



Helping to keep the lights on,
businesses running
and communities strong

2016 10-Year Assessment Preliminary Solutions

Stakeholder and Customer Presentation – May 26, 2016
Jeremy Voigt

Purpose

- Summarize Asset Renewal Solution Identification Process
- Summarize Preliminary Changes to Solutions
- Solicit Input on Solutions
- Solicit Input on Public Policy Driven Solutions
- Review Next Steps

Comment - Asset Renewal (AR) Solution Identification

- ATC identifies AR need (slide 10 of needs presentation)
- ATC assesses long term need for facility
- ATC defines minimum ratings
- ATC develops potential solutions
- ATC adds potential solution to project list
- ATC shares potential solution with affected customer(s)
 - Ad hoc communication
 - Periodic ATC/Customer Distribution Planning meetings
- Customer may share impacts/questions
- ATC confirms need for facility for larger projects
- ATC modifies/develops project

Summary of Preliminary Solutions

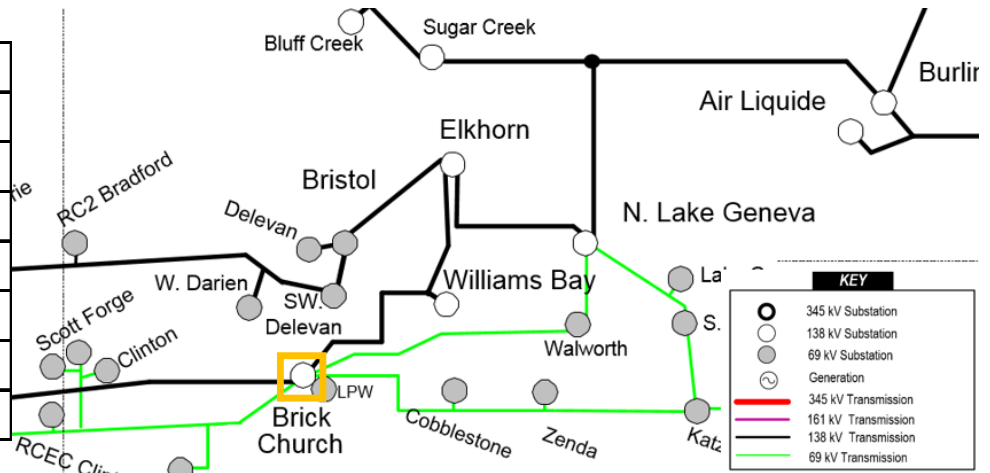
- Solutions identified since the 2015 TYA
 - Contingency: 7
 - T-D: 5
 - Asset Renewal: 13
- Continuing Solutions
 - Numerous
- Eliminated Solutions
 - Contingency: 7

Looking for stakeholder input on the following presentation

Contingency Need: Brick Church 138/69-kV Transformer Loading

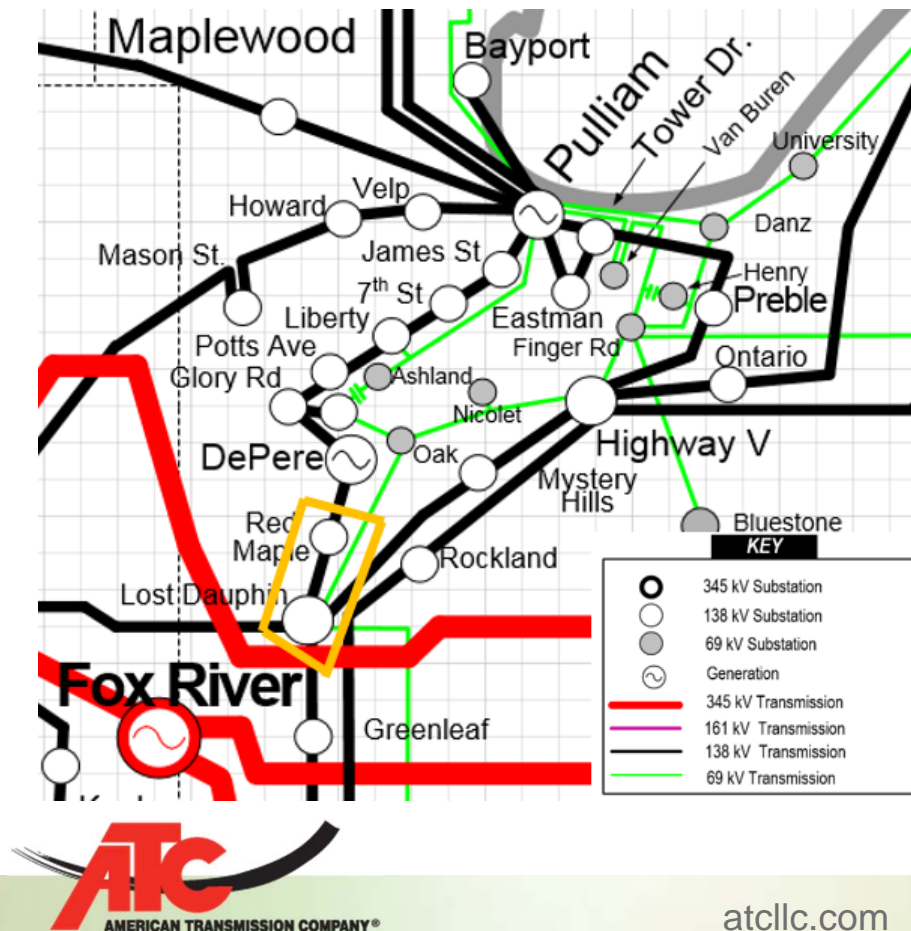
- Solution: Resolve current transformer limitation
- ISD: 2017

Model Year	Emergency Loading	Contingency Type
2017 Peak	104%	P1-3
2021 Peak	105%	P1-3
2026 Peak	125%	P1-3
2021 Shoulder	<95%	
2026 Shoulder	<95%	
2017 Minimum	<95%	
2021 Minimum	<95%	



Contingency Need: Lost Dauphin to Red Maple 138-kV Overload

- Solution: Replace select jumpers at Lost Dauphin 138-kV
- ISD: 2018
- MTEP ID: 9930
- Targeted B MTEP16
- Target A MTEP17

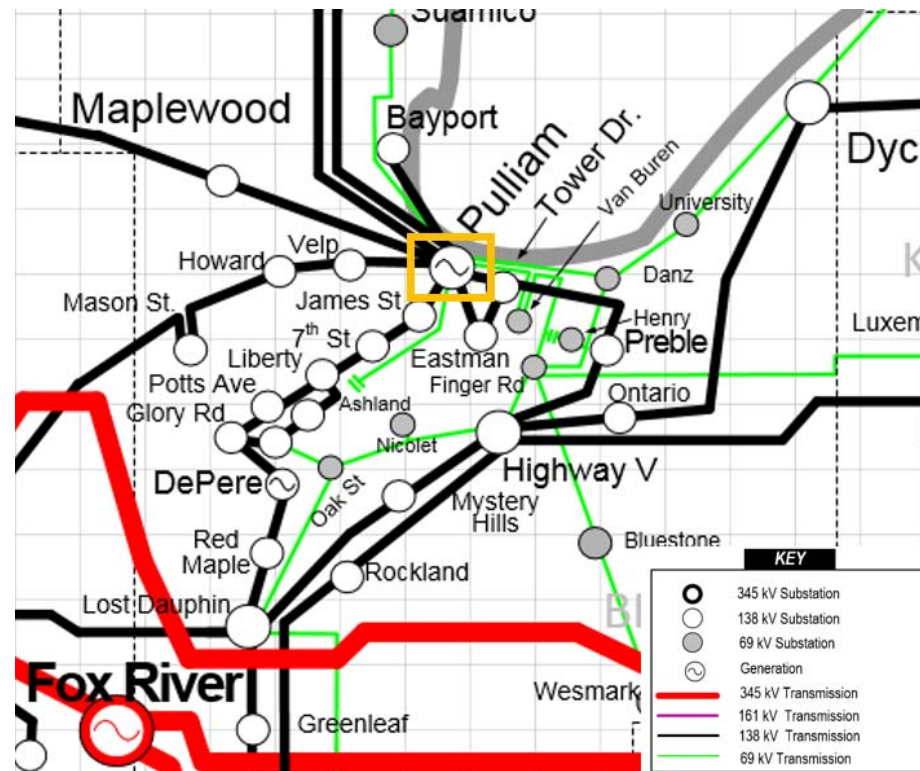


Contingency Need: High 345-kV Voltages

- Solution: Purchase spare 345-kV reactor
- ISD: 2017
- Target A MTEP17

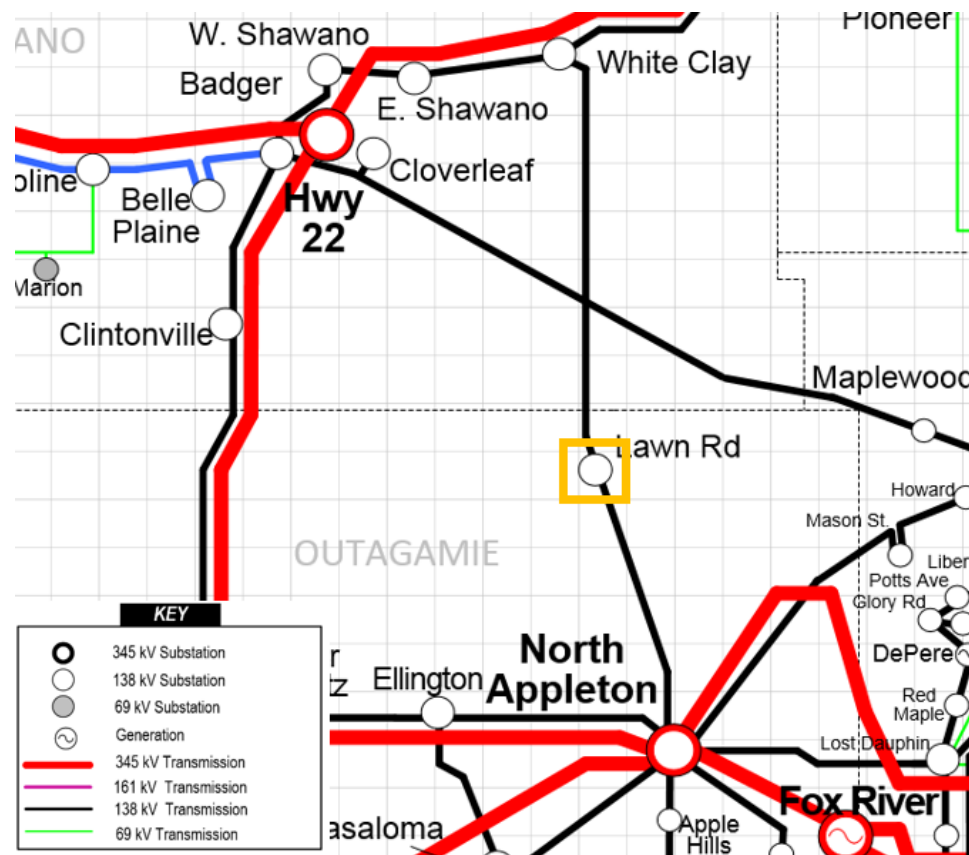
Contingency Need: Pulliam 138-kV P5.5

- Solution: Install redundant bus differential at Pulliam 138-kV
- ISD: 2019



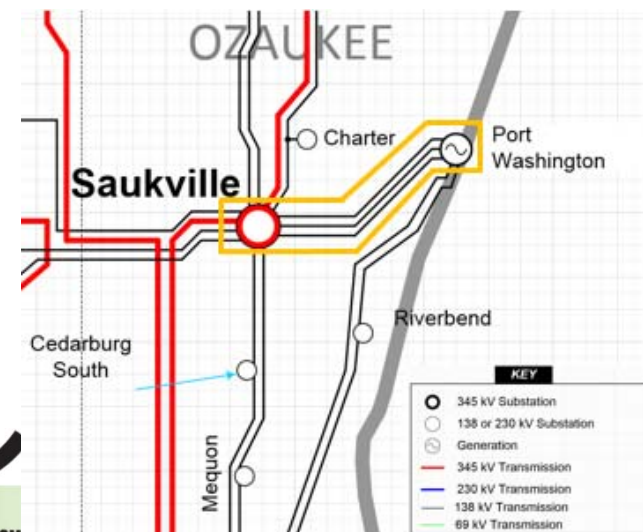
Contingency Need: Lawn Rd 138-kV Charging Current

- Solution: Install line breakers at Lawn Rd 138-kV
- ISD: 2018
- Target A MTEP17



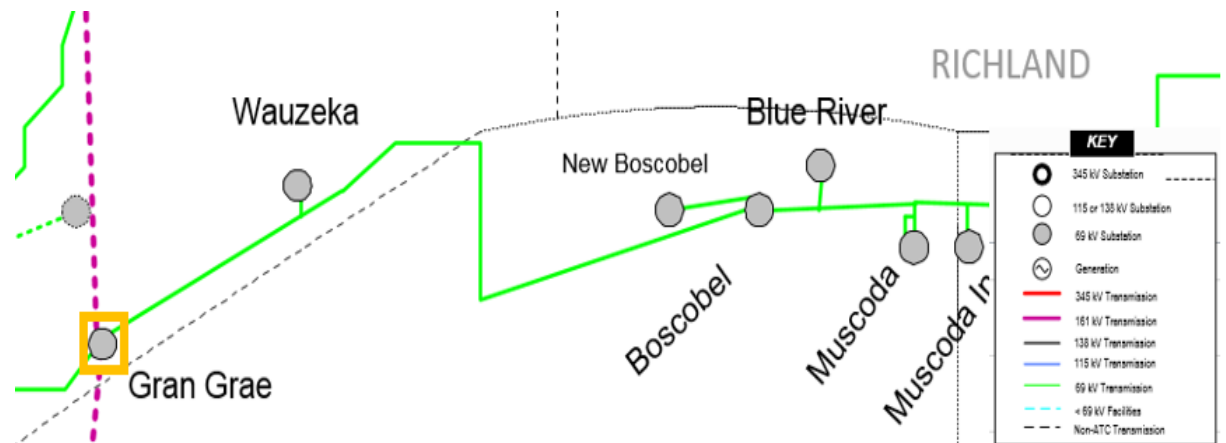
Contingency Need: P2/P7 Potential Cascading

- Significant annual exposure, ~300 MW load, >600 MW generation
- Solution: Rebuild single circuit Port Washington to Saukville 138-kV to a double circuit
- Replaces “Port Washington - Saukville 138-kV line uprate 742” and “Port Washington - Saukville 138-kV line uprate 762”
- ISD: 2021
- MTEP ID: 9986
- Targeted A MTEP16



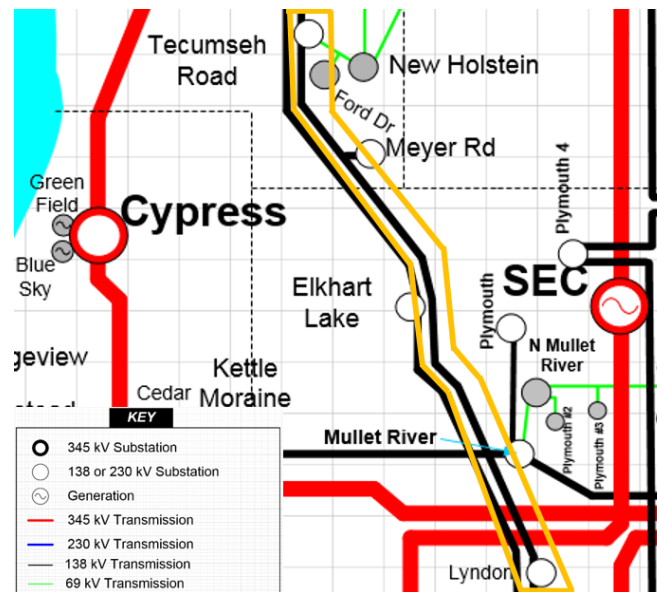
Contingency Need: Low Voltages and Overloads during Long Lead Time Outage of Gran Grae 161/69-kV Transformer

- Solution: Install a Second 161/69-kV Transformer at Gran Grae Substation
- Replaces “Spring Green substation: Install a second 138/69-kV transformer” and “Boscobel 69 kV Substation: Install 1-8.16 Mvar capacitor bank “
- ISD: 2026



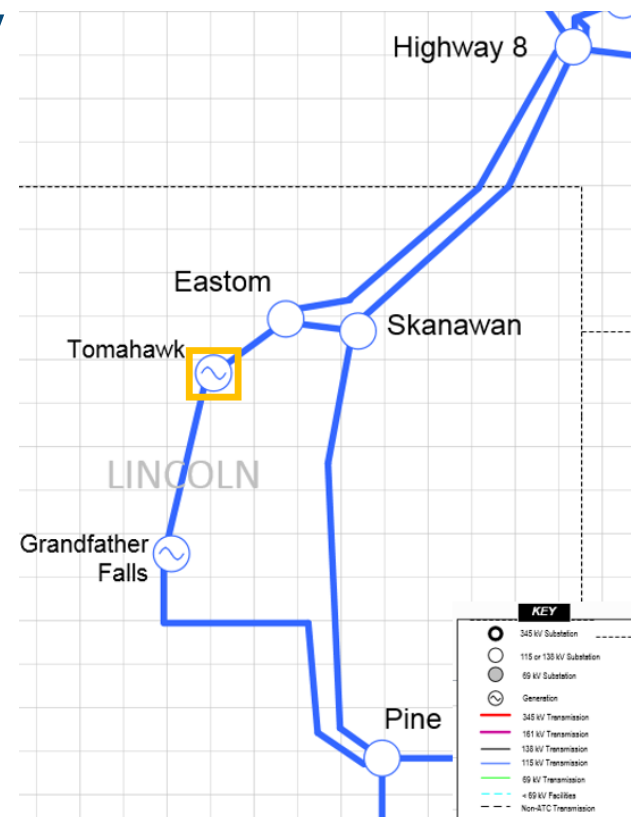
T-D Need: New 138/24.9 kV Transformer near Tecumseh Rd to Lyndon 138-kV Line

- Solution: New Esker View Substation
- Loop Tecumseh Rd to Lyndon 138-kV line into a new substation with 138/24.9-kV transformer, 138-kV bus tie breaker, and two 138-kV line breakers
- ISD: 2017
- MTEP ID: 7780
- Appendix A



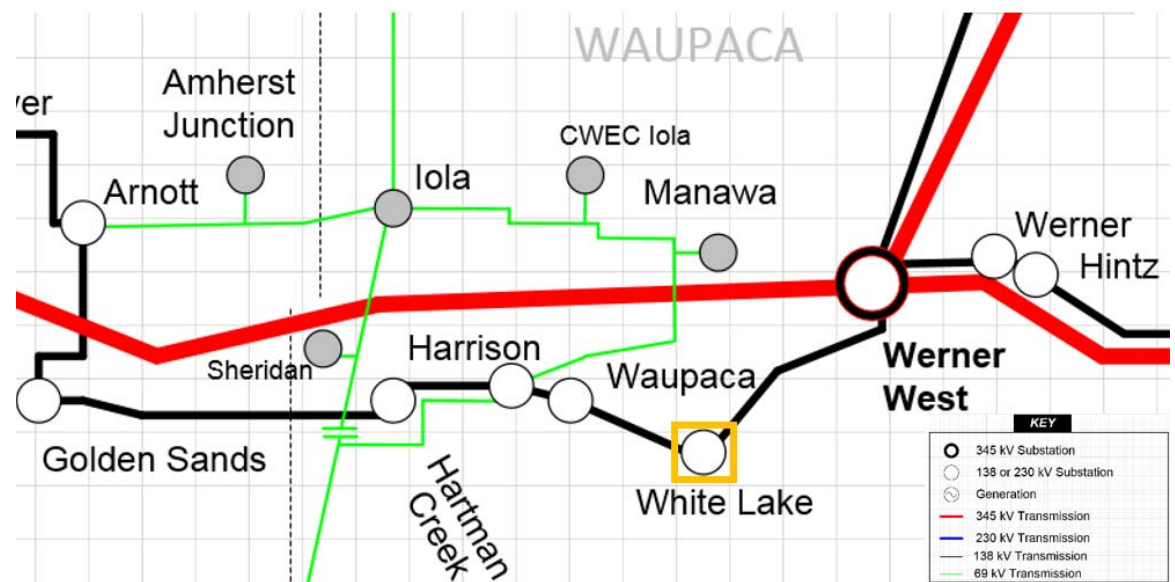
T-D Need: New 115/24.9 kV Transformer at Tomahawk 115-kV

- Solution: Install 115/24.9-kV transformer and 115-kV bus tie breaker at Tomahawk 115-kV
- ISD: 2017
- MTEP ID: 10685
- Targeted A MTEP16



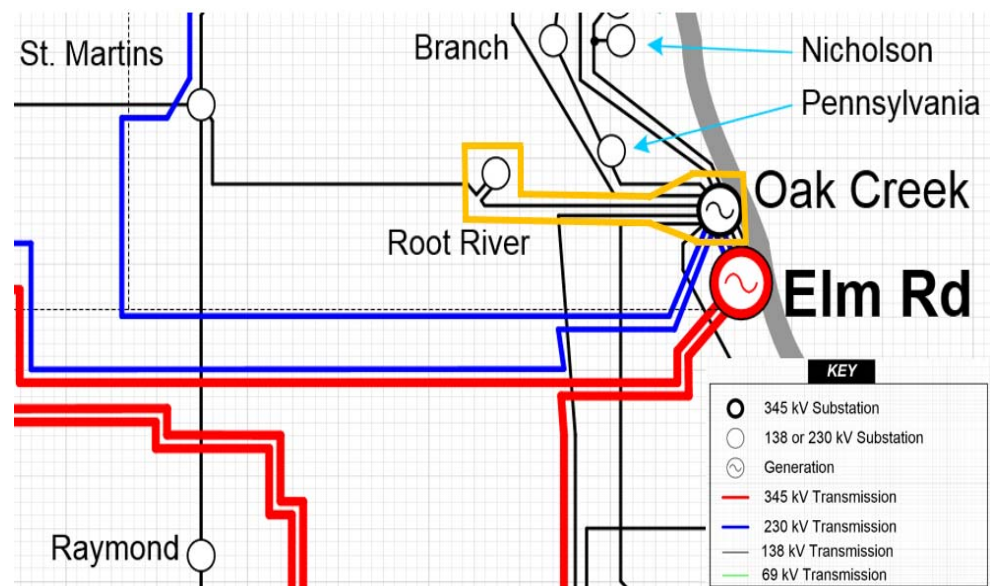
T-D Need: New 138/34.5-kV Transformer at White Lake 138-kV

- Solution: Install 138/34.5-kV transformer and 138-kV line breaker at White Lake 138-kV
- ISD: 2017
- MTEP ID: 11224
- Targeted A MTEP16



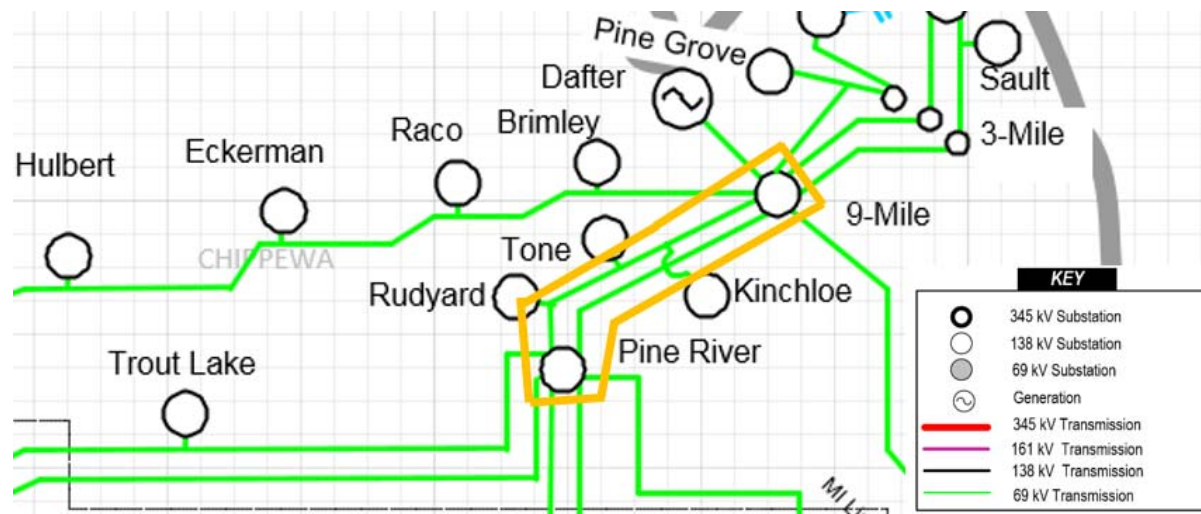
T-D Need: New 138/24.9-kV Transformer near Oak Creek to Root River 138-kV Line

- Solution: New Oakview Substation
- Loop Oak Creek to Root River 138-kV line into a new substation with 138/24.9-kV transformer and two 138-kV line breakers
- ISD: 2018
- MTEP ID: 10563
- Targeted A MTEP16



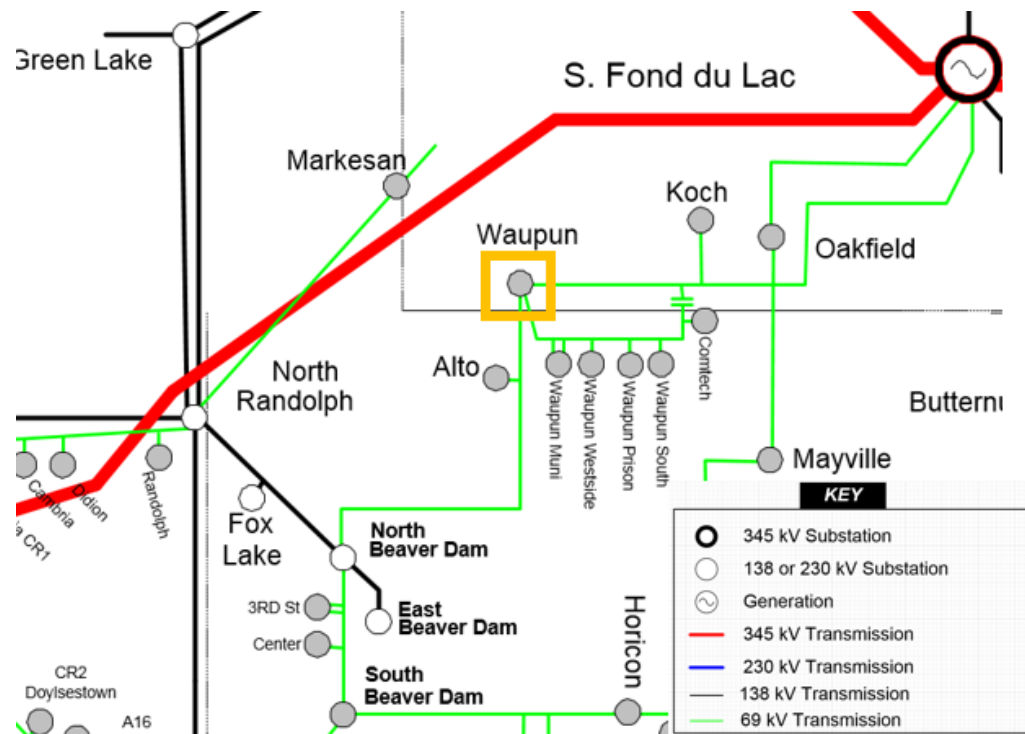
AR Need: 9 Mile to Pine River 69-kV Line and 9 Mile 69-kV Substation

- Solutions: Re-insulate, replace selected poles & cross arms on 9 Mile to Pine River 69-kV line; Add MOD at Nine Mile 69-kV
- ISD MOD: 2018
- ISD Rest: 2025



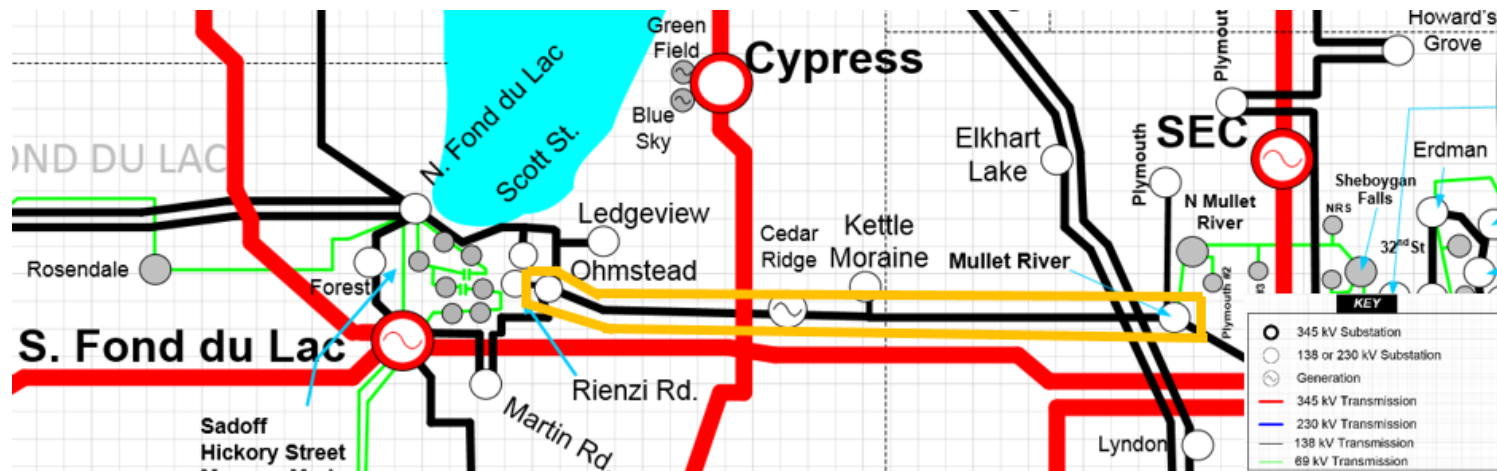
AR Need: Waupun 69-kV Substation

- Solution: Add 69-kV line breaker at Waupun 69-kV to sectionalize Waupun to Waupun Main 69-kV
- ISD: 2018
- Target A MTEP17



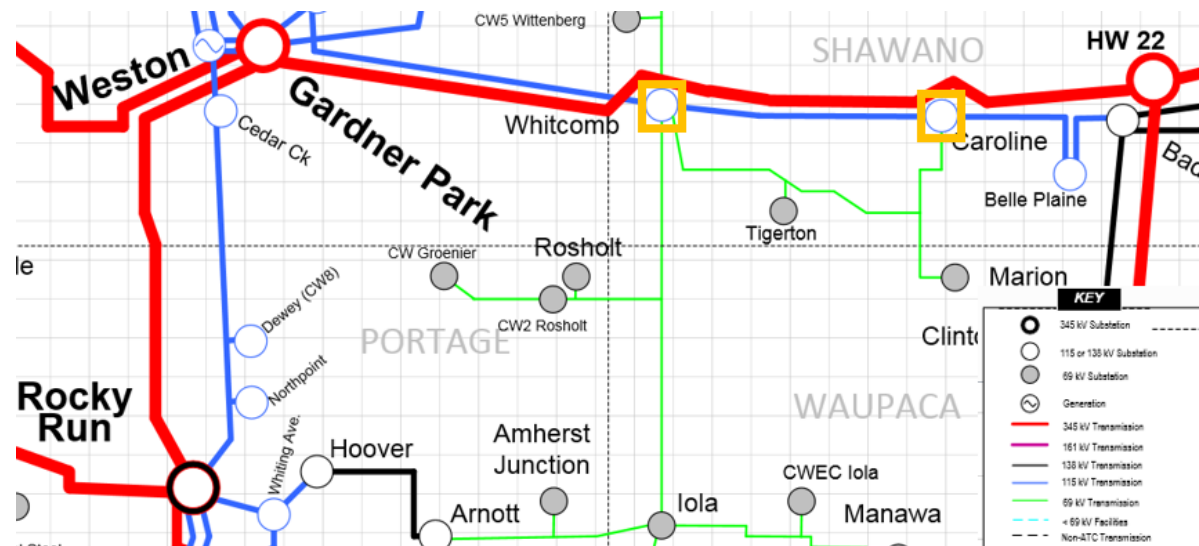
AR Need: Ohmstead to Cedar Ridge Wind 138-kV and Cedar Ridge Wind to Mullet River 138-kV

- Solution: Rebuild Ohmstead to Cedar Ridge Wind 138-kV and Cedar Ridge Wind to Mullet River 138-kV
- ISD: 2019
- Target A MTEP17



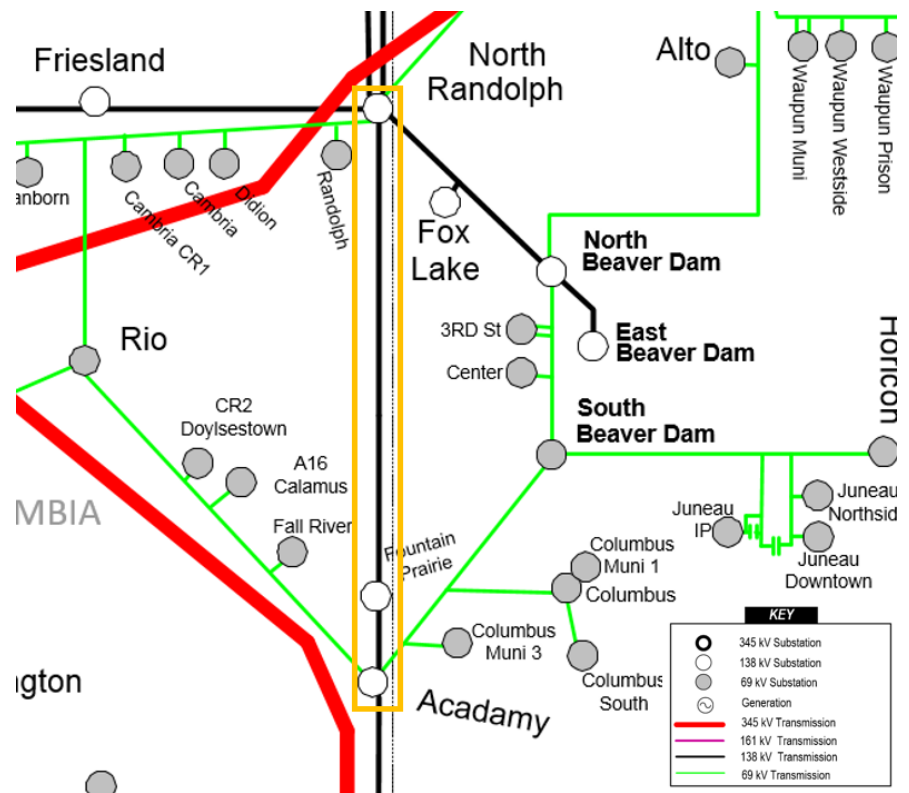
AR Need: Whitcomb 115/69-kV T31 and Caroline 115/69-kV T31

- Solutions: Replace Whitcomb 115/69-kV T31 and Caroline 115/69-kV T31
- ISD: 2020
- Target B MTEP17



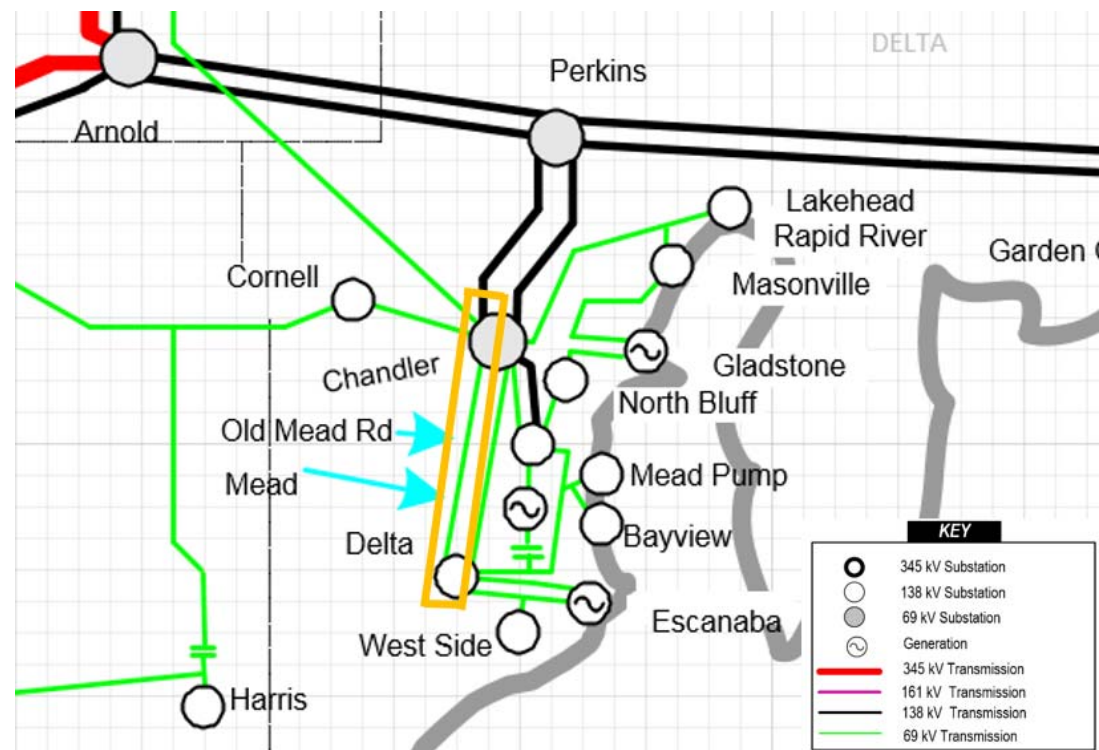
AR Need: Academy to North Randolph 138-kV Line

- Solution: Re-insulate Academy to North Randolph 138-kV line
- ISD: 2021



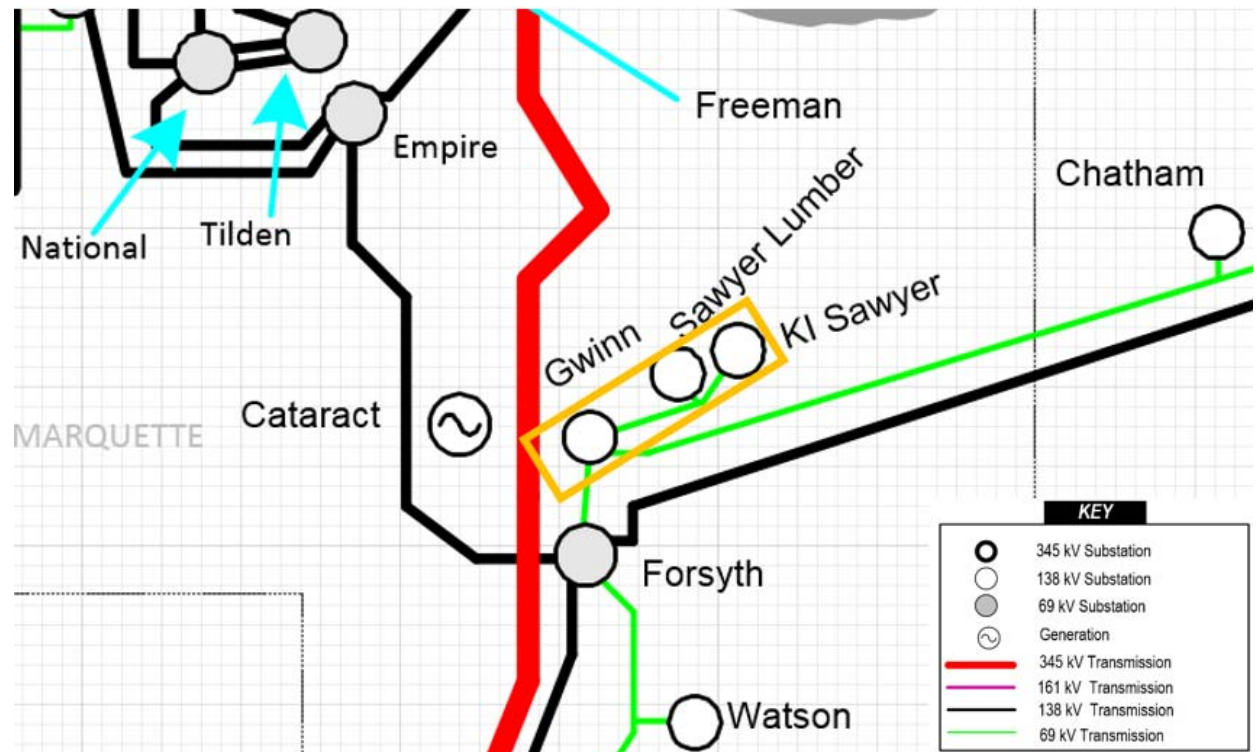
AR Need: Chandler to Delta 69-kV Line

- Solution: Re-insulate and replace selected poles on Chandler to Delta 69-kV line
- ISD: 2023



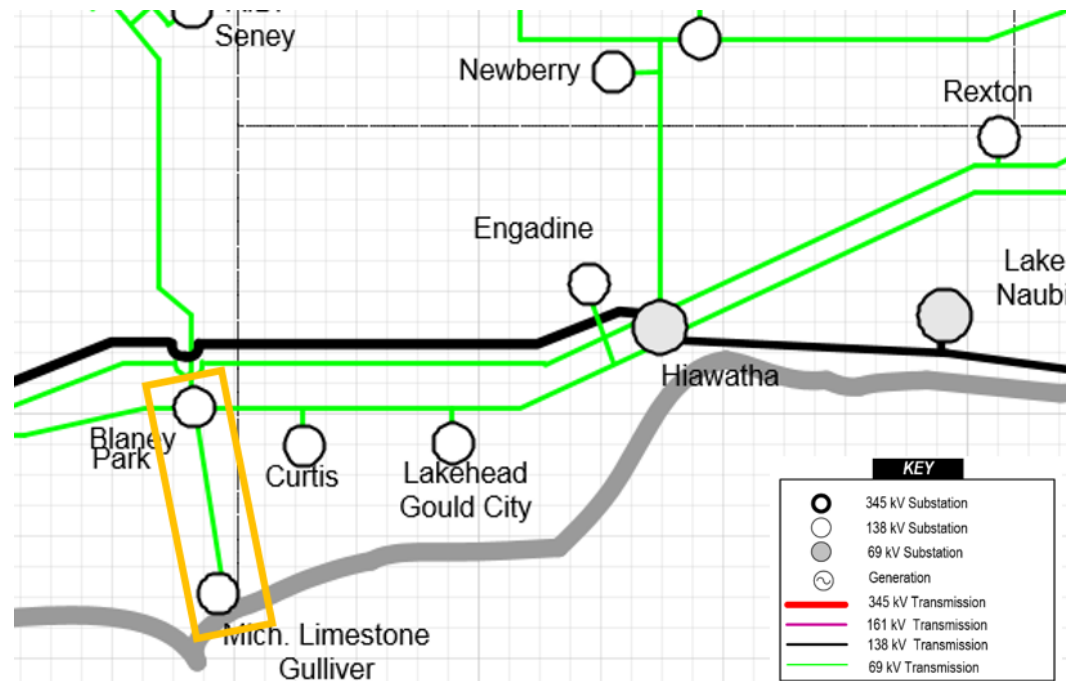
AR Need: Gwinn to KI Sawyer 69-kV Line

- Solution: Re-insulate Gwinn to KI Sawyer 69-kV line
- ISD: 2023



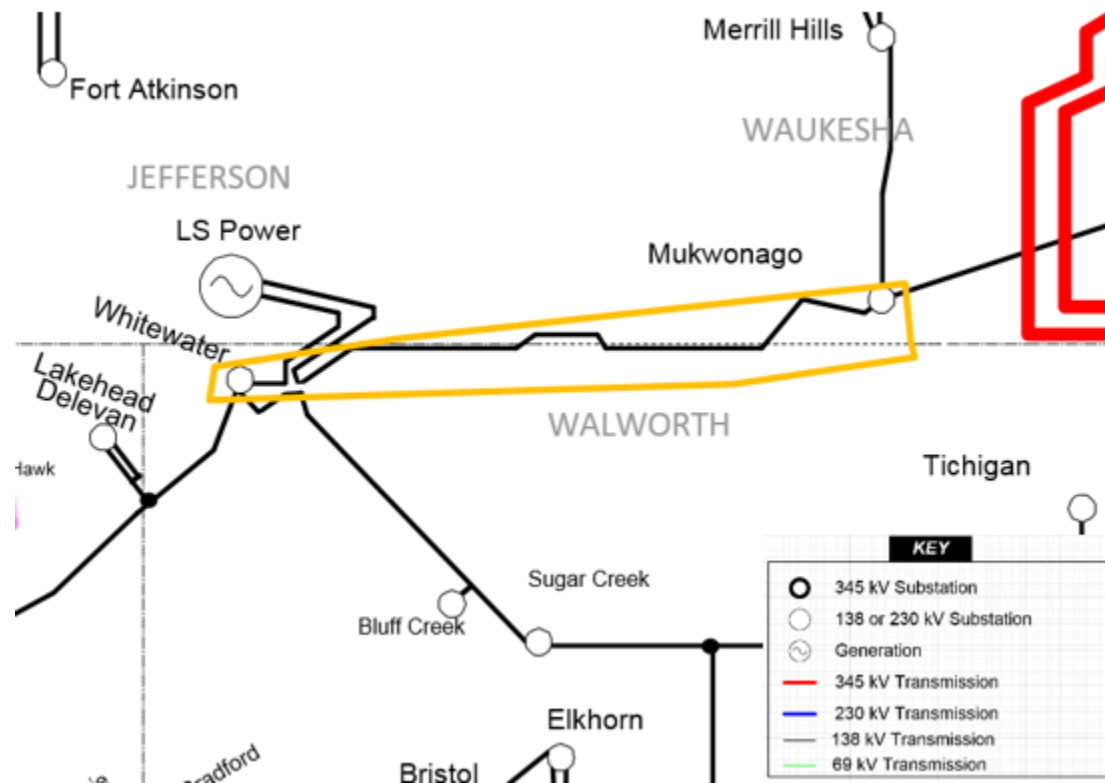
AR Need: Blaney Park to Michigan Limestone Quarry Tap 69-kV Line

- Solution: Re-insulate and replace selected poles and cross arms on Blaney Park to Michigan Limestone Quarry Tap 69-kV line
- ISD: 2025



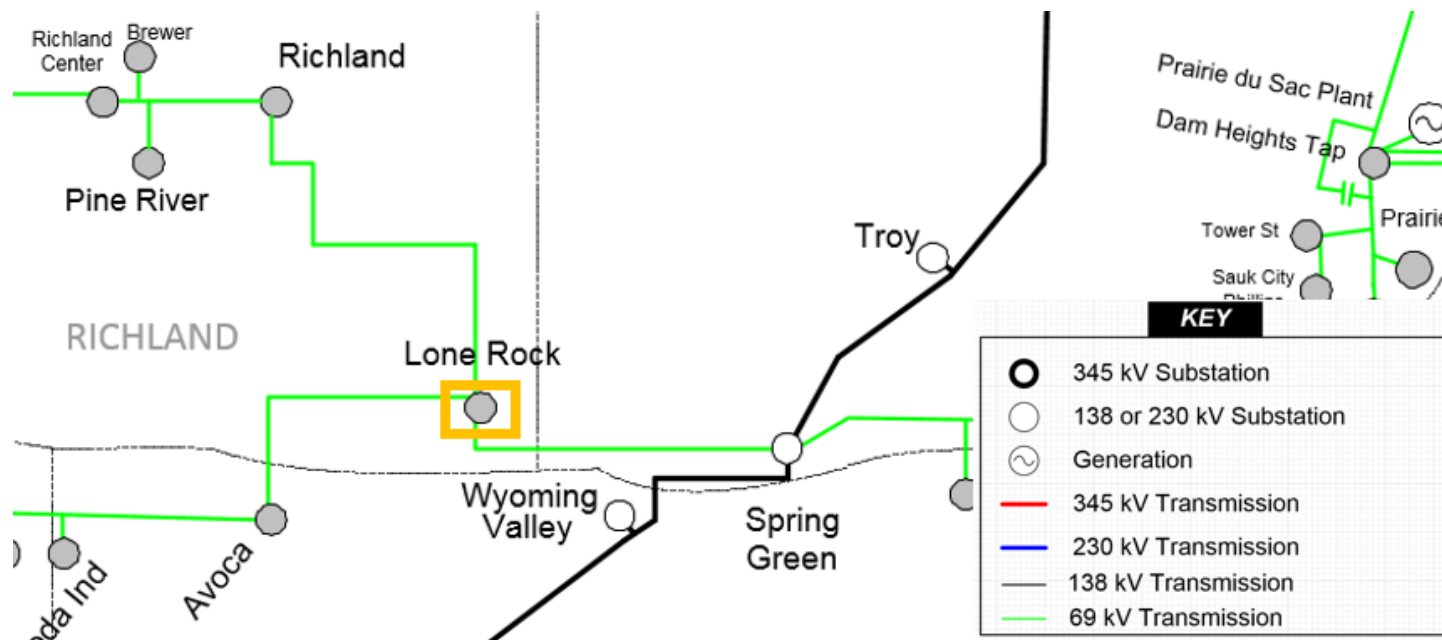
AR Need: Mukwonago to Whitewater 138-kV Line

- Solution: Rebuild Mukwonago to Whitewater 138-kV line
- ISD: 2025



AR Need: Lone Rock 69-kV Phase Shifter

- Solution: Retire Lone Rock 69-kV phase shifter
- ISD: 2026



Continuing Solutions

- See Preliminary Network & AR Tables

Cancelled Network Projects

System Addition	Previous Assessment Projected In-Service Year	Planning Zone	MISO MTEP 16 Appendix Status	MTEP PRJID
Pine River-9 Mile 6921/6923 Minimum Asset Renewal and Uprate	2020	2	B	3678
Port Washington - Saukville 138-kV line uprate 742	2021	5	A	3890
Port Washington - Saukville 138-kV line uprate 762	2021	5	A	3891
Spring Green substation: Install a second 138/69-kV transformer	2022	3a	B	3127
Boscobel 69 kV Substation: Install 1-8.16 Mvar capacitor bank	2023	3a	B	8641
Brick Church substation: Install 2-24.5 Mvar 138-kV capacitor bank and 1-18 Mvar 69-kV capacitor bank	2025	3b	--	2029
West Middleton-Pheasant Branch 69-kV line rebuild 6963	2028	3a	--	3487

Public Policy Requirements – Comments?

- Any public policy driven solutions that may not be covered by the Assessment process?

Assessment Status

- **Completed**
 - Requested load forecast from LDCs
 - Sent final load forecast back to LDCs
 - Process and assumptions meeting
 - Preliminary needs meeting
- **Next Steps**
 - Solutions comments - due June 8th
 - Develop cost estimates - Q2
 - Finish sensitivity studies - Q2
 - Complete multiple outage study - Q3
 - Draft study write-up - Q3
 - ATC review/approval - Q3
 - 2016 Assessment publication - Q3

Questions?

For more information, please contact

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