Subregional RTEP Committee - Western
FirstEnergy Supplemental Projects

August 15, 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

APS Transmission Zone M-3 Process
Leadsville – Loughs Lane 138 kV Misoperation Relays

Need Numbers: APS-2024-112

Process Stage: Solution Meeting – 08/15/2025

Previously Presented: Need Meeting – 12/13/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

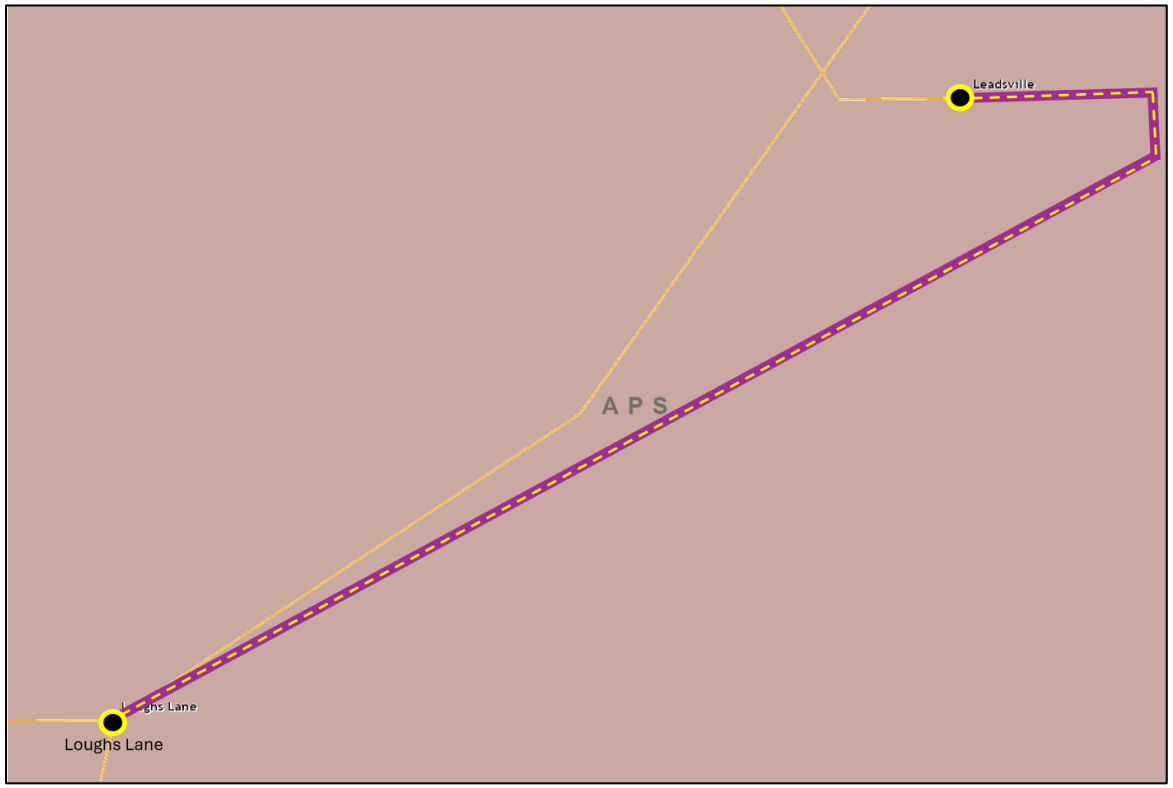
- Substation Condition Rebuild/Replacement

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cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.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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APS Transmission Zone M-3 Process
Leadsville – Loughs Lane 138 kV Misoperation Relays

Need #	Transmission Line / Substation Locations	Existing Line Rating MVA (SN / SE / WN / WE)	Existing Conductor Rating MVA (SN / SE / WN / WE)
APS-2024-112	Leadsville – Loughs Lane 138 kV Line	169 / 213 / 217 / 229	169 / 213 / 217 / 280

APS Transmission Zone M-3 Process
Leadsville – Loughs Lane 138 kV Misoperation Relays

Need Number: APS-2024-112

Process Stage: Solution Meeting 08/15/2025

Proposed Solution:

- Replace 138 kV relaying at Leadsville Substation
- Replace 138 kV circuit breaker, line tuner and coax, CVT, and relaying at Loughs Lane Substation

Transmission Line Ratings:

- Leadsville – Loughs Lane 138 kV Line:
  - Before Proposed Solution: 169 / 213 / 217 / 229 MVA (SN / SE / WN / WE)
  - After Proposed Solution: 169 / 213 / 217 / 280 MVA (SN / SE / WN / WE)

Alternatives Considered:

- Maintain equipment in existing condition with elevated risk of equipment misoperation.

Estimated Project Cost: $2.30M

Projected In-Service: 9/28/2029

Project Status: Conceptual

Model: 2024 RTEP model for 2029 Summer (50/50)

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

APS Transmission Zone M-3 Process
Weirton - Wylie Ridge 138 kV Misoperation Relays

Need Numbers: APS-2024-025

Process Stage: Solution Meeting – 08/15/2025

Previously Presented: Need Meeting – 02/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

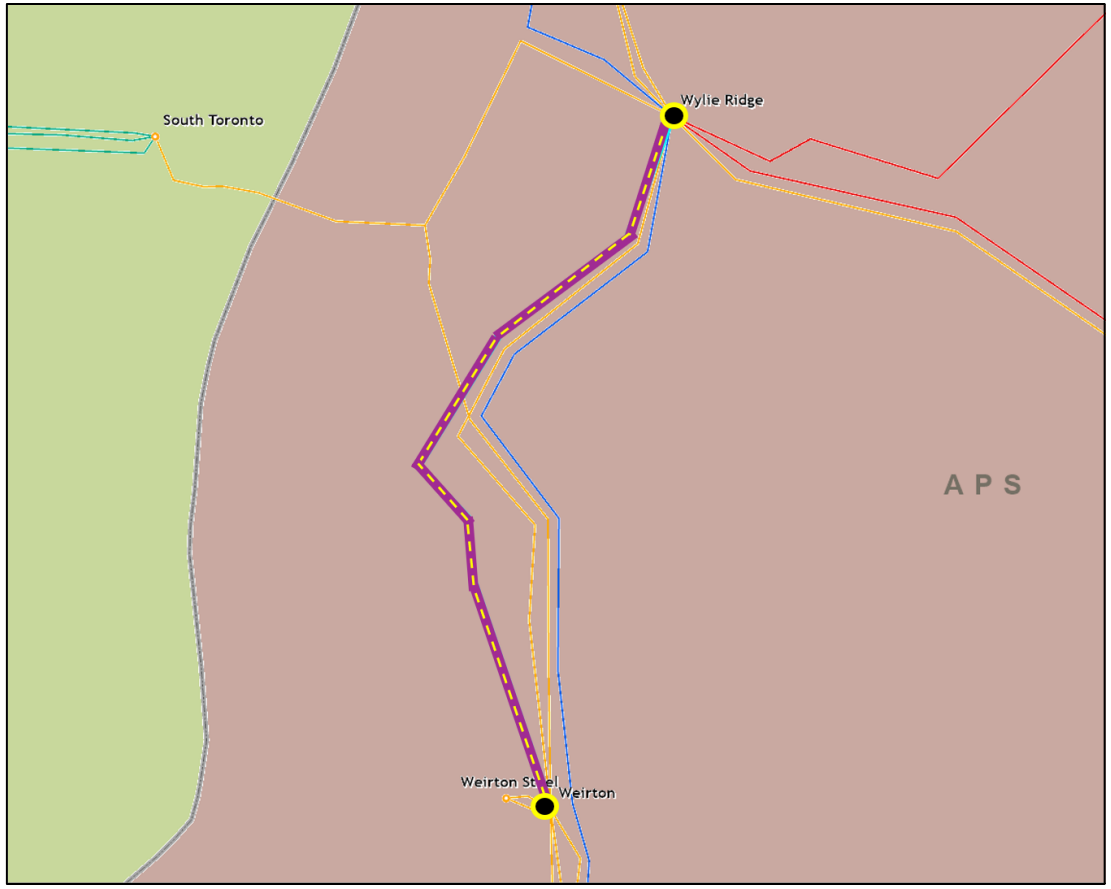
- Substation Condition Rebuild/Replacement

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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APS Transmission Zone M-3 Process
Weirton - Wylie Ridge 138 kV Misoperation Relays

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE / WN / WE)	Existing Conductor Rating (SN / SE / WN / WE)
APS-2024-025	Weirton – Wylie Ridge 138 kV No. 2 Line	225 / 295 / 306 / 306	308 / 376 / 349 / 445

APS Transmission Zone M-3 Process
Weirton - Wylie Ridge 138 kV Misoperation Relays

Need Number: APS-2024-025

Process Stage: Solution Meeting 08/15/2025

Proposed Solution:

- Replace 138 kV disconnect switches, line trap, substation conductor, line tuners, CCVT, and relaying at Weirton Substation.
- Replace 138 kV circuit breakers, disconnect switches, line trap, substation conductor, CCVT, and relaying at Wylie Ridge Substation.

Transmission Line Ratings:

- Weirton – Wylie Ridge 138 kV No. 2 Line:
  - Before Proposed Solution: 225 / 295 / 306 / 306 MVA (SN / SE / WN / WE)
  - After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN / SE / WN / WE)

Alternatives Considered:

- Maintain equipment in existing condition with elevated risk of equipment misoperation.

Estimated Project Cost: $4.50M

Projected In-Service: 07/20/2029

Project Status: Conceptual

Model: 2024 RTEP model for 2029 Summer (50/50)

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

APS Transmission Zone M-3 Process
Rider – Weston 138 kV Line: Customer Connection

Need Number: APS-2025-011

Process Stage: Solution Meeting – 08/15/2025

Previously Presented: Need Meeting – 4/11/2025

Project Driver(s): Customer Service

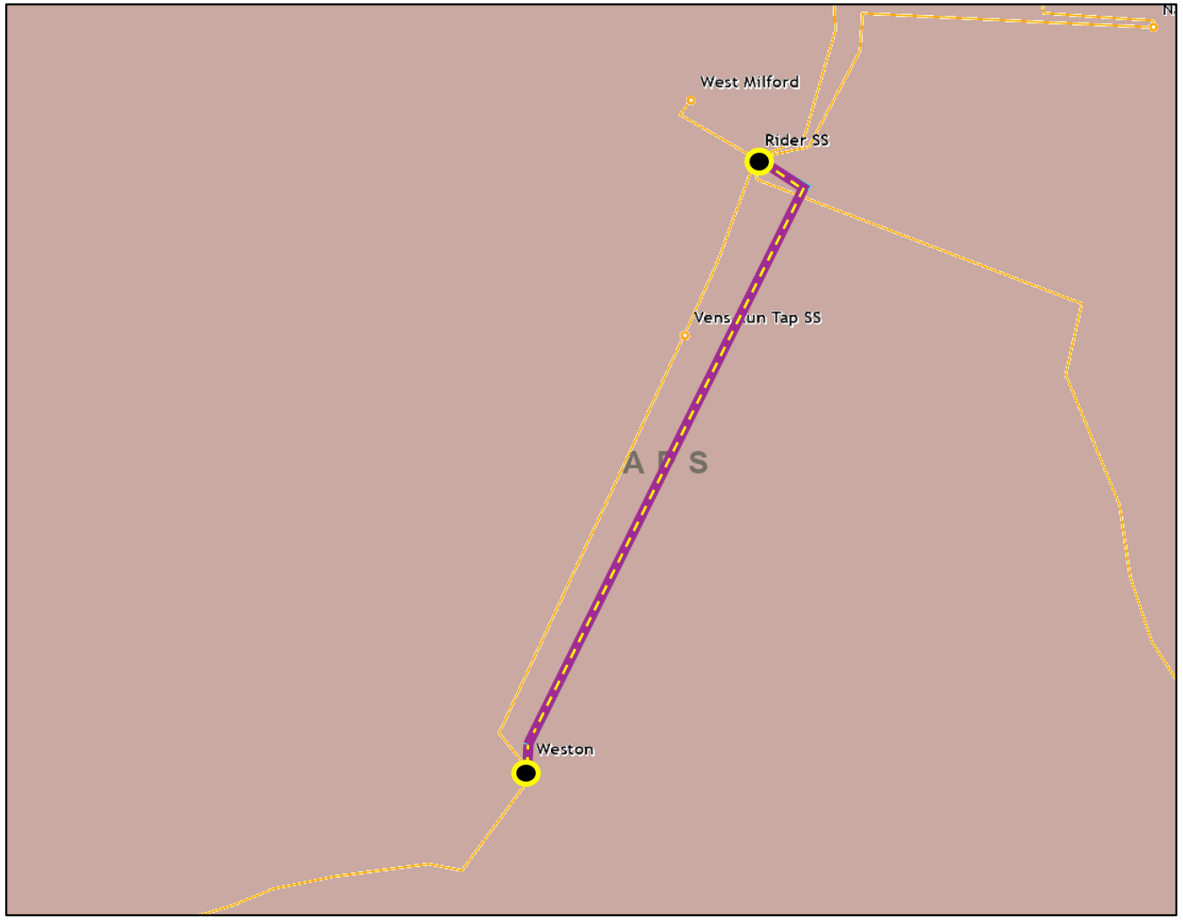
Specific Assumption Reference(s):

Customer connection request will be evaluated per FirstEnergy's "Requirements for Transmission Connected Facilities" document and "Transmission Planning Criteria" document.

Problem Statement:

New Customer Connection – A customer requested a new 138 kV delivery point near the Rider - Weston 138 kV Line. The requested delivery point is approximately 4.58 miles from Weston Substation. The anticipated load of the new customer connection is 22.4 MVA.

Requested in-service date is 12/31/2027



APS Transmission Zone M-3 Process
Rider – Weston 138 kV Line: Customer Connection

Need Number: APS-2025-011

Process Stage: Solution Meeting – 08/15/2025

Proposed Solution:

138 kV Transmission Line Tap

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

Alternatives Considered:

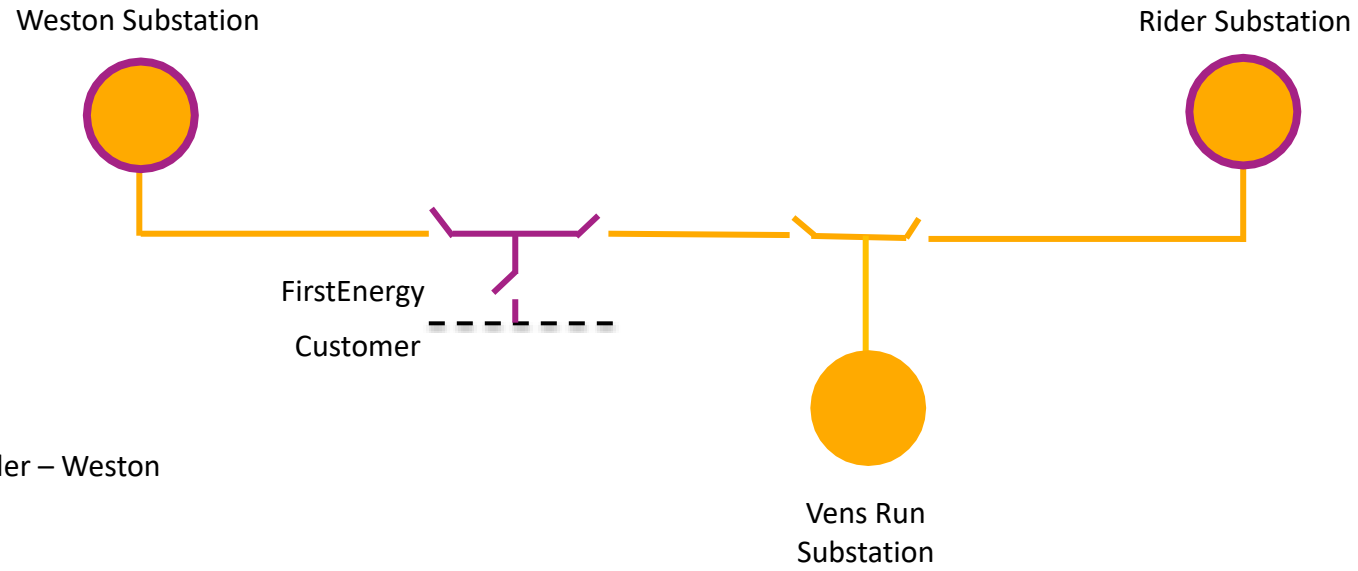
- No reasonable alternatives to meet customer's request due to proximity to Rider – Weston 138 kV Line.

Estimated Project Cost: $0.92 M

Projected In-Service: 4/29/2028

Status: Conceptual

Model: 2024 RTEP model for 2029 Summer (50/50)



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

APS Transmission Zone M-3 Process
Gore - Hampshire 138 kV Line

Need Numbers: APS-2024-029

Process Stage: Solution Meeting 08/15/2025

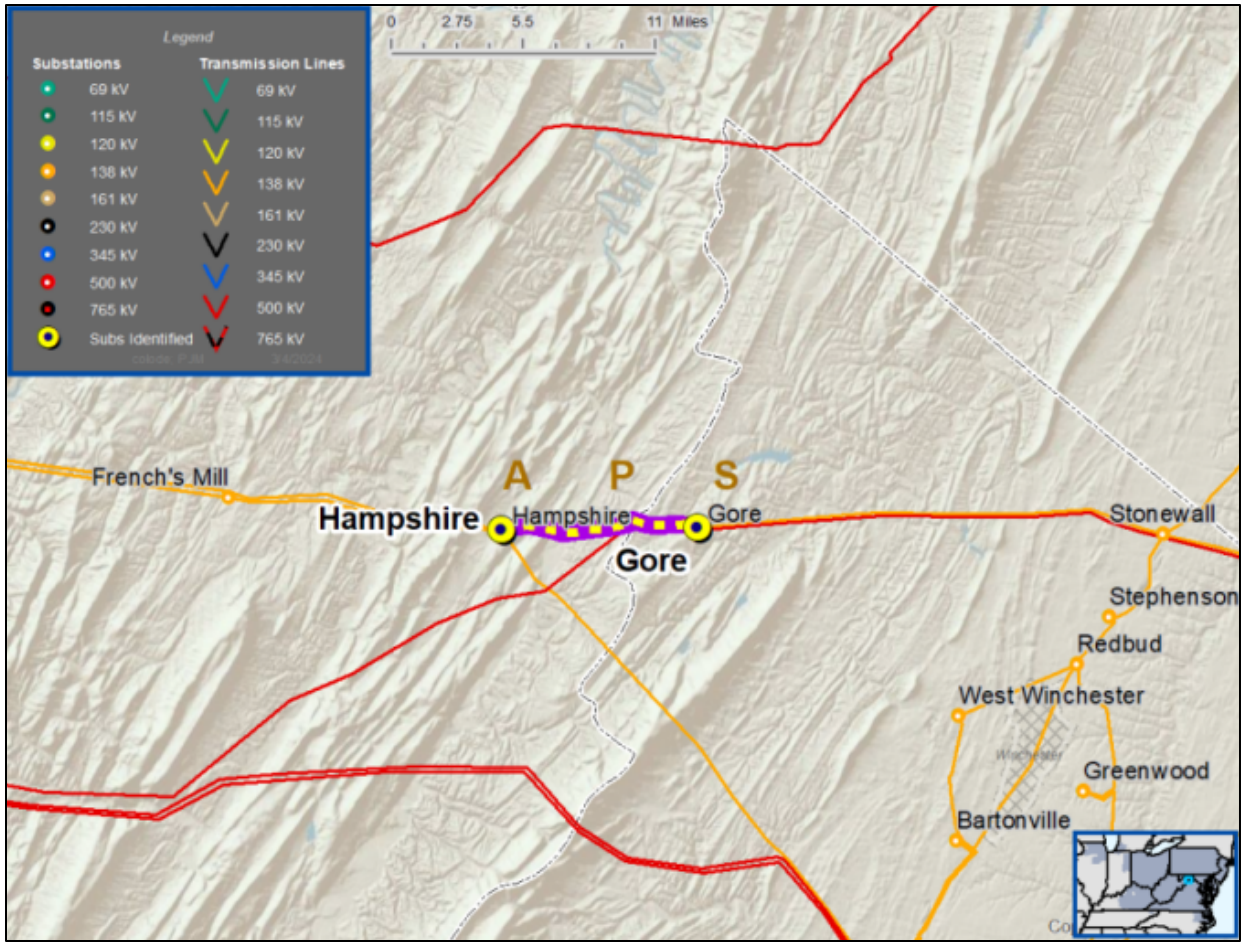
Previously Presented: Need Meeting 03/15/2024

Project Driver:
- *Equipment Material Condition, Performance and Risk*

Specific Assumption Reference:
System Performance Global Factors
- Past system reliability/performance

Line Condition Rebuild/Replacement
- Age/condition of wood pole transmission line structures

Problem Statement:
- The Gore – Hampshire 138 kV Line was constructed in 1956. The line is approximately 6.4 miles long with 51 wood pole structures.
- Recent inspections have indicated that the 49 (96% of total) structures are exhibiting deterioration. Inspection findings include decay, sound test failure, phase raisers and woodpecker damage.
- Since 2014, the line has had one unplanned outage.
- Existing Gore – Hampshire 138 kV line and conductor rating:
  - 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)



APS Transmission Zone M-3 Process
Gore - Hampshire 138 kV Line

Need Number: APS-2024-029

Process Stage: Solution Meeting 08/15/2025

Proposed Solution:

- Rebuild Gore – Hampshire 138 kV Line approximately 6.4 miles and install new conductor
- At Gore Substation, replace substation conductor and disconnect switches.
- At Hampshire Substation, replace substation conductor.

Transmission Line Ratings:

Gore – Hampshire 138 kV Line

- Before Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)
- After Proposed Solution: 448 / 516 / 448 / 543 MVA (SN/SE/WN/WE)

Alternatives Considered:

- Maintain line in existing condition with elevated risk of failure due to deterioration.

Estimated Project Cost: $23.12M

Projected In-Service: 12/29/2028

Project Status: Conceptual

Model: 2024 RTEP model for 2029 Summer (50/50)

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 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

8/05/2025– V1 – Original version posted to pjm.com