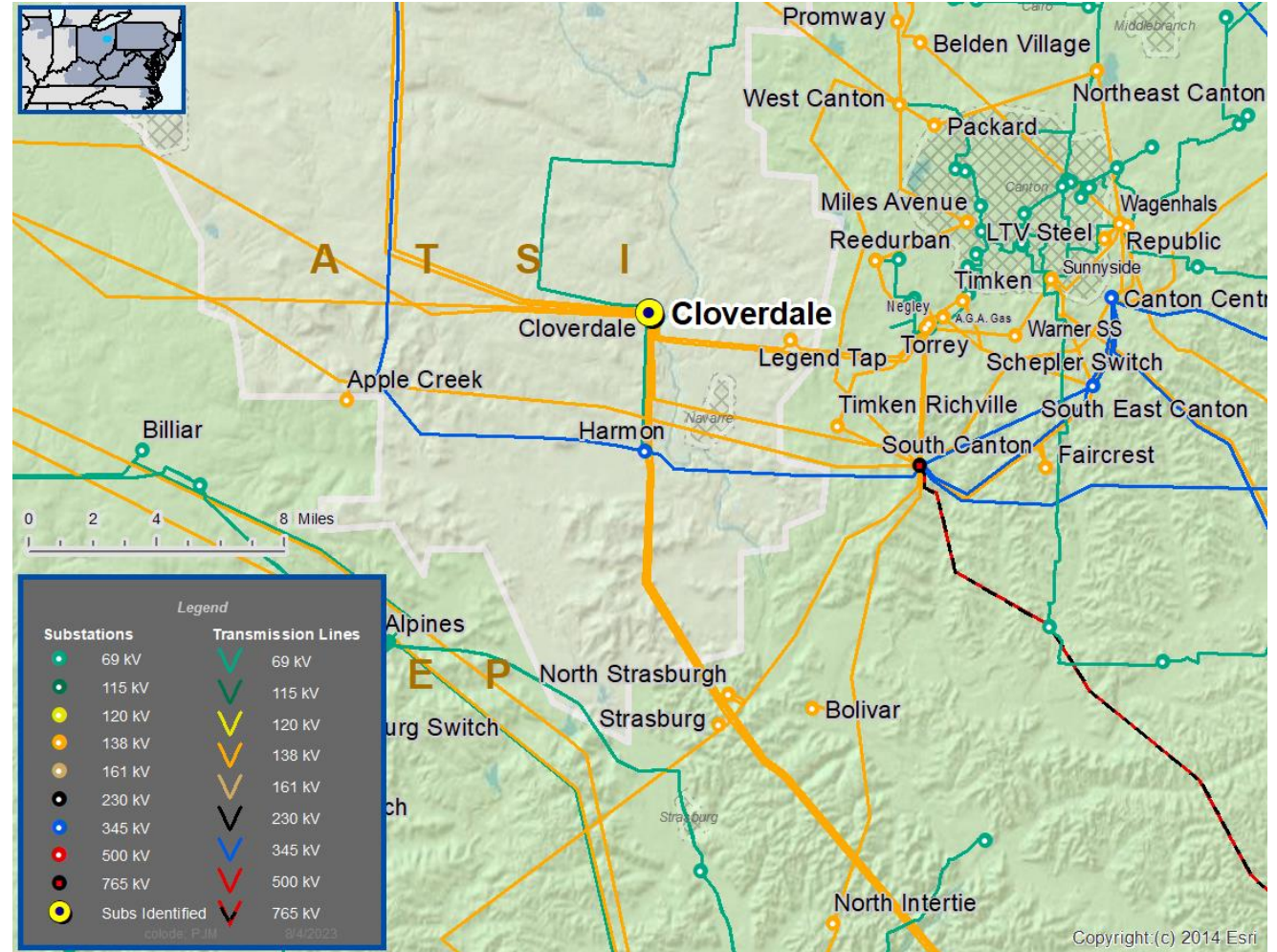
New customer connection request will be evaluated per FirstEnergy’s “Requirements for Transmission Connected Facilities” document and “Transmission Planning Criteria” document.

Problem Statement

New Customer Connection – has requested a new 138 kV delivery point from the Cloverdale 138 kV Substation. The anticipated load of the new customer connection is 200 MVA.

Requested In-Service Date:

October 1, 2022



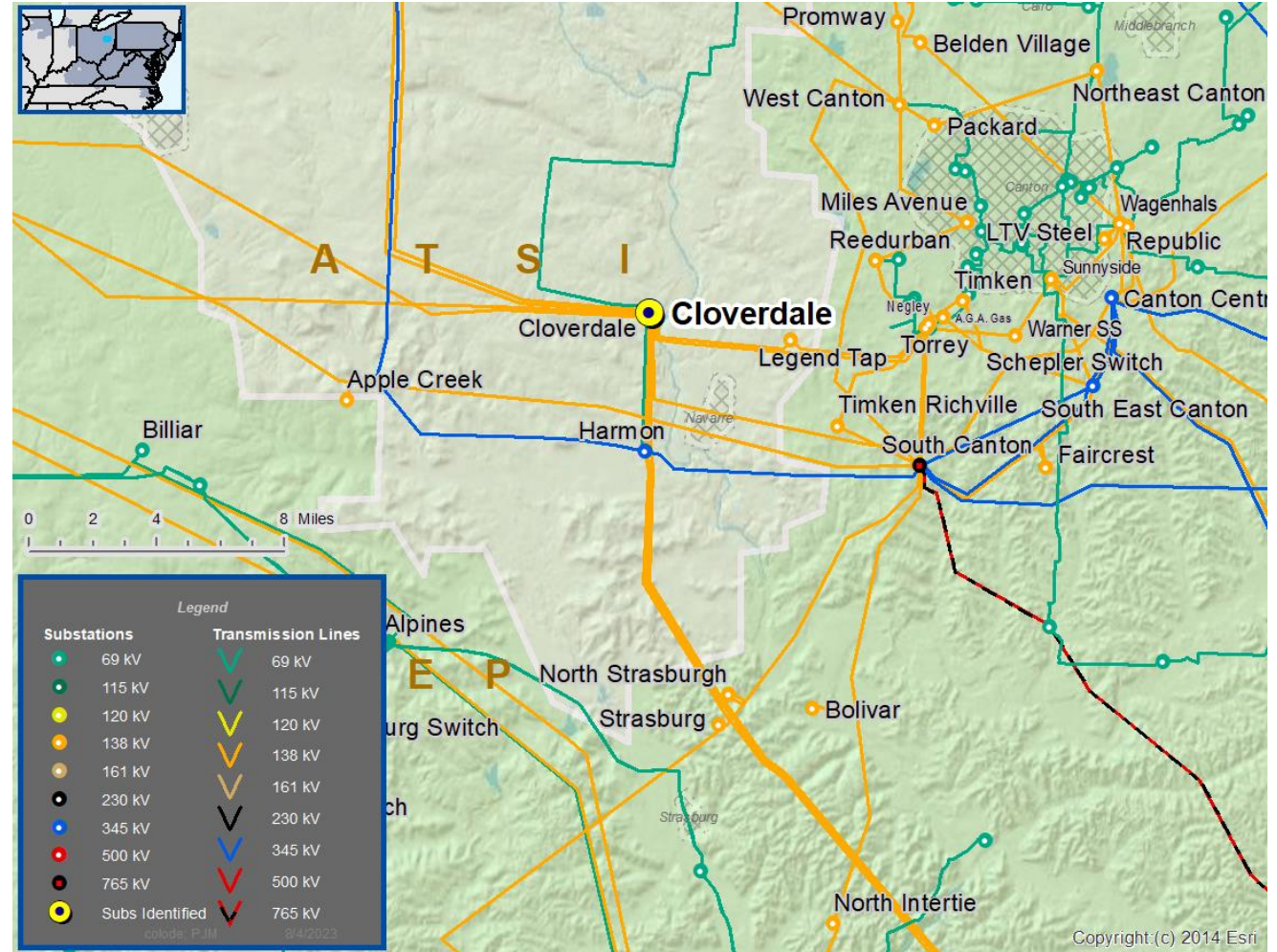
Need Number: ATSI-2023-022
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Selected Solution:

138 kV Direct Substation Delivery Point

- Install a 138 kV circuit breaker at the Cloverdale 138 kV North bus.
- Construct approximately 0.1 miles of transmission line from the Cloverdale Substation to the customer substation.
- Install one SCADA controlled transmission line switch.

Estimated Project Cost: \$0.0
Projected In-Service: 12/1/2025
Supplemental Project ID: s3106.1



Need Numbers: ATSI-2023-019
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024
Previously Presented: Need Meeting – 09/15/2023
 Solution Meeting – 11/17/2023

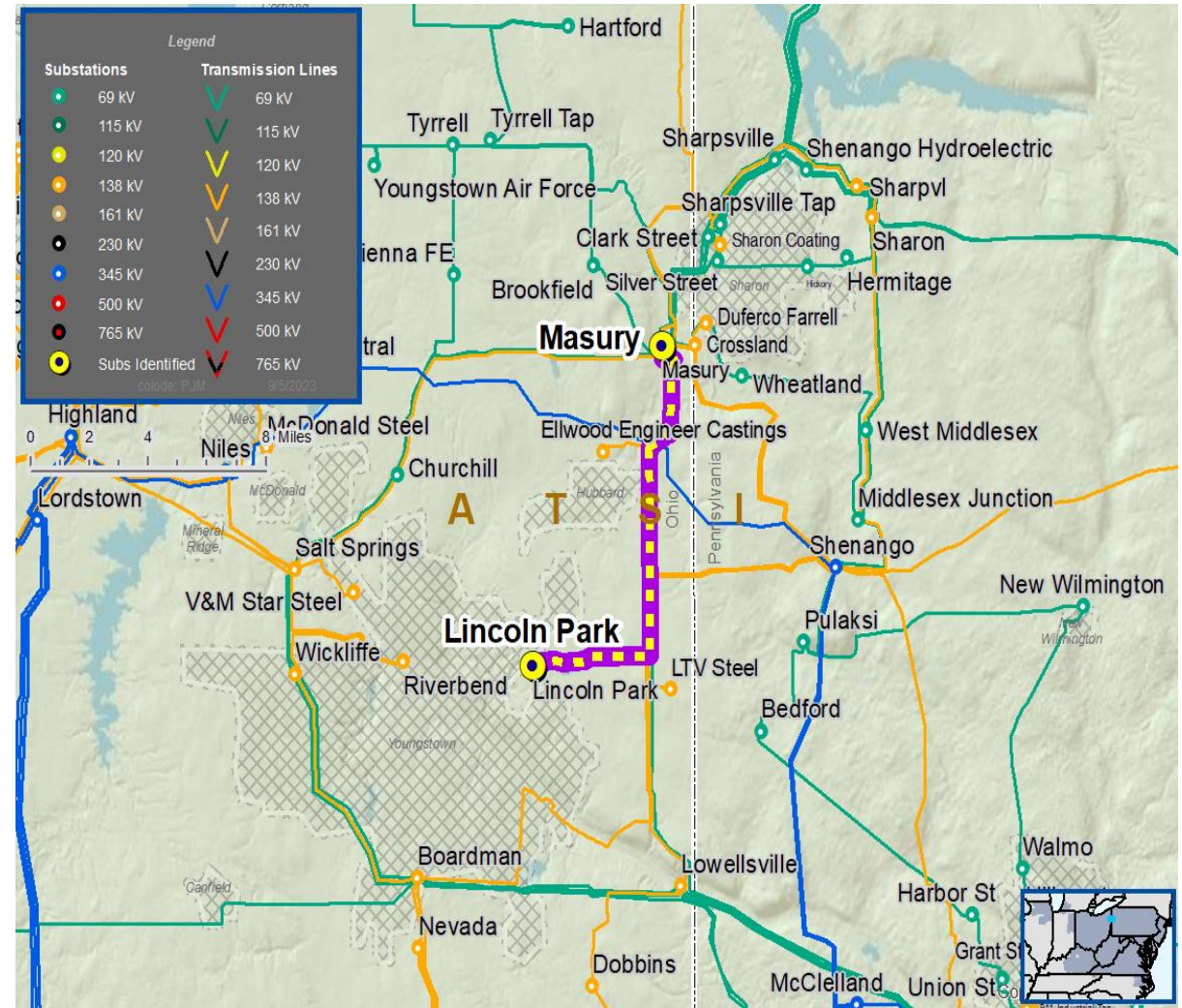
Project Driver:
Equipment Material Condition, Performance and Risk

Specific Assumption Reference:
 System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits
- 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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ATSI Transmission Zone M-3 Process Masury 138 kV Misoperation Relays

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE)	Existing Conductor Rating (SN / SE)
ATSI-2023-019	Masury – Elwood Tap 138 kV Line	164 / 191	187 / 191
	Lincoln Park – Elwood Tap 138 kV Line	155 / 155	187 / 191



ATSI Transmission Zone M-3 Process Masury 138 kV Misoperation Relays

Need Number: ATSI-2023-019
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Selected Solution:

Masury Substation

- Replace relaying on Lincoln Park line terminal with microprocessor relays.
- Replace (2) 138 kV breakers for Lincoln Park and Shenango lines.
- Replace (2) associated disconnect switches.

Lincoln Park Substation

- Replace relaying on Masury line terminal with microprocessor relays.
- Replace (2) 138 kV breakers for Masury Line.
- Replace (4) associated disconnect switches.



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



ATSI Transmission Zone M-3 Process Masury 138 kV Misoperation Relays

Need Number: ATSI-2023-019
Process Stage: Submission of Supplemental Projects for
Inclusion in the Local Plan – 4/26/2024

Transmission Line Ratings:

Need #	Transmission Line / Substation Locations	Existing Line Ratings (SN / SE / WN / WE)	New Line Ratings (SN / SE / WN / WE)
ATSI-2023-019	Masury – Elwood Tap 138 kV Line Section	164 / 191 / 211 / 211	187 / 191 / 211 /211
	Lincoln Park – Elwood Tap 138 kV Line Section	155 / 155 / 155 / 155	187 / 191 / 211 /211

Estimated Project Cost: \$3.4M
Projected In-Service: 12/31/2025
Supplemental Project ID: s3118.1

Need Number: ATSI-2023-020
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024
Previously Presented: Need Meeting – 10/20/2023
 Solution Meeting – 11/17/2023

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

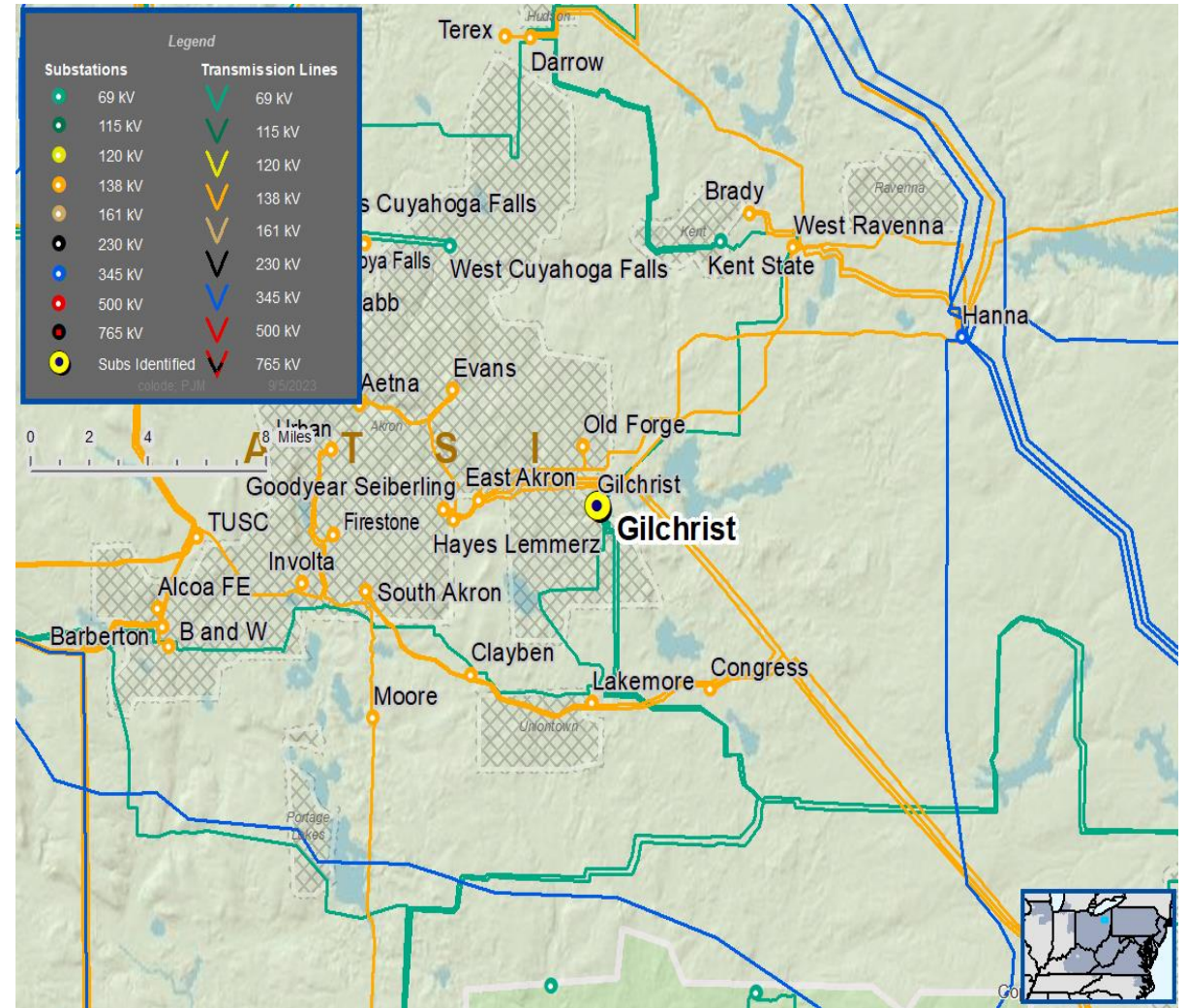
System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits
- 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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ATSI Transmission Zone M-3 Process Gilchrist - Hartville 69 kV Misoperation Relays

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE)	Existing Conductor Rating (SN / SE)
ATSI-2023-020	Hartville – Trelleborg Tap 69 kV Line	76 / 76	76 / 92
ATSI-2023-020	Gilchrist - Burger-Rubbermaid Tap 69 kV Line	76 / 92	76 / 92



ATSI Transmission Zone M-3 Process Gilchrist - Hartville 69 kV Misoperation Relays

Need Number: ATSI-2023-020
Process Stage: Submission of Supplemental Projects for
Inclusion in the Local Plan – 4/26/2024

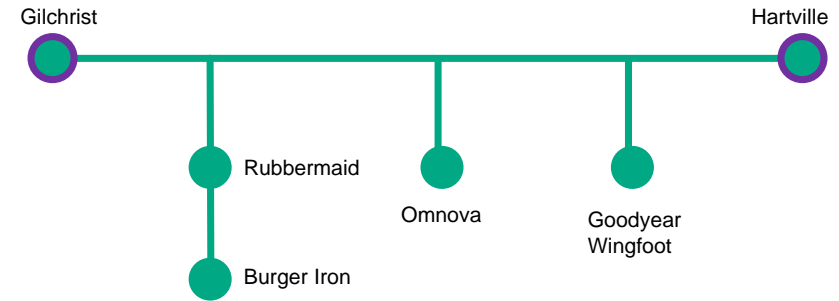
Selected Solution:

Gilchrist Substation

- Replace one circuit breaker, associated disconnect switches and relaying for Hartville line terminal.

Hartville Substation

- Replace one circuit breaker, associated disconnect switches and relaying for Gilchrist line terminal.



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 Gilchrist - Hartville 69 kV Misoperation Relays

Need Number: ATSI-2023-020
Process Stage: Submission of Supplemental Projects for
Inclusion in the Local Plan – 4/26/2024

Transmission Line Ratings:

Need #	Transmission Line / Substation Locations	Existing Line Ratings (SN / SE / WN / WE)	New Line Rating (SN / SE / WN / WE)
ATSI-2023-020	Hartville – Trelleborg Tap 69 kV Line	76 / 76 / 76 / 76	76 / 92 / 87 / 111
	Gilchrist - Burger-Rubbermaid Tap 69 kV Line	76 / 92 / 87 / 101	76 / 92 / 87 / 111

Estimated Project Cost: \$1.6M
Projected In-Service: 6/1/2026
Supplemental Project ID: s3119.1

Need Number: ATSI-2023-023

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Previously Presented: Need Meeting – 10/20/2023
Solution Meeting – 11/17/2023

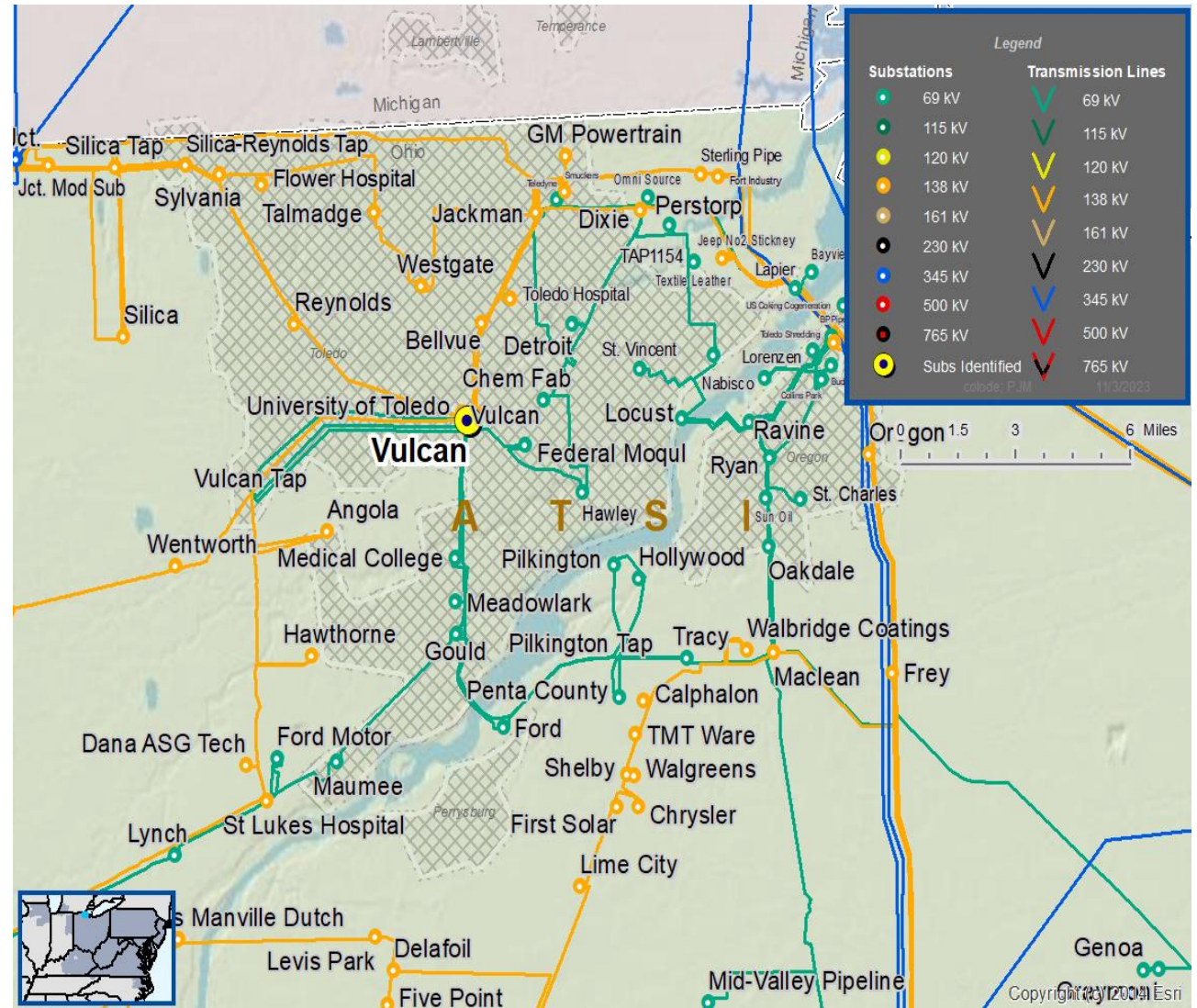
Supplemental Project Driver(s):
Equipment Material Condition, Performance, and Risk
Operational Flexibility and Efficiency
Infrastructure Resilience

Specific Assumption Reference(s)

- Substation / Line equipment limits
- System reliability and performance
- Reliability of Non-Bulk Electric System (Non-BES) Facilities

Problem Statement

The Vulcan 138/69 kV Transformer has been experiencing increased loading during the summer peak seasons requiring Transmission System Operators to mitigate the risk of thermal violations through operational switching.



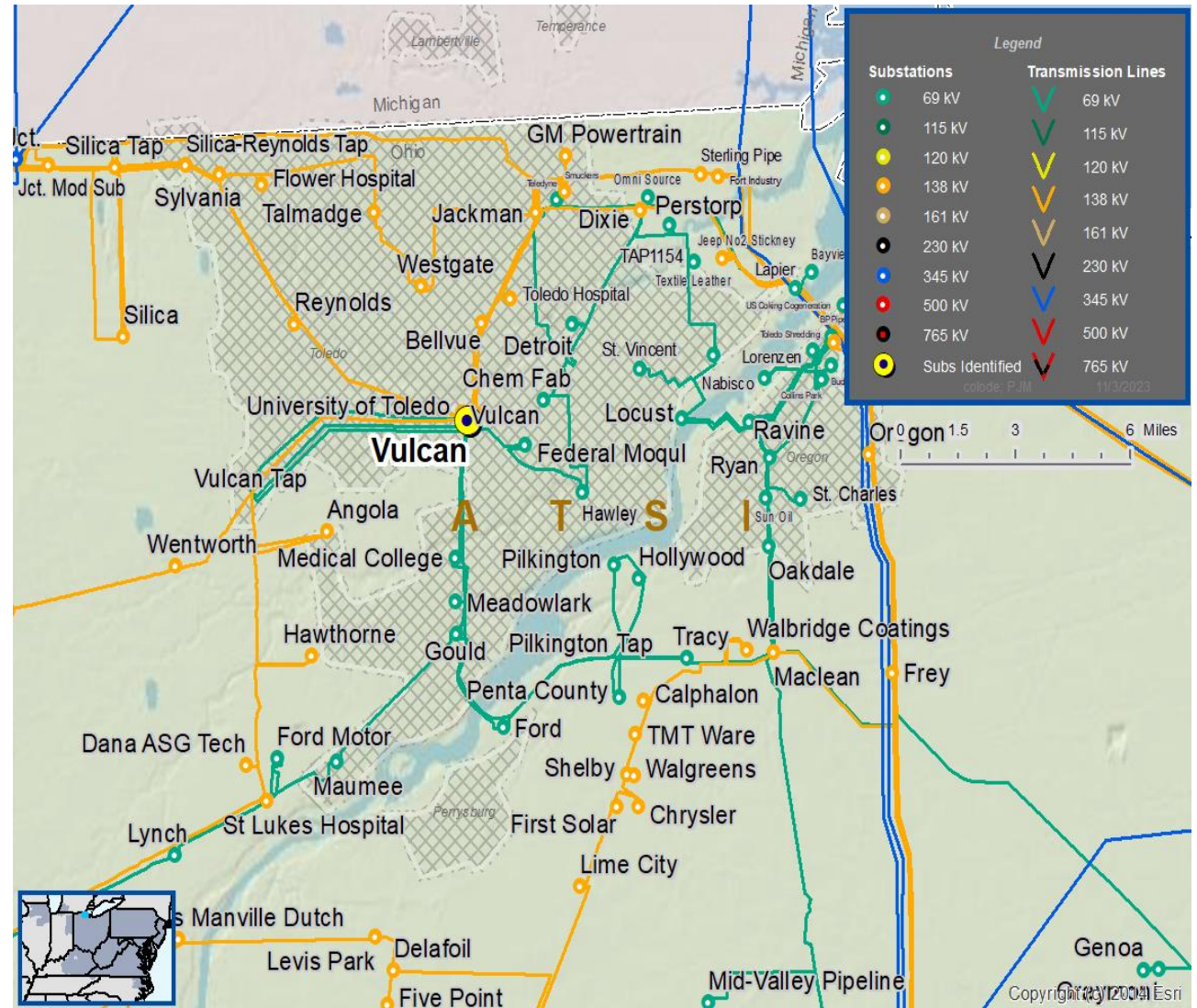
Need Number: ATSI-2023-023
Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 4/26/2024

Selected Solution:

Vulcan 138/69 kV Transformer Terminal Upgrades

- Replace substation conductor including the breaker leads and transformer leads

Estimated Project Cost: \$1.0M
Projected In-Service: 3/28/2024
Supplemental Project ID: s3120.1



Need Numbers: ATSI-2023-029
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024
Previously Presented: Need Meeting – 10/20/2023
 Solution Meeting – 11/17/2023

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

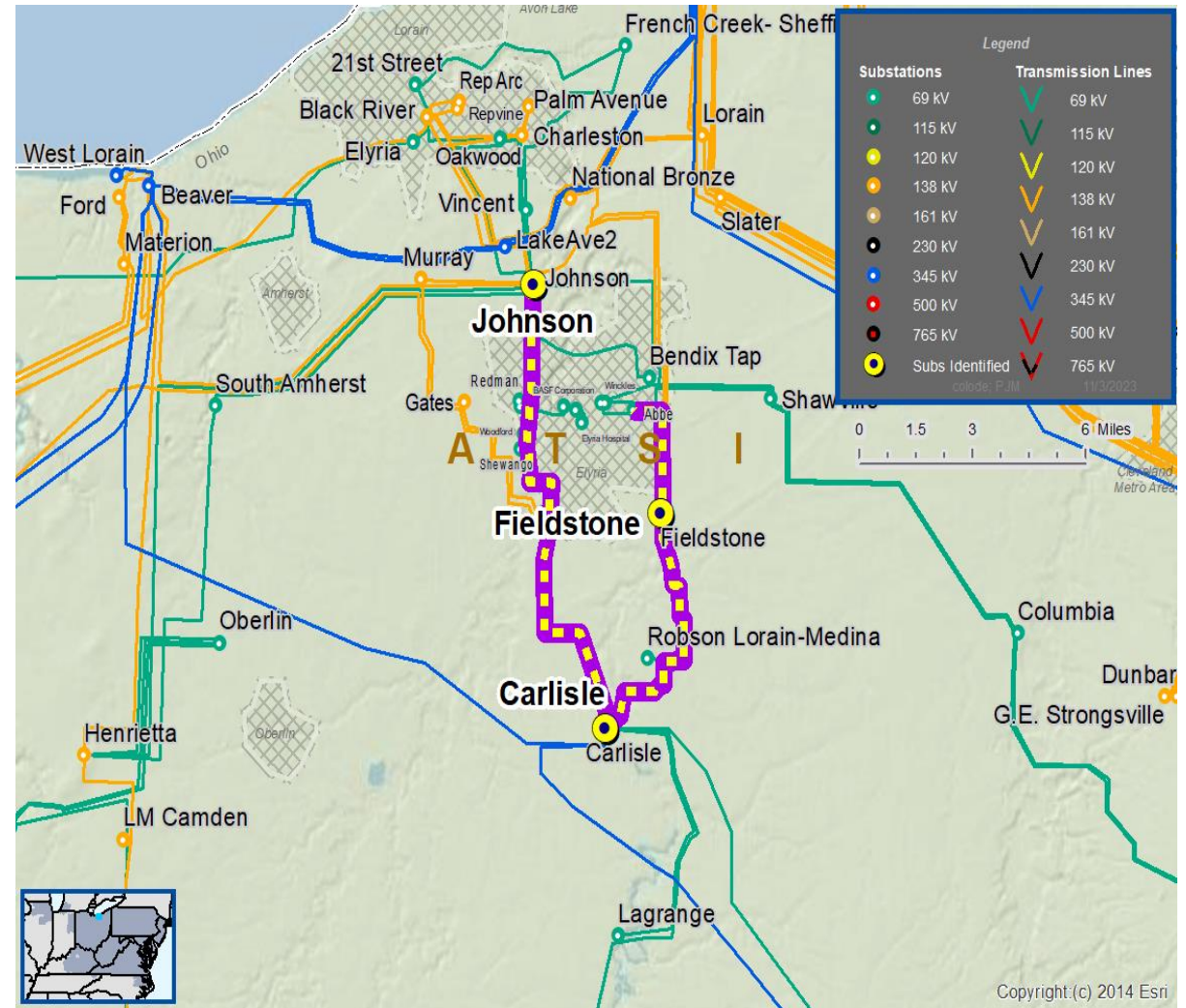
System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits
- 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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ATSI Transmission Zone M-3 Process Carlisle – Johnson 138 kV Misoperation Relays

Need #	Transmission Line / Substation Locations	Existing Circuit Ratings (SN / SE / WN / WE)	Existing Conductor Ratings (SN / SE / WN / WE)
ATSI-2023-029	Carlisle – Fieldstone Tap 138 kV Line Section	233 / 282 / 263 / 333	233 / 282 / 263 / 333
	Fieldstone Tap – Johnson 138 kV Line Section	225 / 282 / 263 / 333	233 / 282 / 263 / 333

Need Numbers: ATSI-2023-029
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Selected Solution:

At Carlisle Substation

- Replace (1) 138 kV Oil Circuit Breaker.
- Replace (3) 138 kV disconnect switches.
- Replace associated relaying with microprocessor relays.
- Remove wave-trap and replace power line carrier communications with fiber communications.

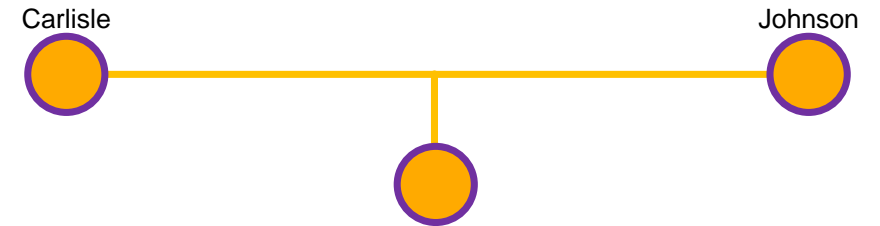
At Fieldstone Substation

- Remove wave-trap.

At Johnson Substation

- Replace (1) 138 kV disconnect switch.
- Remove wave-trap and replace power line carrier communications with fiber communications.
- Connect fiber to existing microprocessor relays.

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



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

Need Numbers: ATSI-2023-029
Process Stage: Submission of Supplemental Projects for
Inclusion in the Local Plan – 4/26/2024

Transmission Line Ratings:

Need #	Transmission Line / Substation Locations	Existing Circuit Ratings (SN/ SE / WN / WE)	New Circuit Ratings (SN / SE / WN / WE)
ATSI-2023-029	Carlisle – Fieldstone Tap 138 kV Line Section	233 / 282 / 263 / 333	233 / 282 / 263 / 333
	Fieldstone Tap – Johnson 138 kV Line Section	225 / 282 / 263 / 333	233 / 282 / 263 / 333

Estimated Project Cost: \$2.2M
Projected In-Service: 6/30/2025
Supplemental Project ID: s3121.1

Need Numbers: ATSI-2023-041
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024
Previously Presented: Need Meeting – 10/20/2023
 Solution Meeting – 11/17/2023

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

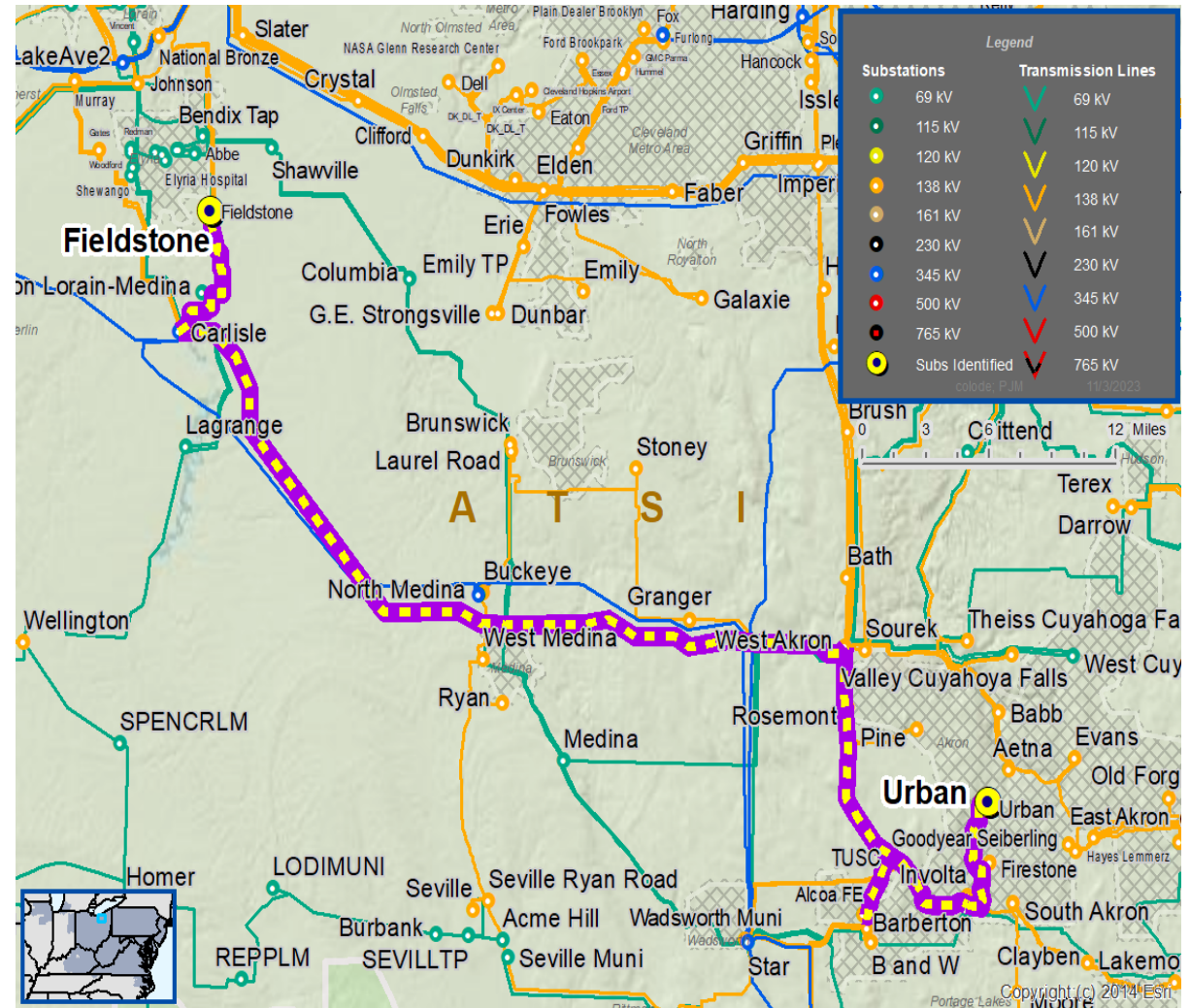
System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits
- 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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ATSI Transmission Zone M-3 Process Firestone – Urban 138 kV Misoperation Relays

Need #	Transmission Line / Substation Locations	Existing Circuit Ratings (SN / SE / WN / WE)	Existing Conductor Ratings (SN / SE / WN / WE)
ATSI-2023-041	Firestone – Urban 138 kV Line	189 / 241 / 237 / 249	233 / 282 / 263 /333

Need Numbers: ATSI-2023-041
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Selected Solution:

At Firestone Substation

- Replace associated relaying with microprocessor relays.
- Replace wave-trap and power line carrier equipment.

At Urban Substation

- Replace (1) 138 kV Oil Circuit Breaker.
- Replace (3) 138 kV disconnect switches.
- Replace associated relaying with microprocessor relays.
- Replace wave-trap and power line carrier equipment.



Continued on next slide...

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



ATSI Transmission Zone M-3 Process Firestone – Urban 138 kV Misoperation Relays

Need Numbers: ATSI-2023-041
Process Stage: Submission of Supplemental Projects for
Inclusion in the Local Plan – 4/26/2024

Transmission Line Ratings:

Need #	Transmission Line / Substation Locations	Existing Circuit Ratings (SN/ SE / WN / WE)	Existing Conductor Ratings (SN / SE / WN / WE)
ATSI-2023-041	Firestone – Urban 138 kV Line	189 / 241 / 237 / 249	233 / 282 / 263 / 333

Estimated Project Cost: \$2.5M
Projected In-Service: 5/15/2026
Supplemental Project ID: s3122.1

Need Number: ATSI-2020-044
Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 4/26/2024
Previously Presented: Solution Meeting 01/19/2024
 Need Meeting 11/20/2020

Project Driver:

Equipment Material Condition, Performance and Risk

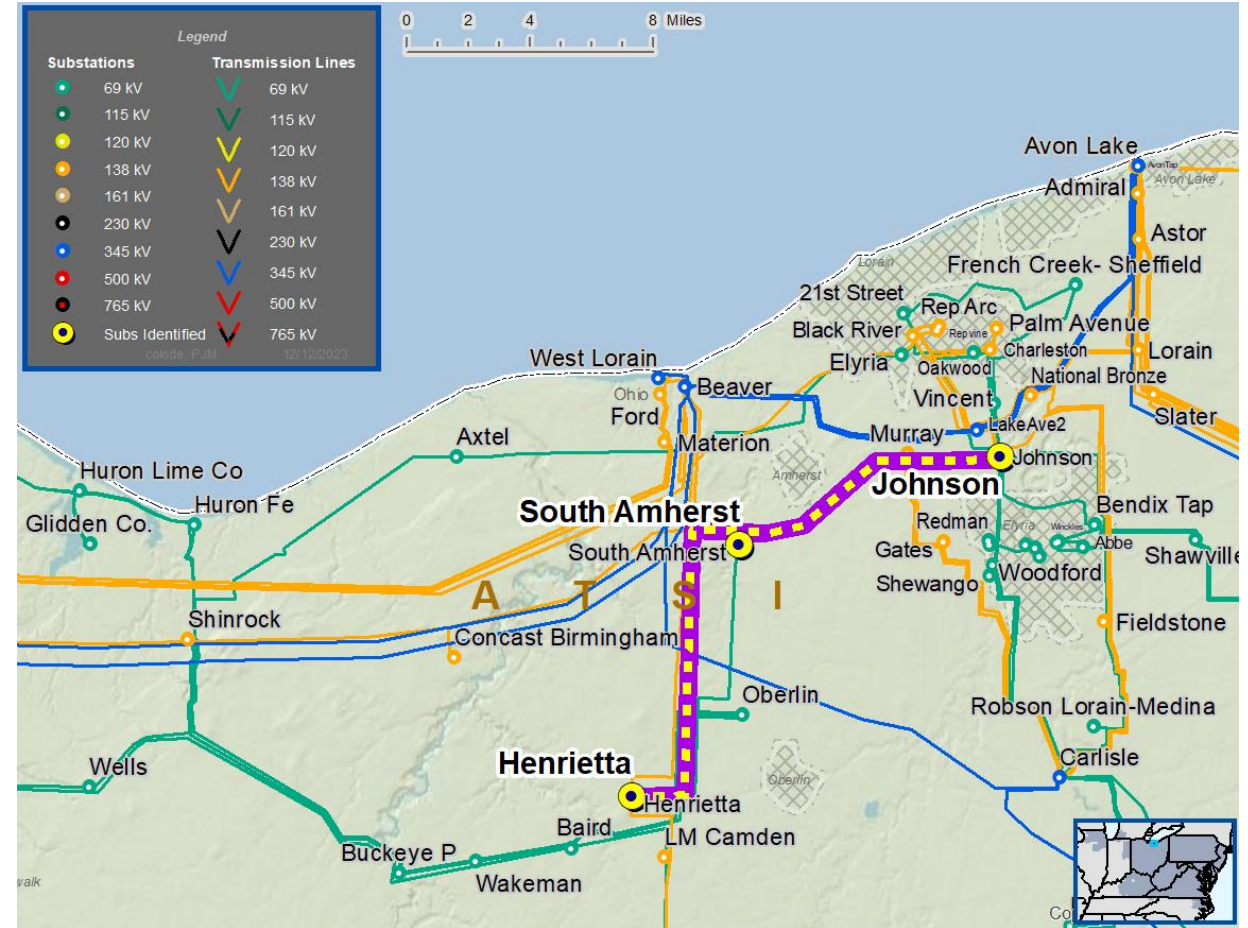
Specific Assumption Reference:

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
- Transmission line ratings are limited by terminal equipment

Problem Statement:

- Henrietta-Johnson 69 kV Transmission Line is approximately 16 miles in length.
- Line survey in 2020 showed a structure reject rate of 43% (93 of 218). The primary reasons for reject were wood pole deterioration, woodpecker holes, ground system damage, and decay damage.
- Worst performing transmission circuit in ATSI.
- Growing trend in unscheduled interruptions with 20 equipment failure caused outages in the past 5 years which have historically impacted approximately 9,200 customers. The majority of outage causes are related to Failed AC Circuit Equipment (conductor, crossarm, static wire, insulator, etc.).
- Transmission line switches are obsolete and limiting the transmission line rating.

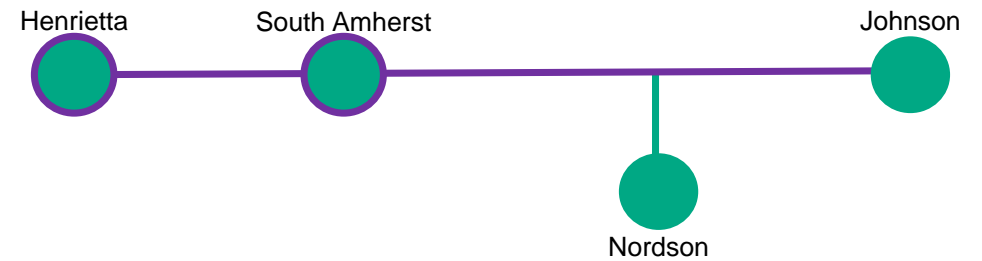


Need Numbers: ATSI-2020-044
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Selected Solution:

Henrietta – Johnson 69 kV Line

- Replace wood structures and rebuild 12.1 miles of line with new conductor.
- Reconductor 1 mile of line on steel structures.
- Replace (2) 600 A switches with 1200 switches at South Amherst.
- Replace limiting substation conductor at Henrietta



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 Henrietta – Johnson 69 kV

Need Numbers: ATSI-2020-044
Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 4/26/2024

Transmission Line Ratings:

Need #	Transmission Line / Substation Locations	Existing Circuit Ratings (SN/ SE / SLD / WN / WE / WLD)	New Circuit Ratings (SN / SE / SLD / WN / WE / WLD)
ATSI-2020-044	Henrietta – South Amherst 69 kV Line Section	80 / 96 / 108 / 90 / 114 / 123	111 / 134 / 151 / 125 / 159 / 171
	South Amherst – Nordson Tap 138 kV Line Section	45 / 54 / 60 / 51 / 65 /69	111 / 134 / 151 / 125 / 159 / 171
	Nordson Tap – Johnson 138 kV Line Section	80 / 96 / 108 / 90 / 114 / 123	111 / 134 / 151 / 125 / 159 / 171

Estimated Project Cost: \$18M
Projected In-Service: 12/31/2025
Supplemental Project ID: s3192.1

Need Number: ATSI-2023-027
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024
Previously Presented: Solution Meeting 01/19/2024
 Need Meeting 11/17/2023

Project Driver:

Equipment Material Condition, Performance and Risk

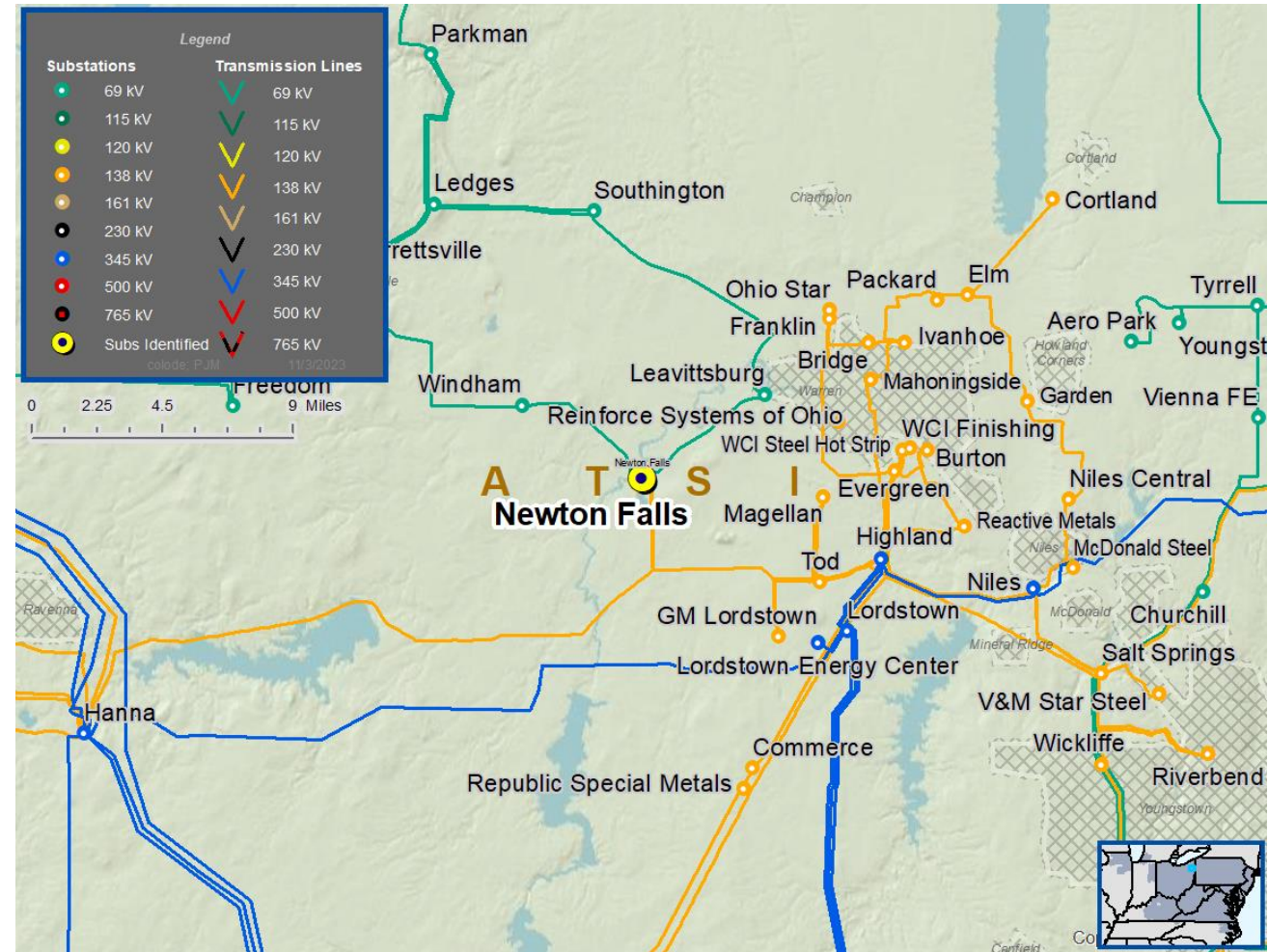
Specific Assumption Reference:

System Performance Projects Global Factors

- Substation/line equipment limits
- Substation Condition Rebuild/Replacement
- Circuit breakers and other fault interrupting devices

Problem Statement:

- The 69 kV Oil Circuit Breaker B-30, associated disconnect switches and protective relaying at Newton Falls is aging with increasing maintenance concerns. The equipment is 48 years old.
- Transmission line ratings are limited by terminal equipment.



Continued on next slide...

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE / WN / WE)	Existing Conductor Rating (SN / SE / WN / WE)
ATSI-2023-027	Newton Falls – NF Muni Tap 69 kV Line Section	76 / 92 / 87 / 93	76 / 92 / 87 / 111



ATSI Transmission Zone M-3 Process Newton Falls 69 kV Breaker

Need Numbers: ATSI-2023-027
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Selected Solution:

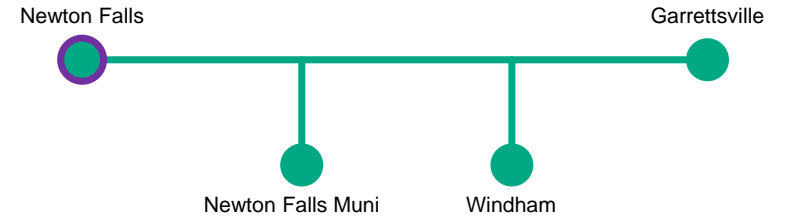
At Newton Falls Substation

- For Garrettsville South 69 kV Line, replace circuit breaker B30.
- Replace (2) associated disconnect switches.
- Replace associated relaying with microprocessor relays.

Transmission Line Ratings:

Existing Ratings (SN/SE/SLD/WN/WE/WLD): 76/92/103/87/93/103 MVA
 New Ratings (SN/SE/SLD/WN/WE/WLD): 76/92/104/87/111/120 MVA

Estimated Project Cost: \$1.0M
Projected In-Service: 02/02/2024
Supplemental Project ID: s3193.1



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



AMPT Projects in ATSI Transmission Zone M3 Process Pioneer, OH

Need Number: AMPT-2022-002
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024
Previously Presented: Solution Meeting – 11/17/2023
Need Meeting – 2/18/2022

Supplemental Project Driver(s):

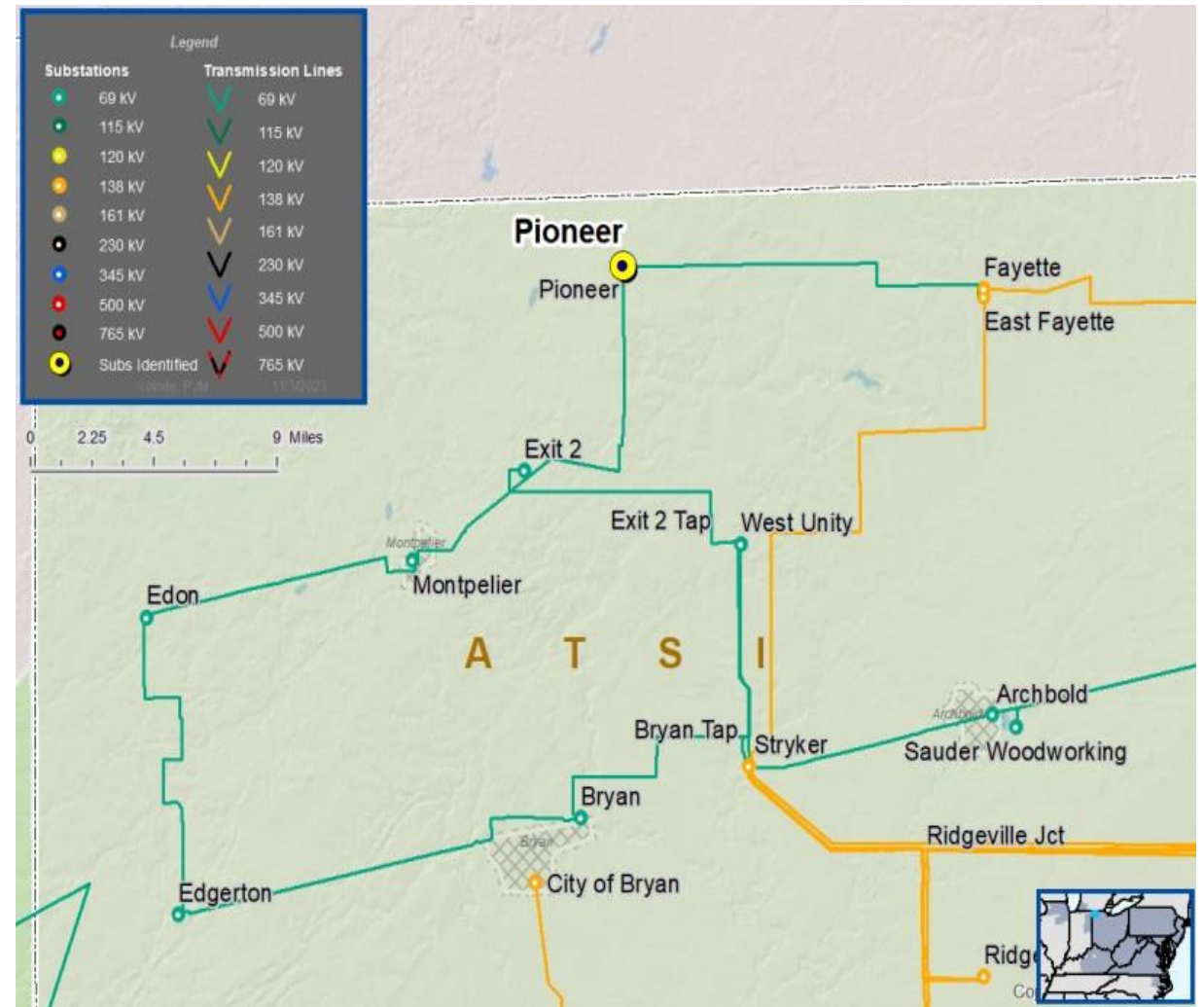
Customer Service

Specific Assumption Reference(s): AMPT’s “Transmission Facilities Interconnection Requirements” document.

Problem Statement:

The existing interconnection is an approximately 2 mile radial 69 kV tap off ATSI’s East Fayette-Exit 2 69 kV line which supplies the Pioneer 69/12 kV substation.

The current peak load at Pioneer is 8 MW. A 2nd supply is needed per AMPT interconnection requirements criteria. The radial supply presents a single point of failure that jeopardizes reliability for the village.





AMPT Projects in ATSI Transmission Zone M3 Process Pioneer, OH

Need Number: AMPT-2022-002
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 4/26/2024

Selected Solution: (ATSI):

Snyder 69 kV substation (s3117.4 / \$5.4M)

- Expand the Snyder Substation from five to a six-breaker ring bus by adding one 69 kV circuit breaker to accommodate the Kexon-Bruce R. Kidston-Snyder 69 kV Line terminal (i.e., Kexon- Snyder #2) and install a dead-end structure just outside Snyder Substation to provide a termination point for the new line.
- Revise line relay settings to Kexon (formerly E Fayette exit)
- Install standard BES line relay panel with on the new line exit for the Kexon-Snyder #2 69 kV Line

Stryker (s3117.5 / \$6.4M)

- Install 2nd 138/69 kV transformer, adjust all 69 & 138 kV relays as required, integrate the new transformer protection to the system.
- Install one 138 kV bus tie breaker

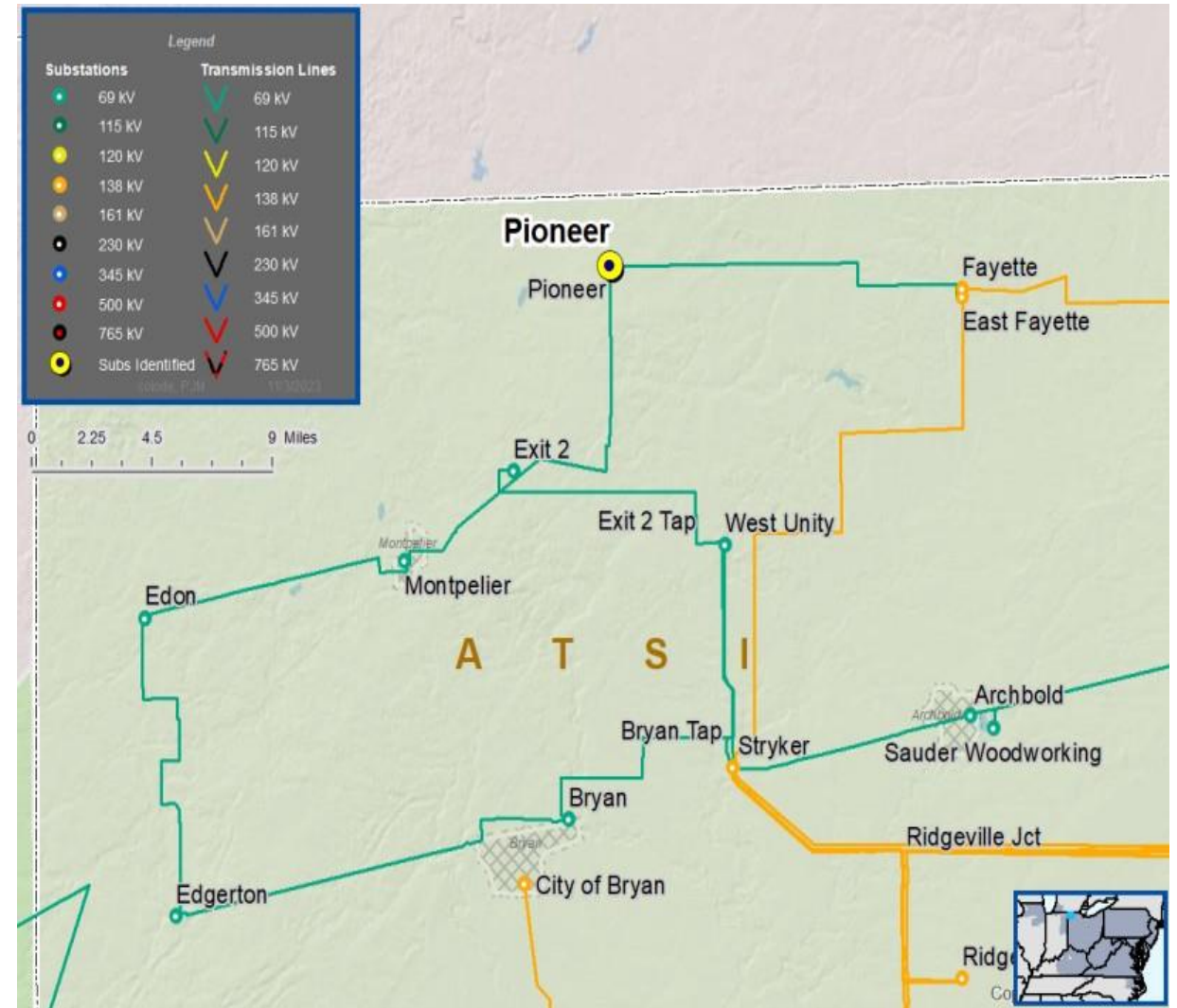
East Fayette-Snyder 69 kV Line (s3117.6 / \$0.8M)

- Split the E Fayette-Snyder 69 kV Line between structure # 191 & 192 to loop in the AMPT Kexon Substation.
- Revise relay settings at E Fayette and Snyder substations
- Install a jumper between the new E. Fayette-Kexon & Snyder-Kexon #1 69 kV Line with inline normally open SCADA controlled switch

Estimated Project Cost: \$12.6 M

Projected In-Service: 5/31/2027

Supplemental Project ID: s3117.4, s3117.5, s3117.6





Revision History

1/4/2024 – V1 – Original Slides with AEP-2019-OH034

4/26/2024 – V2 – Added s3129.1, s3130.1, s3132.1, s3106.1, s3118.1, s3119.1, s3120.1, s3121.1, s3122.1, s3117.4, s3117.5, s3117.6, s3192.1, s3193.1