

2026 10-Year Assessment Preliminary Study Design

Stakeholder and Customer Webcast

PRESENTED BY:

System Planning

November 17, 2025

- ATC Proprietary -

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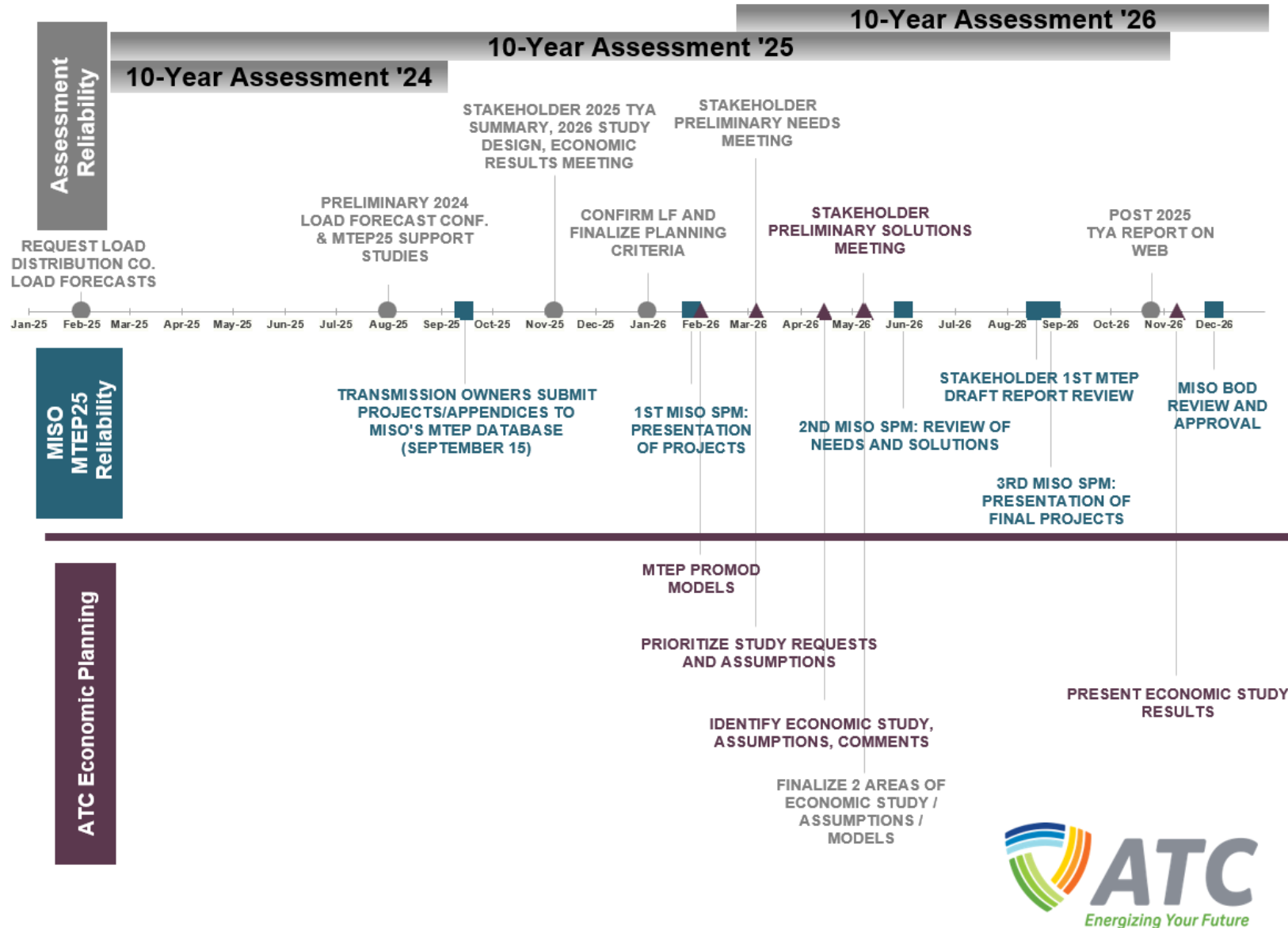
Purpose

Summarize	Summarize ATC's project development processes
Solicit	Solicit input for the 2026 Assessment Study Design
Solicit	Solicit input on any new Public Policy Requirements

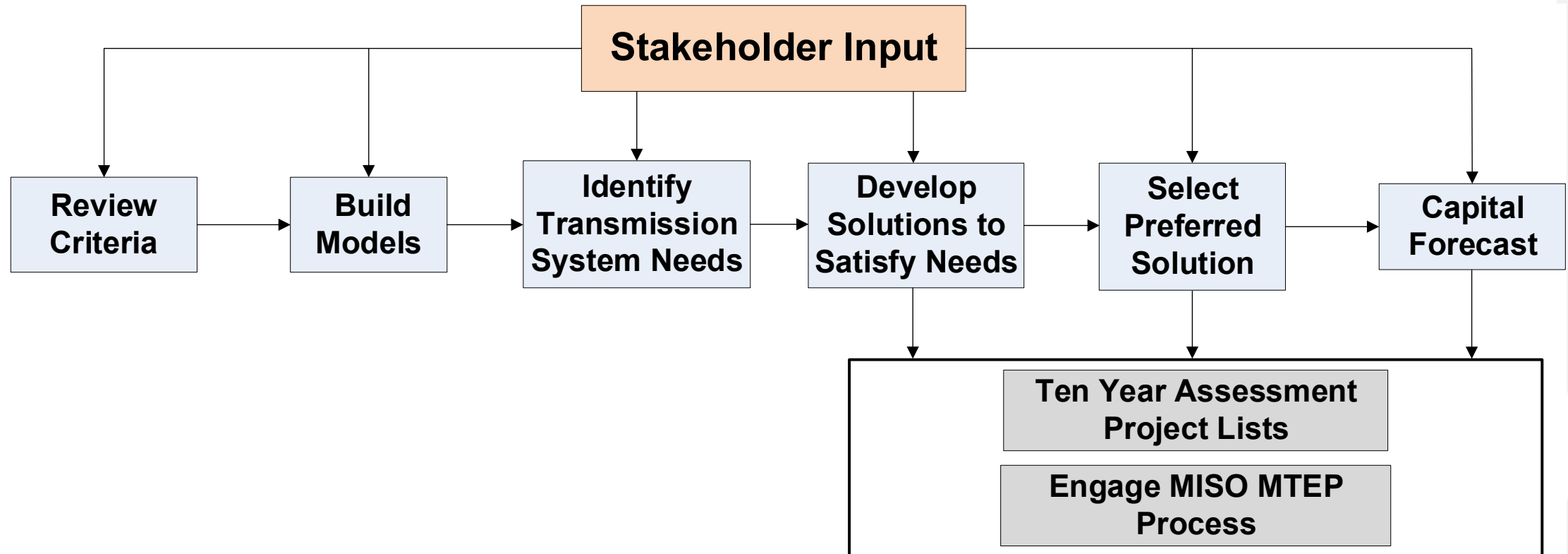
ATC's project development processes

- 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

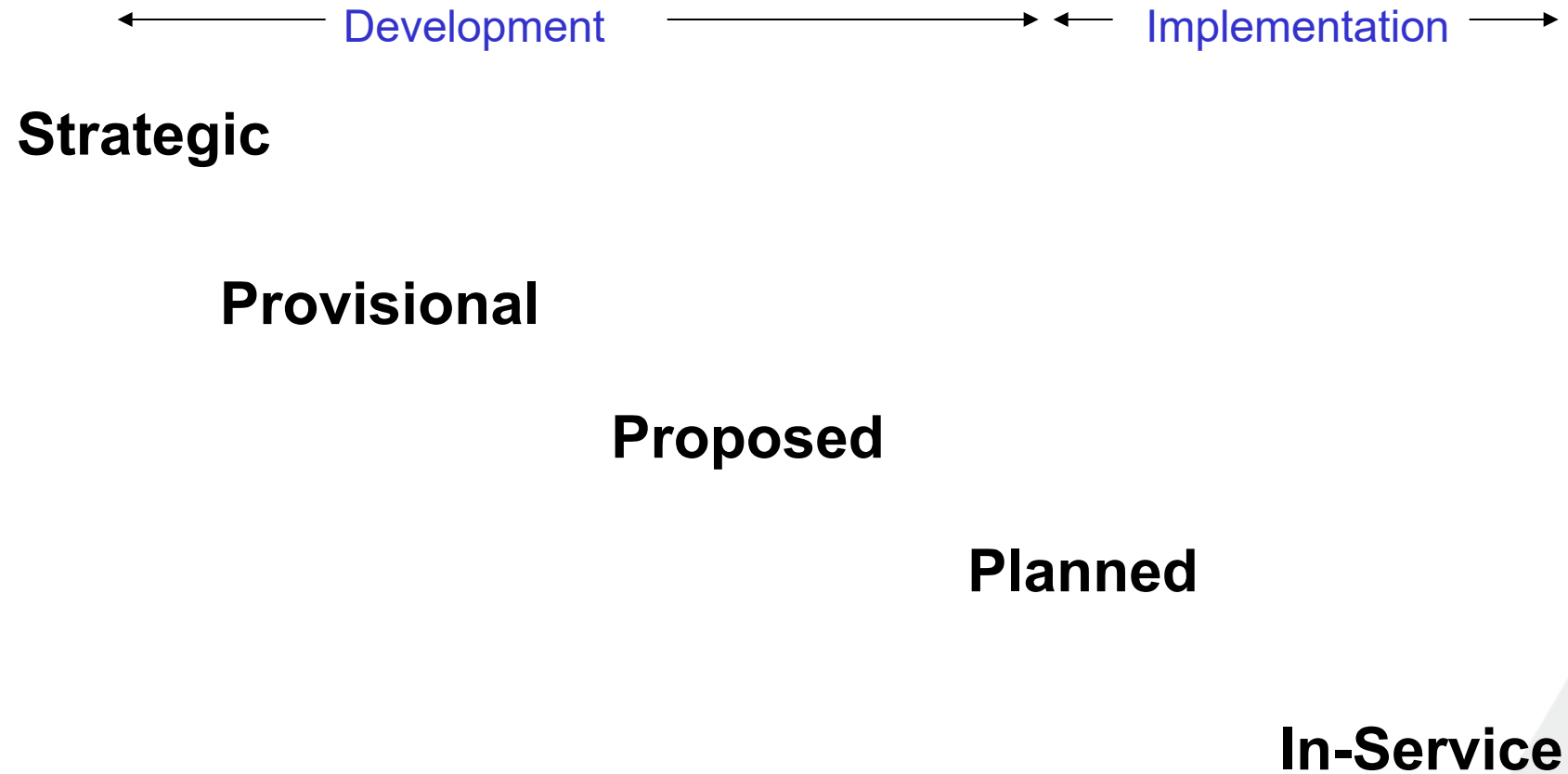
Timeline



ATC project identification process



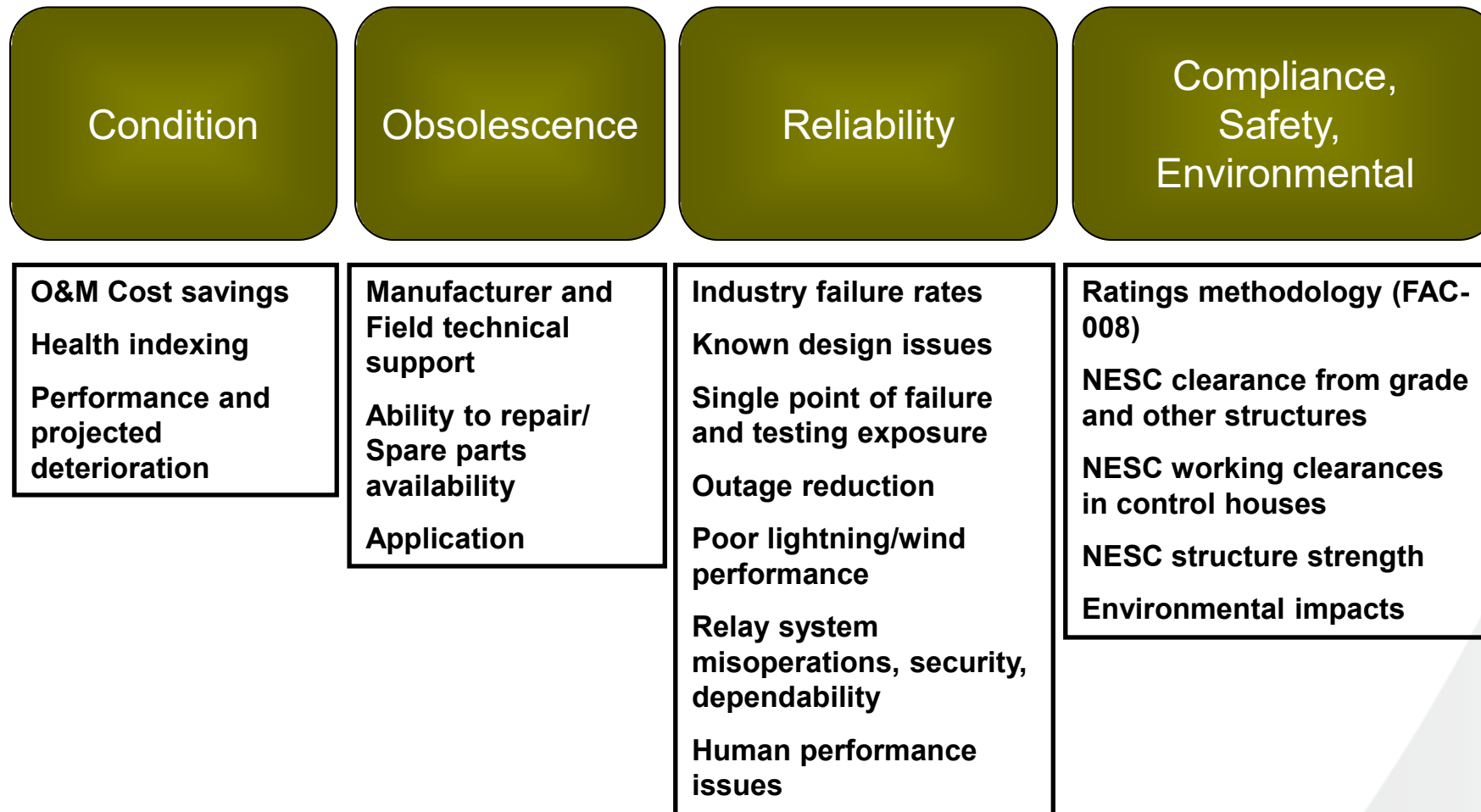
ATC project status definitions



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

2025 TYA Project List

TYA 2024 Q3 of 2025 Updated Project List
as of October 15, 2025

ATC's 2024 10-Year Assessment Project List

	2025 Est. ISD Month - Year	ZONE	Need Category	Planned / Proposed / Provisional	MISO MTEP Appendix (BOLD = Approved)	MTEP PRJID	Cost	
ge Project	Dec-25	1	Operational Flexibility	Planned	A in MTEP19	15947	\$ 13,857,000	
C-40), OPGW Installation	Dec-25	1	Communication	Planned	A in MTEP21	19587	\$ 4,900,000	
ier	Jul-25	1	T-D Interconnection	Planned	A in MTEP20	14907	\$ 104,678	
al Transformer	Dec-25	1	T-D Interconnection	Planned	A in MTEP23	24783	\$ 3,700,000	
a Network Improvement Project	May-27	1	T-D Interconnection	Planned	A in MTEP23	23913	\$ 39,900,000	
IV (Y-47), Rebuild	Dec-25	1	Condition and Performance	Planned	A in MTEP18	7763	\$ 13,000,000	
and Breaker Asset Renewal	Dec-25	1	Condition and Performance	Planned	A in MTEP22	19525	\$ 8,200,000	
a Sub	Dec-25	1	T-D Interconnection	Planned	A in MTEP23	24475	\$ 4,800,000	
30, 69 kV (Y-71), Partial Rebuild and Rerate	Dec-25	1	Condition and Performance	Planned	A in MTEP23	21921	\$ 19,200,000	
IV-107), Partial Rebuild	Dec-30	1	Condition and Performance	Proposed	A in MTEP25	21922	\$ 5,500,000	
Interconnection Facilities and Network Upgrades	Dec-29	1	G-T Interconnection	Planned	A in MTEP21	19729	\$ 21,245,605	
wer Transformer Replacement	Jun-27	1	Reliability	Planned	A in MTEP23	24093	\$ 17,600,000	
70), Rebuild & OPGW	Oct-25	1	Condition and Performance	Planned	A in MTEP23	23874	\$ 12,300,000	
Project	Dec-28	1	Reliability	Planned	A in MTEP23	22587	\$ 92,400,000	
om 115 kV (I-9), OPGW Addition & Partial Rebuild	Feb-32	1	Communication	Proposed	A in MTEP25	23841	\$ 47,000,000	
Y-74), Rebuild & OPGW	Oct-26	1	Condition and Performance	Planned	A in MTEP24	24983	\$ 48,800,000	
on	Nov-25	1	T-D Interconnection	Planned	A in MTEP24	22911	\$ 561,327	
IV (Z-52), Reconnector	Jun-26	1	Reliability	Planned	A in MTEP24	25160	\$ 2,600,000	
ect	Dec-28	1	T-D Interconnection	Proposed	A in MTEP25	25314	\$ 35,900,000	
1 kV, Construct New Line	Dec-27	1	Reliability	Planned	A in MTEP24	25348	\$ 10,300,000	
r (Y-90), Upgrade	Oct-26	1	Operational Flexibility	Planned	A in MTEP24	22798	\$ 3,150,000	
grades and Interconnection Facilities	Sep-28	1	G-T Interconnection	Planned	A in MTEP24	50108	\$ 2,633,000	
ork Upgrades and Interconnection Facilities	Sep-28	1	G-T Interconnection	Planned	A in MTEP24	50107	\$ 3,168,000	
Upgrades and Interconnection Facilities	Jan-28	1	G-T Interconnection	Planned	A in MTEP24	50110	\$ 9,703,000	
aker and House Asset Renewal	Dec-28	1	Condition and Performance	Proposed	A in MTEP25	50126	\$ 7,950,000	
Asset Renewal	Dec-28	1	Condition and Performance	Proposed	A in MTEP25	50172	\$ 9,800,000	
Addition	Dec-26	1	T-D Interconnection	Planned	A in MTEP24	22911	\$ 500,000	
Project	Dec-28	1	Reliability	Proposed	A in MTEP25	50233	\$ 17,500,000	
Asset Renewal	Dec-28	1	Condition and Performance	Proposed	A in MTEP25	50262	\$ 5,155,000	
rk Upgrades and Interconnection Facilities	Mar-29	1	G-T Interconnection	Proposed	A in MTEP25	50507	\$ 14,094,000	
Upgrades and Interconnection Facilities	May-28	1	G-T Interconnection	Proposed	A in MTEP25	50545	\$ 16,455,000	
ork Upgrades and Interconnection Facilities	Jun-28	1	G-T Interconnection	Proposed	A in MTEP25	50514	\$ 19,847,000	
ork Upgrades	Aug-26	1	G-T Interconnection	Proposed	A in MTEP25	50517	\$ 1,475,000	
ation	Apr-26	1	T-D Interconnection	Proposed	A in MTEP25	50613	\$ 3,200,000	
ers 69kV (Y-86), Partial Rebuild	Dec-31	1	Condition and Performance	Provisional	B in MTEP25	50629	\$ 19,000,000	
Relay Asset Renewal	Dec-29	1	Condition and Performance	Proposed	A in MTEP26	50666	\$ 4,791,444	

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 5.1](#)
- ATC Planning Criteria
 - [Consists of criteria and assessment practices](#)
 - Current versions: Planning Criteria v25 & Planning Assessment Practices v22.5
 - Planning Criteria v25
 - ◆ v22.5 (Feb 2025)
 - ✓ Added verbiage which specifies Vmax for 765 kV facilities
 - ✓ Added Section 2.3 'Mackinac Area Stability Planning Assumptions'
 - ◆ v25 (Aug 2025)
 - ✓ Added new section 9 for Large Load Interconnection Requirements, moved Definitions to section
 - Planning Assessment Practices v22.5
 - ◆ v22.5 (July 2025)
 - ✓ Added guidance for studying P6 contingencies with non-SCADA controlled disconnect switches under 12.2 'Multiple Contingency Planning'

Large Load Guideline and Criteria Update

- **ATC Load Interconnection Guide** (updated on August 22, 2025) describes ATC's minimum requirements and process for the connection of load to ATC's transmission system.
- **ATC Planning Criteria** (updated August 28, 2025) provides technical details of ATC's planning criteria

Large Load Interconnection Challenges



- **Unprecedented Load Growth:** Driven by data centers and industrial expansion



- **New Load Characteristics:** New electronic loads have a scale and behavior never seen before



- **Rising Customer Expectations:** Scale, speed, complexity and uncertainty are high stakes

Large Load Characteristics

- Load size comparable to large generation plants
- Large load changes & impacts
 - Load oscillation: Power swings/rapid angle changes
 - Load loss/recovery: Voltage and frequency change
 - Steady state, dynamic, and transient effects on other loads and equipment.
 - More robust ride through and slower ramp rates minimize effects

Large Load Power Factor Guidelines

All Loads

- >95% lagging when load is >85% maximum forecast
- Measured at low-side of distribution transformer

Large Loads

- Single end-use customer **200+ MW**
- >98% lagging/leading at the **low-side** of distribution transformer

- Enhances system efficiency by minimizing energy losses and maximizing available capacity
- Supports grid reliability by maintaining stable voltage
- Low power factor can increase system demands that impact other customers
- ATC will coordinate with the customer on their reactive power design

New Planning Criteria Topics

- Power oscillations
 - 25 MW per 5 seconds
- Power ramp rate
 - Starting/stopping of large jobs - ramp at 30 MW per min
 - Ensure contingency analysis can keep up
- Voltage ride through
 - Ride through common system disturbances & faults

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

2025 Load Forecast- Historical

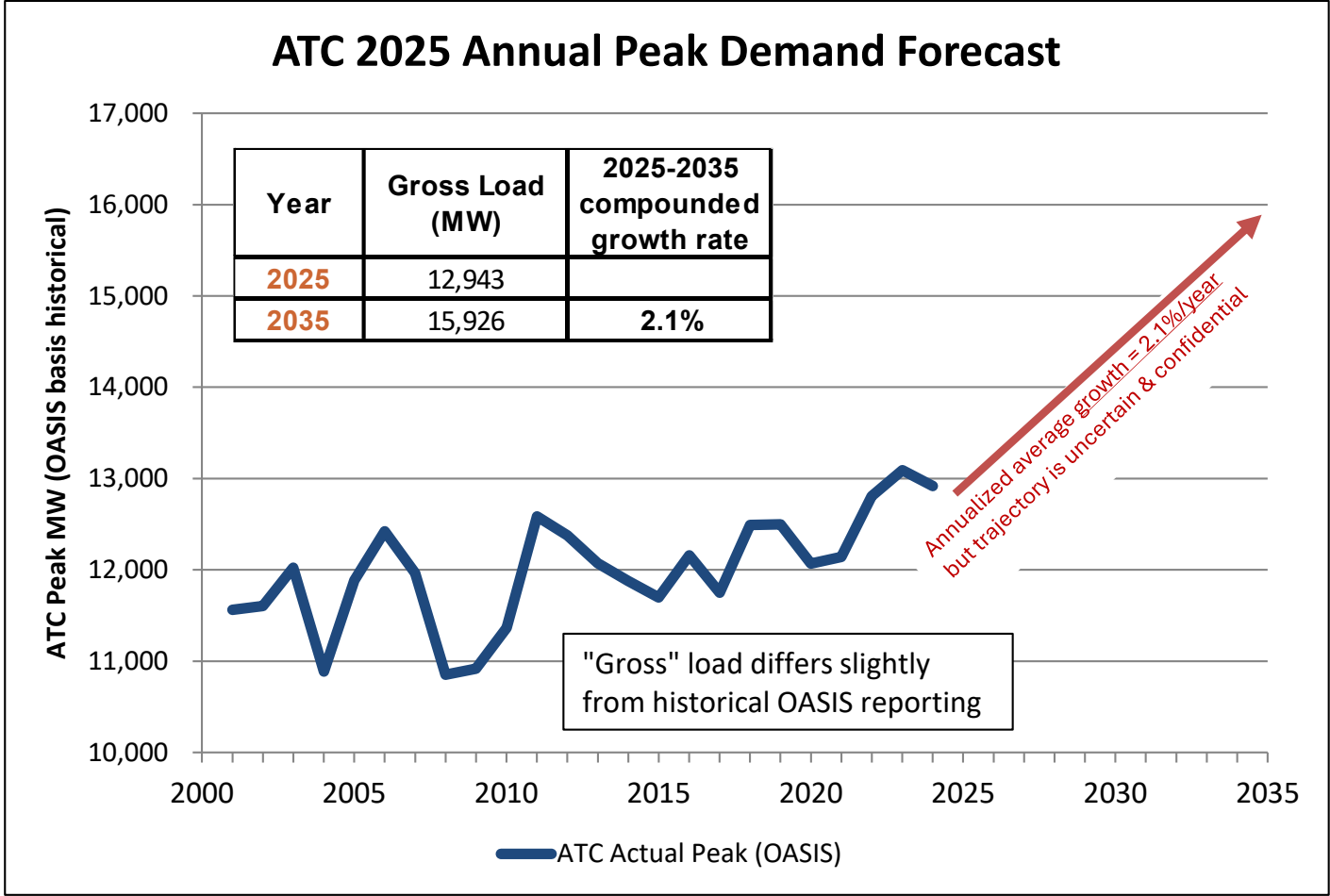
- Requested September 22, 2025
 - ATC's 2025 summer peak hour
 - ATC's 2024-2025 winter peak hour
 - Light load (Easter morning at 4:00 AM)
 - Shoulder load
- Requested by November 1, 2025.
- Compile, review, and add to the existing load databases

2025 Expected forecast for TYA 2026

- Requested LDC forecasts in February 2025
 - 11 years per D-T Interconnection Agreement
 - Consistent with resource planning forecast
 - Expected (50/50 probability)
- Received in April 2025
- 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 2025
 - Forecasts incorporated into the 2026 TYA to plan the system

ATC 2025 Load Forecast

ATC Forecast Trajectory (for 2026 TYA)



The ATC load growth trajectory is generally consistent with the final 2024 SEA forecast and publicly-available data regarding expected load growth in the region

The ATC load growth trajectory appears to provide somewhat faster growth than forecasts from the DOE or MISO, although this may be a timing issue since new large load announcements are becoming fairly common

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.

Additional network planning studies

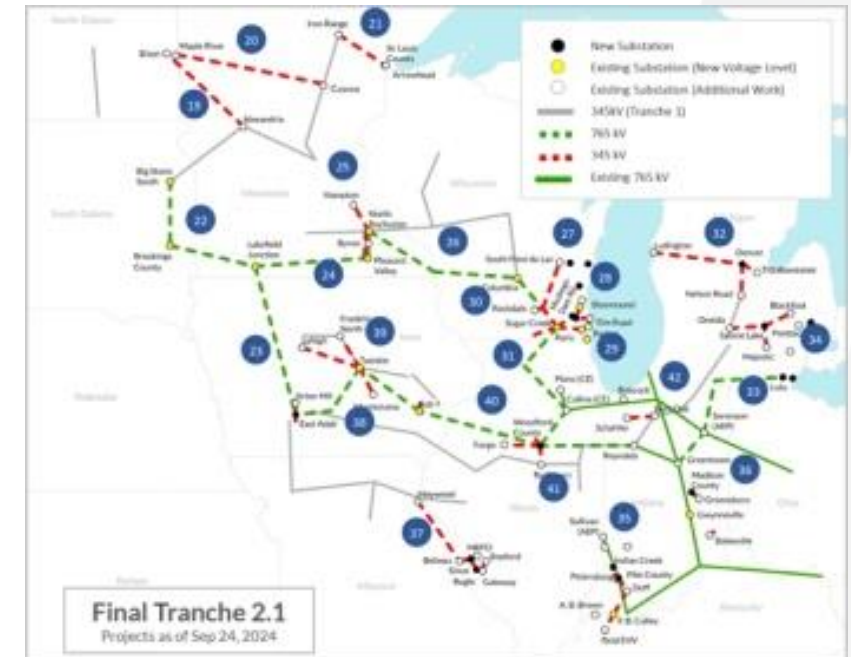
- Load Loss Allowed
- Existing Generator Stability Reviews
- Annual Fault Study
- Sensitivity Studies

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

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
 - ◆ Approved by the MISO Board retroactively to MTEP24 in 2024
 - ◆ Portfolio of 24 projects for \$21.9 B
 - ◆ ATC ownership share in 3 projects
 - Several Tranche 2.1 projects up for Competitive Bid
- Latest information available at [MISO's LRTP Page](#)



Projects Flow from TYA to MTEP

- Projects developed in the 2025 TYA process will be included in the MTEP26 approval process
 - A list of those projects can be found in the [TYA 2025 Network Project List.pdf](#)
- Projects that may develop after the 2025 TYA publication will be included on the project list each quarterly update and will be submitted into MTEP26
- [MISO Active Project List](#)

MTEP26 – Summary (as of 10/28/25)

- Appendix A Projects
 - Count: 30
 - Est Cost: \$1,396,364,898
- Appendix B Project
 - Count: 41
 - Est Cost: \$1,223,437,135

MTEP26 Appendix A Project Breakdown

Project Category	Count
Baseline Reliability Project	0
Generator Interconnection Project	1
Other – Age and Condition	19
Other – Load Growth	3
Other – Local Needs	5
Other – Local Reliability	2
Total	30

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 2025.
 - MISO will accept stakeholder project alternatives through May 31, 2025.
 - 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 MTEP26 Support Study – Done
- Post 2026 TYA Preliminary Study Design Presentation – Done
- Stakeholder Preliminary Study Design Meeting – November 17, 2025
- Stakeholder Study Design Comments Due – November 30, 2025
- Study Design Completion – December 2025
- Preliminary Needs Meeting – March 2026
- Preliminary Solutions Meeting – May 2026
- Document and Publish – November 2026

Thank you for participating

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

Ted Weber (tweber2@atcllc.com)

by November 30, 2025

Q&A

