2025 10-Year Assessment Preliminary Needs

Stakeholder and Customer Webcast

PRESENTED BY:

System Planning, ATC

March 17, 2025

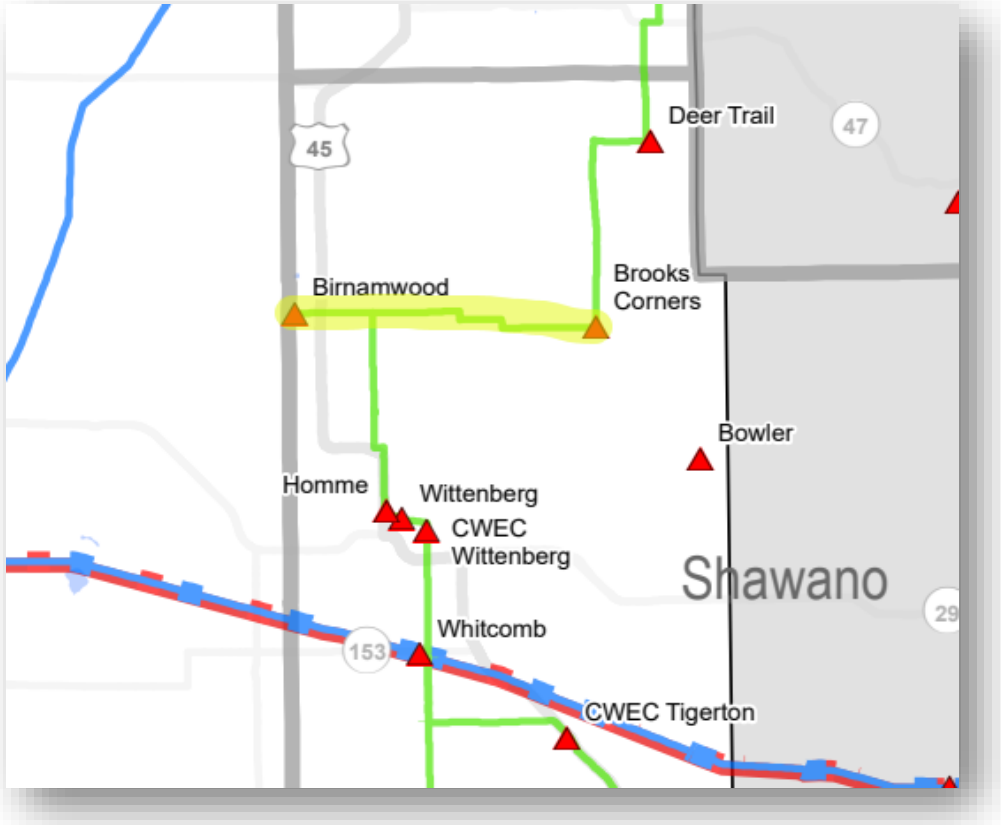
Purpose

- Define and solicit input on needs
  - Network and reliability
  - Generation interconnection (G-T)
  - Distribution interconnection (D-T)
  - Asset renewal
  - Communications
- Solicit input on public policy driven needs
- Summarize next steps

Preliminary Needs

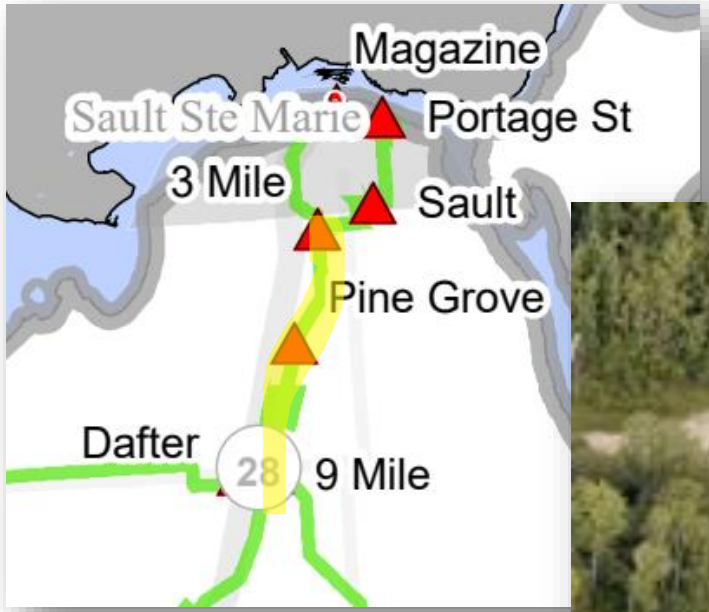
- We are seeing new projects based on new needs this year.
  - New network reliability projects
  - Additional renewable interconnections
  - Distribution interconnections
  - Substation and transmission line asset renewal work
  - Changes in regulatory body priorities & policies

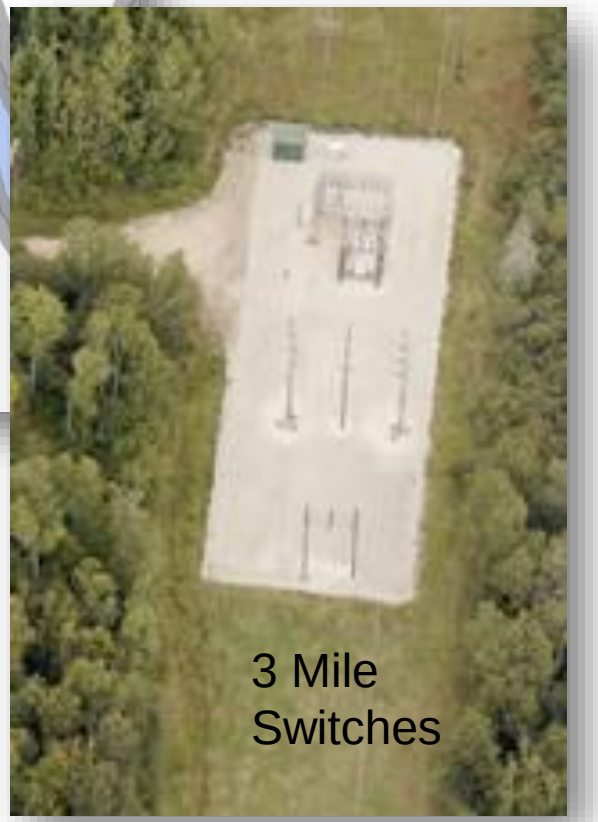
Y-86 Birnamwood to Brooks Corners Asset Renewal Project



- Need Drivers:
  - Asset Renewal needs for sections along the line
  - 1960s vintage wood monopoles
  - Alignment with the Birnamwood Area Reliability Project MTEP25 Target App A ID 50233 (ISD Dec 2028)
- Scope:
  - Rebuild ~9.3 out of 28.4 miles of Y-86
- Estimated Cost: ~$19M
- Proposed ISD: 2031
- MTEP25 Target Appendix B, ID 50629

3 Mile Asset Renewal Project

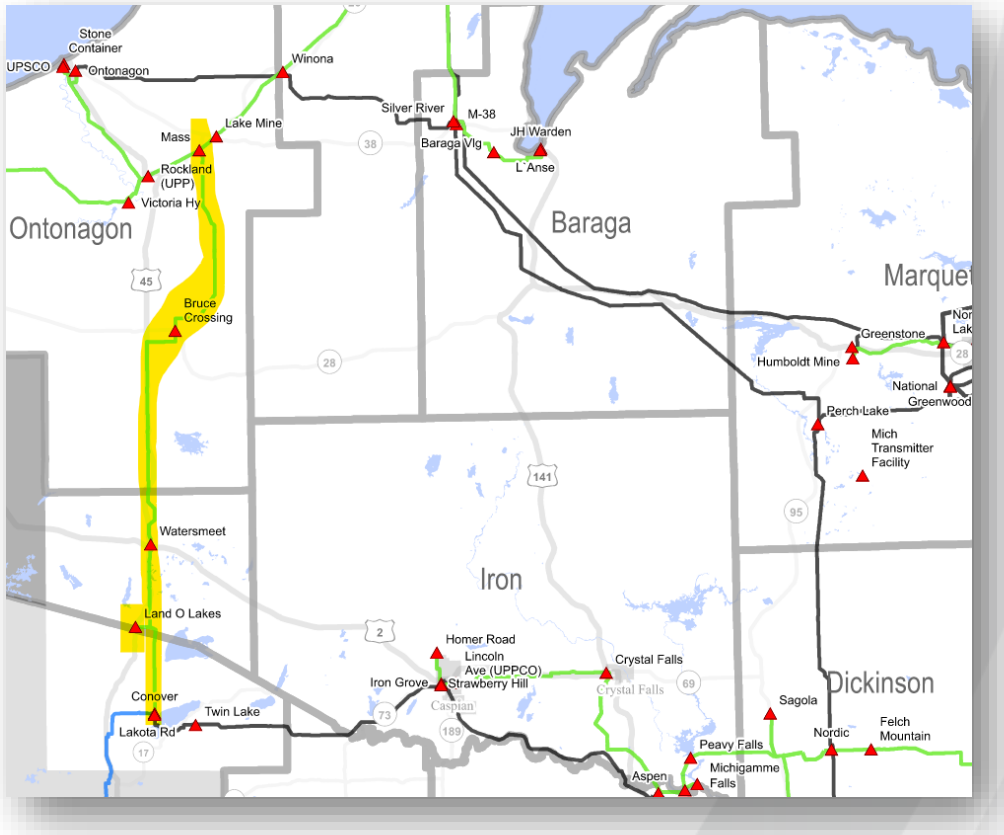




- Need Drivers:
  - Asset Renewal needs for 69 kV lines between 3 mile to 9 mile.
  - Switch issues at 3 Mile
- Scope:
  - 3 Mile station, Exploring replacing existing switches with SCADA Motor Operated Disconnects or
  - Lines ESE_6903, ESE_6902/6901, Exploring rebuilding single circuit 69kV as double circuit and reconfiguring double circuit to single circuit.
- Estimated Cost: Line Rebuilds ~$21M, 3 Mile substation ~$5M.
- Proposed ISD: 2029 Line, 3 Mile Station ~2027
- Line: Proposed MTEP25, Target Appendix B
- Station: Proposed MTEP25, Target Appendix B

6530 Conover - Mass Rebuild Project

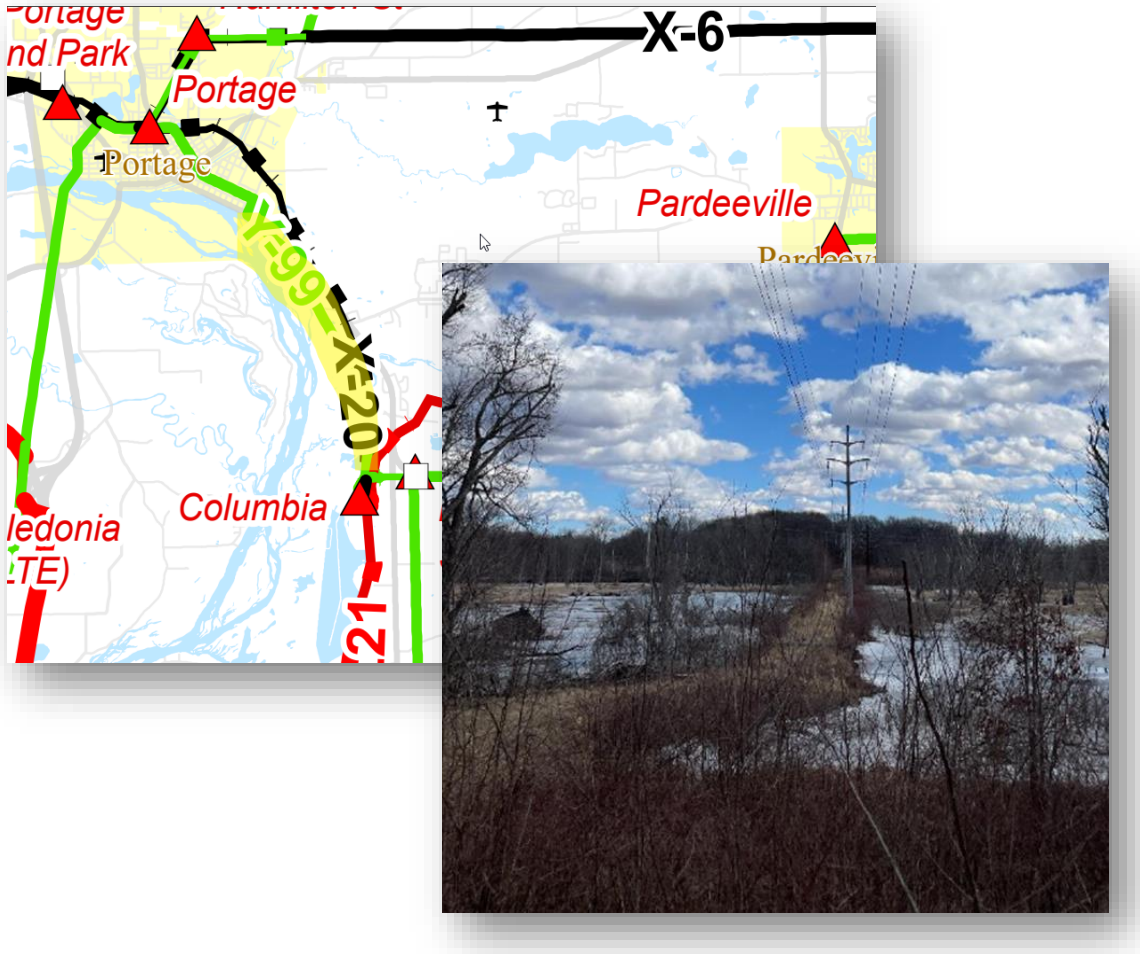
- Need Drivers:
  - Baseline reliability, N-1-1 contingencies causing thermal limitations
  - Asset renewal needs for sections along the line
  - Economic benefits under review
- Scope:
  - Exploring 69 kV and/or 138 kV options
- Estimated Cost: TBD
- Proposed ISD: 2029-2031
- MTEP25, Target Appendix B, ID 50130



Columbus Reconfiguration DIC Project

- Needs Drivers:
  - ATC asset renewals
    - Y-21 rebuild
    - Columbus substation retirement
  - CWL asset renewal and sectionalizing needs
    - Existing load limits transformer outages
- Scope:
  - Network Columbus / Rebuild Y-21
- Estimated Cost: $26.6M
- Proposed ISD: Q2 2028
- MTEP approved Appendix A
  - Y-21 Rebuild: MTEP21 ID 10590
  - Columbus DIC: MTEP22, ID 22989

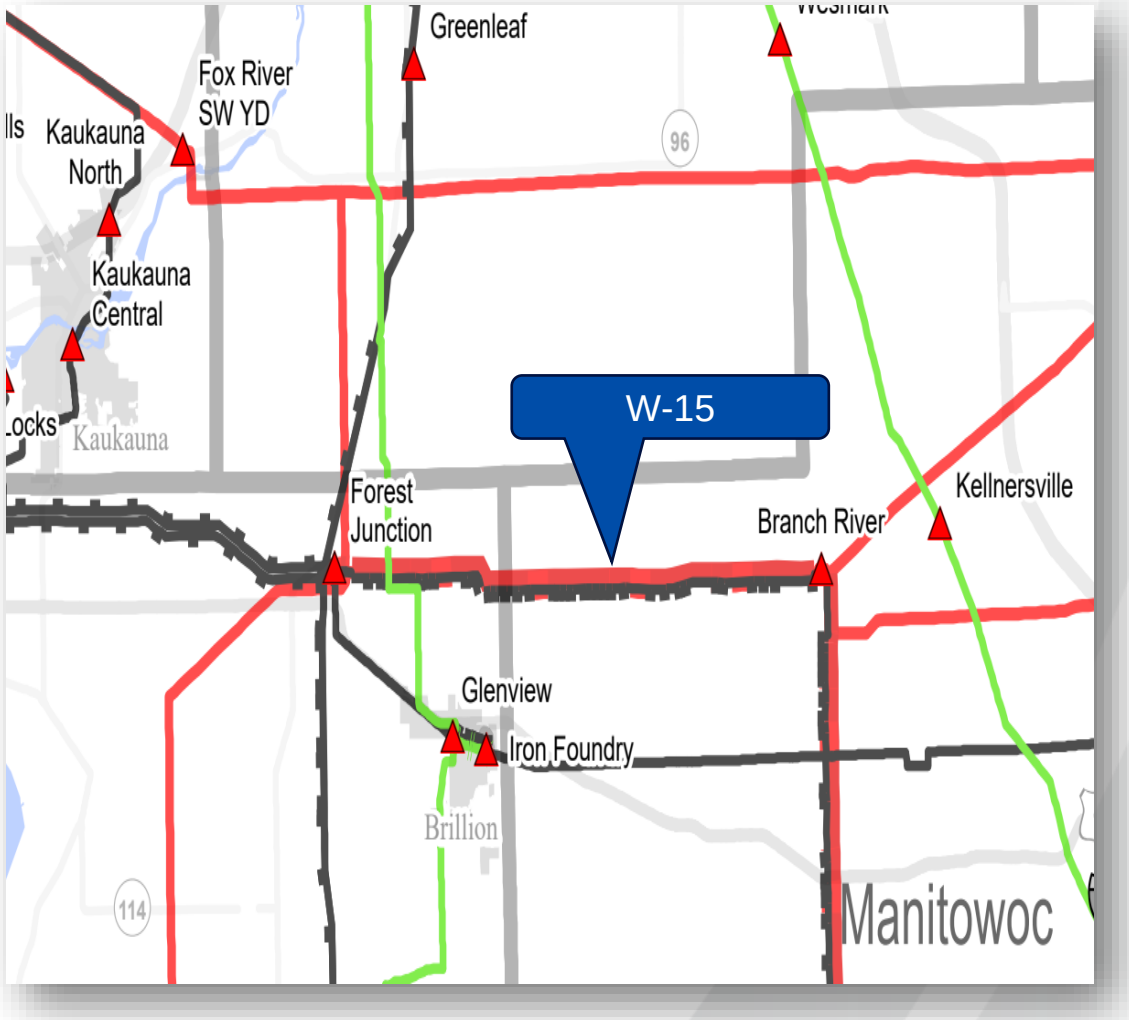
Y-99 Partial Rebuild Columbia Substation to Highway 51



- Need Drivers:
  - Asset Renewal needs for section along the line
  - 1970s vintage wood monopoles
  - Located in Wisconsin River floodplain, very challenging access limits maintenance and vegetation activities.
- Scope:
  - Rebuild 3.2 out of 5.5 miles
  - Reroute and/or improve access along existing alignment
- Estimated Cost: ~$15.5M
- Estimated ISD: 2029
- MTEP25, Target Appendix B, ID 50627

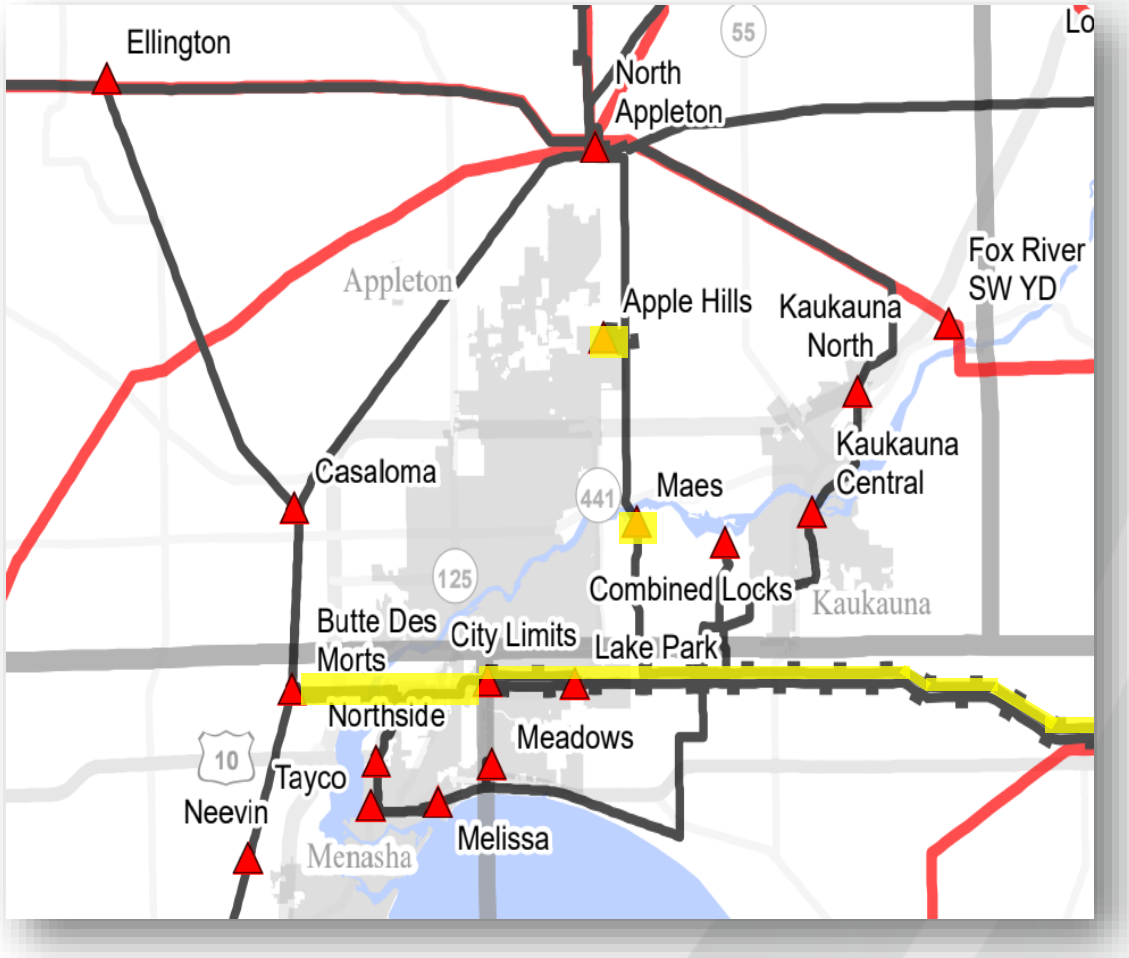
Branch River – Forest Junction (W-15) 345kV, Uprate

- Need Drivers:
  - Baseline reliability issue, thermal overload
- Scope of Work:
  - Address line clearance issues to achieve maximum conductor rating
- Estimated Cost: $8M
- Proposed ISD: Q1 2029
- MTEP25, Target Appendix A, ID 50588



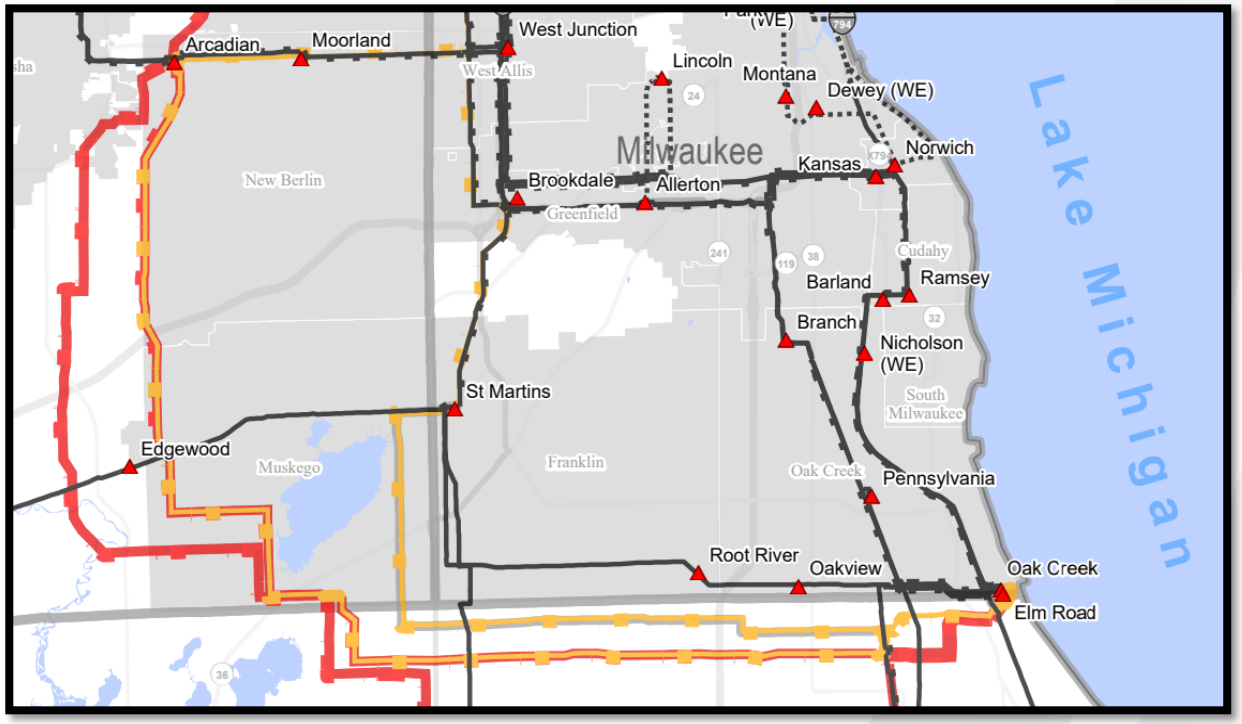
Appleton Area Reliability Project

- Need Drivers:
  - Baseline Reliability Issues, thermal overloads and voltage limitation issues
- Scope of Work:
  - Exploring either new transmission line or new substation to be constructed
- Estimated Cost: $60M
- Proposed ISD: Q2 2029
- MTEP25, Appendix B, ID 50529



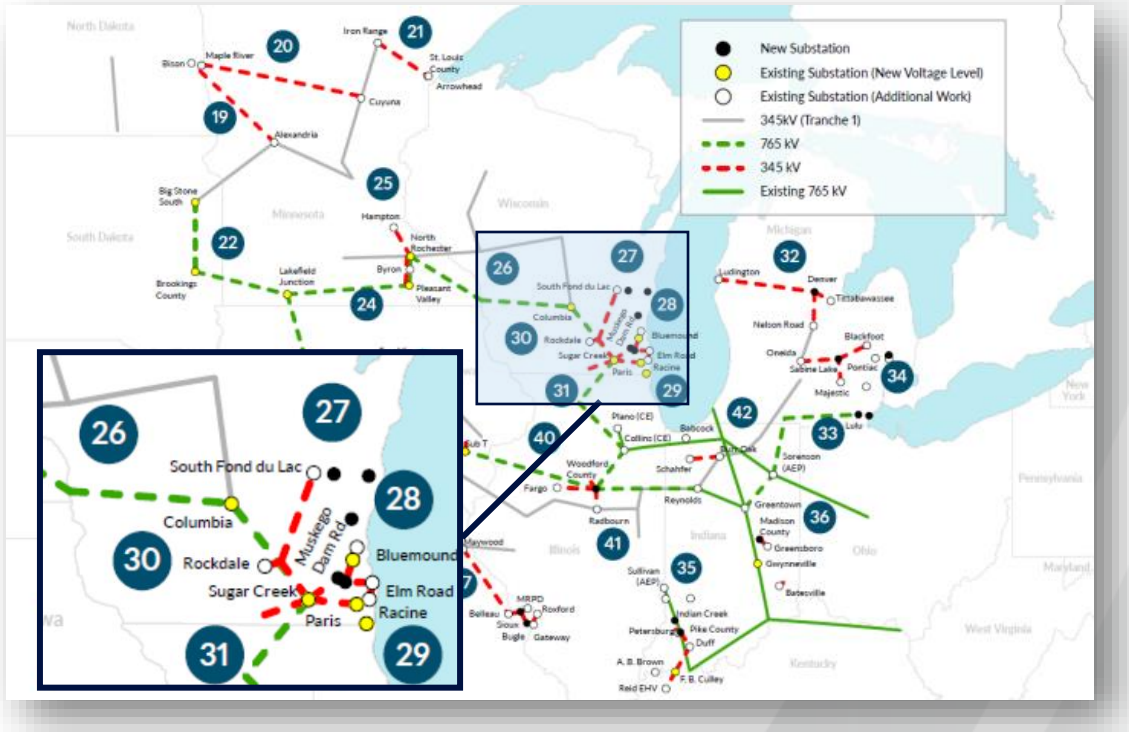
Milwaukee Area 230 kV Conversion To 345 kV Project

- Need Drivers:
  - Condition and performance, reliability
- Project scope:
  - Re-networking, rebuild and conversion of 230/138 kV facilities to 345/138 kV capability
  - Retire 230 kV facilities
- Estimated Cost: $542M
- Project ISD of Q4 2029
- MTEP24 Appendix A, ID 50562, as a portion of the MISO LRTP Tranche 2.1 portfolio project 29



Long Range Transmission Plan (LRTP)

- Tranche 2.1 Approved in MTEP 24
- 24 project totaling $21.8B investment
  - ATC assigned $2B in projects
  - Competitively Bid Projects in ATC footprint ($1.8B)
- Request For Proposal (RFP) process underway at MISO
- Additional Info on the [MISO LRTP Website]



Communication Reliability Program (CRP)
- In Service Fiber and Active Projects

Label:	CRP - MTEP25 Projects:	PCO Cost Estimate:
1	North Central Wisconsin Plan OPGW - Line I-9 - (Pine to Skanawan Tap to Eastom) Align w/T-Line Re-Build & Reinsulate Scope	$36,000,000.00
2	North Central U.P. Plan #2 OPGW - Line X-119 - (Empire Mine - Huron)	$13,000,000.00
3	UG Fiber - Line W-30 - (Paris to Structure: #10104)	$2,000,000.00
	Total Estimate:	**$51,000,000.00**

Label:	CRP - MTEP26 Projects:	PCO Cost Estimate:
4	OPGW - Line UNIG51 to Structure: #3434 (Whitewater) w/Re-Conductor Scope	$6,000,000.00
5	Oshkosh Plan OPGW - Line I-61 (Sunset Point to Pearl Ave) OPGW - Line Q-43 (12th Ave to Ellinwood) Align w/T-Line Re-Build Scope	$12,000,000.00
6	UG Fiber - (Sun Prairie to Highway 151)	$4,000,000.00
7	UG Fiber - Old Mead Road to Masonville	$9,000,000.00
8	OPGW - Line CRFY21 - (Iron Grove to Lincoln Ave: UPPCO)	$3,000,000.00
	Total Estimate:	**$34,000,000.00**

Communications Reliability Program (CRP) Projects - 2025 & Beyond

- **Challenges, trends & opportunities**
  - Telecom carrier performance & service challenges
  - Future substation technology & communication demands
  - T-Line asset management & system planning alignment

Distribution to Transmission (D-T) Interconnections

141 requests in 2024

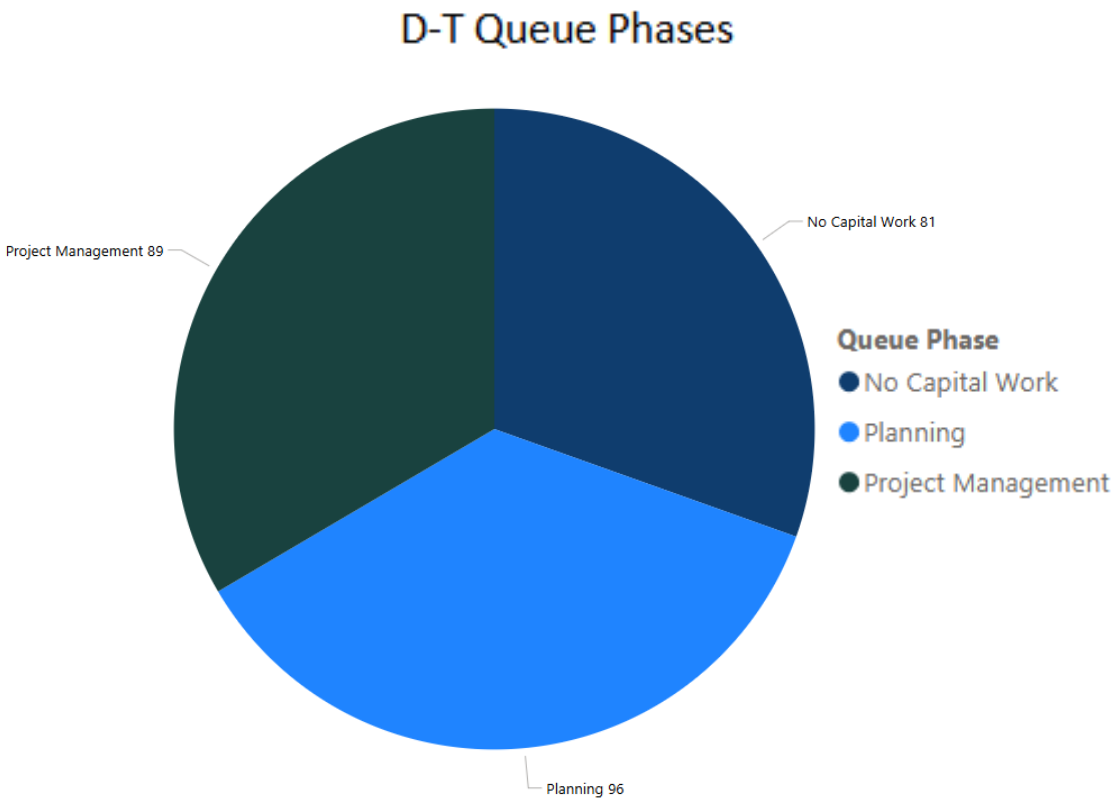
- Governing documents:
  - FERC Tariff Attachment FF-ATCLLC
  - NERC Standards
  - FERC Filed D-T Interconnection Agreement (IA)
  - ATC's Load Interconnection Guide
  - ATC's Business Practices

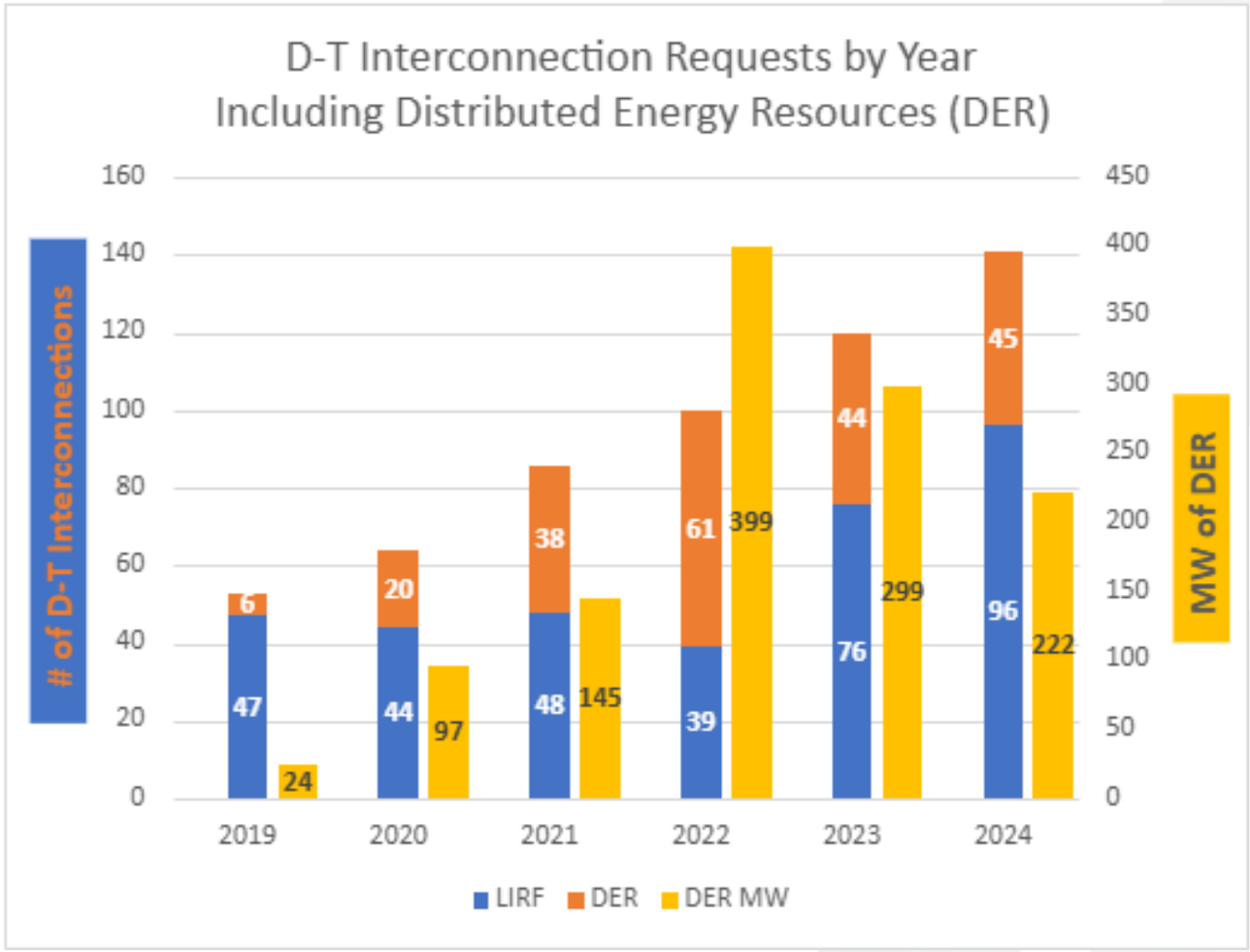
D-T Best Value Planning (BVP) Process

- Collaborative planning assessment to determine the best value solution for all parties
- Types of requests
  - New distribution substation
  - Distribution substation equipment change
  - Distributed energy resources (DERs)
  - Unforecasted load or change in load characteristics
  - Economic development projects
  - Power quality issues
- Individual project timelines vary widely

D-T Dashboard

266 Active Projects

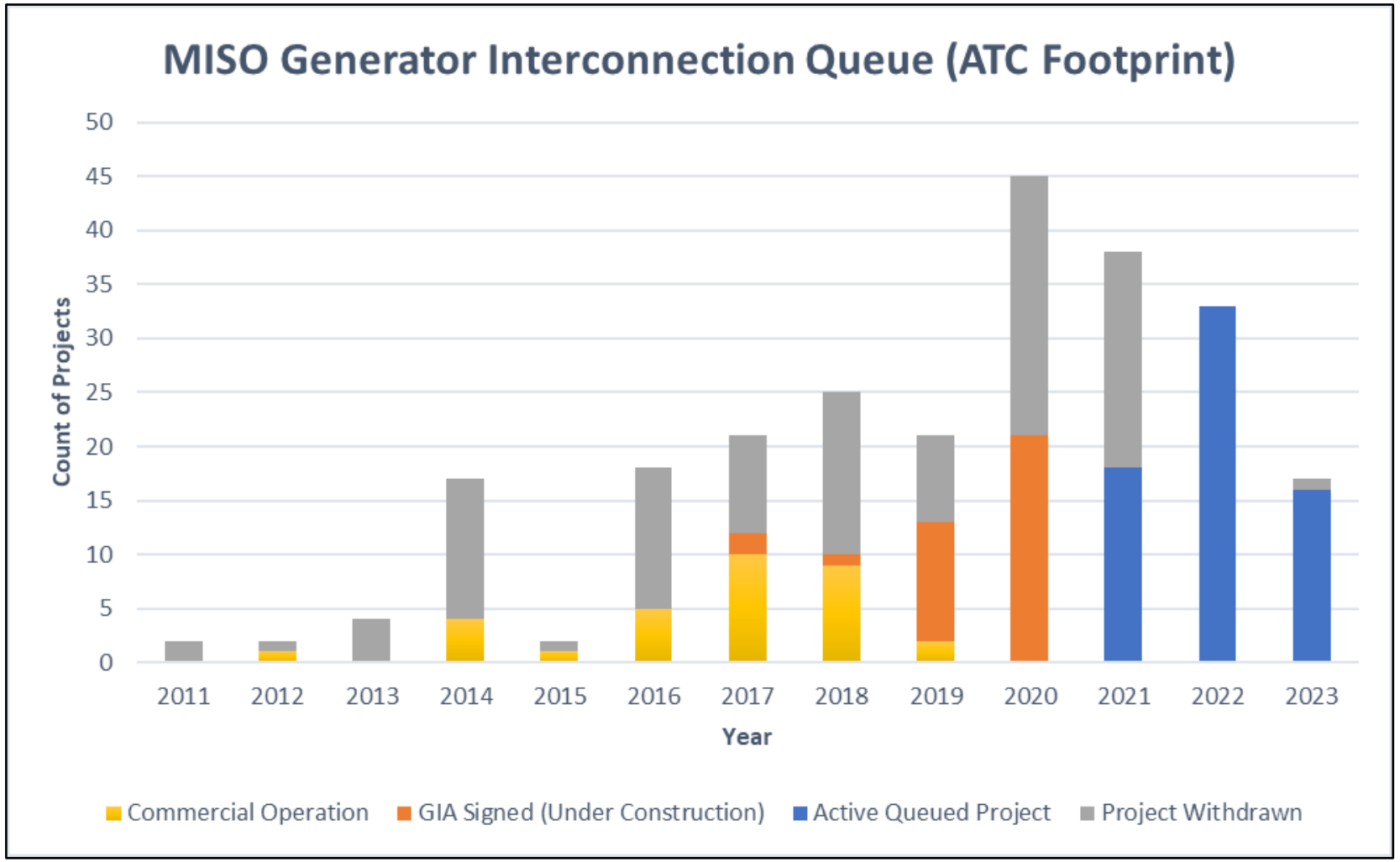




MISO Generator Interconnection Process

- Generator application to MISO
- MISO Tariff dictates schedule and process
- Definitive Planning Process (3 phases)
  - DPP1 – Preliminary system impact study
  - DPP2 – Revised system impact study and interconnection facility study
  - DPP3 – Final system impact study and network upgrade facility study
- Generator Interconnection Agreement (GIA)
- Shared network upgrades – Multiparty Facility Construction Agreement (MPFCA)

G-T Dashboard



Active MISO GT Projects
116
Developers
43
Total MWs in Queue
16.09K

- Solar - 7 GW
- Storage - 4.7 GW
- Wind - 1.9 GW
- Gas - 2.4 GW

“ATC’s Asset Renewal strategy is about balancing Asset Risk and Costs”

Asset Renewal Program Objectives

SAFETY – PUBLIC AND WORKER

MINIMIZE TOTAL LIFE CYCLE COST [NET PRESENT VALUE OF REVENUE REQUIREMENTS (NPV RR) FROM CUSTOMER COST/RATE PERSPECTIVE]

COMPLIANCE

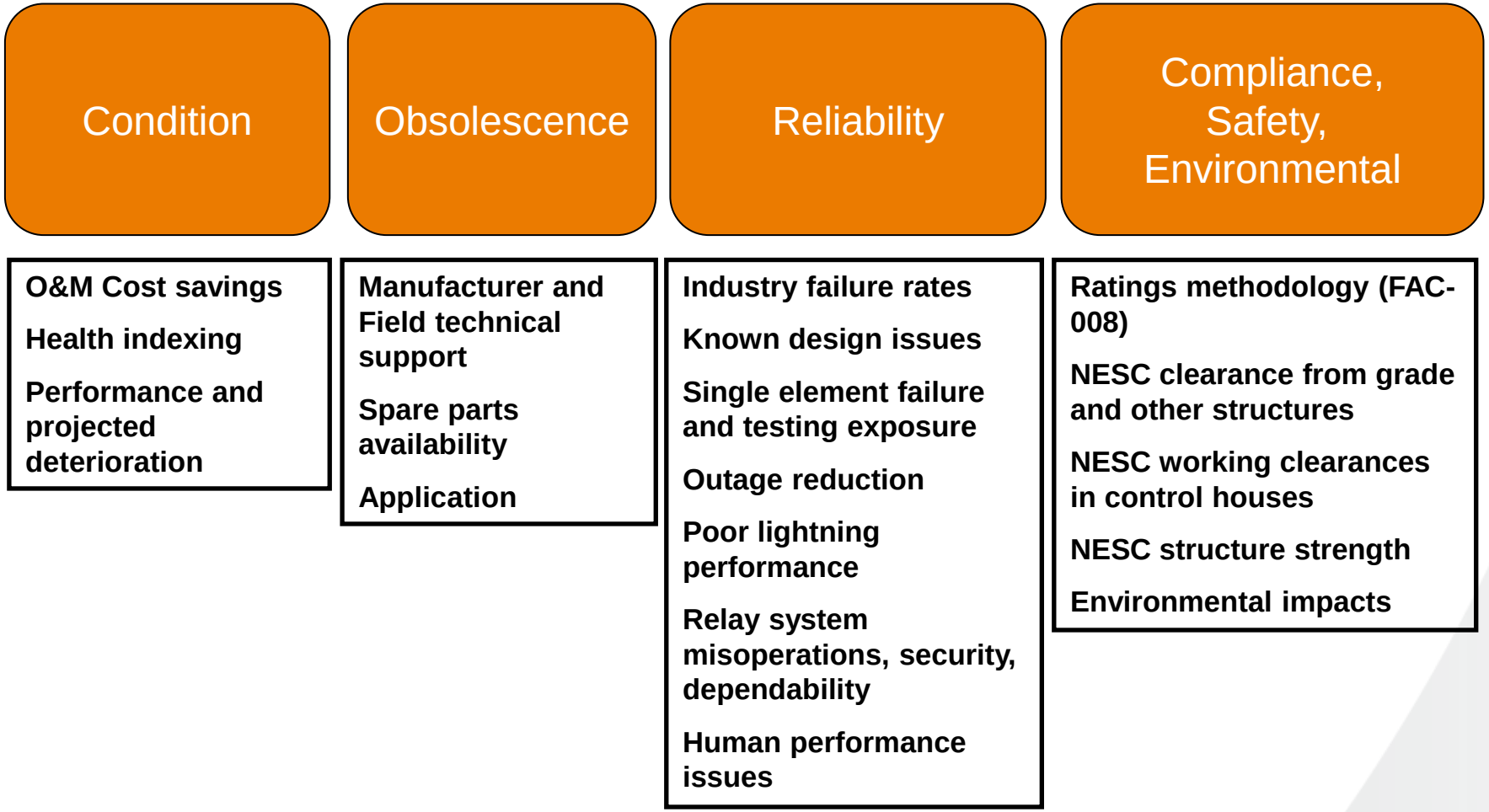
MANAGE RISK

RELIABLE PERFORMANCE – MAINTAIN OR IMPROVEMENT

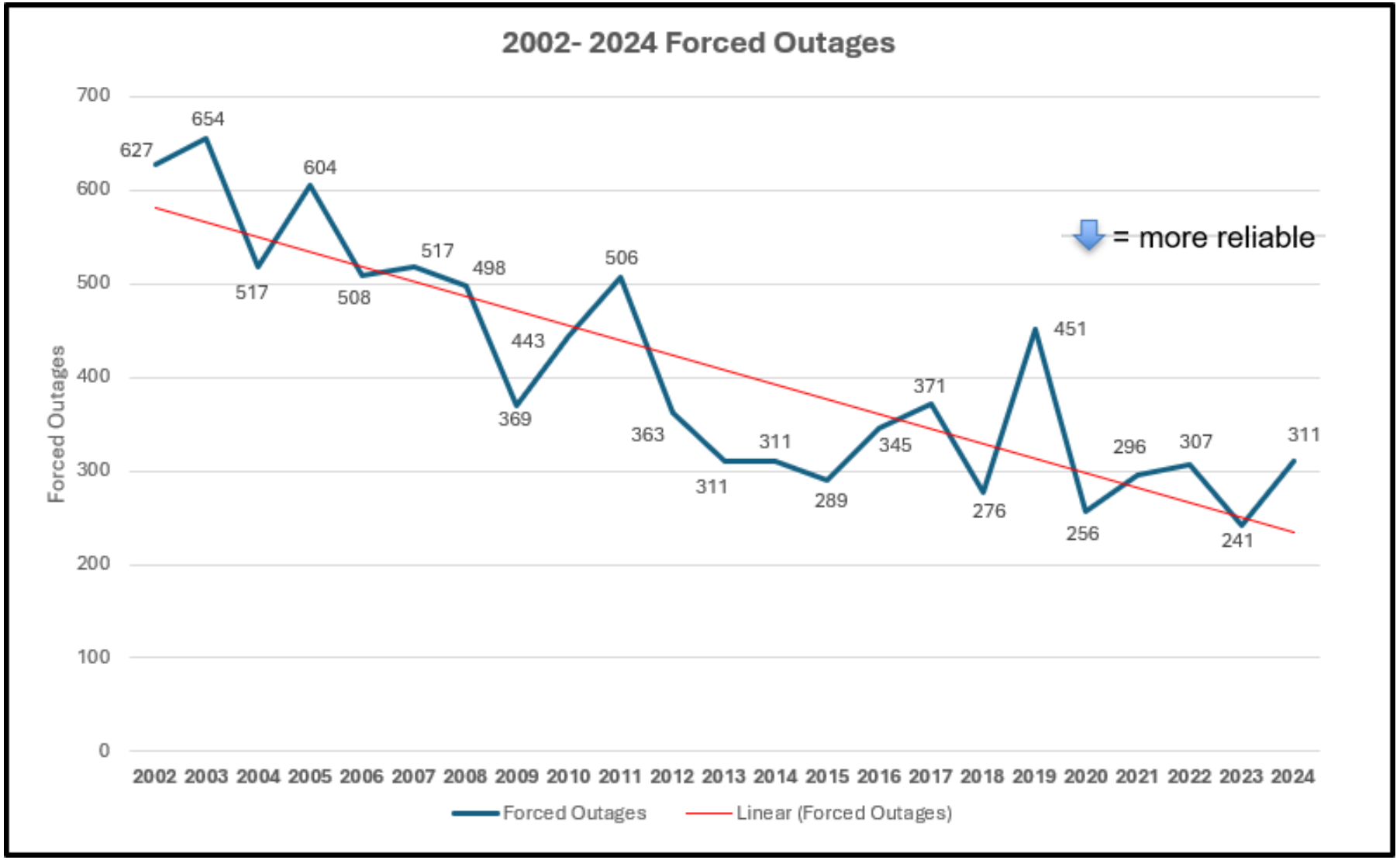
ENVIRONMENTAL PERFORMANCE IMPROVEMENTS

COORDINATION WITH STAKEHOLDERS

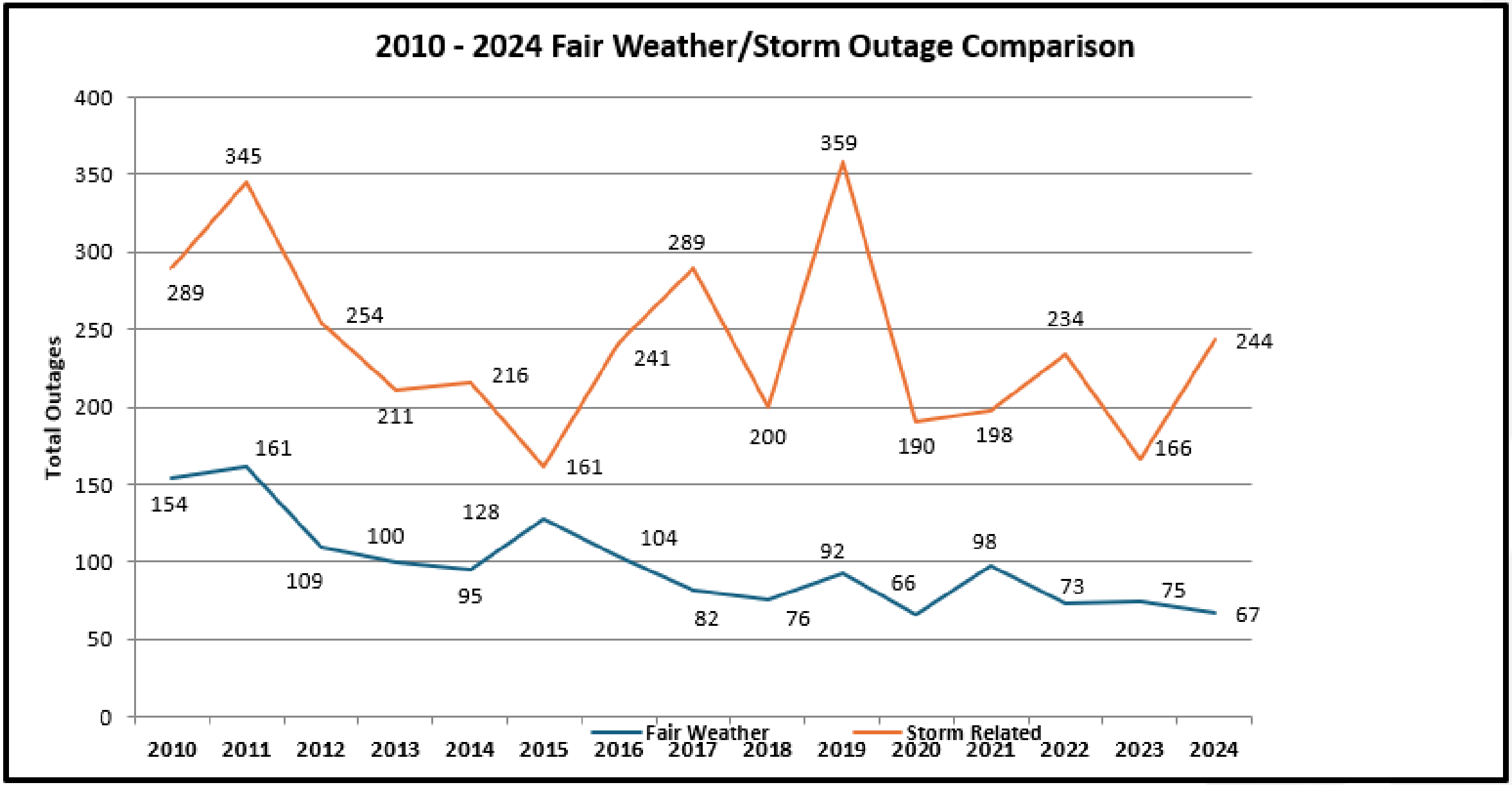
Asset Renewal Program Considerations



What is the Value of Asset Renewal?

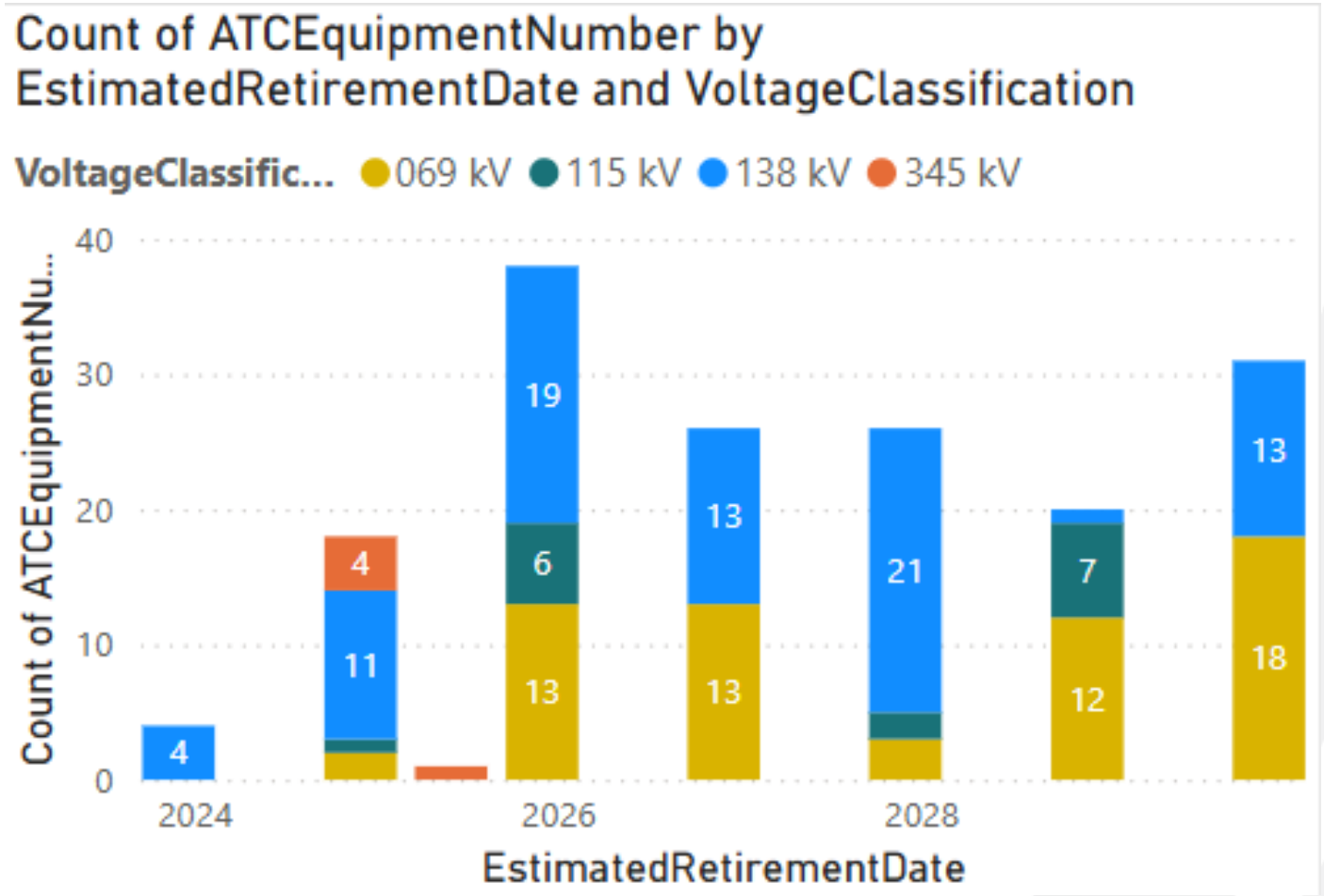


- One way to measure the value of the asset renewal program is the increased reliability by driving down forced outages.
- This trend has continued through the expansion of the transmission system and the addition of assets.

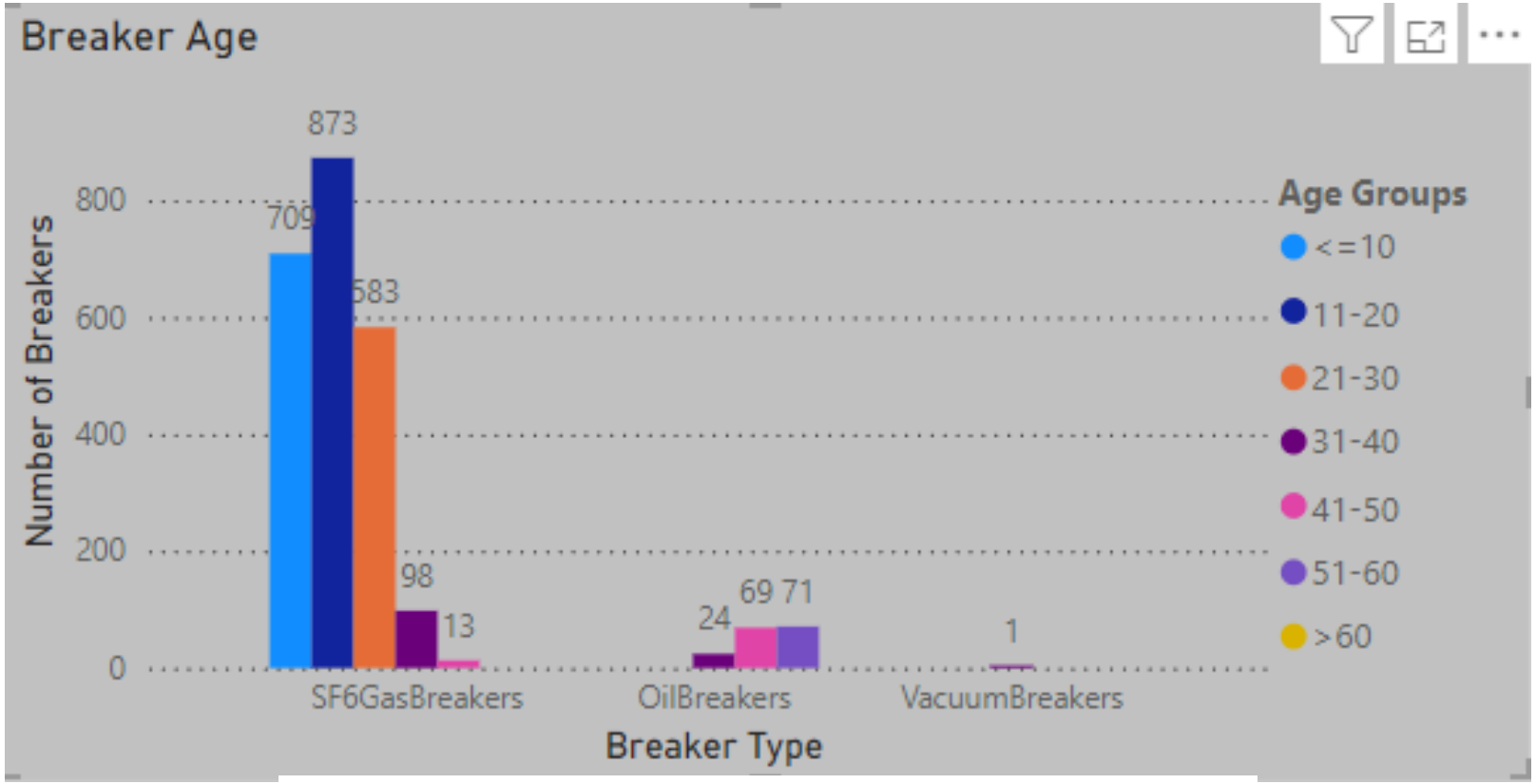


Oil Circuit Breakers Replacement Program

- Approved in 2020, OCB program accelerates the replacement of remaining oil circuit breakers not included in past years programs. **164** breakers remain to be retired by 12/01/2029. 40 breakers were removed in 2024.



Circuit Breakers Age Distribution 2025



Number of Breakers in Fleet

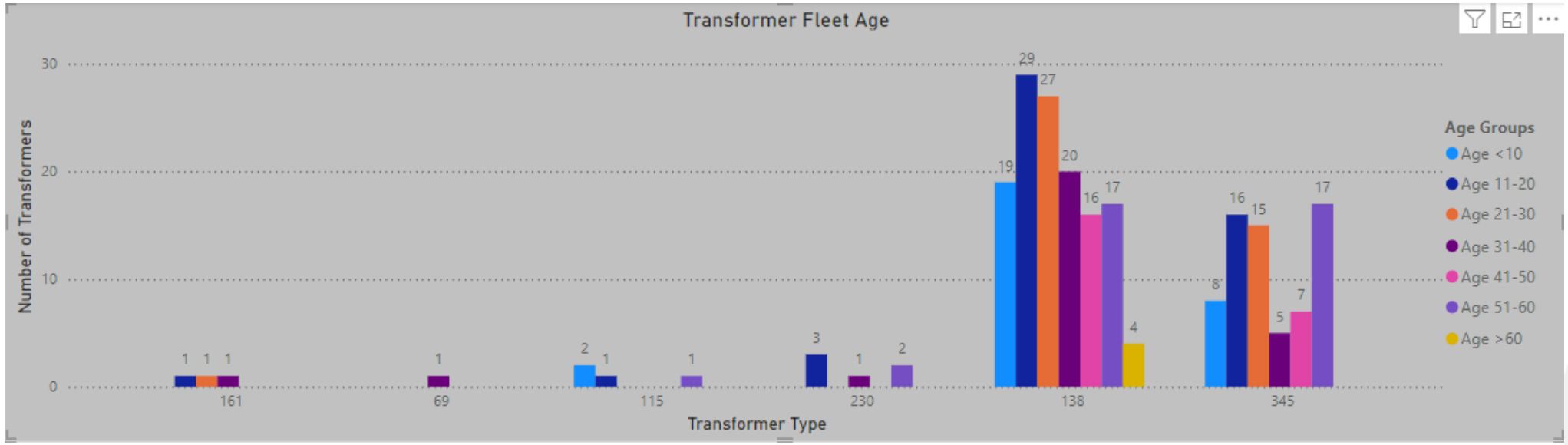
69 kV	115/138/161 kV	230/345 kV	Total
784	1411	241	2441

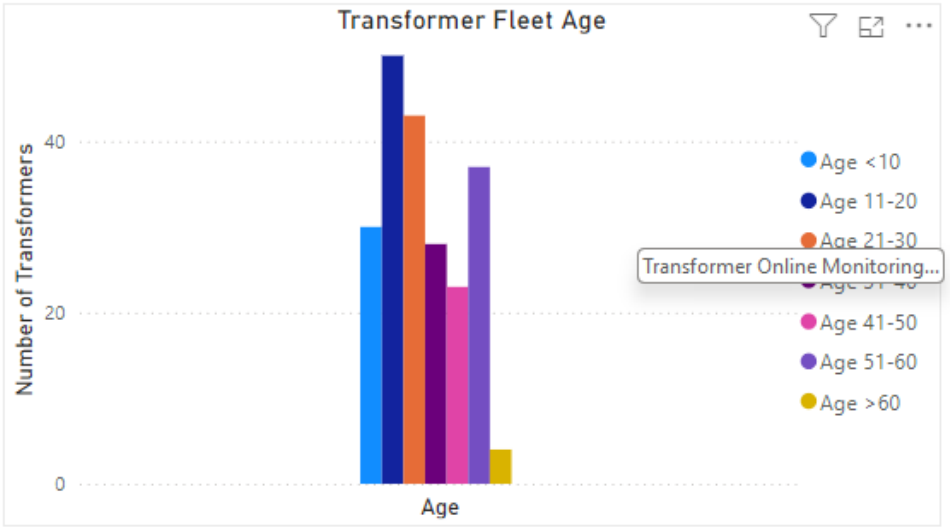
Power Transformer Asset Renewal

"Three-Legged Stool Analogy"

1. Transformer Health Index
2. Probability of Failure
3. Corporate Risk

Transformer Age Distribution 2025





Age <10	Age 11-20	Age 21-30	Age 31-40	Age 41-50	Age 51-60	Age >60
30	50	43	28	23	37	4

Number of Power Transformers in Fleet

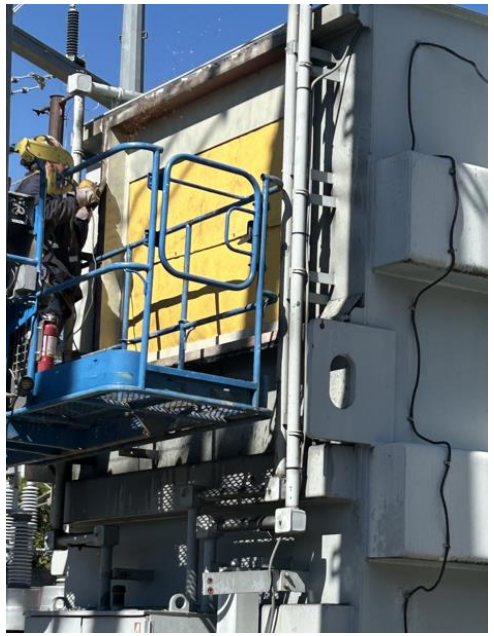
1	139	74	214
69kV	161-115kV	345-230kV	Total

Includes Spare Transformers

Femrite Transformer – Life Extension Project

- Femrite 138/69kV Transformer
  - 1989 vintage 187MVA with model vacuum load tap changer (LTC)
  - Transformers and LTCs are generally expected to be in service for 60 years
- Existing model issues:
  - Parts and service are no longer available
  - service issues with the control and LTC protection
- Solution: Replace model with new LTC
  - Quick payback, (<2 Yr NPVRR break even)
  - Minimal project risk
  - Work completed for summer 2024
  - Transformer is expected to be in service for an additional 20+ years

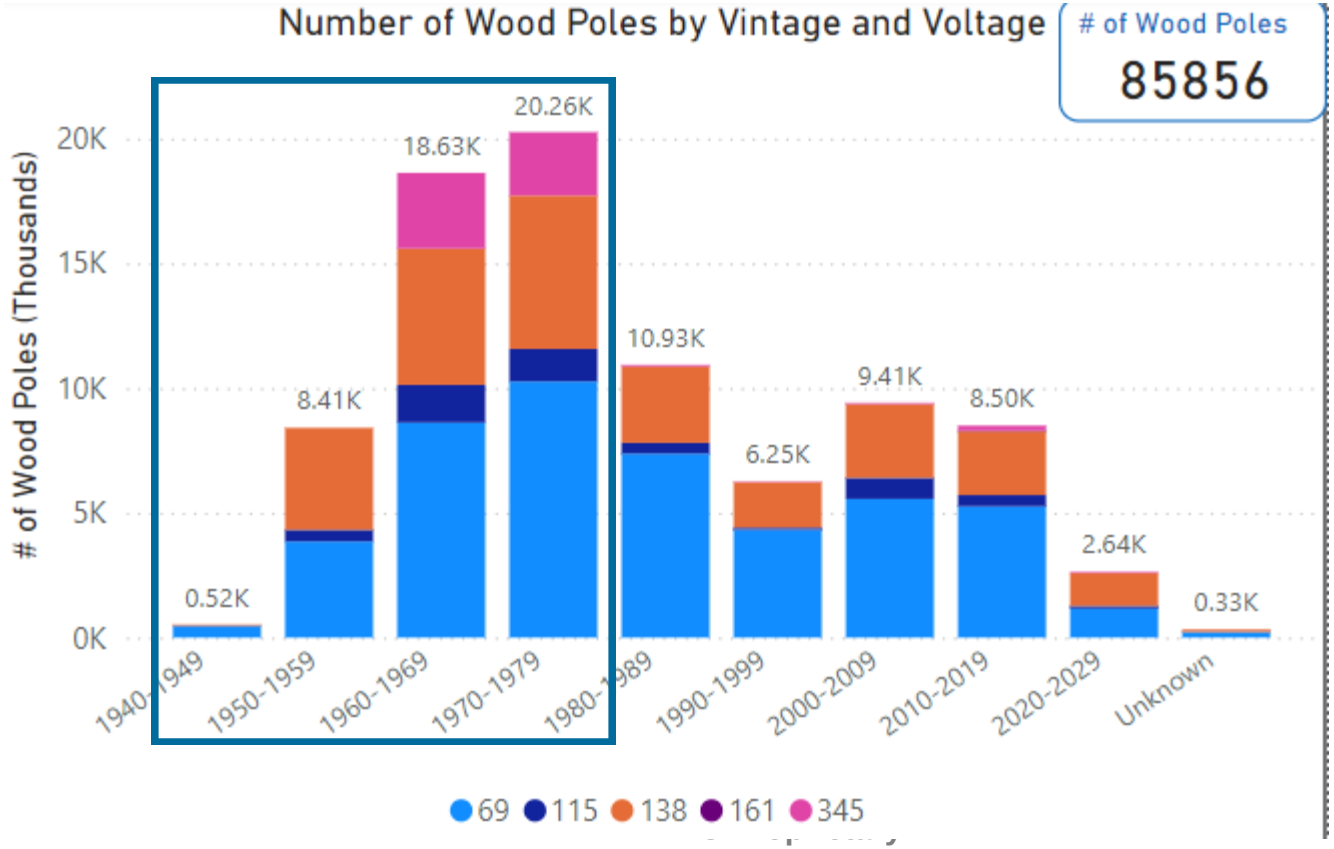
Before LTC Replacement



After LTC Replacement

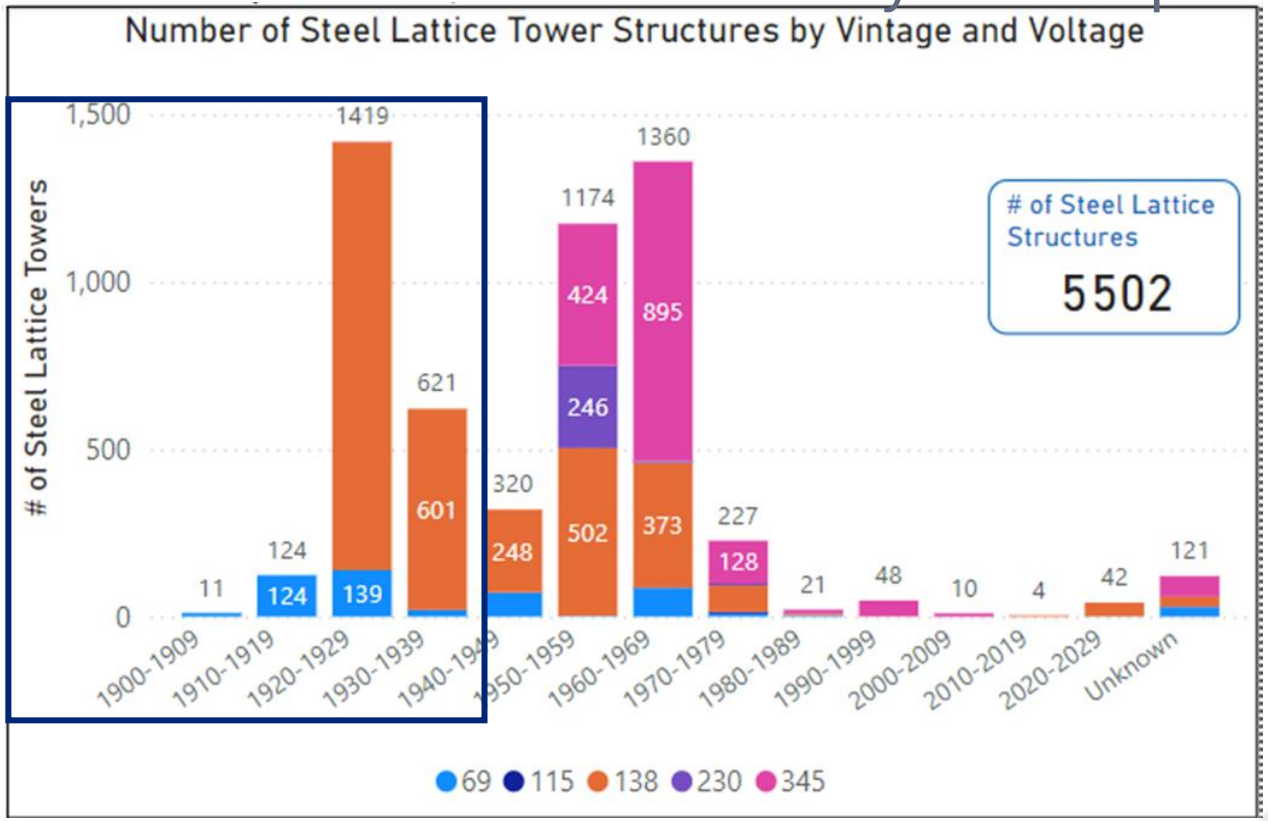
Overhead Transmission Lines – Wood Pole Lines 20-year Outlook

- Objective is to manage condition and preserve reliability and safety as these assets reach end of life.
- Pre-1980 vintage wood poles are likely to be replaced in the next 20 - 25 years.



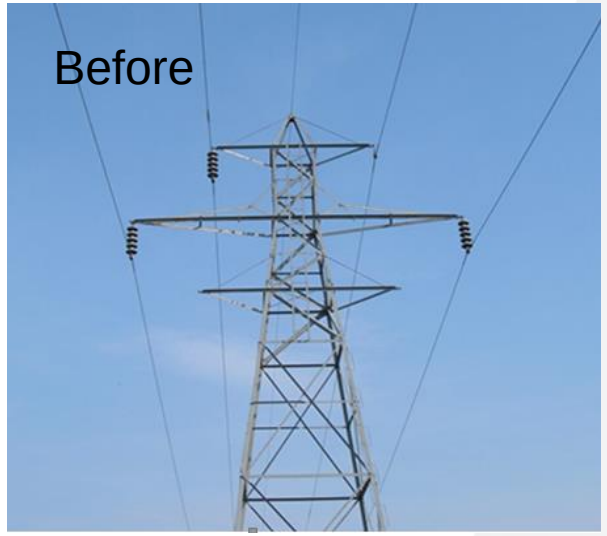
Overhead Transmission Lines – Steel Lattice Lines – Preliminary 20-year Outlook

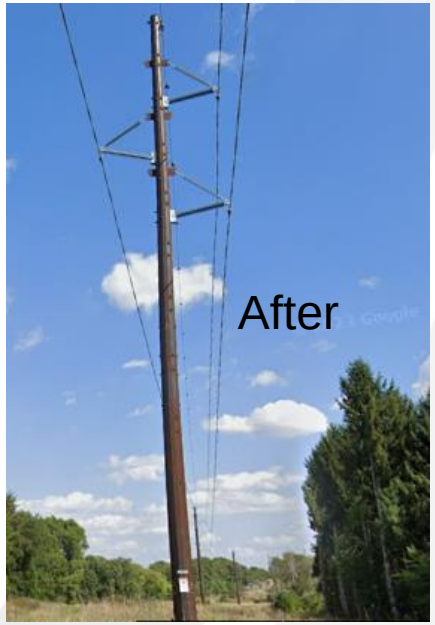
- Objective is to manage condition and preserve reliability and safety as these pre-1940's assets reach end of life.
- Pre-1940 vintage lattice tower structures are likely to be replaced in the next 20 - 25 years.



Asset Renewal T-line Needs Example of Successful Project

- Stoughton - Sheepskin 69 kV (Y-12), Rebuild
  - Project Background
    - Approximately 7 miles of rebuild
  - Past Needs
    - Condition and Performance Issues
    - Replace 1910-1920's vintage lattice structures, below grade corrosion and design spacing issues.
    - Outages: Was One of the most frequently outage ATC lines
      - ✓ On average about 3 outages per year
      - ✓ Need to update to avian friendly design
      - ✓ Improved lightning performance
  - Current status
    - Project went in-service Spring 2021
    - 0 outages since the new design went into service





Assessment Status

- Next Steps
  - Needs comments – due March 31, 2025
  - Finalize needs – Early April
  - Preliminary solutions meeting/presentation – May 12, 2025
  - Finish sensitivity studies – May
  - Develop new or revised scope and cost estimates – June
  - ATC internal review/approval – August
  - 2025 Assessment publication – November 17, 2025

Contacts

Ted Weber (TYA)
Email: tweber2@atcllc.com

Matt Eternicka (Asset Management)
Email: meternicka@atcllc.com

Justin Nettesheim (AR T-line)
Email: jnettesheim@atcllc.com

Matt Falkowski (Communications)
Email: mfalkowski@atcllc.com