



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

2016 10-Year Assessment Preliminary Needs

Stakeholder and Customer Presentation – April 19, 2016
Jeremy Voigt

Purpose

- Address Remaining Stakeholder Questions
- Review Assumptions
- Summarize Preliminary Changes to Needs
- Solicit Input on Needs
- Solicit Input on Public Policy Driven Needs
- List Next Steps

Responses to Stakeholder Questions

- Available on the ATC 10-Year Assessment Website
 - <http://www.atc10yearplan.com/wp-content/uploads/2016/03/Compiled-Meeting-Questions-and-Comments.pdf>
- Provide additional responses in this presentation

Assumptions Review

- Studies
- Load Forecast
- Generation/Imports
- Asset Renewal Need Identification

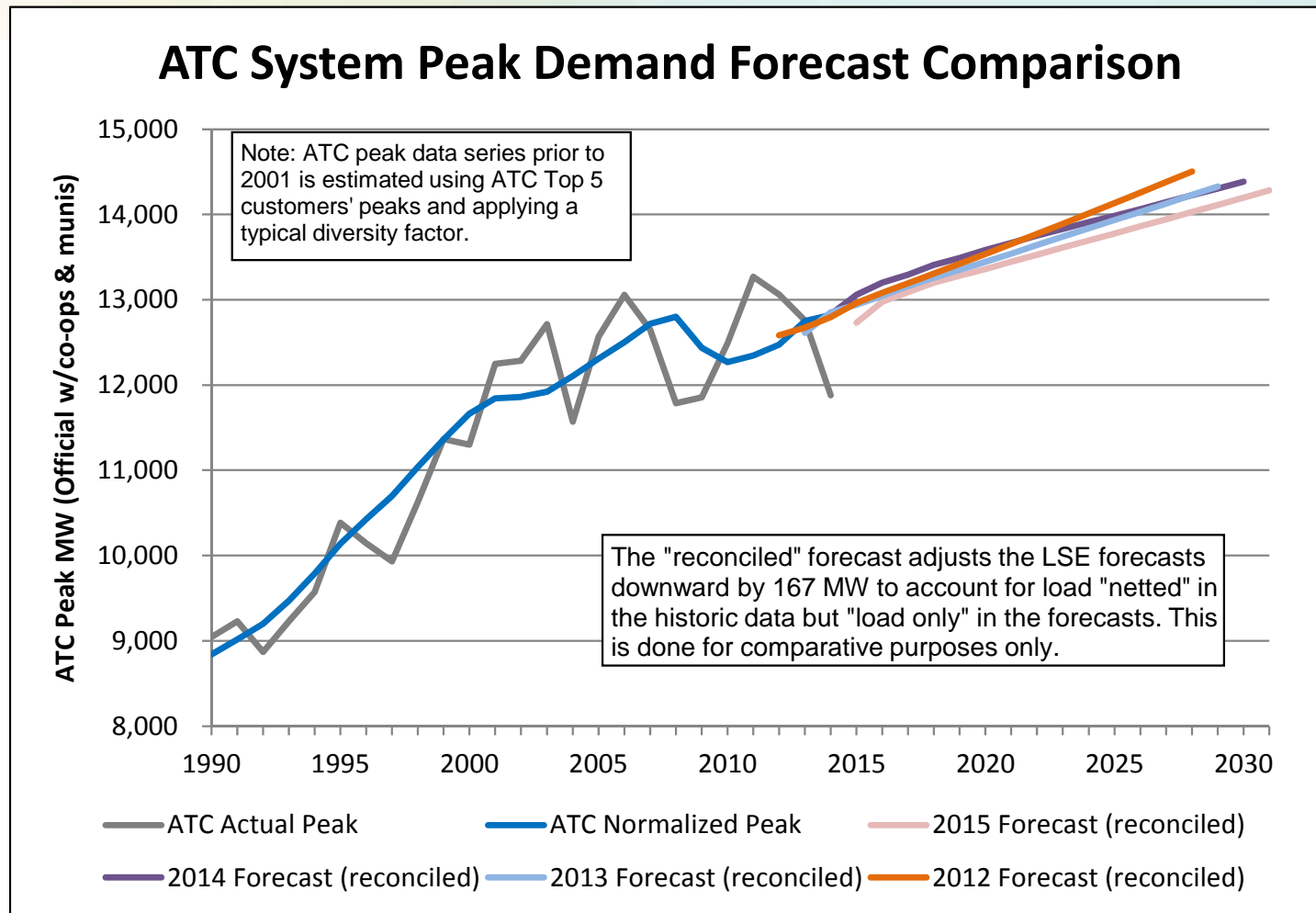
Core Assessment Studies

2015 TYA		2016 TYA	
<i>Model</i>	<i>Year(s) Studied</i>	<i>Model</i>	<i>Year(s) Studied</i>
Summer Peak	2016, 2020, 2025	Summer Peak	2017, 2021, 2026
Shoulder	2020, 2025	Shoulder	2021, 2026
40% Minimum Load	2016, 2020	40% Minimum Load	2017, 2021

Sensitivity Studies

- 90/10 2026 Summer Peak – assess long term needs
- Distribution Substation Capacitor Bank Retirement Study

Load Forecast Trends



Off-Peak Load Forecasts

- **Shoulder**
 - 70% of summer peak in Zones 1, 3, southern 4, and 5
 - 80% of summer peak in northern Zone 4
 - 90% of summer peak in Zone 2
- **Minimum**
 - 40% of summer peak for all Zones
 - Power factors: historical minimum for a Local Balancing Authority

Generation Dispatch Changes Compared to the 2015 Assessment

- Escanaba removed
- ATC net interchange
 - Year 1 (2017 Peak): 4 MW increase in exports
 - Year 5 (2021 Peak): 4 MW reduction to imports
 - Year 10 (2026 Peak): 4 MW reduction to imports

Asset Renewal (AR) Need Identification

- Focused on Life Cycle Management of ATC's Transmission Assets
- Objective
 - Ensure assets perform required function in sustainable manner
 - Manage life cycle costs
 - Coordination of design, commissioning, operation, maintenance and replacement strategy needed to achieve objective
 - Asset renewal is the “replacement strategy” piece of the asset life cycle
- Driven by Public and Worker Safety, Regulatory Compliance, Reliability and Operational Performance

Preliminary Needs

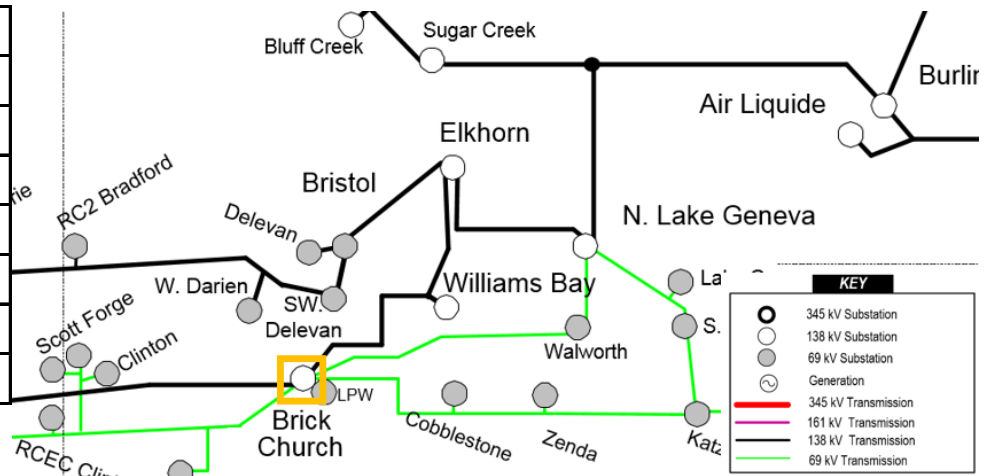
- Needs identified since the 2015 TYA
 - Contingency: 5
 - Asset Renewal: 14
- Continuing Needs
 - Numerous
- Eliminated Needs
 - Contingency: 3

Looking for Stakeholder Input

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

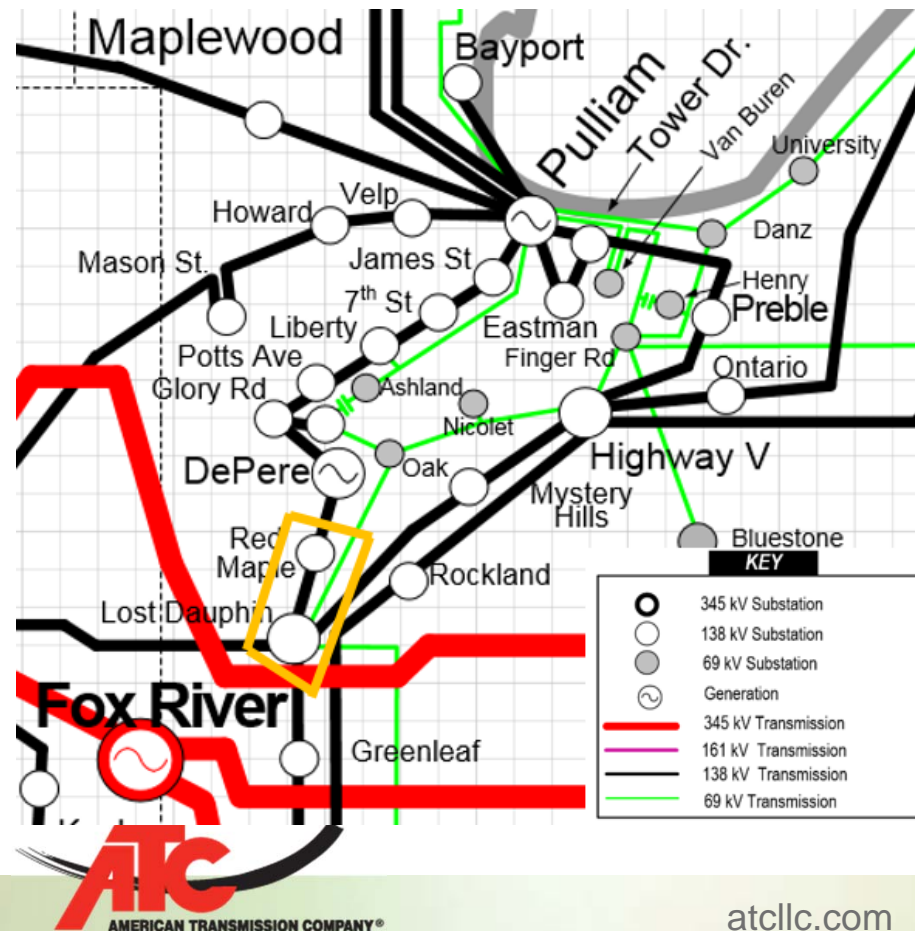
- Only limited by associated substation equipment

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

- Only limited by jumpers at Lost Dauphin Substation in some NARA scenarios

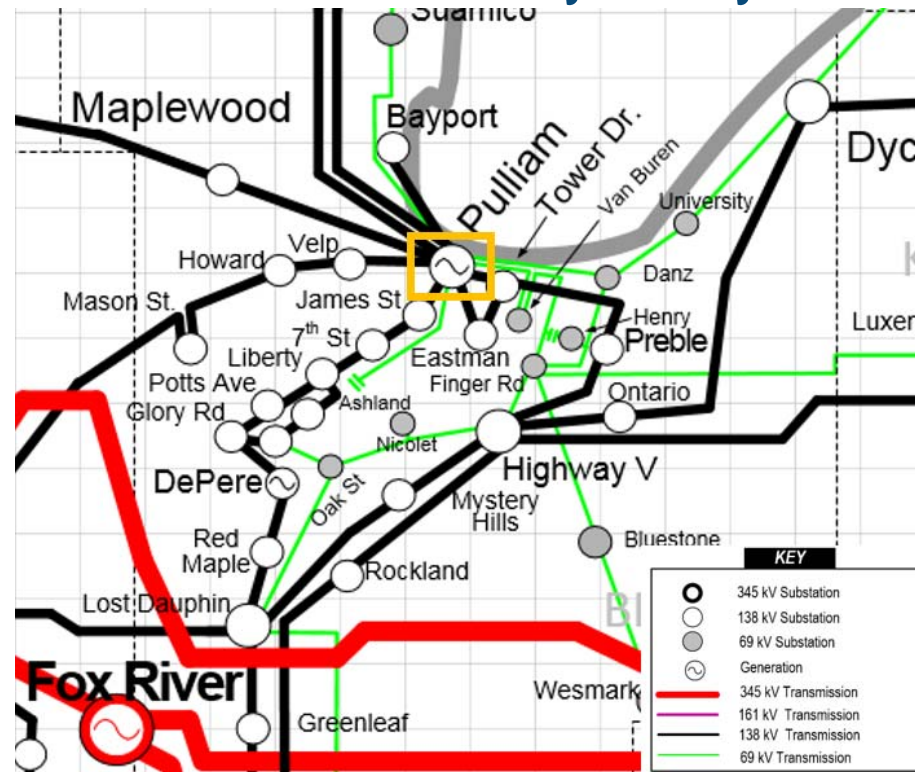


Contingency Need: High 345-kV Voltages

- Some existing or planned 345 kV lines have reactors
- Some reactors in substations are used to limit voltage
- Reactors have long lead times for replacement
- Need to mitigate high voltage after a reactor fails

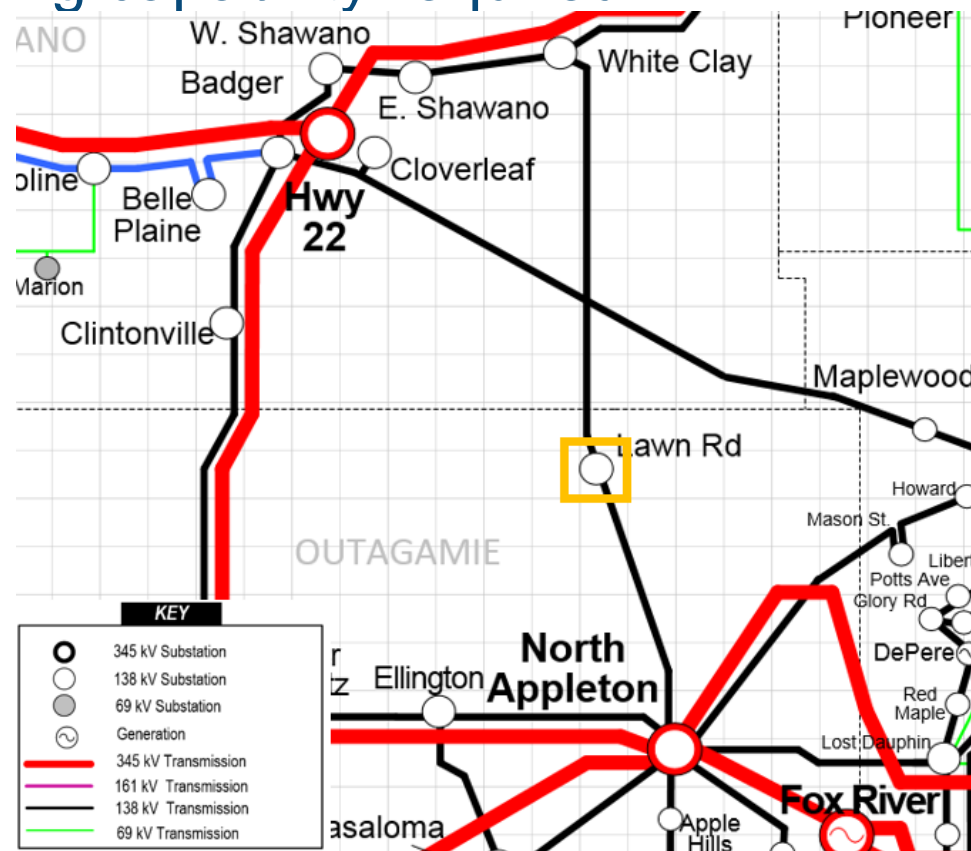
Contingency Need: Pulliam 138-kV

- Angular instability for P5.5 contingency in certain models studied for the 2015 TYA stability analysis



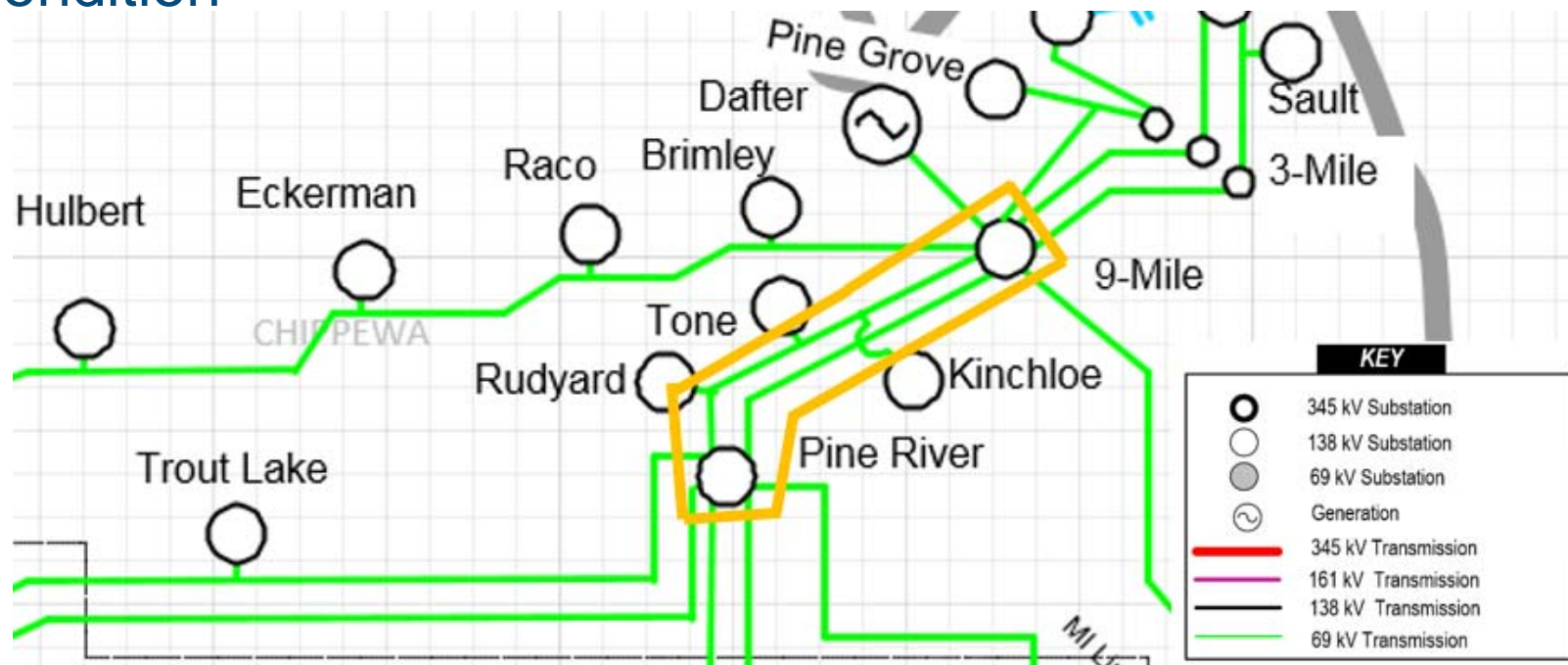
Contingency Need: Lawn Rd 138-kV

- More interrupting capability required
- Sectionalizing



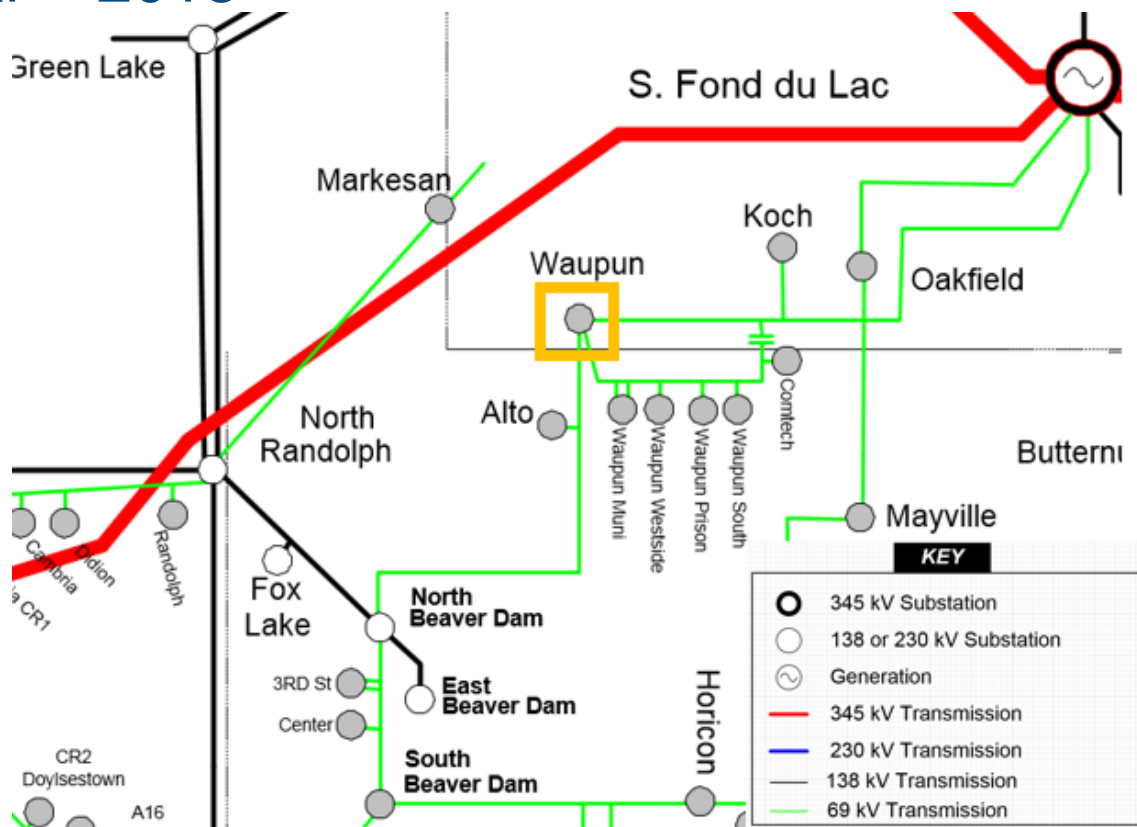
AR Need: 9 Mile to Pine River 69-kV Line and 9 Mile 69-kV Substation

- Substation Need Year – 2018
- Line Need Year – 2025
- Condition



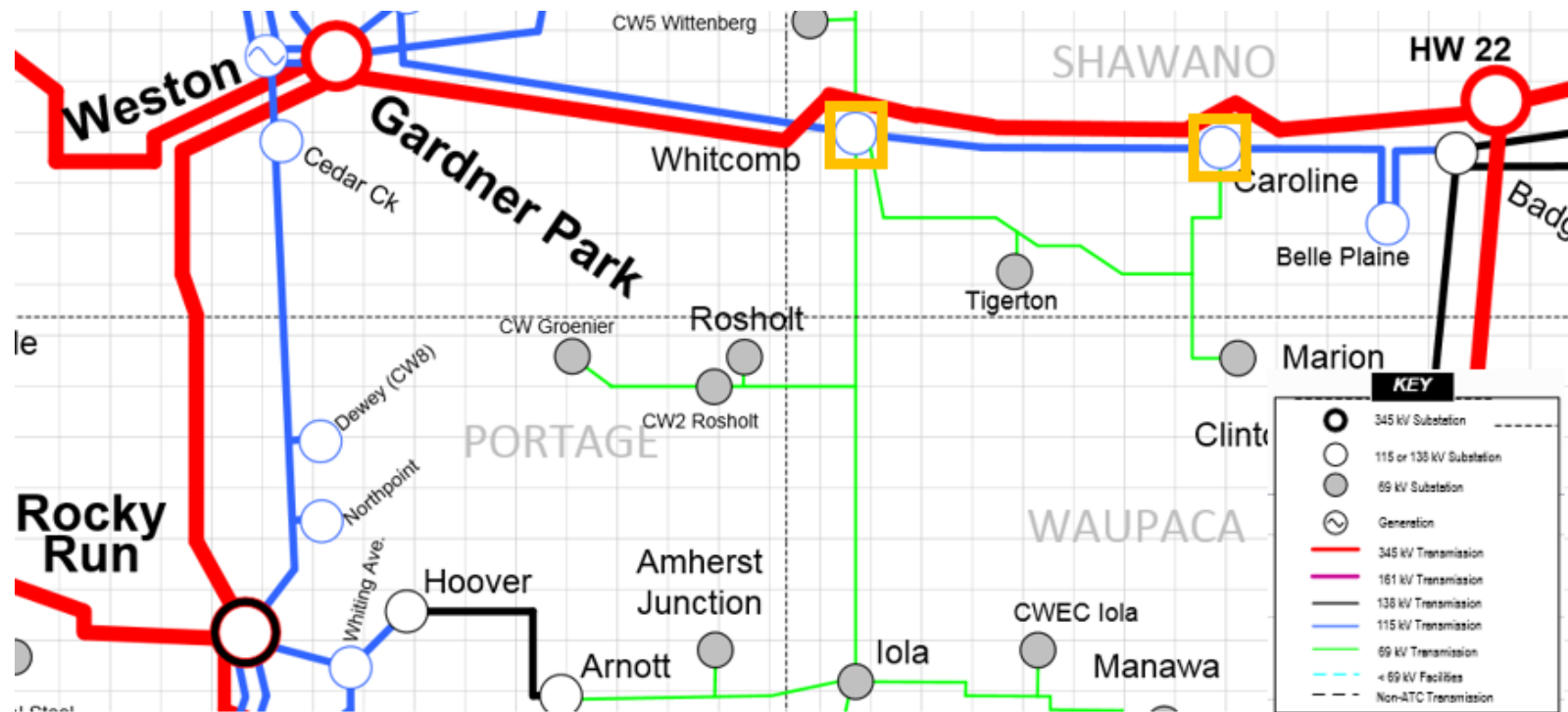
AR Need: Waupun 69-kV Substation

- Need Year – 2018
- Condition



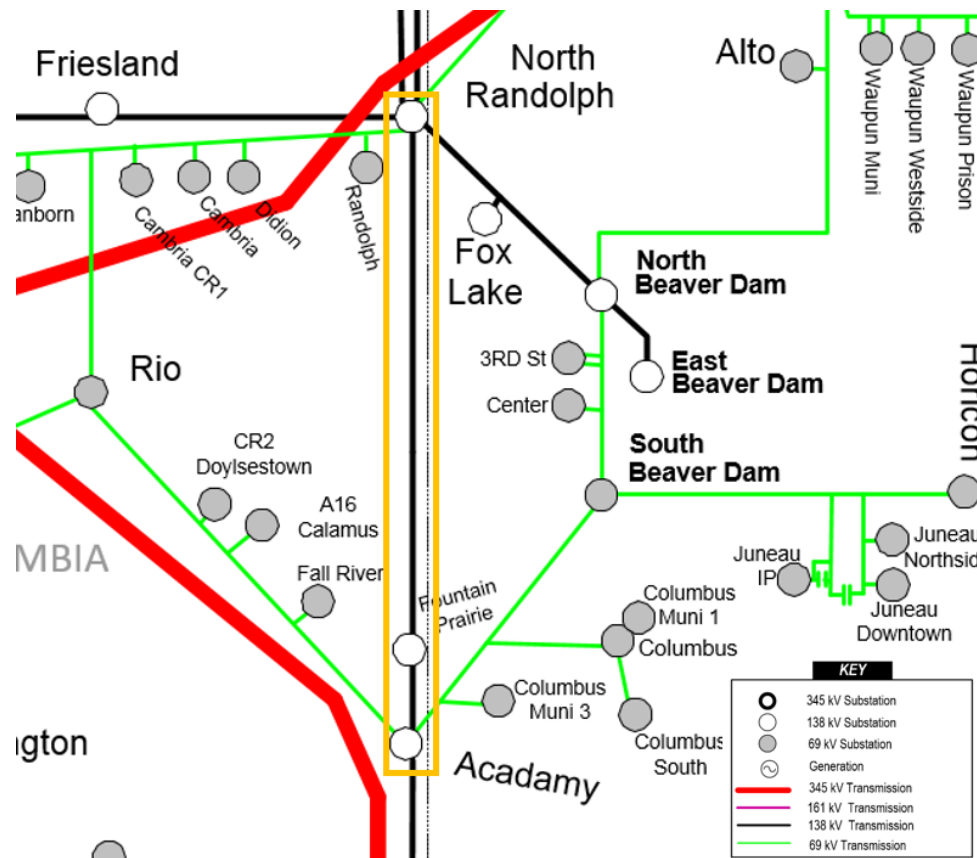
AR Need: Whitcomb 115/69-kV T31 and Caroline 115/69-kV T31

- Need Year – 2020
- Condition



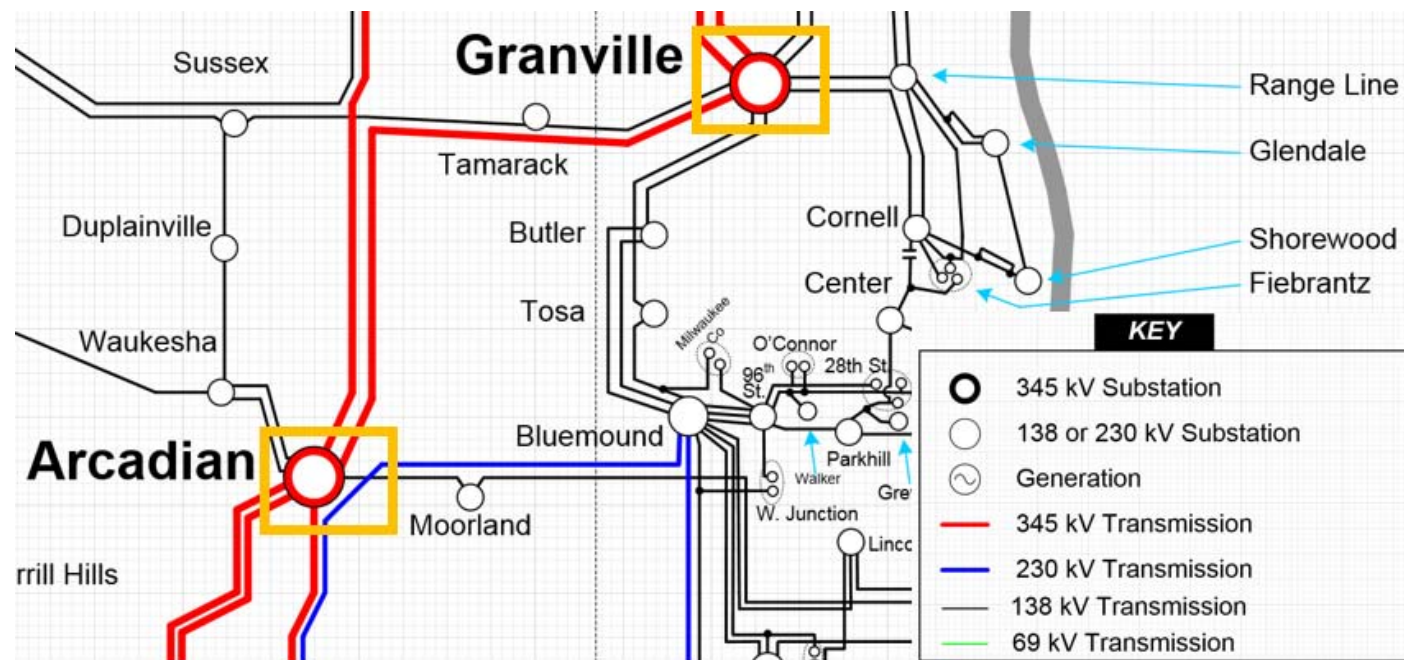
AR Need: Academy to North Randolph 138-kV Line

- Need Year – 2021
- Condition



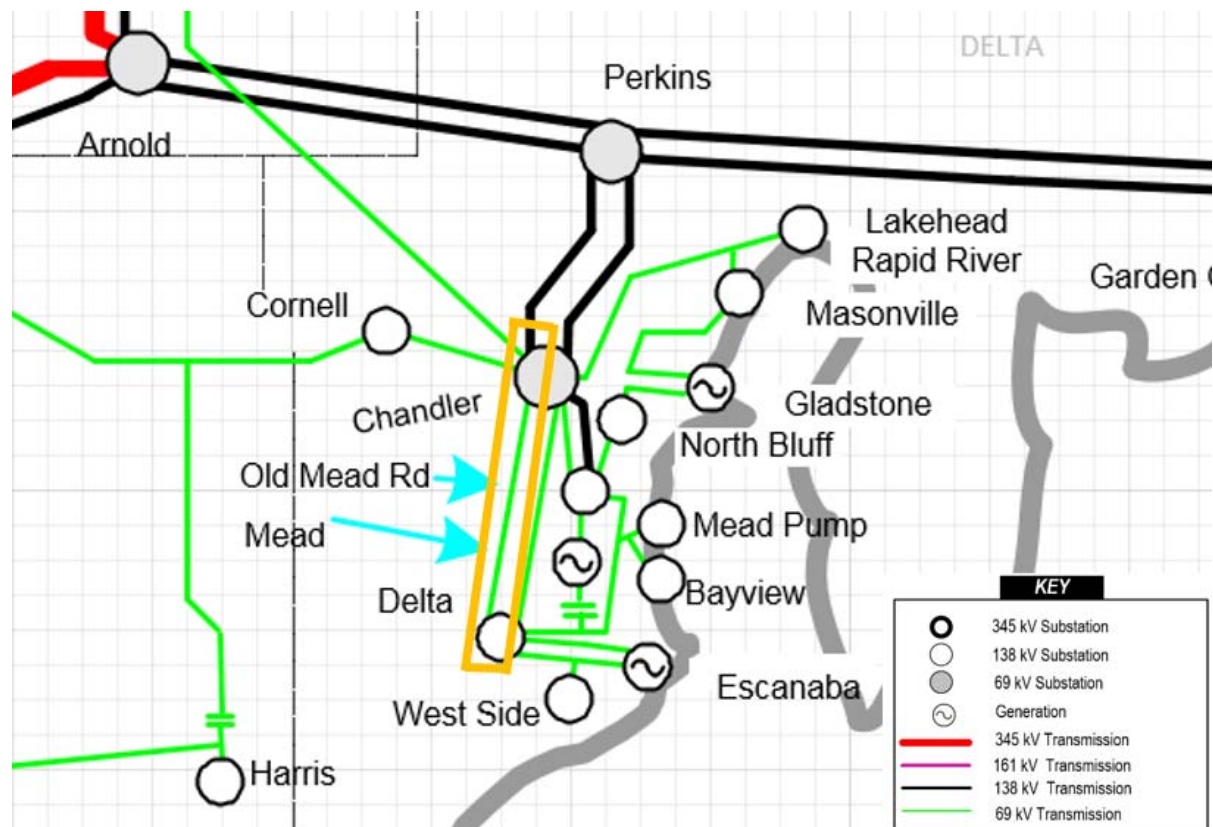
AR Need: Granville 345/138-kV T3 and Arcadian 345/138-kV T2 & T3

- Granville Need Year – 2021
- Arcadian Need Year – 2022
- Condition



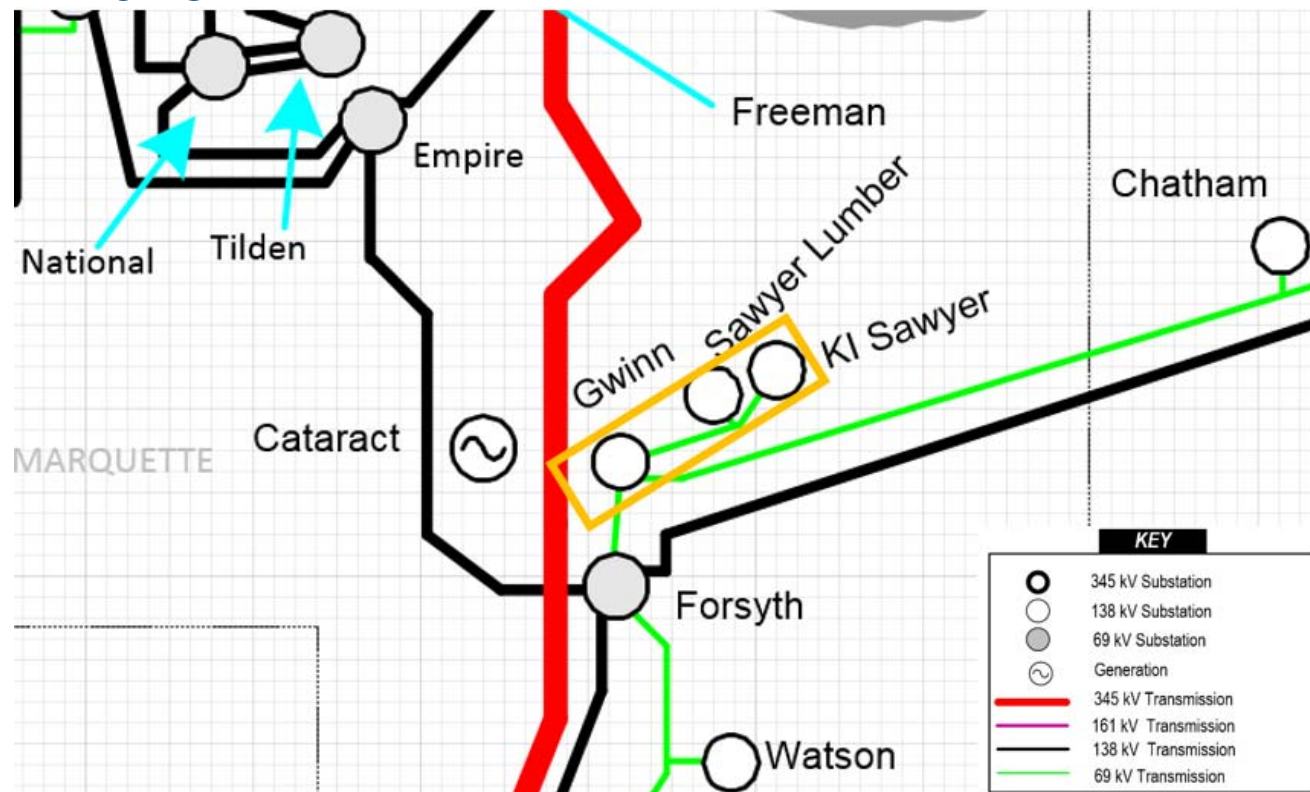
AR Need: Chandler to Delta 69-kV Line

- Need Year – 2023
- Condition



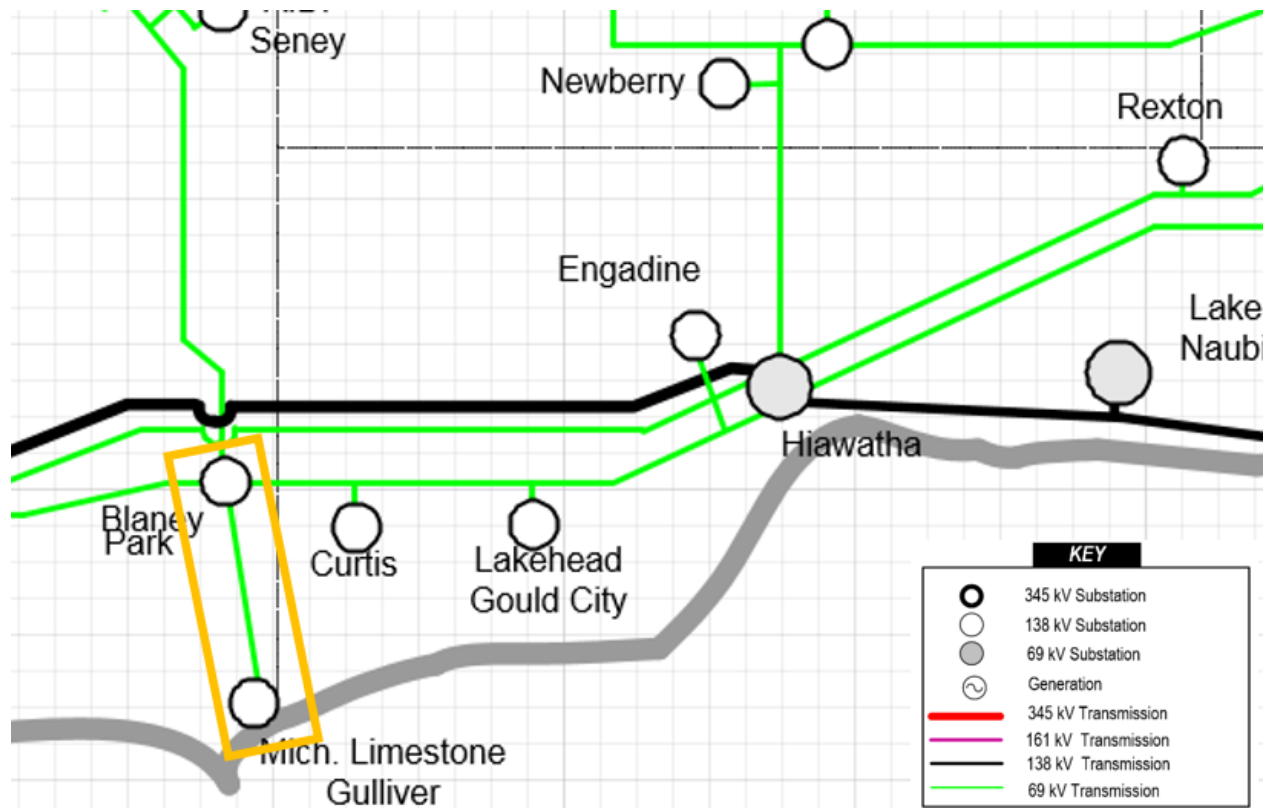
AR Need: Gwinn to KI Sawyer 69-kV Line

- Need Year – 2023
- Condition



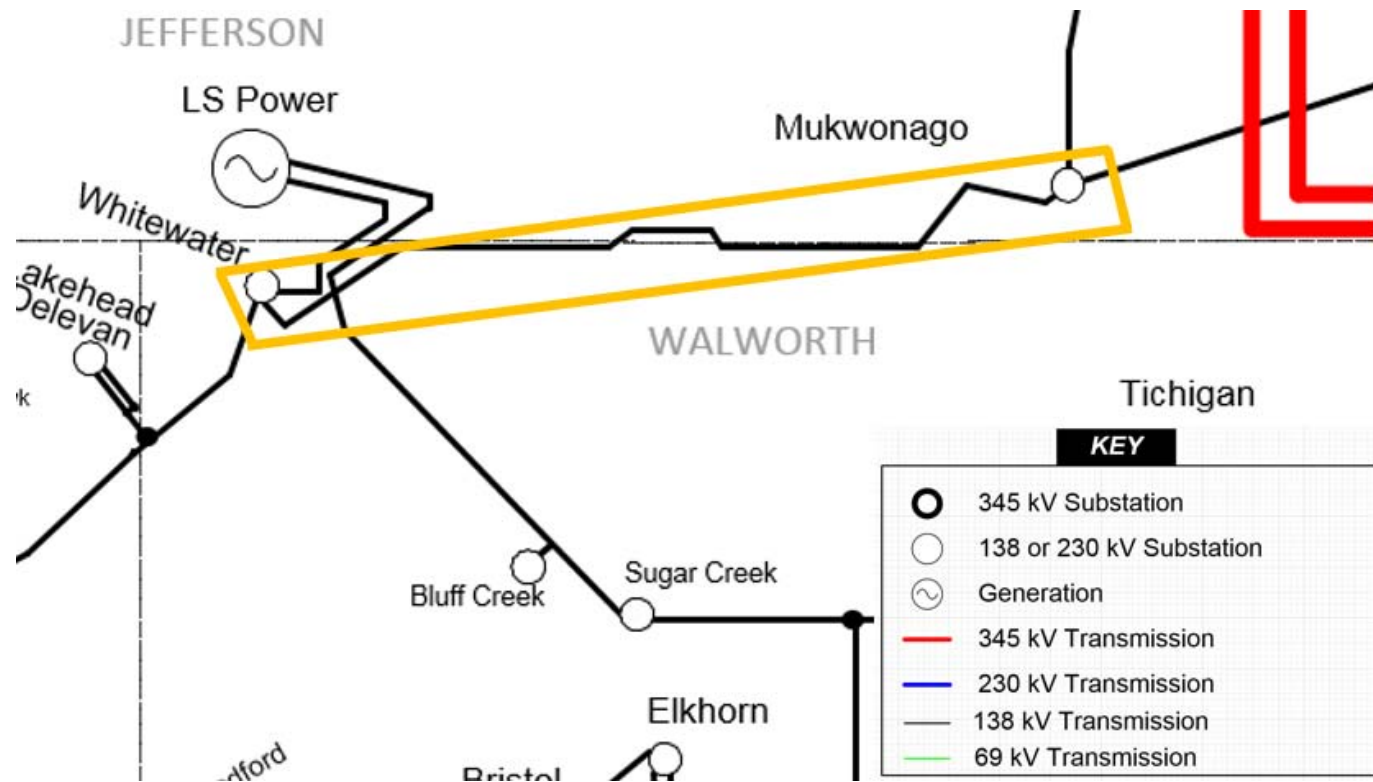
AR Need: Blaney Park to Michigan Limestone Quarry Tap 69-kV Line

- Need Year – 2025
- Condition



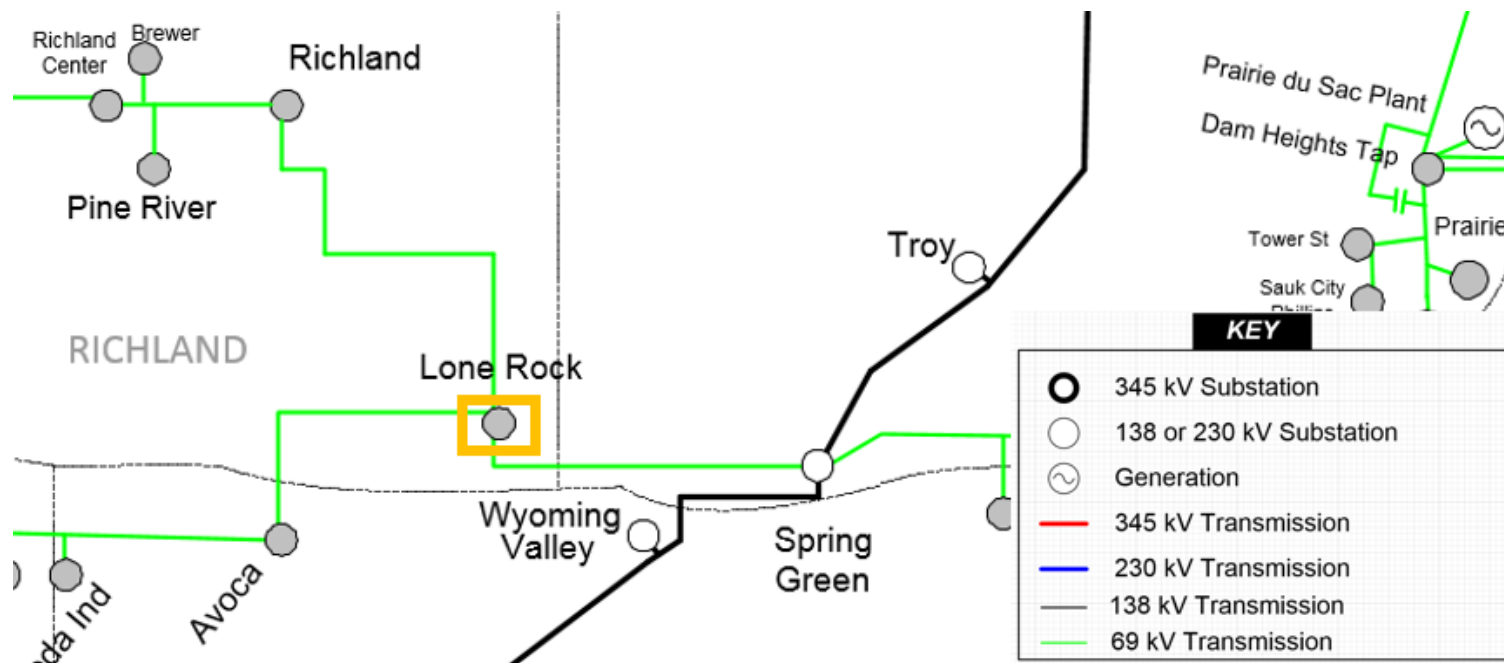
AR Need: Mukwonago to Whitewater 138-kV Line

- Need Year – 2025
- Condition



AR Need: Lone Rock 69-kV Phase Shifter

- Need Year – 2026
- Condition



Projects with Continuing Needs

- See Preliminary Network & AR Needs Table

Network Projects with Eliminated Needs

System Addition	2014 TYA Network Need Year	2015 TYA Network Need Year	2016 TYA Network Need Year	Planning Zone	Need Category	MISO MTEP 15 Appendix Status	MISO MTEP 16 Targeted Appendix Status	MTEP PRJiD
Brick Church substation: Install 2-24.5 Mvar 138-kV capacitor bank and 1-18 Mvar 69-kV capacitor bank	>2029	>2030	>2031	3b	reliability (P1.2, 69 P1.2)	--	--	2029
West Middleton-Pheasant Branch 69-kV line rebuild 6963	>2029	>2030	>2031	3a	reliability (69 P1.2)	--	--	3487
Pine River-9 Mile 6921/6923 Minimum Asset Renewal and Uprate	***	***	***	2	reliability (69 P1.2)	B	--	3678

Public Policy Requirements – Comments?

- Any public policy driven needs 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
- **Next Steps**
 - Needs comments - due April 26
 - Finalize needs - end of April
 - Preliminary solutions meeting/presentation - May
 - Develop cost estimates - Q2
 - Finish sensitivity studies - Q2
 - Draft study write-up - Q3
 - Complete multiple outage study
 - ATC review/approval – Q3
 - 2016 Assessment publication - Q3

Questions?

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