Subregional RTEP Committee – Western
FirstEnergy Supplemental Projects

October 20, 2023

Needs

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

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

Need Number: ATSI-2023-024
Process Stage: Need Meeting – 10/20/2023

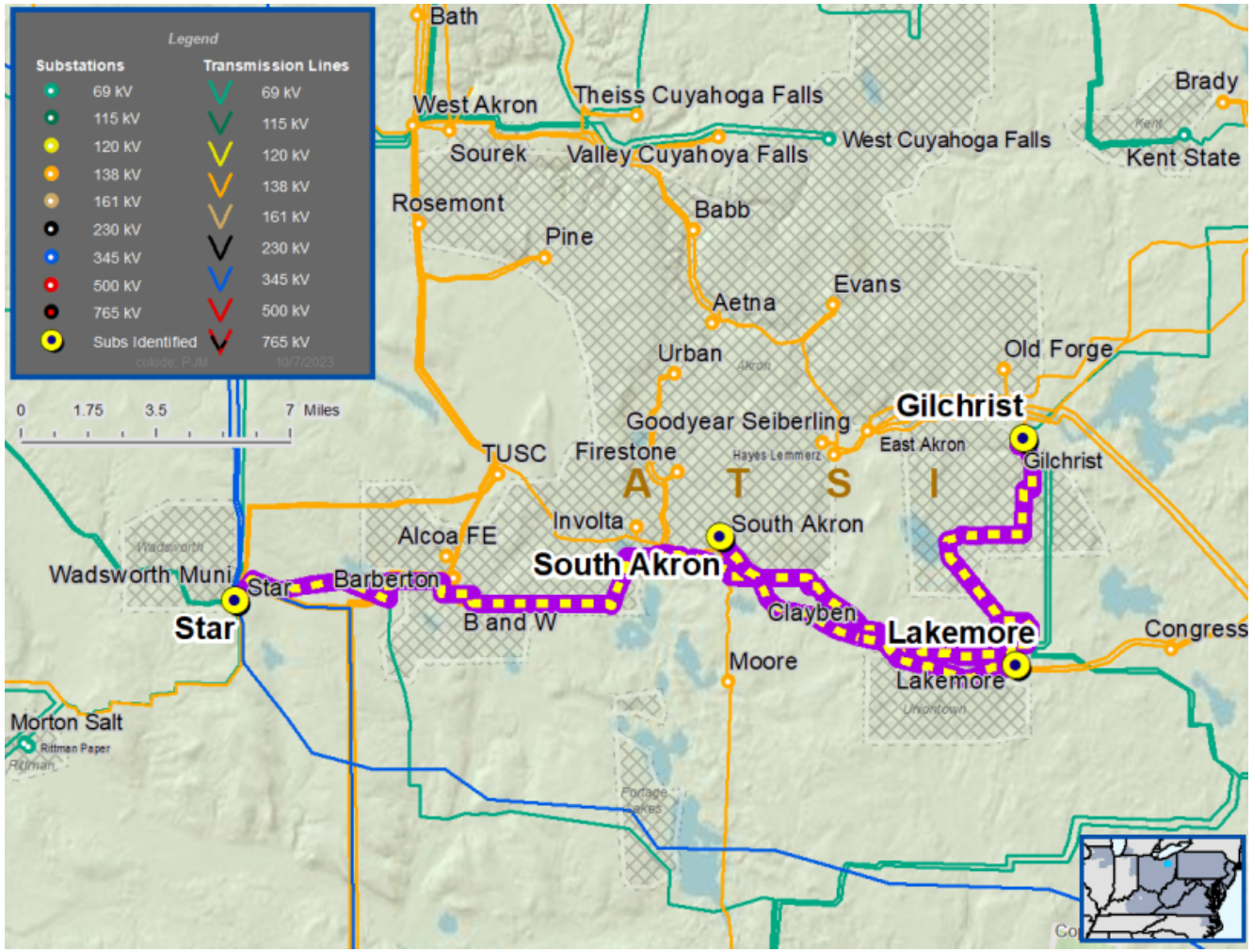
Supplemental Project Driver(s):
Operational Flexibility and Efficiency
Equipment Material Condition, Performance and Risk
Infrastructure Resilience

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

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.



ATSI Transmission Zone M-3 Process
Dowling – Chrysler 138 kV Line

Need Number: ATSI-2023-025

Process Stage: Need Meeting – 10/20/2023

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

Problem Statement:

- The Chrysler – Dowling 138 kV Line is approximately 10 miles
- A line fault will cause approximately 80 MW consequential loss of load and approximately 4,800 residential customers and 1 industrial customer at risk
- Since 2018, the Chrysler – Dowling 138 kV Line has experienced a total of 1 momentary outages and 2 sustained outages.

ATSI Transmission Zone M-3 Process Misoperation Relays – Multiple Lines

Need Numbers: ATSI-2023-029 and ATSI-2023-041

Process State: Need Meeting 10/20/2023

Project Driver:

Equipment Material Condition, Performance and Risk

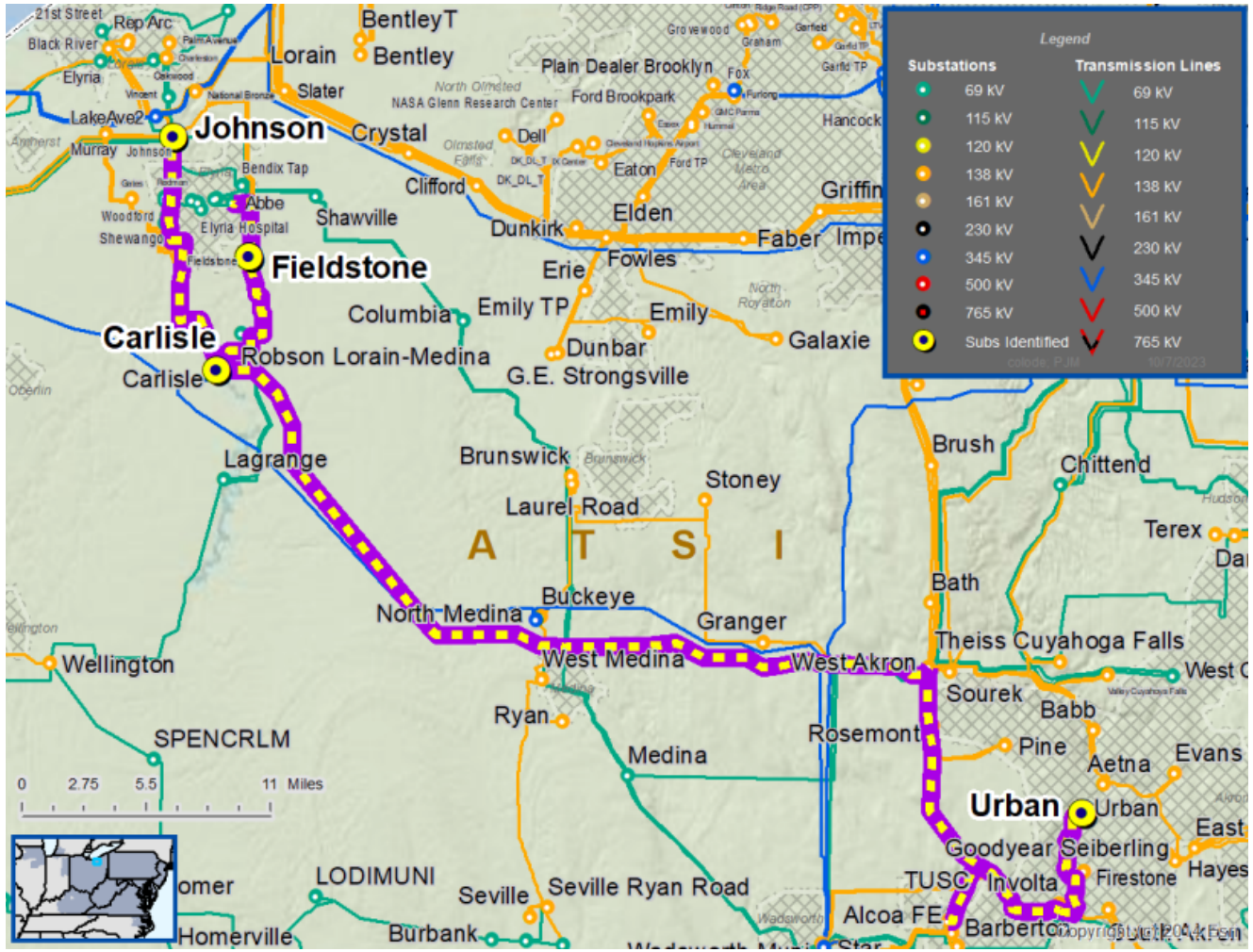
Specific Assumption Reference:

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 Misoperation Relays – Multiple Lines

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

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

Need Numbers: ATSI-2023-019

Process State: Need Meeting 10/20/2023

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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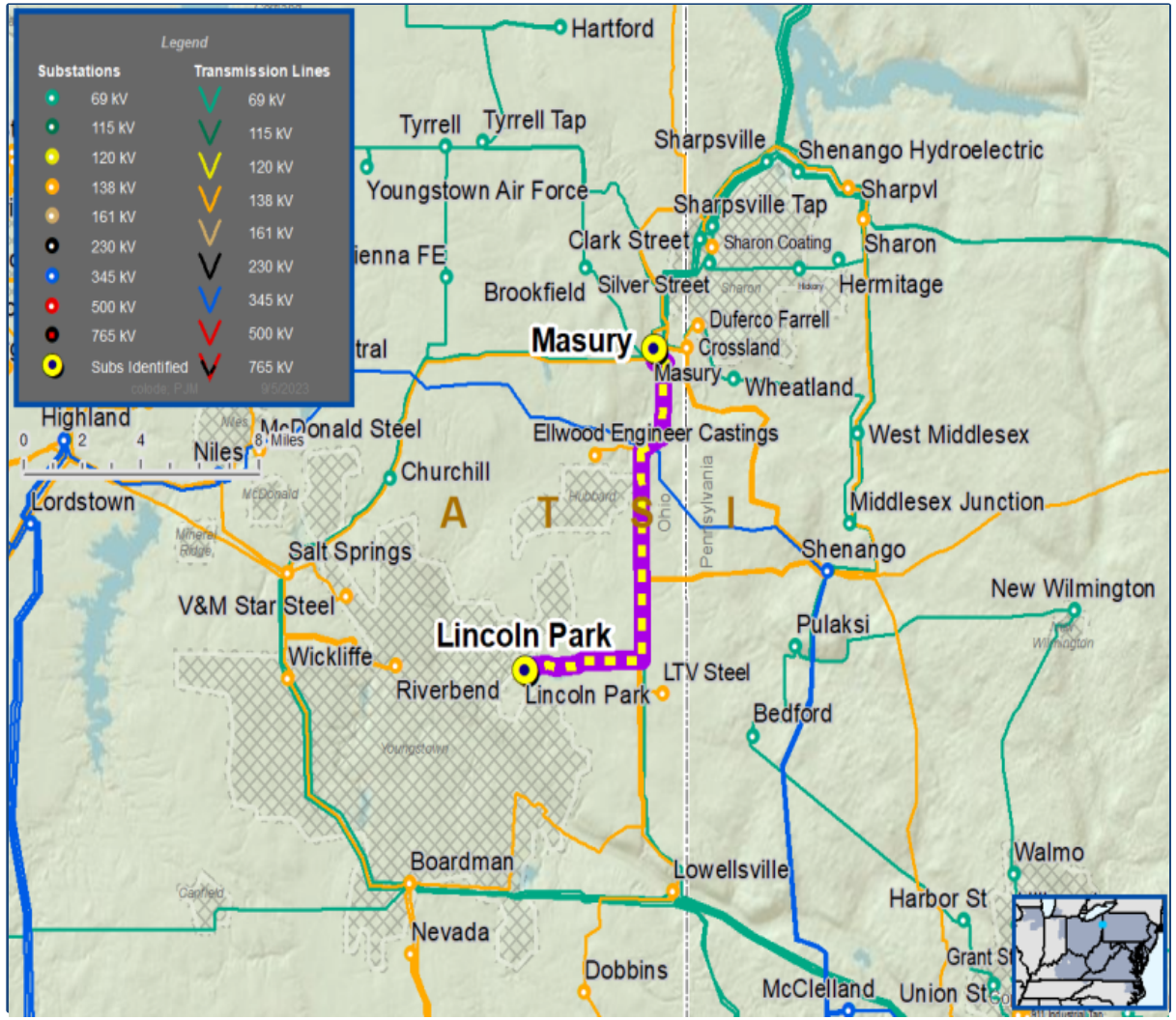

ATSI Transmission Zone M-3 Process
Masury 138 kV Misoperation Relays

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
Gilchrist - Hartville 69 kV Misoperation Relays

Need Numbers: ATSI-2023-020

Process State: Need Meeting 10/20/2023

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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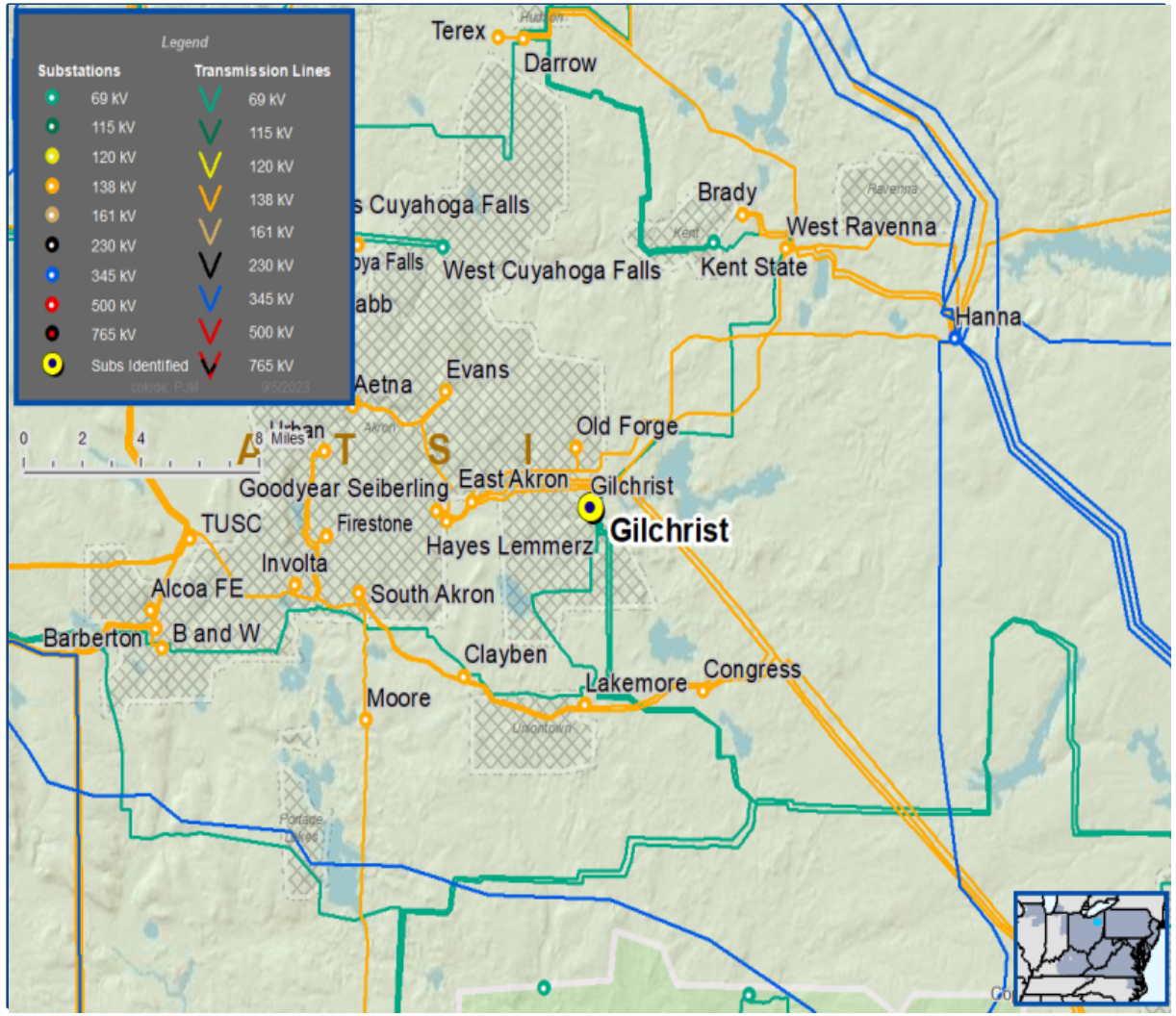


ATSI Transmission Zone M-3 Process
Gilchrist - Hartville 69 kV Misoperation Relays

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE)	Existing Conductor Rating (SN / SE)
ATSI-2023-020	Hartville - MON 1 Tap 69 kV Line	76 / 76	76 / 92

ATSI Transmission Zone M-3 Process
Bellevue-Groton 69 kV Line - Need

Need Number: ATSI-2023-013
Process Stage: Need Meeting – 10/20/2023

Project Driver(s):

Equipment Material Condition, Performance, and Risk
System Reliability
Operational Flexibility and Efficiency
Infrastructure Resilience

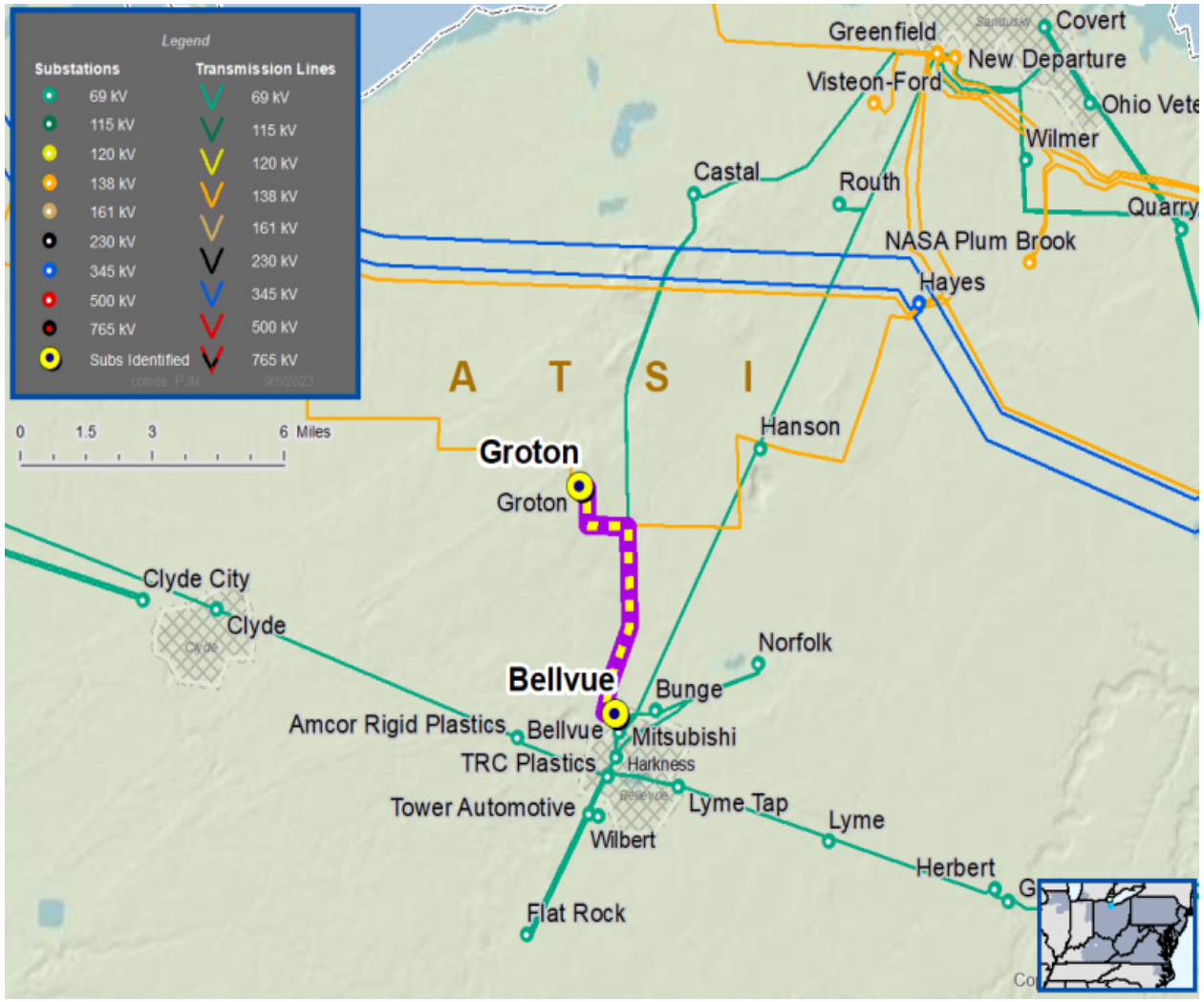
Specific Assumption Reference(s):

- Substation / Line equipment limits
- System reliability and performance
- Reliability of Non-Bulk Electric System (Non-BES) Facilities
- Transmission line with high loading

Problem Statement:

- The Bellevue – Groton 69 kV Line is approximately four miles in length with 4/0 CU and 336 ACSR 26/7 conductor types.
- The Bellevue-Groton 69 kV Line is expected to approach its thermal capability based on local planning studies.
- Bellevue-Groton 69 kV line has experienced 5 unscheduled outages (sustained) since 2018.
- The structures on this line are 41 years old.

Model: 2023 Series 2028 RTEP 50/50 Summer Case



ATSI Transmission Zone M-3 Process
Vulcan 138-69 kV Transformer

Need Number: ATSI-2023-023

Previously Presented: Need Meeting – 10/20/2023

Supplemental Project Driver(s):

Equipment Material Condition, Performance, and Risk

Operational Flexibility and Efficiency

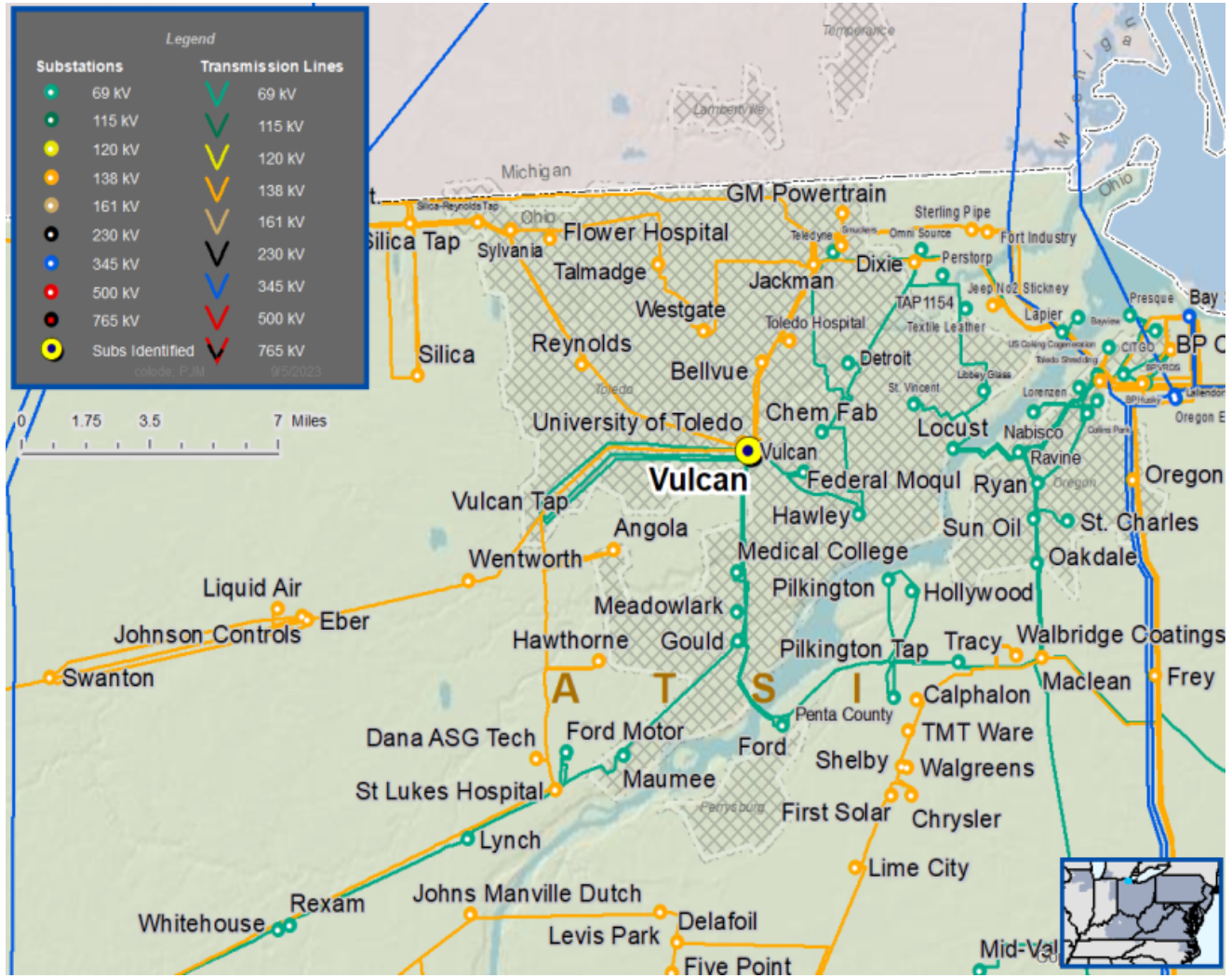
Infrastructure Resilience

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.



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
Cloverdale 138 kV Customer Connection

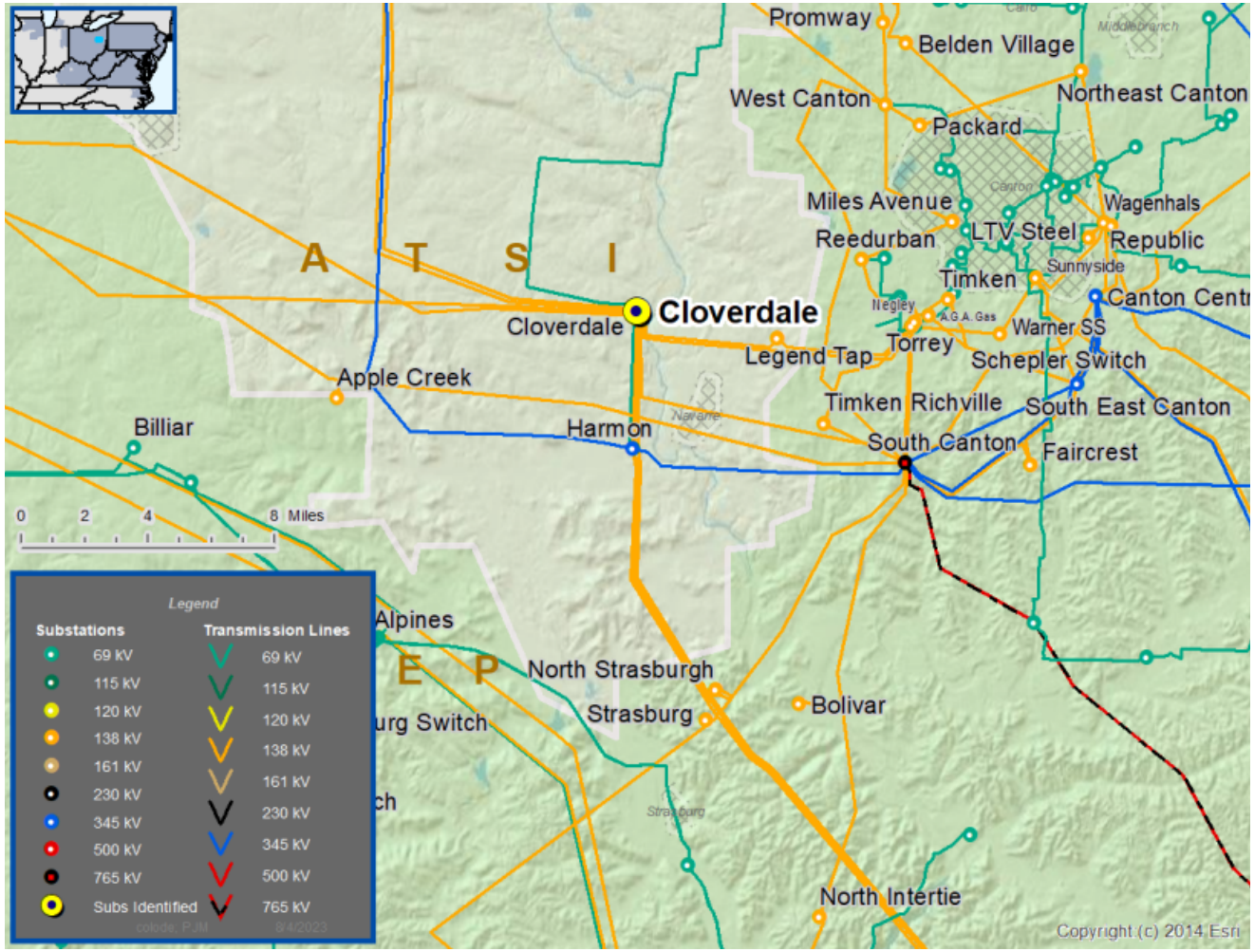
Need Number: ATSI-2023-022
Process Stage: Solution Meeting – 10/20/2023
Previously Presented: Need Meeting – 8/18/2023

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
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



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

Need Number: ATSI-2023-022
Process Stage: Solution Meeting – 10/20/2023
Previously Presented: Need Meeting – 8/18/2023

Proposed 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.

Alternatives Considered:

- No other feasible alternatives to serve the customer's load.

Estimated Project Cost: $0.0

Projected In-Service: 12/1/2025

Status: Engineering

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

9/7/2023 – V1 – Original version posted to pjm.com

10/10/2023 – V2 –

Addition of ATSI-2023-025, ATSI-2023-029, ATSI-2023-041 as needs

Addition of ATSI-2023-022 as solutions