

# Subregional RTEP Committee - Western ATSI Supplemental Projects

July 24, 2019

# 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-2019-058

**Process Stage:** Need Meeting 07/24/2019

**Project Driver:**  
*Customer Service*

**Specific Assumption References:**

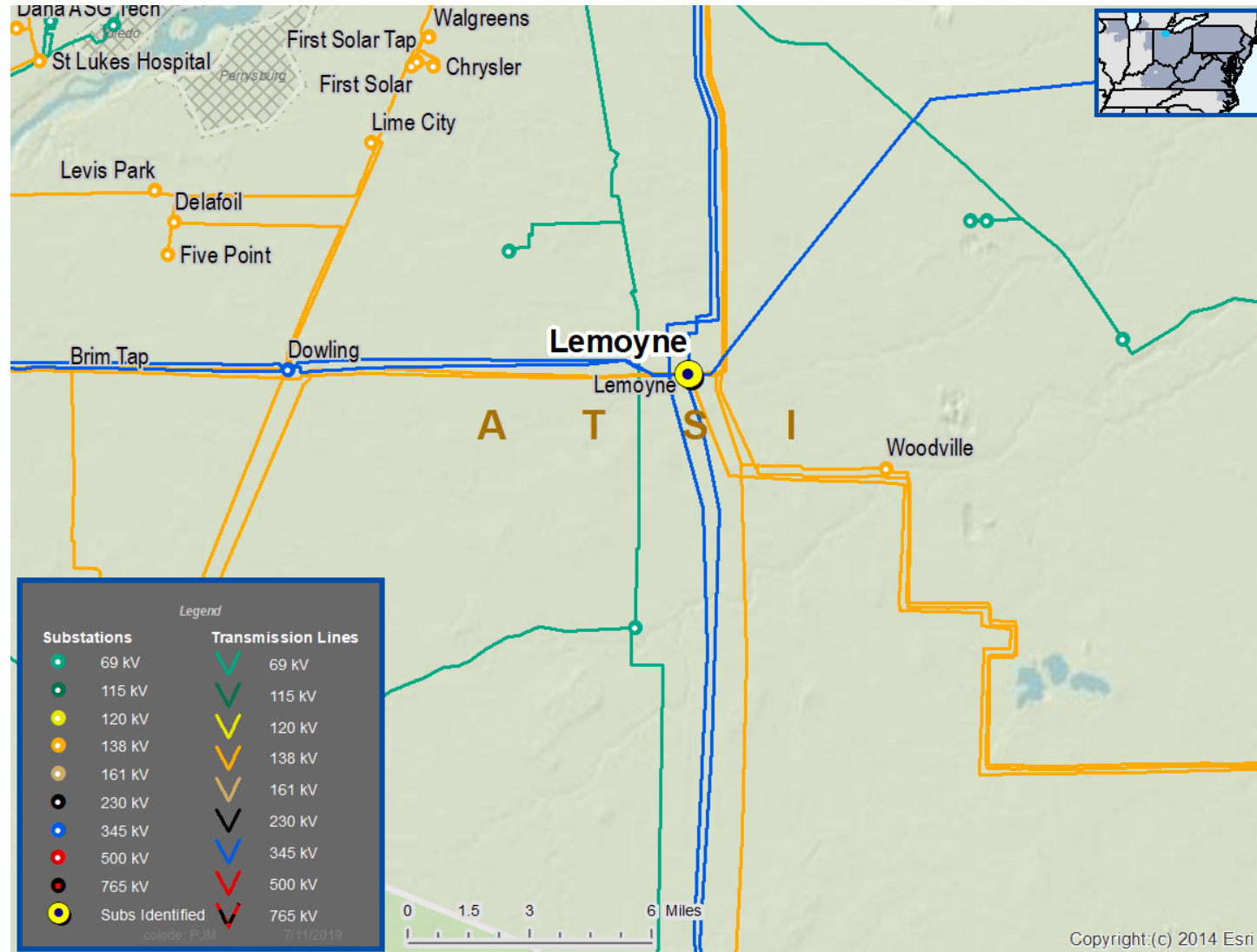
New customer connection request evaluated per FirstEnergy's "Requirements for Transmission Connected Facilities" document and "Transmission Planning Criteria" document.

**Problem Statement:**

New Customer Connection

- A customer requested a 138 kV transmission service for a 138/12.47 kV substation with approximately 10.0 MVA of load near Lemoyne substation.

**Requested In-Service Date:** 03/01/2020



**Need Number:** ATSI-2019-Multiple (See next slide)

**Process Stage:** Need Meeting 07/34/2019



**Project Driver:**

*Equipment Material Condition, Performance and Risk*

**Specific Assumption References:**

*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

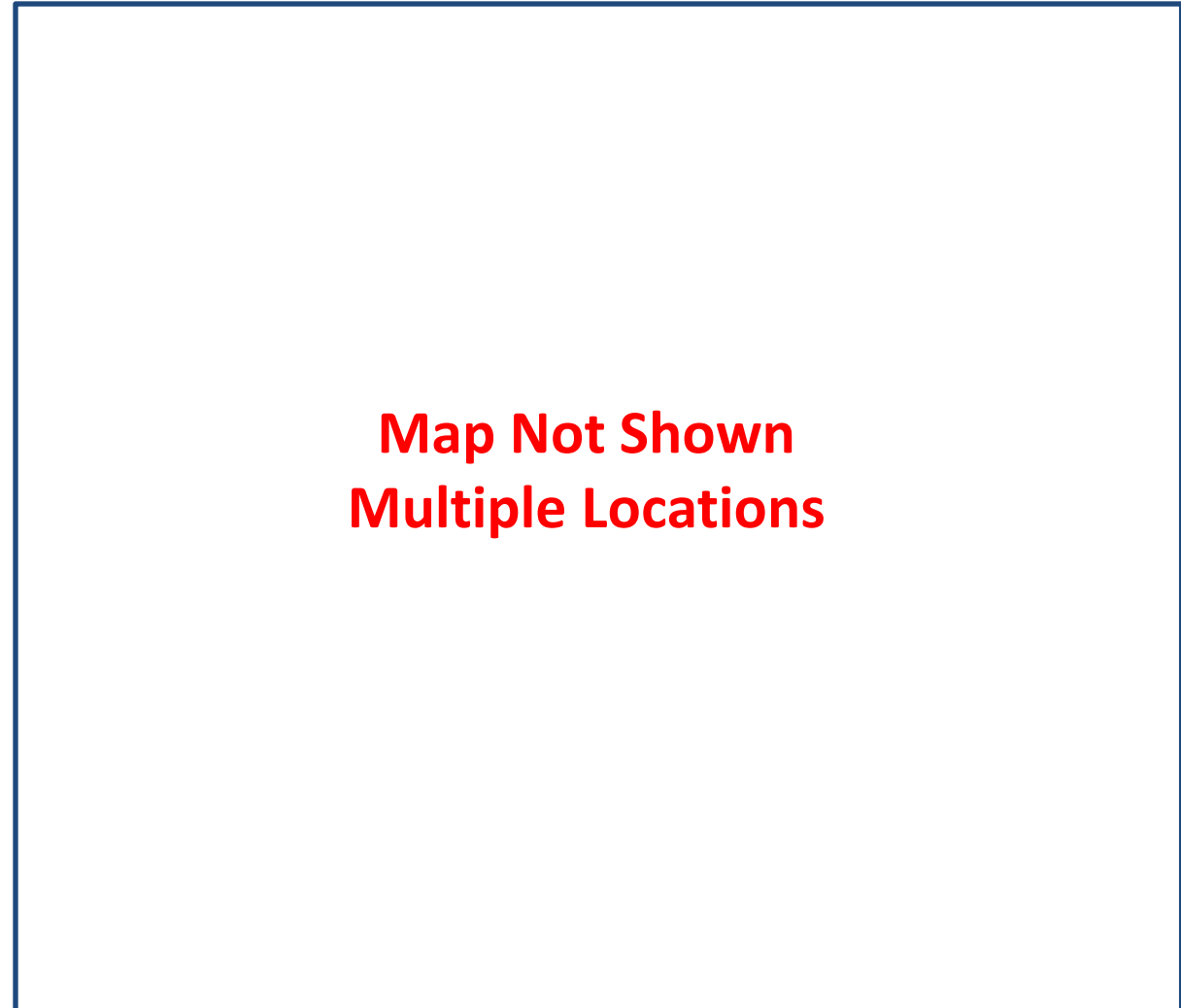
*System Performance Projects*

- 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.

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## ATSI Transmission Zone M-3 Process Multiple Line Rehab / Rebuild Needs

ATSI-2019	Transmission Line / Substation Locations	Existing Circuit MVA Rating (SN / SE)	Existing Conductor MVA Rating (SN / SE)	Limiting Terminal Equipment	Length of Line (miles)	Identified Structures (end of life / total)	Failure reasons
<b>McDowell – Sharon (Y-300) 69 kV Line (18.8 Miles)</b>							
-059	McDowell – Dept. of Corrections	47 / 48	47 / 56	Relay	6.0	195 / 235 (83% Failure Rate)	Woodpecker holes, decay and age
	Dept. of Corrections – Mercer Forge	47 / 56	47 / 56	-	1.0		
	Mercer Forge – Reznor Tap	47 / 56	47 / 56	-	0.3		
	Reznor Tap – Mercer Tap	47 / 56	47 / 56	-	1.1		
	Mercer Tap – Sharon 69kV	72 / 72	80 / 96	Relay	10.4		
<b>East Springfield – London 69 kV Line (29.7 Miles)</b>							
-060	East Springfield – Titus Tap	45 / 48	45 / 54	Relay	4.7	273 / 449 (61% Failure Rate)	Decay/rot and age
	Titus Tap – Plattsburg Tap	45 / 54	45 / 54	-	5.6		
	Plattsburg Tap – London Cor. Tap	45 / 54	45 / 54	-	7.5		
	London Cor. Tap – Big Plain Tap	76 / 92	76 / 92	-	11.1		
	Big Plain Tap – London 69kV Line	76 / 92	76 / 92	-	0.8		
<b>Darrow – Shalersville 69 kV Line (11.2 Miles)</b>							
-061	Darrow – Little Tikes Tap	76 / 92	76 / 92	-	0.7	59 / 178 (33% Failure Rate)	Decay, woodpecker holes, and age
	Little Tikes Tap – Streetsboro	76 / 92	76 / 92	-	4.3		
	Streetsboro – Streetsboro	76 / 92	76 / 92	-	1.8		
	Streetsboro – Aurora Plastics Tap	82 / 103	100 / 121	Switch	2.2		
	Aurora Plastics Tap – Shalersville	100 / 104	100 / 121	Relay	2.2		

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# ATSI Transmission Zone M-3 Process Multiple Line Rehab / Rebuild Needs

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ATSI-2019	Transmission Line / Substation Locations	Existing Circuit MVA Rating (SN / SE)	Existing Conductor MVA Rating (SN / SE)	Limiting Terminal Equipment	Length of Line (miles)	Identified Structures (end of life / total)	Failure reasons
<b>Clark – Navistar 69 kV Line (11.3 Miles)</b>							
-062	Clark – Ferncliff 69kV Line	76 / 92	76 / 92	-	2.9	93 / 185 (50% Failure Rate)	Age, woodpecker holes, grounding not present.
	Ferncliff – Ridgewood 69kV Line	76 / 92	76 / 92	-	1.0		
	Ridgewood – Navistar 69kV Line	45 / 54	45 / 54	-	7.4		

**Need Number:** ATSI-2019-Mutiple (See next slide)

**Process Stage:** Need Meeting 07/34/2019

**Project Driver:**

*Equipment Material Condition, Performance and Risk*

**Specific Assumption References:**

*Global Factors*

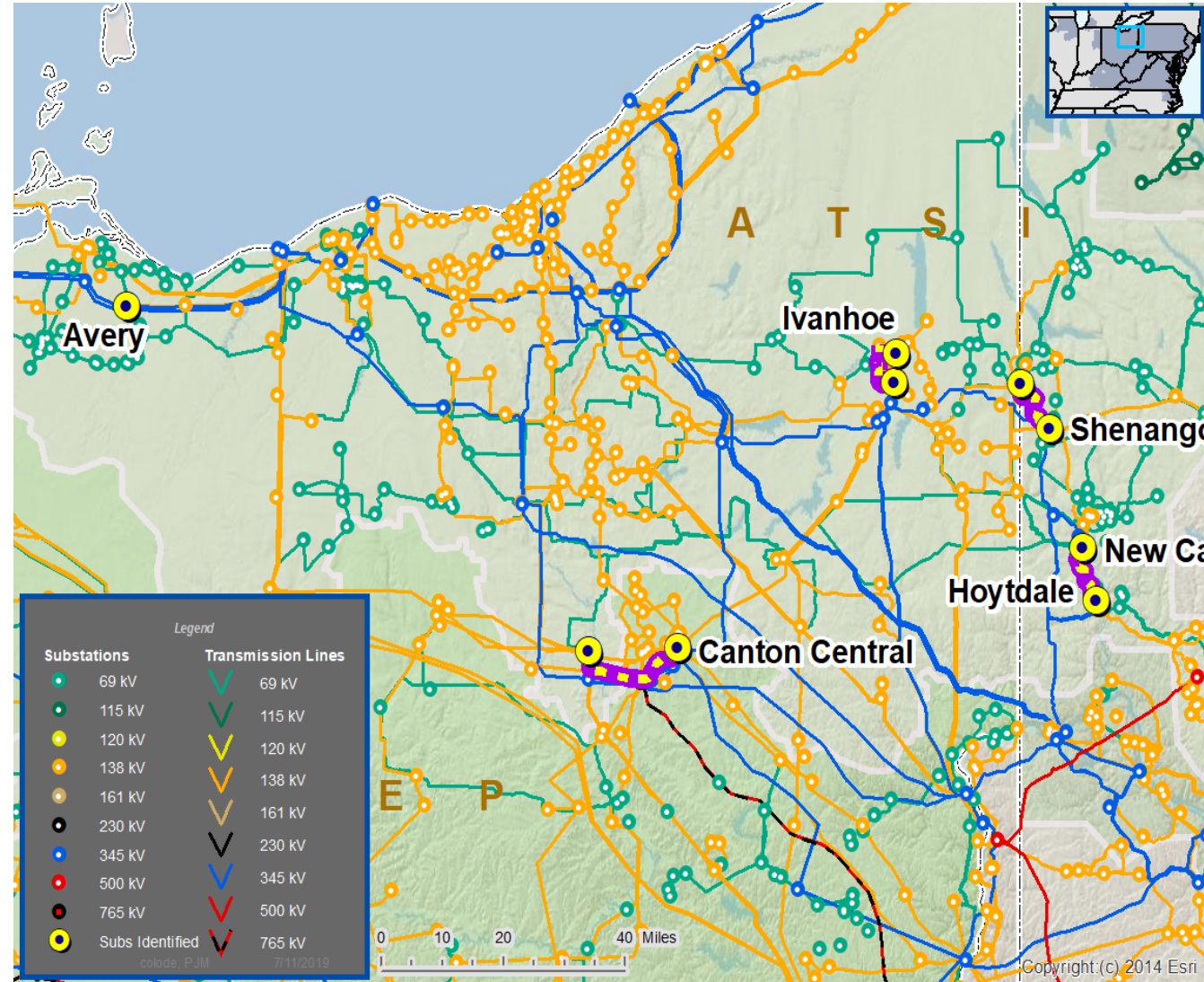
- System reliability and performance
- Substation / line equipment limits

*Upgrade Relay Schemes*

- Relay schemes that have a history of misoperation
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades
- Bus protection schemes

**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-2019	Transmission Line / Substation Locations	Existing Line/Terminal Equipment MVA Rating (SN / SE)	Existing Conductor/Transformer MVA Rating (SN / SE)	Limiting Terminal Equipment
-063	Avery Substation No.1 Transformer 138/69 kV	153 / 153	177 / 209	Line Relay, Substation Conductor
-064	Cloverdale – Canton Central 138kV Line	161 / 194	161 / 194	Relay (Winter Ratings)
-065	Evergreen – Ivanhoe 138kV Line	200 / 242	200 / 242	Line Relay
-066	Hoytdale – Newcastle #2 138kV Line	329 / 373	425 / 522	Relay, Substation Conductor, Disconnect Switch
-067	Crossland – Shenango #2 138kV	215 / 215	265 / 316	Relay, Substation Conductor



**Need Number:** ATSI-2019-068

**Process Stage:** Need Meeting 07/24/2019

**Project Driver:**

*Operational Flexibility and Efficiency*

*Equipment Material Condition, Performance, and Risk*

*Infrastructure Resilience*

**Specific Assumption References:**

*Global Factors*

- System Reliability and Performance
- Substation/line equipment limits
- Load at risk in planning and operational scenarios

*Substation Condition Rebuild / Replacement*

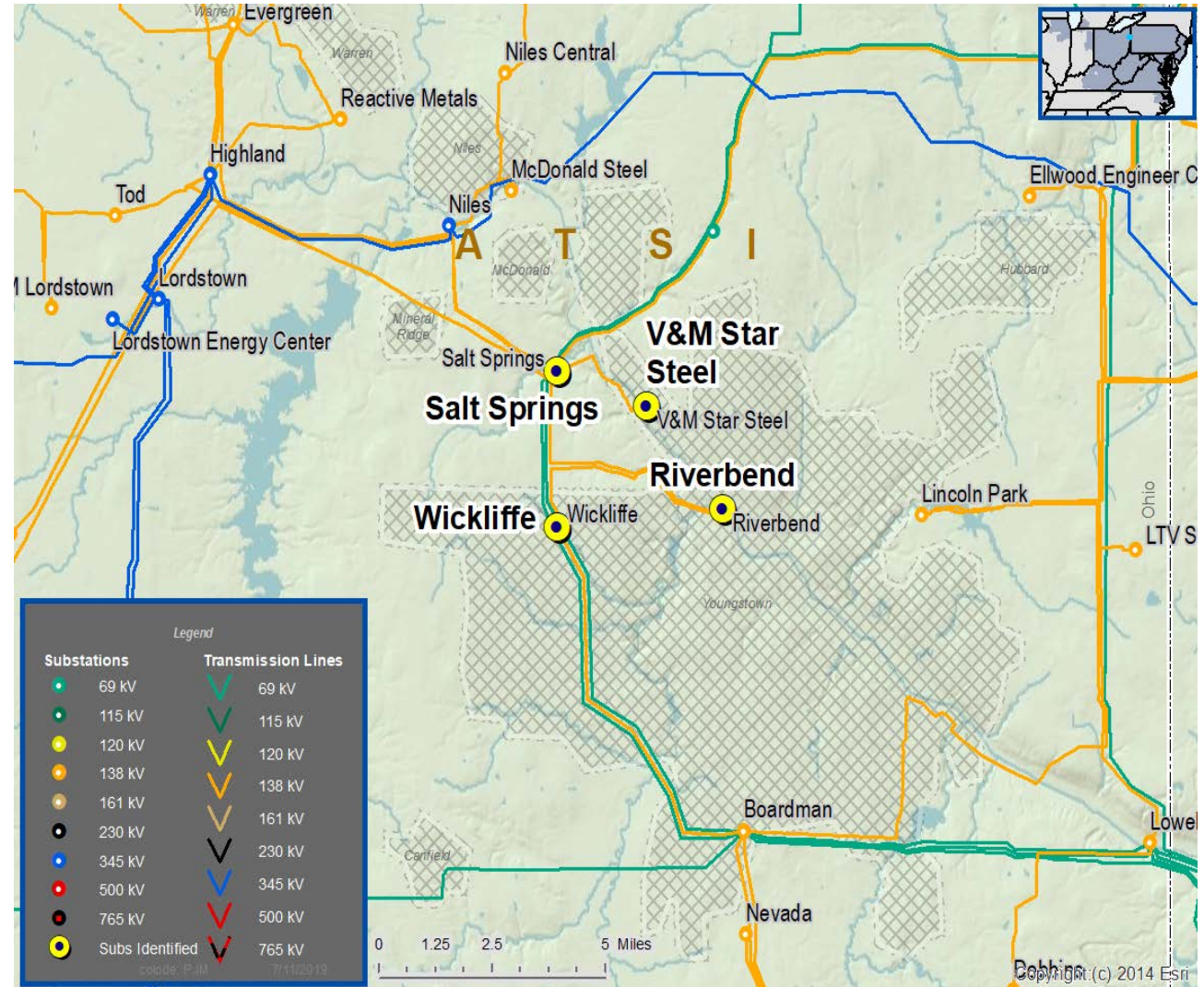
- Circuit breakers and other fault interrupting devices

*Add / Expand Bus Configuration*

- Loss of substation bus adversely impacts transmission system performance.
- Eliminate simultaneous outages to multiple networked elements.
- Capability to perform system maintenance

*Upgrade Relay Schemes*

- Bus protection schemes
- Relay schemes that have a history of misoperation





**Need Number:** ATSI-2019-068

**Process Stage:** Need Meeting 07/24/2019

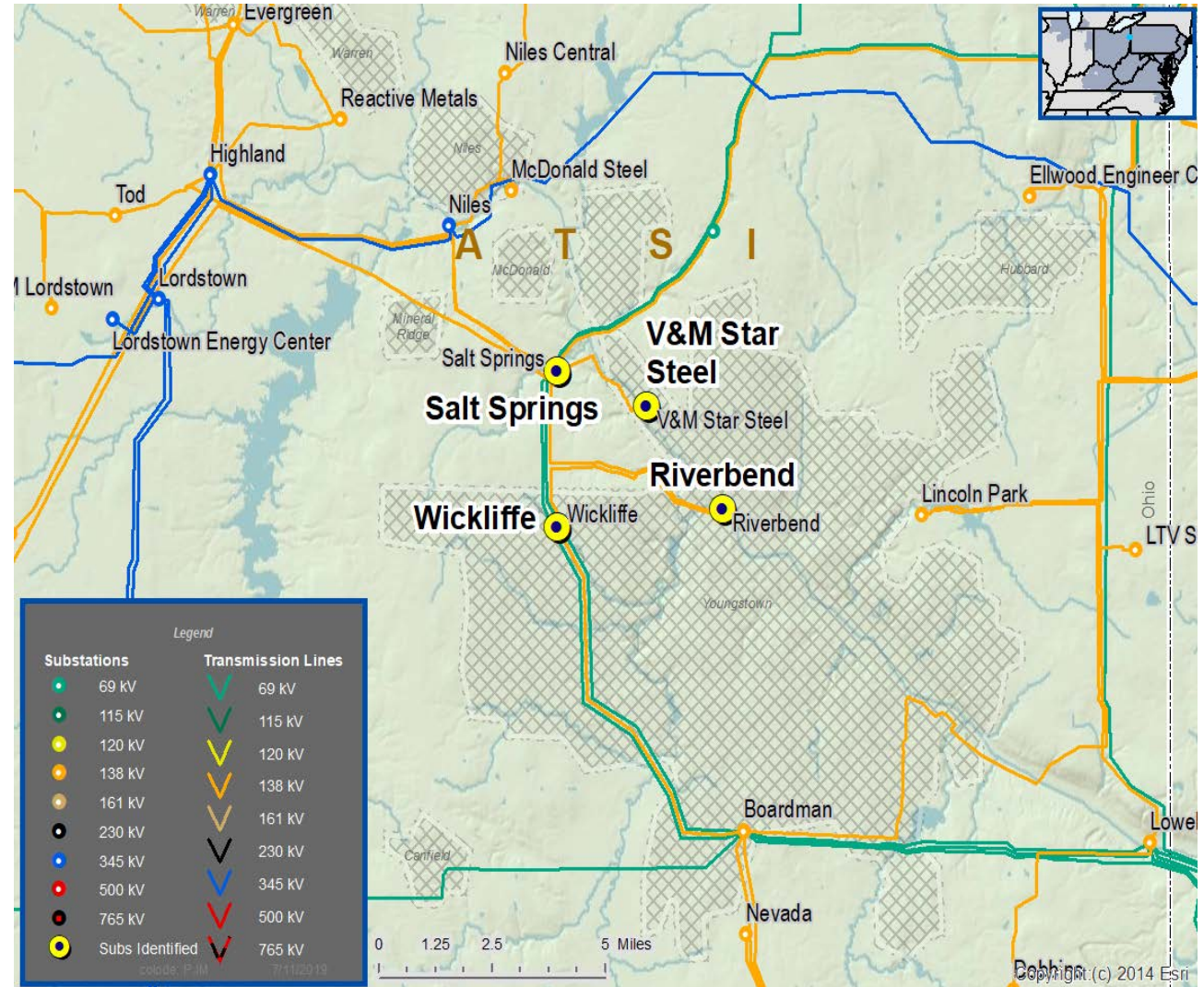
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**Problem Statement:**

**Salt Springs 138 kV Substation**

- System analysis shows that after a Salt Springs 138 kV Bus Fault (ATSI-P2-2-OEE-138-019) a substantial amount of load is at risk (Approximately 138 MW).
- Bus blocking scheme in place is complicated and requires multiple relays to all function properly for every internal and external fault.
- The 138 kV breakers B35, B56, B40, B2, B42, B45 do not have enough CTs for separate inputs to a primary and backup differential scheme.
- Relays on the Salt Springs-Riverbend 138 kV Line and the relays on the Salt Springs-Masury 138 kV Line have a history of misoperation.
- Breakers B35 and B45 are oil circuit breakers over 45 years old

**Model:** 2018 Series 2023 Summer RTEP 50/50



**Need Number:** ATSI-2019-069

**Process Stage:** Need Meeting 07/24/2019

**Project Driver:**

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

**Specific Assumption References:**

*Global Factors*

- System reliability and performance
- Substation / line equipment limits
- Increasing negative trend in maintenance findings and/or costs
- Expected service life (at or beyond) or obsolescence

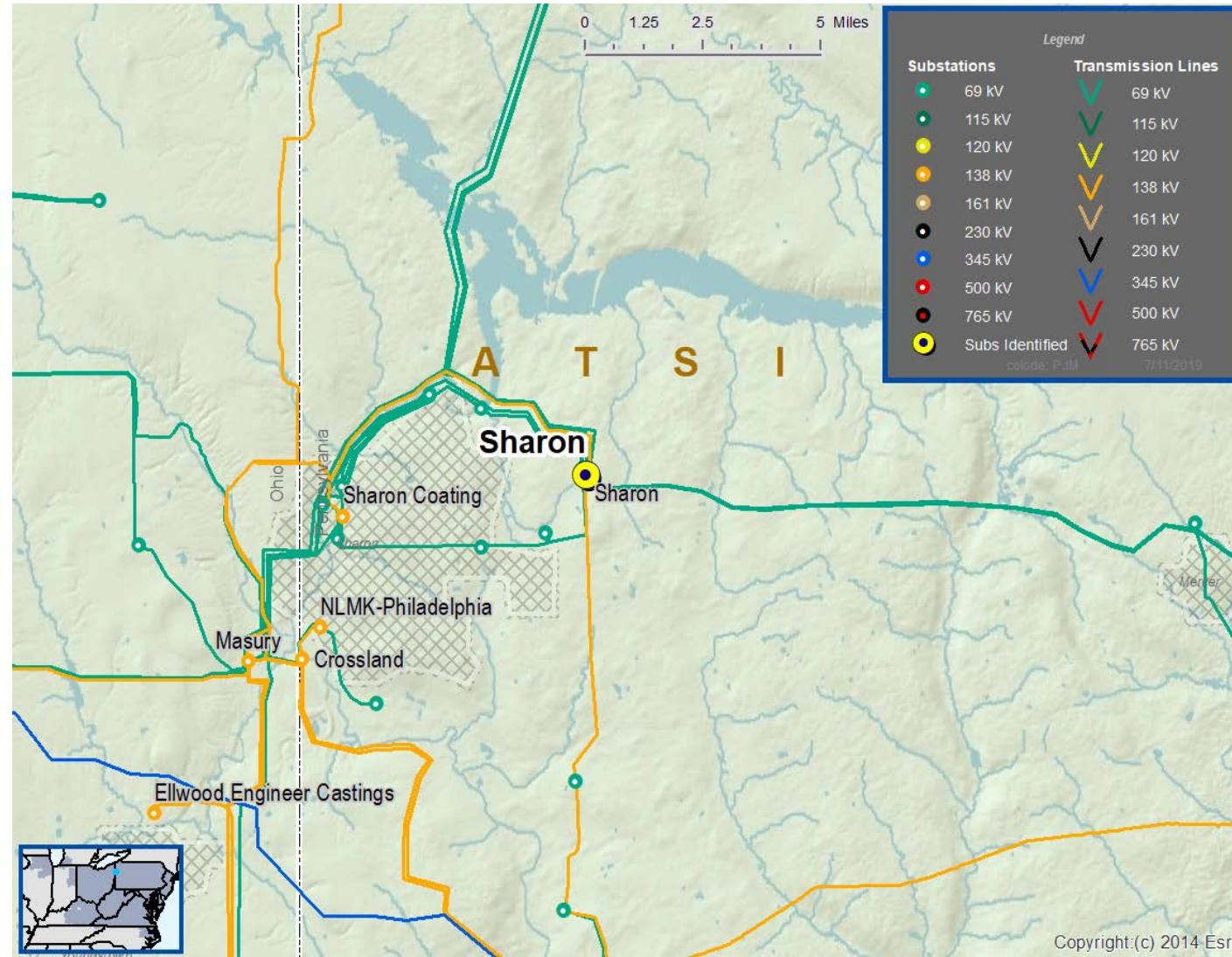
*Substation Condition Rebuild / Replacement*

- Circuit breakers and other fault interrupting equipment

**Problem Statement:**

**Sharon 138 kV Substation**

- Increasing maintenance costs for 138 kV breakers B-48 and B-60
- Breakers B-48 and B-60 are over 30 years old
- CCVT's are over 25 years old





**Need Number:** ATSI-2019-070

**Process Stage:** Need Meeting 07/24/2019

**Project Driver:**

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

**Specific Assumption References:**

*Global Factors*

- 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

*Line Condition Rebuild / Replacement*

- Customer outage frequency and/or durations
- Increasing negative trend in maintenance findings and/or costs

*Network Radial Lines*

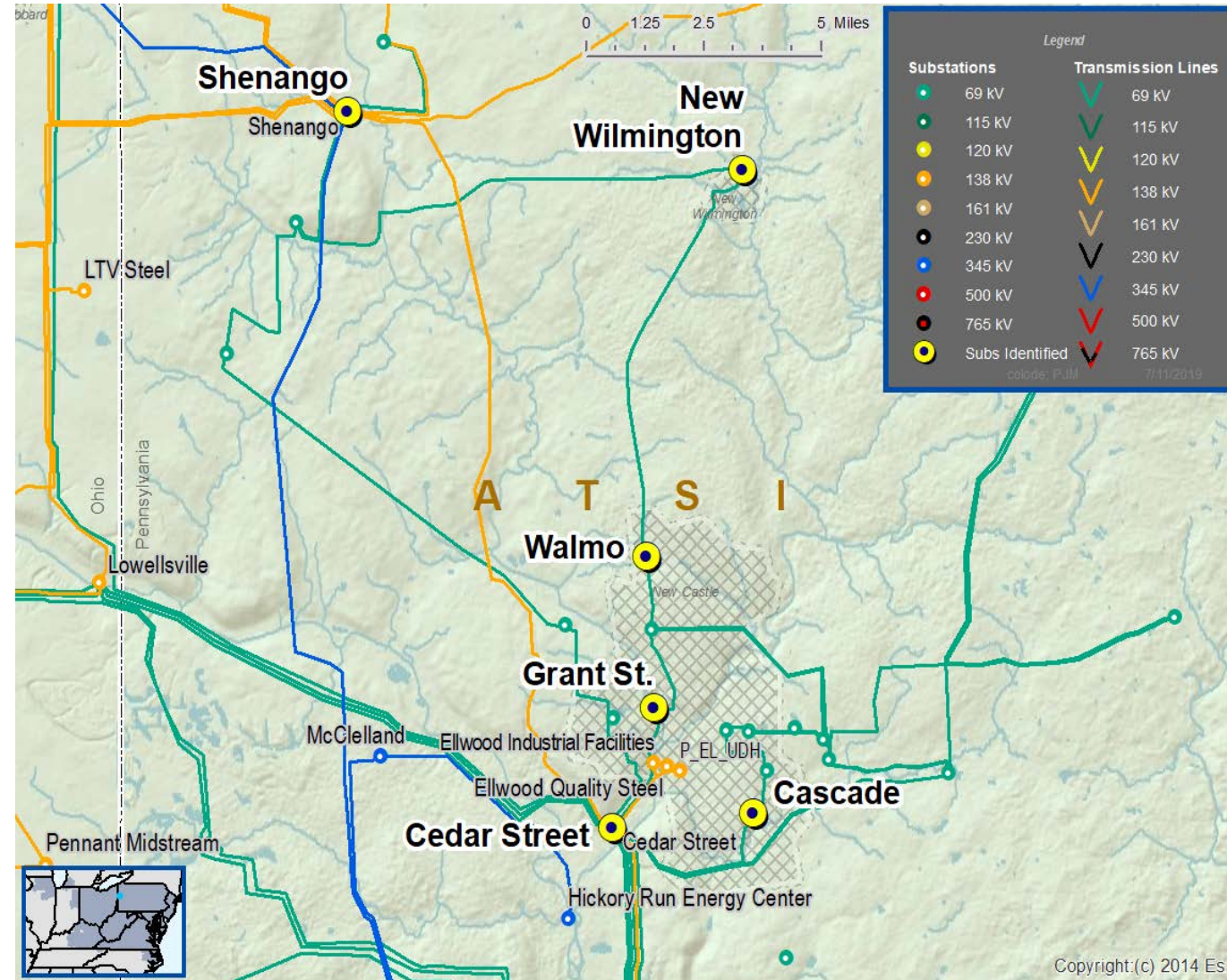
- Load at risk and/or customers affected
- Radial lines defined by normally open points

*Add / Expand Bus Configuration*

- Loss of substation bus adversely impacts transmission system performance
- Accommodate future transmission facilities

*Automatic Sectionalizing Schemes*

- Projects are developed under this methodology by evaluating load at risk and/or customers impacted



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**Need Number:** ATSI-2019-070

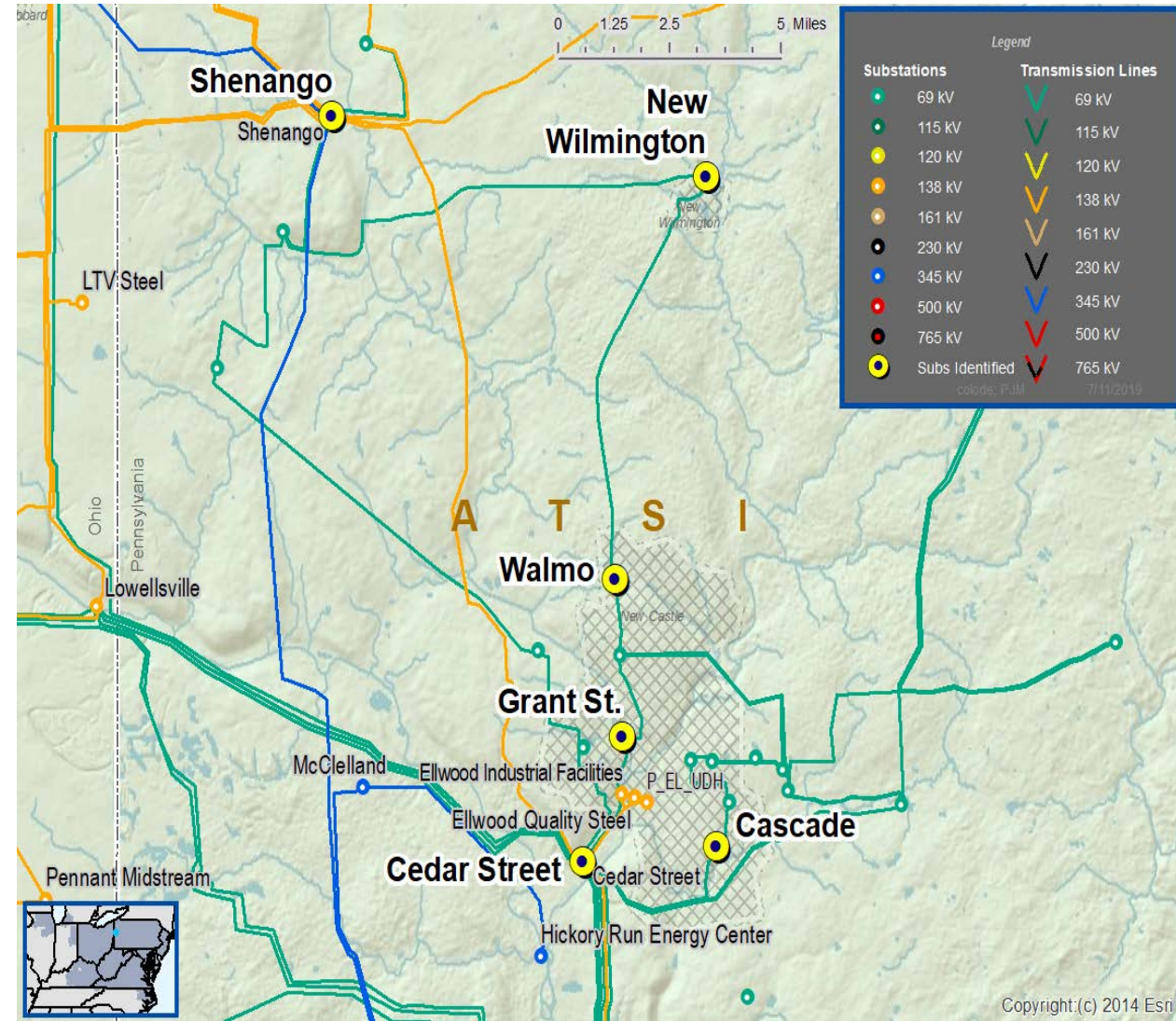
**Process Stage:** Need Meeting 07/24/2019

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**Problem Statement:**

**Walmo 69 kV Area**

- The Cedar Street-Grant Street 69 kV line serves roughly 18.6 MW and 5,287 customers on a 5.8 mile radial with a normally open point near Walmo substation.
- The Cedar Street-Grant Street 69 kV Line has experienced 5 outages in the past 5 years (3 sustained)
- After the construction of the Shenango 69 kV switching station (s1712 / ISD 12/31/2021) the newly networked Cedar Street-Shenango #2 69 kV line (formally the Cedar Street-Cascade 69 kV and Cedar Street-New Wilmington 69 kV lines) will serve approximately 44.2 MW and 10,842 customers with total line exposure of 23 miles. Walmo substation is currently served from this transmission line.
- The Cedar Street-Shenango #2 69 kV Line is exhibiting an upward trend in both minor and major maintenance, with several recent ground-line rejects.
  - 58% Rejection Rate (191 / 327)
  - Overall condition, age, woodpecker holes, broken grounds and insulator bells.
  - 9 line switches on the circuit are aged and do not meet current established design standards
  - Experienced 8 outages in the past 5 years (all sustained)



# 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-2019-055  
**Process Stage:** Solutions Meeting – 07/24/2019  
**Previously Presented:** Need Meeting – 05/20/2019

**Supplemental Project Driver(s):**  
*Customer Service*

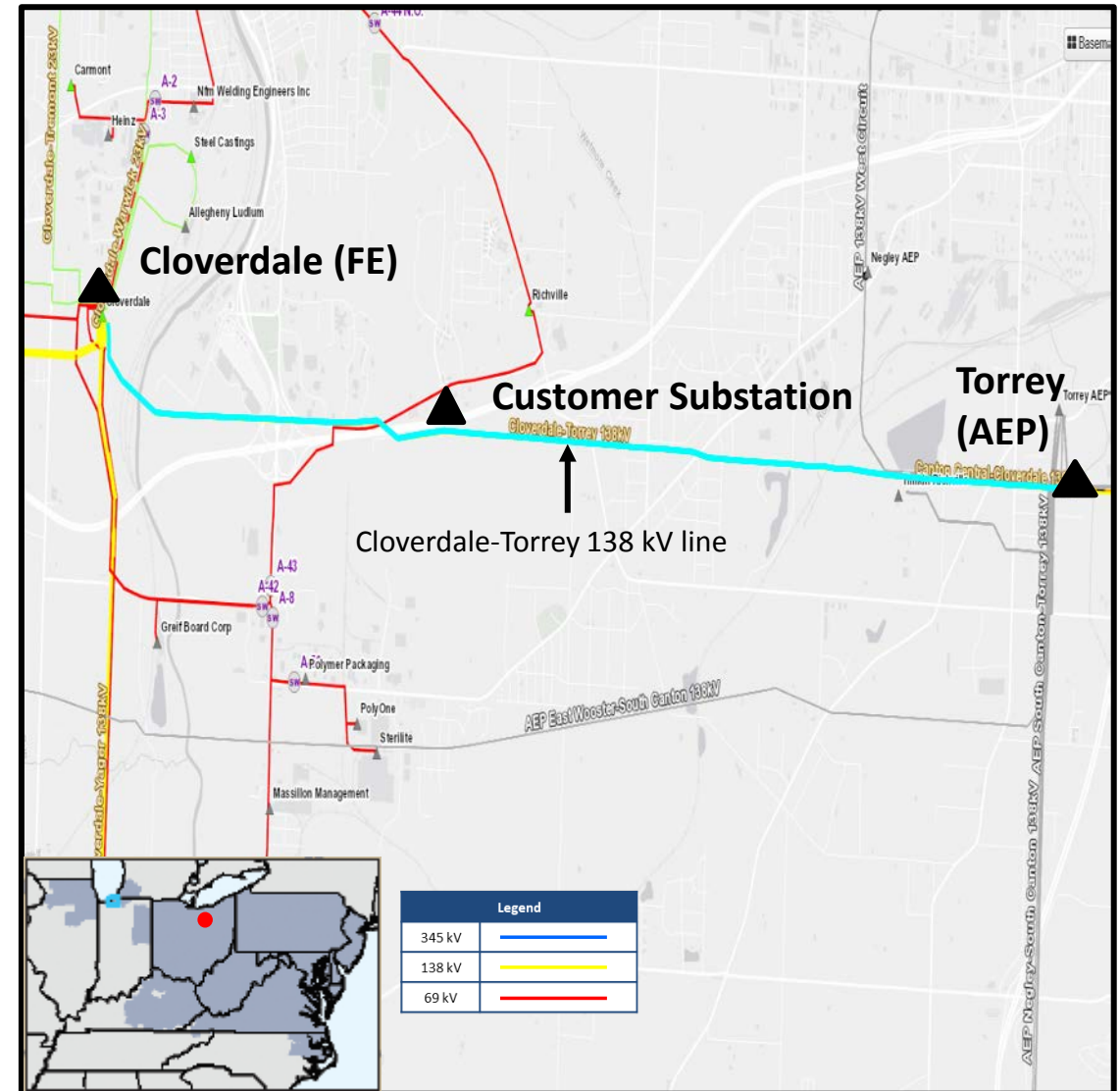
**Specific Assumption Reference(s)**

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

**Problem Statement**

New Customer Connection - A customer requested a 138 kV transmission service for a 138/12.47 kV substation with approximately 17.5 MVA of load be connected to the Cloverdale-Torrey 138 kV line approximately 2.3 miles from Cloverdale 138 kV substation.

**Requested In-Service Date:** 06/01/2020



**Need Number:** ATSI-2019-055  
**Process Stage:** Solutions Meeting – 07/24/2019

**Proposed Solution:**

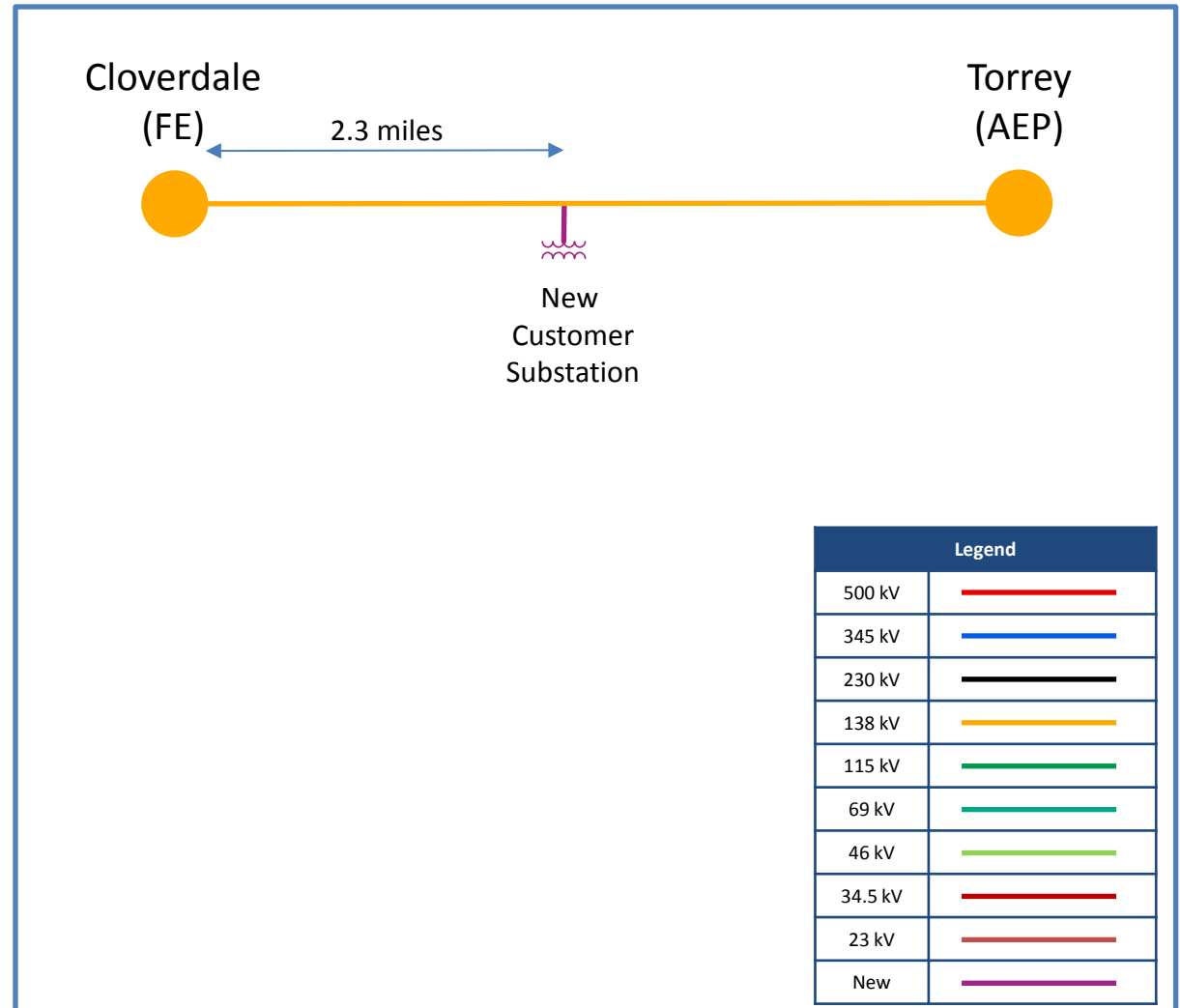
- Tap the Cloverdale-Torrey 138 kV line approximately 2.3 miles from Cloverdale (FE) substation and build a 138 kV line, approximately 0.2 miles, to the proposed customer substation
- Install two (2) 138 kV in-line switches with SCADA control on either side of the new tap connection
- Install one (1) 138 kV in-line switch on the line extension towards the customer substation

Estimated Project Cost: \$ 0.8M

**Alternatives Considered:**

- None (obligation to serve)

**Projected In-Service:** 06/01/2020  
**Project Status:** Conceptual  
**Model:** 2018 Series 2023 Summer RTEP 50/50





**Need Number:** ATSI-2019-056  
**Process Stage:** Solutions Meeting – 07/24/2019  
**Previously Presented:** Need Meeting – 05/20/2019

**Supplemental Project Driver(s):**  
*Customer Service*

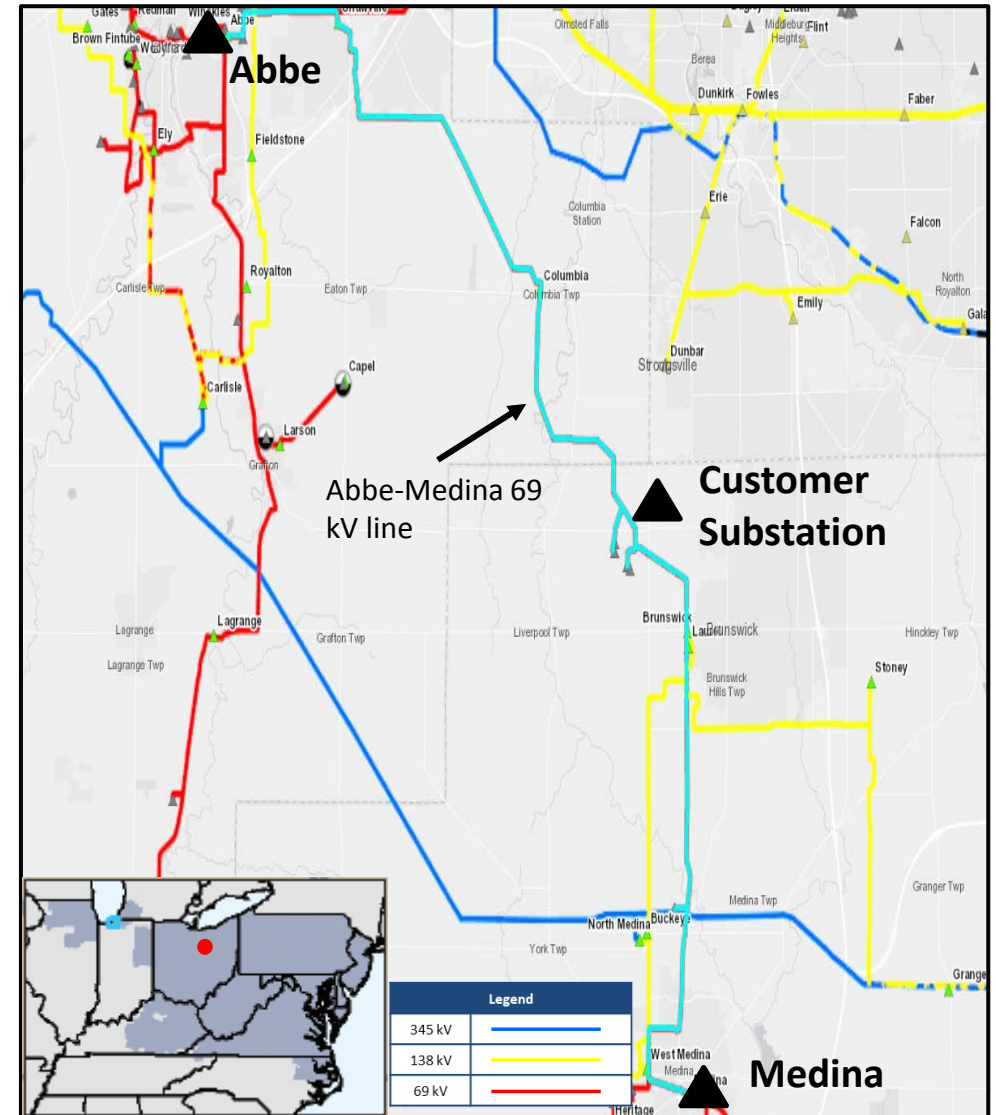
**Specific Assumption Reference(s)**

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

**Problem Statement**

New Customer Connection - A customer requested 69 kV transmission service for a 69/12.47 kV substation with approximately 13 MVA of load be connected to the Abbe-Medina 69 kV line approximately 10.9 miles from Medina 69 kV substation.

**Requested In-Service Date:** 12/31/2020



**Need Number:** ATSI-2019-056  
**Process Stage:** Solutions Meeting – 07/24/2019

**Proposed Solution:**

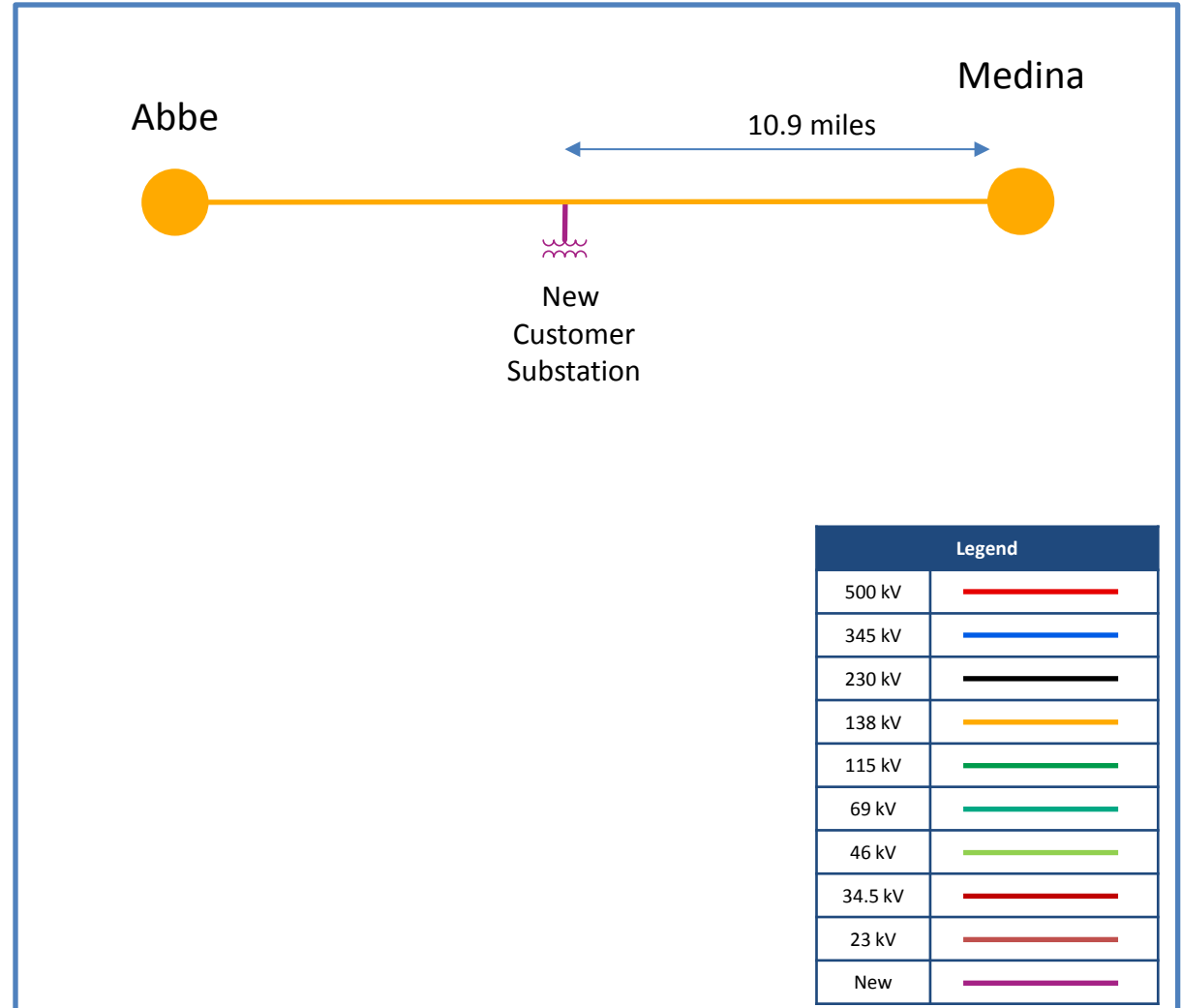
- Tap the Abbe-Medina 69 kV line approximately 10.9 miles from Medina substation and build one 69 kV span to the proposed customer substation
- Install two (2) 69 kV in-line switches with SCADA control on either side of the new tap connection
- Remove switch A-259 from structure # 24 at Marks road south of the proposed customer substation

Estimated Project Cost: \$ 1.4M

**Alternatives Considered:**

- None (obligation to serve)

**Projected In-Service:** 12/31/2020  
**Project Status:** Conceptual  
**Model:** 2018 Series 2023 Summer RTEP 50/50



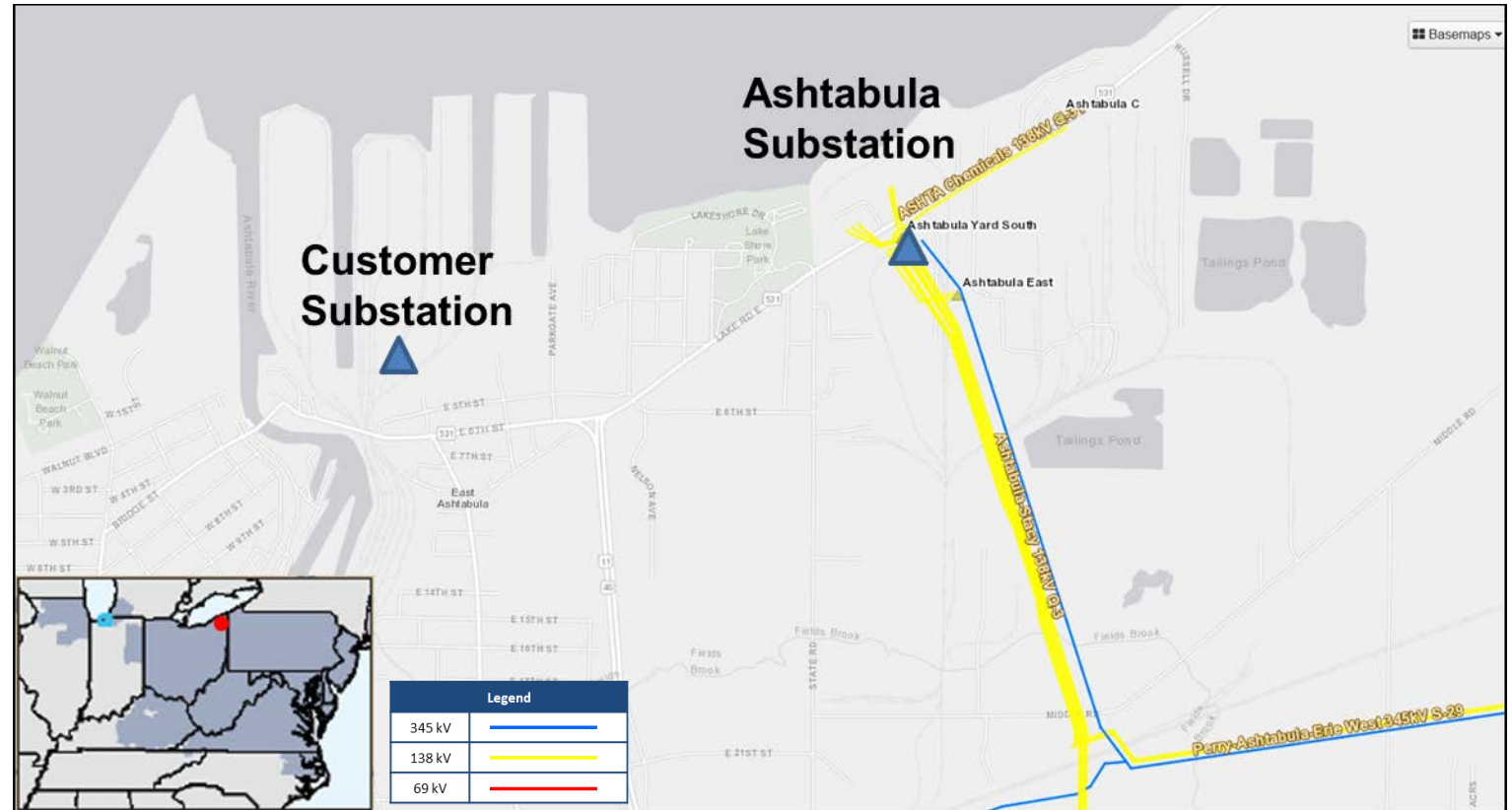
**Need Number:** ATSI-2019-057  
**Process Stage:** Solutions Meeting – 07/24/2019  
**Previously Presented:** Need Meeting – 05/20/2019

**Supplemental Project Driver(s):**  
*Customer Service*

**Specific Assumption Reference(s)**  
 New customer connection request evaluated per FirstEnergy’s “Requirements for Transmission Connected Facilities” document and “Transmission Planning Criteria” document.

**Problem Statement**  
 New Customer Connection - A customer requested 138 kV transmission service approximately 75 MVA of load be connected to the Ashtabula 138 kV substation, approximately 1.7 miles from the customer substation.

**Requested In-Service Date:** 06/01/2020



**Need Number:** ATSI-2019-057  
**Process Stage:** Solutions Meeting – 07/24/2019

**Proposed Solution:**

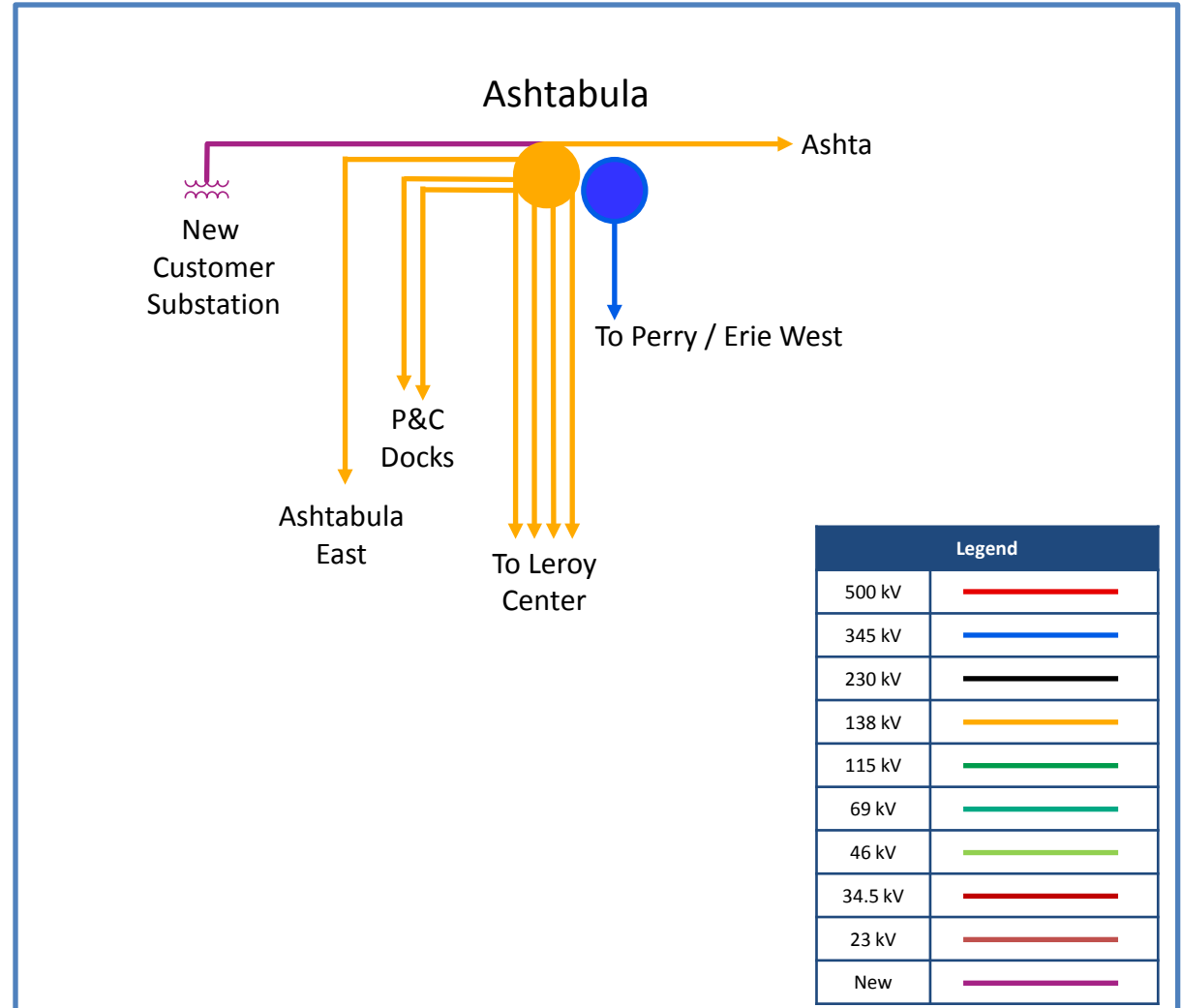
- Build a new 138 kV line (1.5 miles) from Ashtabula substation to the new customer substation with fiber communications for relay coordination.
- Relocate the existing Ashta 138 kV line terminal to make room for the new customer line exit
- Install one 138 kV circuit breaker and protective relaying at Ashtabula substation for the new customer line exit
- New 138 kV circuit ratings: 200 MVA SN/ 242 MVA SE

Estimated Project Cost: \$ 6.2M

**Alternatives Considered:**

- None (obligation to serve)

**Projected In-Service:** 06/01/2020  
**Project Status:** Conceptual  
**Model:** 2018 Series 2023 Summer RTEP 50/50



# 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

7/17/2019 – V1 – Re-posted separately from the APS presentation

7/12/2019 – V1 – Original posting, combined with APS presentation