

2025 10-Year Assessment Preliminary Study Design

Stakeholder and Customer Webcast

PRESENTED BY:

System Planning

November 04, 2024

- ATC Proprietary -

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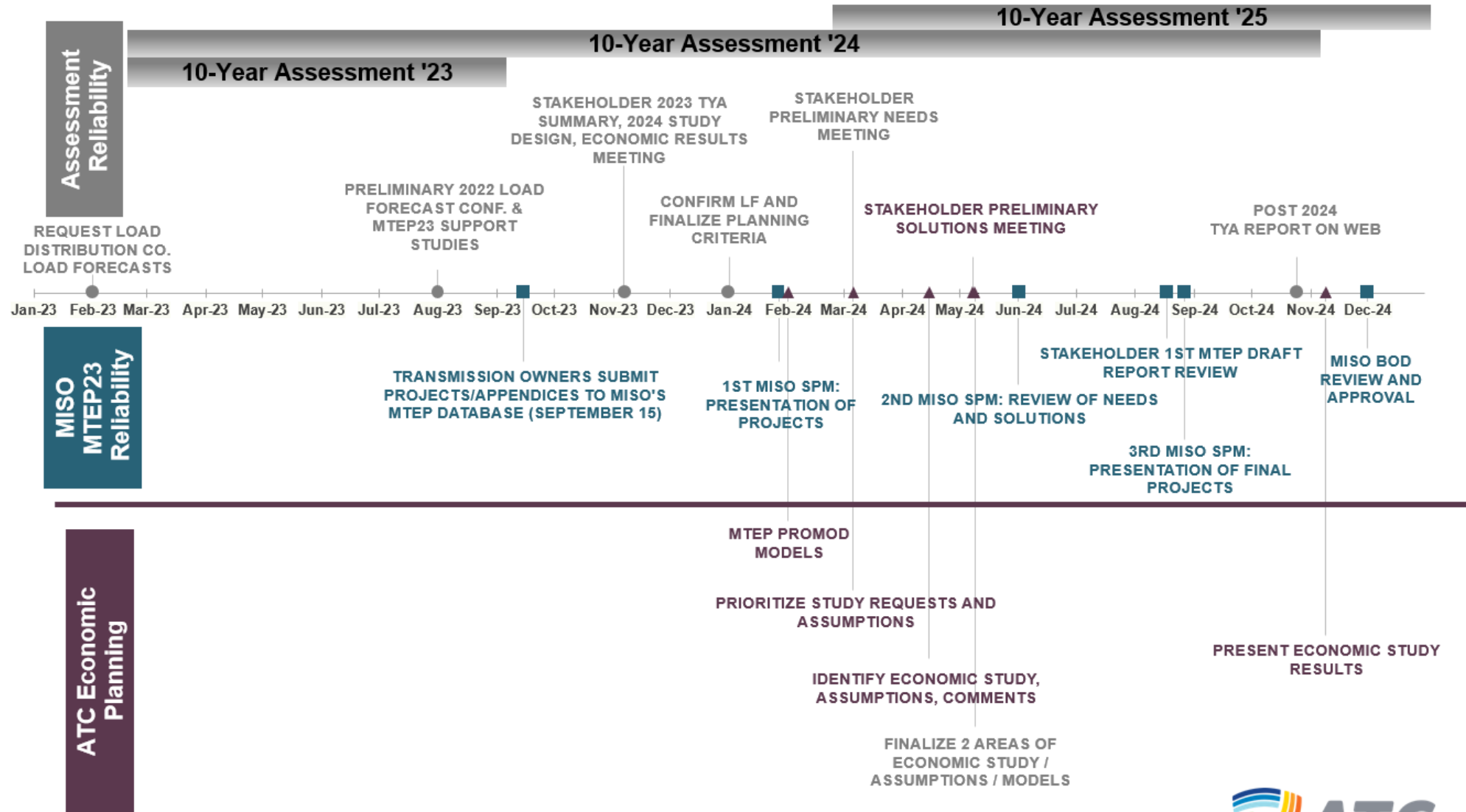
Purpose

- Summarize ATC's project development processes
- Solicit input for the 2025 Assessment Study Design
- Solicit input on any new Public Policy Requirements

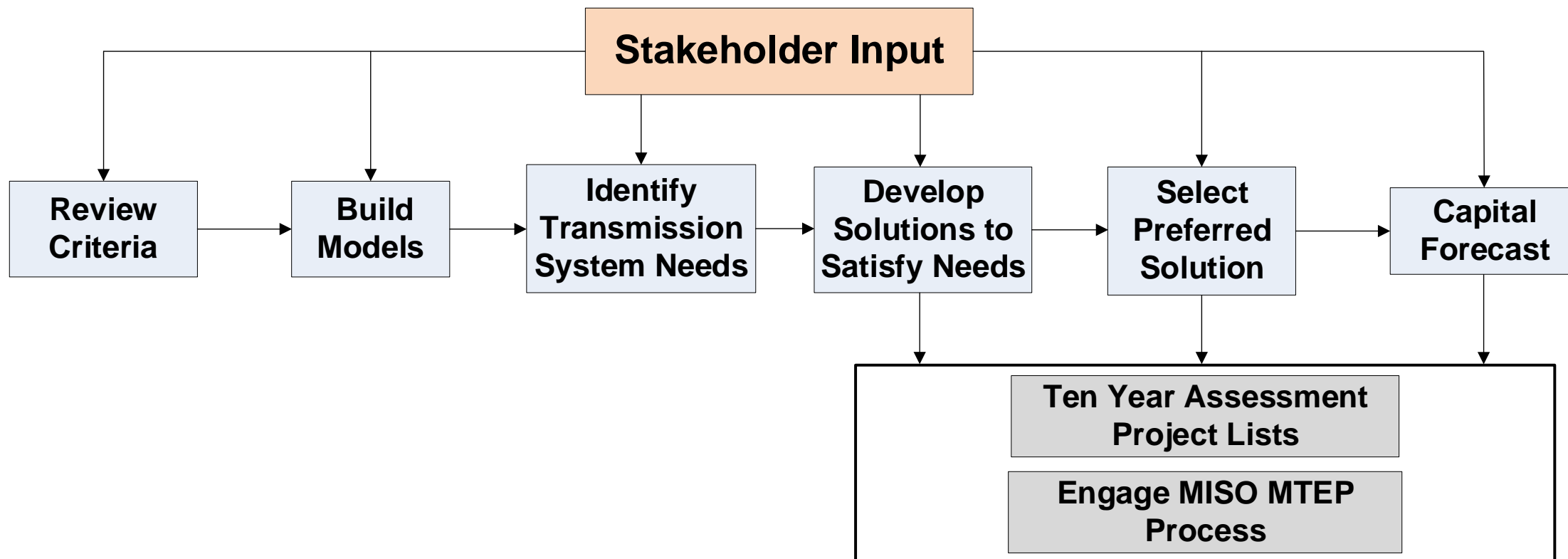
ATC's project development processes

- Local Transmission Planning
 - Asset Renewal
 - Interconnections
 - Network
 - ◆ Planning Reliability Criteria
 - ◆ Sectionalizing Guidelines
 - Economic Benefits
- Consider Other Solutions (Non-Transmission Alternatives)
- Regional Planning
- Public Policy Requirements

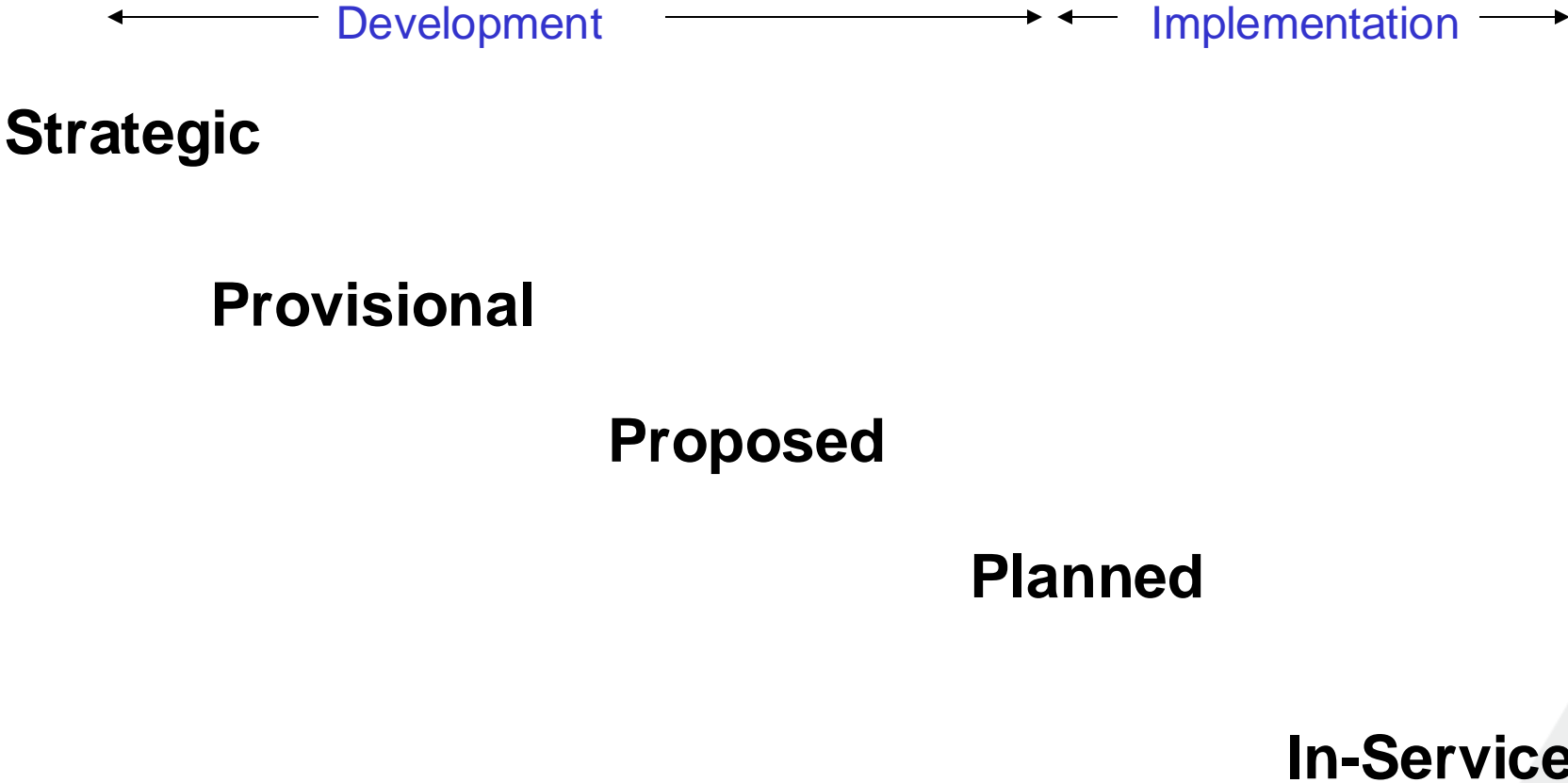
Timeline



ATC project identification process



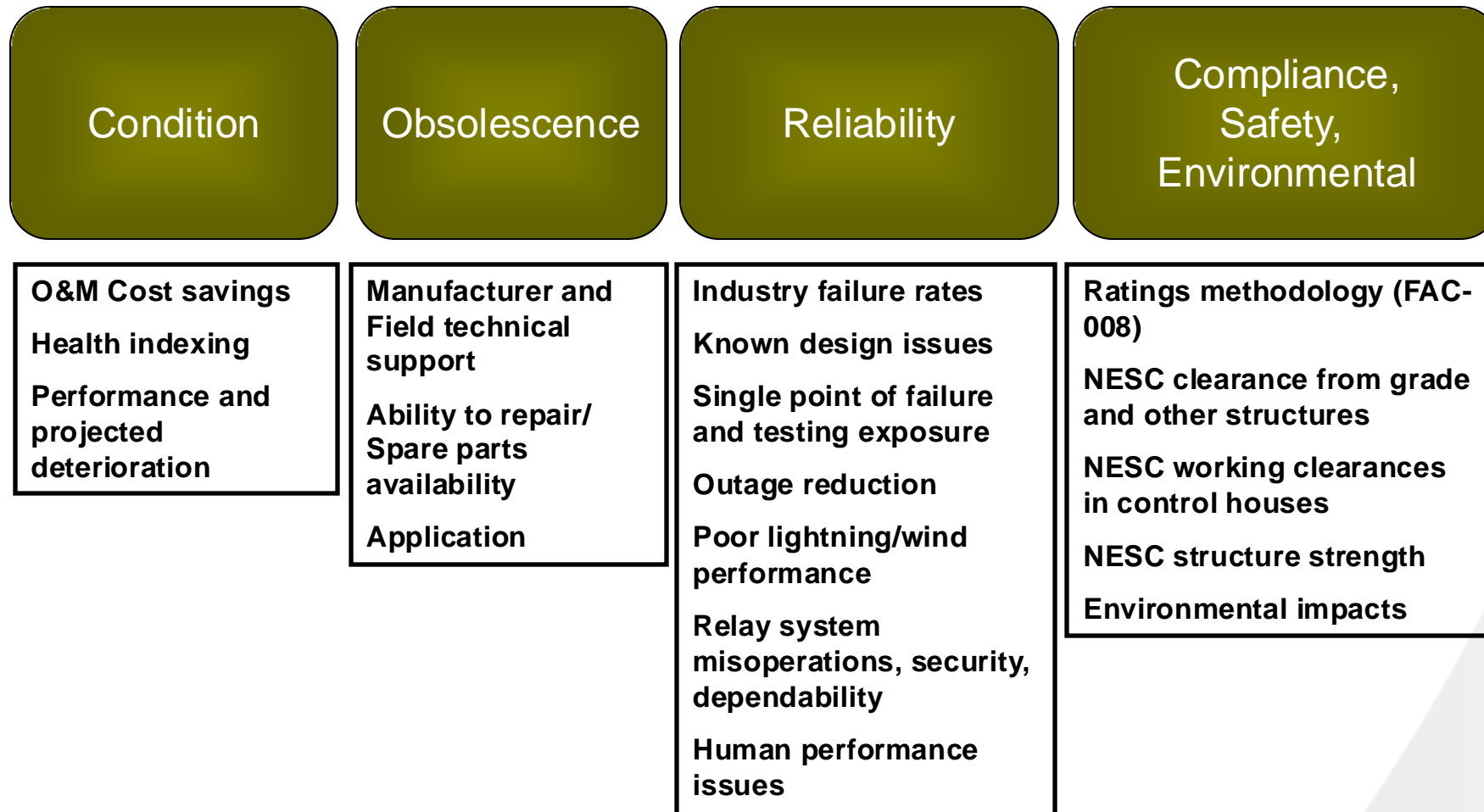
ATC project status definitions



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 Replacement is based on.... (Hint: Not Age!)



Asset renewal considerations

- Is the asset still needed?
 - Assess area needs
 - Obtain cross-functional and distribution provider input
 - Consider removal of lines/equipment
 - Consider system reconfiguration
 - Other alternatives
 - Communication and System Protection needs
- What ratings and performance are needed?

Listing of Asset Renewal Project Solutions

- See ATC 10 Year Assessment Site under
 - [Projects - Network Projects List - Related Resources](#)
 - Condition and Performance: Later ISDs, Explanation “Project Added”

Related Resources

2024 TYA Project List

TYA 2023 Q3 of 2024 Updated Project List
as of October 15, 2024

Project Name	2024 Est. BD Month - Year	ZONE	Need Category	Planned / Proposed / Provisional	MISO MTEP Appendix (BOLD = Certified)	MTEP PRJID	Cost	Explanation
101 - Board 69 kV, Construct New Line	Dec-31	3	Reliability	Provisional	B in MTEP23	1730	\$ 28,791,800	Updated Cost
11 Monroe - Verona 69 kV (Y-42/Y-208), Rebuild & OPGW	Jul-27	3	Condition and Performance	Provisional	B in MTEP24	25001	\$ 49,000,000	No Update
12 Lake Geneva - Watworth 69 kV (Y-41), Partial Rebuild & OPGW	Aug-28	3	Condition and Performance	Provisional	B in MTEP24	25002	\$ 22,500,000	Updated Project Cost
13 Lake Geneva - North Lake Geneva 69 kV (Y-132), Partial Rebuild & OPGW	Aug-27	3	Condition and Performance	Provisional	B in MTEP24	25004	\$ 11,000,000	No Update
14 Grae - Hilsde 69 kV (Y-161), Rebuild & OPGW	Jul-27	3	Condition and Performance	Provisional	B in MTEP24	25019	\$ 12,000,000	No Update
15 River SS, Bus Rebuild	Apr-25	3	Condition and Performance	Planned	A in MTEP23	20201	\$ 847,000	No Update
16 J1326 J1377 J1410 J1411 MPFCA Network Upgrades	May-25	3	G-T Interconnection	Planned	A in MTEP23	24841	\$ 1,279,961	No Update
17 J1305 J1460 MPFCA Network Upgrades	Dec-25	3	G-T Interconnection	Planned	A in MTEP23	24782	\$ 4,930,697	No Update
18 Beaver Dam - North Beaver Dam 69 kV (Y-58), Upgrade	Apr-24	3	Reliability	Planned	A in MTEP20	14809	\$ 216,470	Updated ISD
19 Prairie Area Reliability Project	Dec-28	3	Reliability	Provisional	B in MTEP24	25161	\$ 50,000,000	Updated Cost
20 Sand - Hill Valley 138 kV, Construct New Line	Dec-29	3	Reliability	Provisional	B in MTEP24	25203	\$ 9,500,000	Updated ISD
21 City South, DIC, Sub Expansion	Dec-27	3	T-D Interconnection	Proposed	A in MTEP24	25220	\$ 11,000,000	No Update
22 Towline, DIC, Sub Expansion	Jun-26	3	T-D Interconnection	Proposed	A in MTEP24	25226	\$ 6,700,000	No Update
23 Madison Area Reliability Project	Dec-28	3	Reliability	Provisional	B in MTEP24	25087	\$ 14,000,000	Updated Project Name, Need Category, and ISD
24 Iron Area Reliability Project	Dec-28	3	Reliability	Provisional	B in MTEP24	25103	\$ 6,500,000	Updated ISD
25 Onago - University 138 kV (LNU02), Rebuild	Dec-31	3, 5	Condition and Performance	Provisional	B in MTEP24	50010	\$ 55,000,000	No Update
26 Middleton - Ste 30 69 kV (8967/8963), Rebuild Green Poles (CAC/CCA/SX) Replacements	Oct-26	3	Condition and Performance	Provisional	B in MTEP24	50017	\$ 7,200,000	No Update
27 Geneva SS, DIC, New Substation	Feb-27	3	T-D Interconnection	Planned	A in MTEP20	14807	\$ 2,471,000	Updated ISD
28 Ridge, DIC, Additional Transformer and Bus Tie	Dec-25	3	T-D Interconnection	Planned	A in MTEP23	20204	\$ 1,268,000	No Update
29 Earth, DIC, Additional Transformer	Jun-25	3	T-D Interconnection	Proposed	A in MTEP24	22911	\$ 1,808,000	No Update
30 Wood SS Relay and Capacitor Bank Asset Renewal	Dec-27	3	Condition and Performance	Proposed	A in MTEP24	22798	\$ 1,200,000	No Update
31 Unity - Whitewater 138 kV (LNU01), Partial Rebuild & OPGW	Dec-29	3	Reliability, Operational Reliability	Proposed	A in MTEP24	50102	\$ 4,825,000	Project Added
32 Edmund SW St Network Upgrades and Interconnection Facilities	Mar-30	3	G-T Interconnection	Proposed	A in MTEP24	50113	\$ 18,691,000	Project Added
33 Hill Valley SS Network Upgrades and Interconnection Facilities	Mar-30	3	G-T Interconnection	Planned	A in MTEP24	50112	\$ 7,239,000	Project Added
34 Onago SS Power Transformer Asset Renewal	Dec-28	3	Condition and Performance	Provisional	B in MTEP24	50122	\$ 16,461,000	Project Added
35 Onago SS Relay and Breaker Asset Renewal	Dec-28	3	Condition and Performance	Provisional	B in MTEP25	50124	\$ 7,300,000	Project Added
36 River SS and Remote Ends Asset Renewal	Dec-28	3	Condition and Performance	Provisional	B in MTEP25	50125	\$ 8,842,000	Project Added
37 SS Relay and House Asset Renewal	Dec-28	3	Condition and Performance	Provisional	B in MTEP25	50128	\$ 4,945,000	Project Added
38 Heights - Baraboo 69 kV (Y-75), Partial Rebuild	Dec-28	3	Condition and Performance	Provisional	B in MTEP25	50131	\$ 13,000,000	Project Added
39 Tap - Katzenberg 69 kV (Y-01 ALE), Partial Rebuild Green Poles	Dec-28	3	Condition and Performance	Provisional	B in MTEP25	50133	\$ 13,000,000	Project Added

Asset Renewal T-line Project Example

- Portage – Dam Heights 69kV Rebuild (Y-16)
 - Project Background
 - ◆ Approximately 25 of miles of rebuild
 - Past Needs
 - ◆ Condition and Performance Issues
 - ◆ Replace 1910's vintage lattice structures
 - ◆ Outages: One of the most frequently outaged ATC lines
 - ✓ On average about 4 outages per year
 - ✓ Updated to avian friendly design
 - ✓ Improved lightning performance
 - Current status
 - ◆ Project went in-service Fall of 2017
 - ◆ Improvement in performance: One momentary outage in 2021 due to lightning above design (69kV – 45kA design, actual strike 192kA)



Femrite Transformer – Life Extension Project

- Femrite Transformer
 - 1989 vintage Westinghouse 187MVA with model UVT load tap changer (LTC)
 - Transformers and LTCs are generally expected to be in service for 60 years
- Existing UVT model issues:
 - Parts and service are no longer available
 - service issues with the control and LTC protection
- Solution: Replace UVT model with new LTC
 - Quick payback period, 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

Interconnections

- G-T
 - MISO Attachment X and Y Processes
- D-T
 - Collaborate with distribution providers through Load Interconnection Request Form (LIRF) and BVP process
- T-T
 - Collaborate with other Transmission Owners

Network planning objectives

- Compliance with North American Electric Reliability Corporation (NERC) regional and local criteria
- Best Value Planning (BVP) process
- Customer involvement
- Address Public Policy requirements
- Maintain or improve the adequacy and reliability of the electric transmission system

Planning Criteria and Assessment Practices

- NERC Standards, particularly [TPL-001, Version 5](#)
- ATC Planning Criteria
 - [Consists of criteria and assessment practices](#)
 - <http://www.atc10yearplan.com> (About tab)
 - Current versions: Planning Criteria v22.4 & Planning Assessment Practices v22.4
 - Planning Criteria v22.4
 - ◆ v22.3 (March 2024)
 - ✓ PSCAD model submission timeline update for DPP in Section 4
 - ◆ v22.4 (Sept 2024)
 - ✓ Removal of 20s simulation requirement for Dynamic Stability where adequate damping is seen earlier
 - ✓ Clarification of Post COD PSCAD model update requirements in Section 4.3
 - ✓ BESS resources shall maintain POI voltage in charging mode
 - Planning Assessment Practices v22.4
 - ◆ v22.4 (Sept 2024)
 - ✓ Added clarifications on known, long-lead time, and maintenance outage steady state implementation in section 12.3-4
 - ✓ Added a methodology description of the updated damping criteria (removal of 20s simulation requirement)

2024 studies and assumptions

- Preliminary 2024 Load Forecast Confirmation and MTEP25 Support Studies
- Modeling Assumptions
 - Model Years
 - Load
 - Generation
 - No Load Loss Allowed Contingency Analysis
- Additional Studies

Preliminary load forecast and MTEP25 support studies

- Initial screening (reduced generator reactive capability)
 - Summer peak (5 and 10 year models)
 - 2024 load forecast
 - 2024 TYA outside world (2023 MMWG cases)
- To confirm 2024 Load Forecast and support MTEP25 database development
 - No load loss allowed contingencies
 - Completed August 2024

2025 TYA model years

- 2025 (As-planned)
 - 2026
 - 2030
 - 2035
-
- All models will likely be completed by the Spring of 2025

2024 Load Forecast- Historical

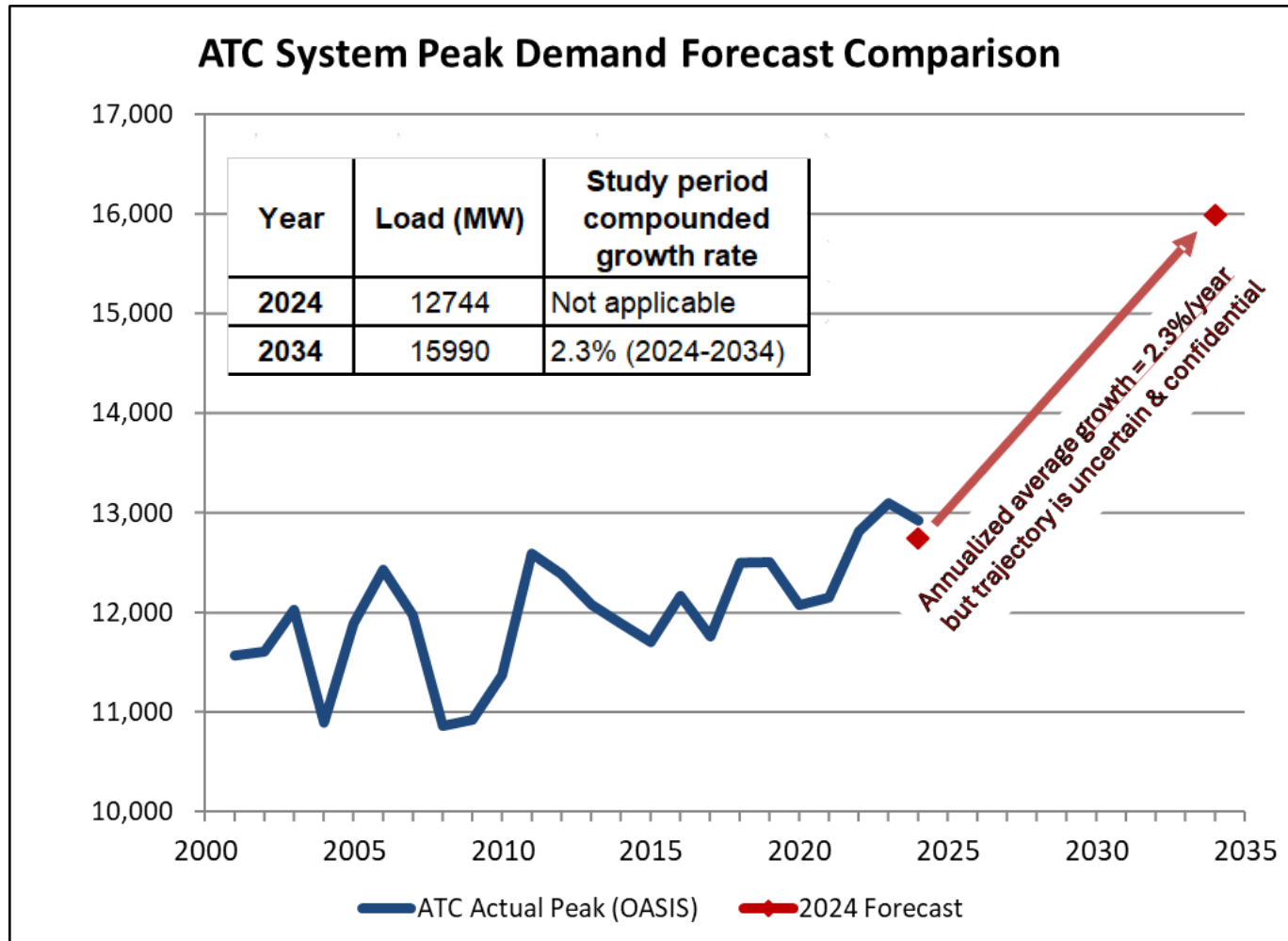
- Requested September 26, 2024
 - ATC's 2024 summer peak hour
 - ATC's 2023-2024 winter peak hour
 - Light load (Easter morning at 4:00 AM)
 - Shoulder load
- Requested by November 1, 2024.
- Compile, review, and add to the existing load databases

2024 Expected forecast for TYA 2025

- Requested LDC forecasts in February 2024
 - 11 years per D-T Interconnection Agreement
 - Consistent with resource planning forecast
 - Expected (50/50 probability)
- Received in April 2024
- ATC compares forecasts to previous forecasts and historic data
 - Notable differences are confirmed with the LDCs and revised if needed
 - Finalized copy of forecast provided to LDCs in August 2024
 - Forecasts incorporated into the 2025 TYA to plan the system

ATC 2024 Load Forecast Estimated Growth

Graphical Comparisons of ATC Peak Load and Forecast



The TYA forecast includes multiple significant load additions that are expected to be added over the next decade. The timing, sizes, and locations of these additions are commercially sensitive and remain confidential at this time.

Generation modeling

- Existing generator data
 - Annual updates requested from Generator Owners (GOs) in Q3
- Generation additions
 - Only add generators with signed interconnection agreements (IAs)
 - Additions modeled at MISO Facility study location
- Generation retirements
 - Generators with a completed MISO Attachment Y are modeled as retired, unless there is a System Support Resource (SSR) agreement
- Under intact system and outage conditions
 - Generators are limited to:
 - ◆ 90% of maximum reactive power output and
 - ◆ 90% of maximum reactive power consumption

Generation dispatch

- Local Balancing Area (LBA) merit order dispatch:
 - Used in Assessment's summer peak and shoulder models.
 - Provided by LBAs
- ATC-wide merit order dispatch:
 - Used in minimum load models
 - ATC-wide merit order dispatch determined using PROMOD
- Generators without scheduled transactions:
 - If they have signed IAs, generator included in the host LBA.

No load loss allowed contingency analysis

- Peak
 - 1, 5, and 10 year out models
- Shoulder (firm)
 - 5 and 10 year out models
 - 70% load except for Zone 2 (90% load) and northern Zone 4 (80% load)
 - Shoulder rating methodology
- Minimum load
 - 1 and 5 year out model
 - 40% load, may be adjusted based on analysis of historical loads

Additional network planning studies

- Load Loss Allowed
- Existing Generator Stability Reviews
- Annual Fault Study
- Sensitivity Studies

Long Range Transmission Plan (LRTP)

- MISO led initiative, under the Reliability Imperative
 - Transmission solutions to provide reliable and economic energy delivery for a reliable energy future
- 4 Tranches planned
 - Tranche 1
 - ◆ Approved by the MISO Board retroactively to MTEP21 in 2022
 - ◆ Portfolio of 18 projects for \$10.3 B
 - ◆ ATC ownership share in 3 projects
 - Tranche 2
 - ◆ Under development and study, ATC actively participating
- Latest information available at [MISO's LRTP Page](#)



Projects Flow from TYA to MTEP

- Projects developed in the 2024 TYA process will be included in the MTEP25 approval process
 - A list of those projects can be found in the [2024 TYA Project List](#)
- Projects that may develop after the 2024 TYA publication will be included on the project list each quarterly update and will be submitted into MTEP25
- [MISO Active Project List](#)

MTEP25 – Summary (as of 10/25/24)

- Appendix A Projects
 - Count: 49
 - Est Cost: \$1,500,573,089
- Appendix B Project
 - Count: 12
 - Est Cost: \$312,768,000

MTEP25 Appendix A Project Breakdown

Project Category	Count
Baseline Reliability Project	1
Generator Interconnection Project	16
Other – Age and Condition	10
Other – Load Growth	8
Other – Local Needs	6
Other – Local Reliability	8
Total	49

Non-Transmission Alternatives (NTAs)

- ATC and MISO work together in the TYA and MTEP processes to provide Stakeholders an opportunity to provide NTA Feedback on Projects
- MISO will post a list of NTA eligible projects as part of their Subregional Planning Meeting (SPM) #1, in January of 2024.
 - MISO will accept stakeholder project alternatives through May 31, 2024.
 - Best candidates for NTA consideration are MTEP Appendix B and Target Appendix B projects.
 - Stakeholders should submit alternatives to MISO's MTEP SPM contact, who is [Greg Plauck](#).

Regional planning

- MTEP
- MISO's Coordinated Seasonal Assessments
- Reliability First's (RF's) Seasonal Assessments

Public policy requirements

- Follow MISO Tariff (Attachment FF) Processes
- Previously identified requirements
 - State Renewable Portfolio Standards (RPSs)
 - EPA regulations
 - State mandates and goals for energy efficiency (EE) and demand side management (DSM) programs
- We are asking for any feedback on whether there are additional public policy requirements we need to be made aware of.

Schedule

- Expected Load Forecast – Review complete August 2024
- Preliminary MTEP23 Support Study – Done
- Post 2023 TYA Preliminary Study Design Presentation – Done
- Stakeholder Preliminary Study Design Meeting – November 04, 2024
- Stakeholder Study Design Comments Due – November 30, 2024
- Study Design Completion – December 2024
- Preliminary Needs Meeting – March 2025
- Preliminary Solutions Meeting – May 2025
- Document and Publish – November 2025

Thank you for participating

**To provide solicited comments or for
more information, please contact:**

Ted Weber (tweber2@atcllc.com)

by November 30, 2024

Q & A

