



Transmission Planning

Entergy Regional State Committee (ERSC)

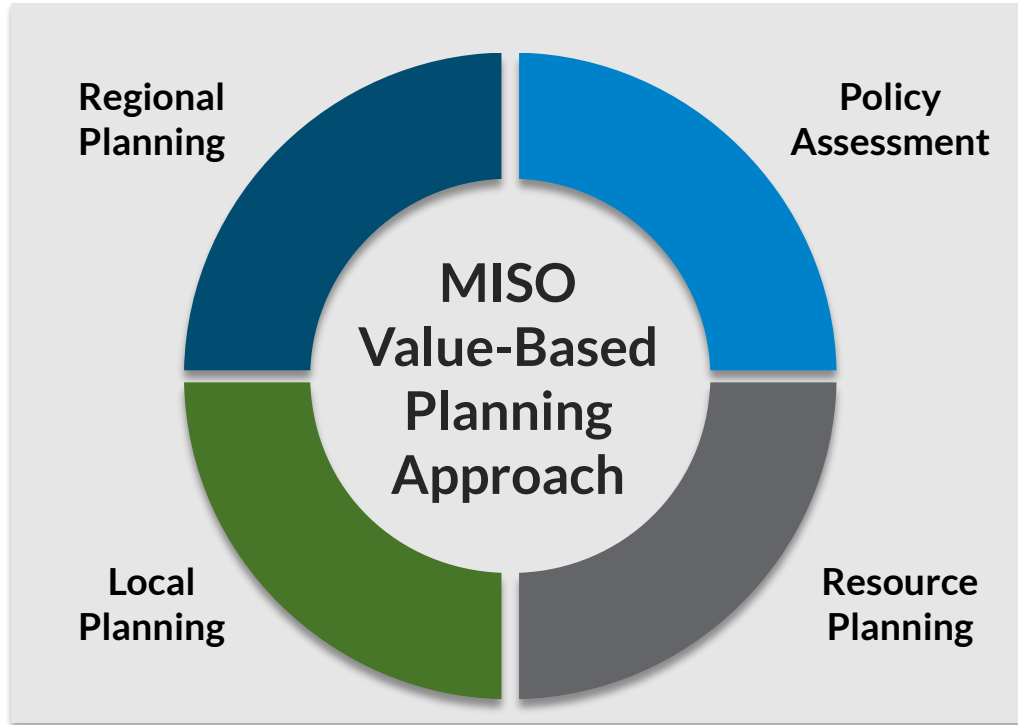
July 17, 2023

Executive Summary



- MISO's resource fleet continues to evolve, creating a new imperative for transmission to maintain the reliable and efficient energy delivery across the near and long term
- Simultaneously, the need for transparency around transmission plans and alternatives is growing, both for regional and local issues
- MISO continues to adapt to these challenges, providing transparency through our MISO Transmission Expansion Plan (MTEP), associated Subregional Planning Meetings (SPMs), and evolving our processes through initiatives such as the Long Range Transmission Plan (LRTP)

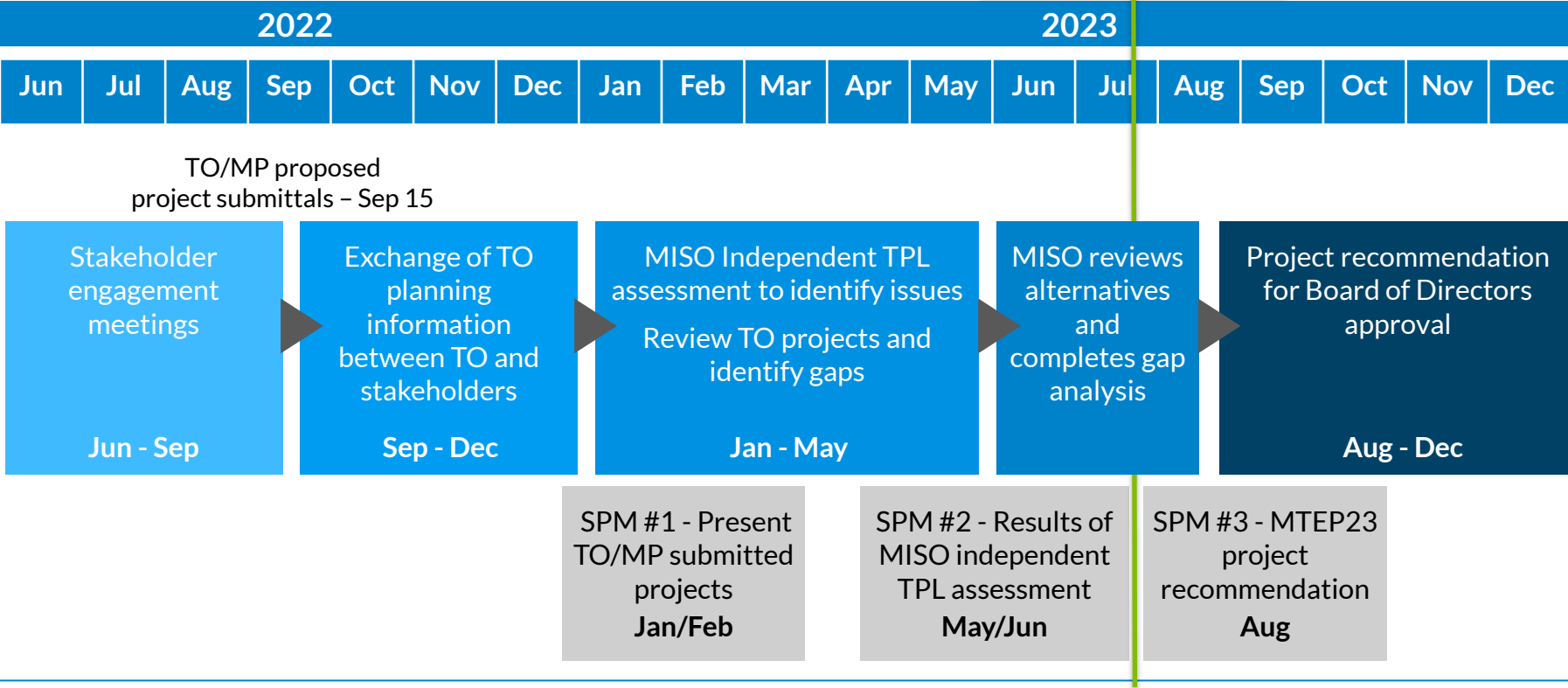
MISO Transmission Expansion Plan (MTEP) integrates expansion based on reliability, economic, and public policy needs across all planning horizons



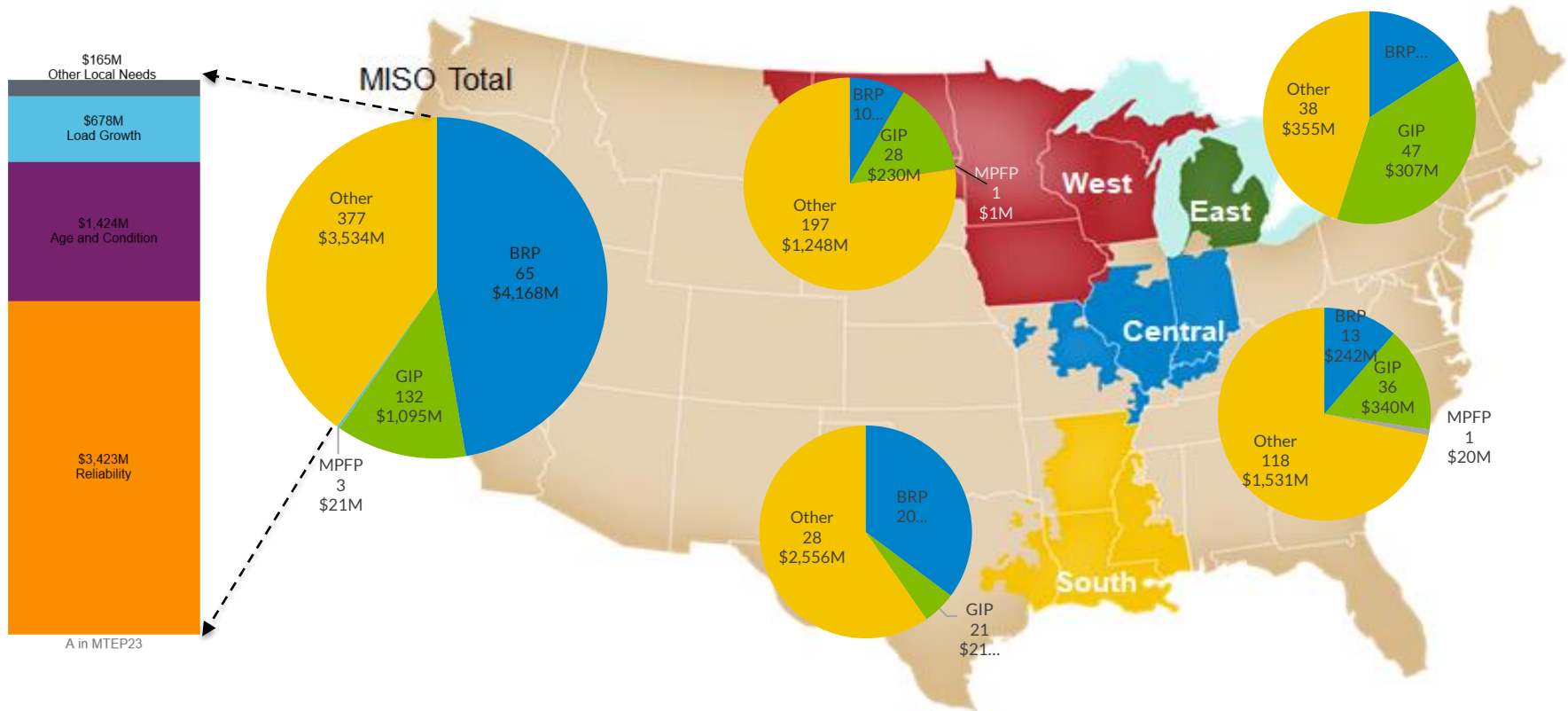
- The MTEP is the culmination of all planning efforts during a given planning cycle
- Establishes the recommended regional plan that integrates key value drivers across all planning horizons
- An annual report is produced, with most projects being approved in December
- Today, we will discuss local and regional planning

MISO staff is working to prepare recommendations on local transmission projects for the third SPM

You are here



In MTEP23, 576 new projects, at an estimated cost of \$8.8 billion, are targeted for BOD approval in December



Project information as of May 22, 2023.

Statistics do not reflect all economic projects, GIPs, or TDSPs currently under evaluation in separate planning processes.

As part of MISO's Reliability Imperative, Long Range Transmission Planning (LRTP) provides orderly and timely regional transmission expansion given the changing resource portfolio

Reliable System



Maintain robust and reliable performance in future conditions with greater uncertainty and variability in supply

Cost Efficient



Enable access to lower-cost energy production

Accessible Resources



Provide cost-effective solutions allowing the future resource fleet to serve load across the footprint

Flexible Resources

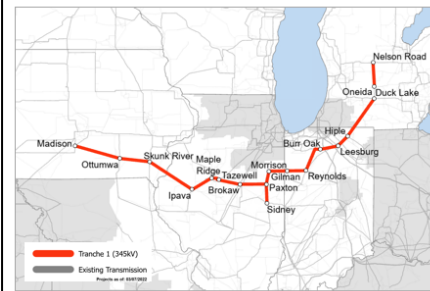
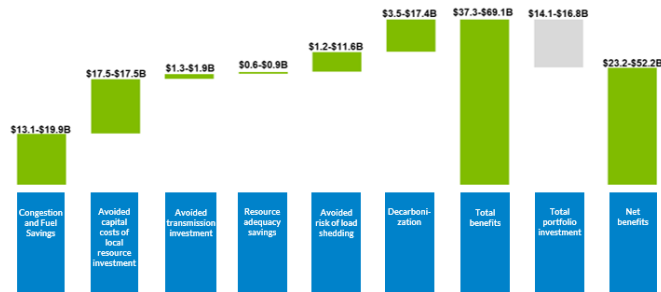


Allow more flexibility in the fuel mix for customer choice

The goal of LRTP is to evaluate the system's transmission needs through a variety of lenses, including both regional and project-specific assessments, with a goal with optimizing the total investment costs (inclusive of generation)

LRTP Tranche 1 Benefits vs. Costs 20 – 40-Year Present Value (2022 \$B)

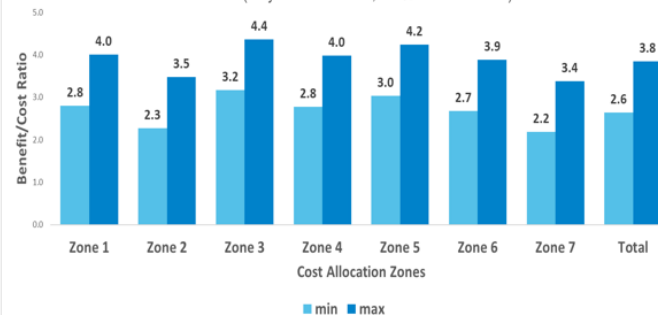
Calculations are generally based on conservative assumptions including the analysis period and discount rate



Solution

- Madison – Ottumwa – Skunk River – Ipava – Maple Ridge 345kV
 - Tazewell – Brokaw – Paxton – Gilman – Morrison – Reynolds – Hipple – Duck Lake 345kV
 - Paxton – Sidney 345kV
 - Oneda – Nelson Road 345kV
- Delivers significant increase in transfer capability to support generation deficient areas due to unexpected decrease in renewable output
 - Relieves elements with excessive loading for the first transmission element loss:
 - 28 in Michigan
 - 16 in Indiana
 - 19 in Missouri
 - 14 in Iowa
 - Provides more robust performance under large shifts in dispatch of generation across the region

Range of Benefit/Cost Ratio by Cost Allocation Zone (20-yr Present Value, 6.9% Discount Rate)



Map of Midwest Cost Allocation Zone Boundaries*



*MISO Tariff, Attachment WW

MISO thanks the ERSC for their principles and is committed to working with our stakeholders to develop a cost allocation solution for Tranche 3 that balances the different needs of our subregions.

ERSC Cost Allocation Principles

1. Costs shall not be allocated on a postage stamp basis;
2. Costs shall be allocated:
 - a) as granularly and accurately, as possible;
 - b) based on cost causation and beneficiaries pay principles;
 - c) in an equitable manner to protect all consumers; and
 - d) to interconnecting resources that receive benefits from Tranche 3 projects, e.g., reduced network upgrade costs;
3. The cost-benefit and other analyses that are used to inform the business case and cost allocation for Tranche 3 shall be based only on accurate, objective, measurable, quantifiable, non-duplicative, forward-looking, and replicable metrics that are supported by data;
4. Tranche 3 costs shall be allocated using an exclusive list of benefit metrics identified by the E-RSC, with advice from MISO and MISO South Stakeholders, that meet the criteria identified in Paragraph 3 above. These metrics shall be memorialized after being approved by the E-RSC;
5. Each Tranche 3 project must individually satisfy the cost-benefit analysis used for the business case and cost allocation on a stand-alone basis. Where two or more transmission facility upgrades combine to address a specific transmission issue, they may be evaluated as a single project for the purpose of analysis and cost allocation.

MISO continues efforts to ensure the build of Tranche 1 solutions while planning Tranche 2 and developing cost allocation for Tranches 3 and 4

| Tranche | Key Milestones | Status |
|----------------|--|--------|
| Tranche 1 | Identify transmission solutions based on Future 1 | ✓ |
| | Select developers through Competitive Transmission process | ➡ |
| | Provide post-approval transparency and support as required | ➡ |
| Tranche 2 | Identify transmission solutions based on Future 2A | ➡ |
| | Select developers through Competitive Transmission process | TBD |
| | Provide post-approval transparency and support as required | TBD |
| Tranches 3 & 4 | Identify transmission solutions | TBD |
| | Identify cost allocation approach | ➡ |
| | Select developers through Competitive Transmission process | TBD |
| | Provide post-approval transparency and support as required | TBD |



Appendix

Entergy-LA – 23935 DSG Reliability & Resiliency Project – Project Justification

- **Other - Reliability Project**

- **Project description**

- Construct a 27-mile 230 kV line from the Waterford substation interconnecting into the Churchill substation.
- Station work at both Waterford and Churchill including additional breakers to accommodate the new line

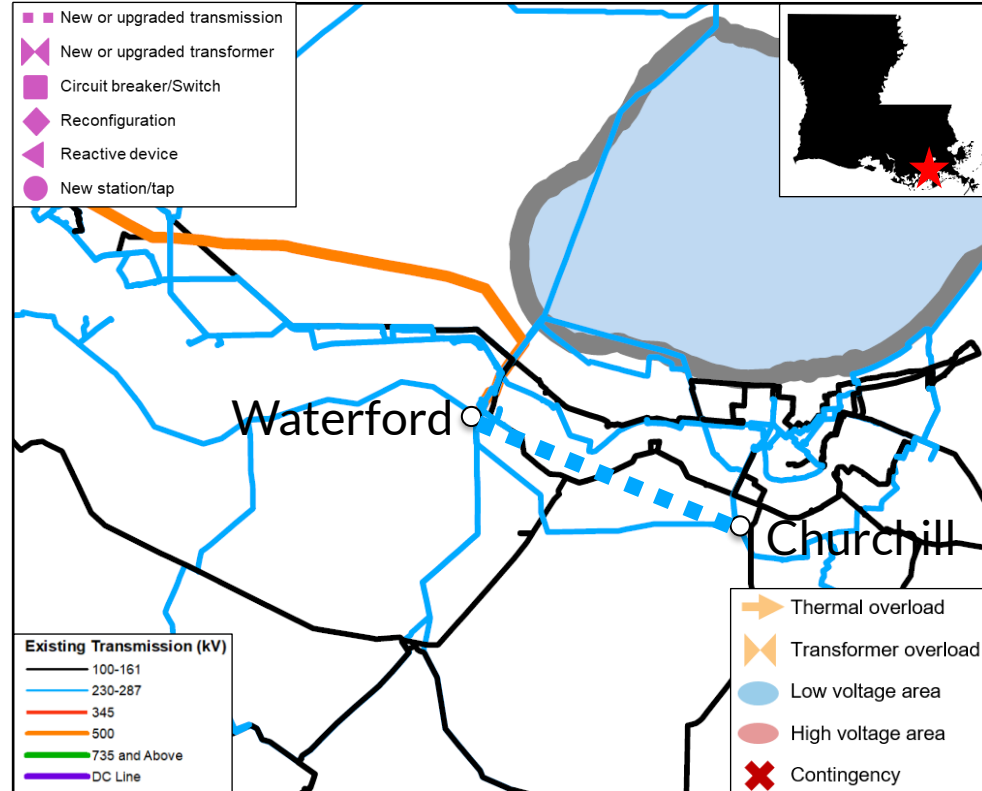
- **System Needs**

- Meeting Local Planning Criteria for load serving capability - Increases load serving capability in DSG.
- Increased operational flexibility to allow for generation and transmission outages in DSG. Addressing generation retirements in DSG, which could be accelerated by proposed EPA rules
- Improved extreme event resilience - Provides an additional hardened path into DSG, which includes the Metro New Orleans area that can be useful in restorations during Hurricane and other extreme weather events.

- **Estimated Cost: \$164.2M**

- **Expected ISD: 9/23/2027**

- **Target Appendix: A in MTEP23**



Entergy-LA – 23954 Amite South Reliability Project - Phase 1 – Project Justification

- Other - Reliability Project

- Project description

- Construct 500/230 kV Commodore station near the existing Derrick 230 kV Station
- Cut in Derrick to Iberville and Richardson to Wise 230 kV lines.
- Cut in the Webre to Bayou Labutte 500 kV line
- Install one 500-230 kV Autotransformer
- Commodore 230 kV station will be a breaker and half station
- Commodore 500 kV station will be a 4 breaker ring
- Construct a new 60 mile 500 kV line and 230 kV line between Commodore and Waterford.
- Expand Waterford 500 kV into a four-breaker ring. Install 2nd 500-230 kV Autotransformer at Waterford. Add additional bays at Waterford 230 kV to accommodate the Auto and the new 230 kV line.

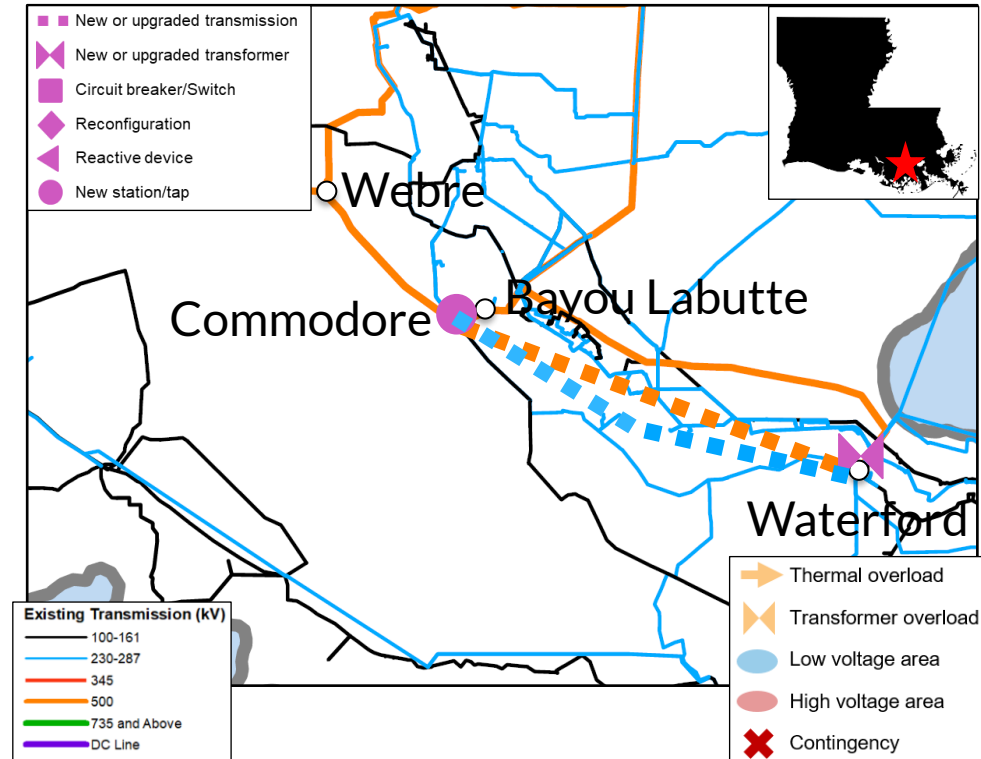
- System Needs

- Improved extreme event resilience - Provides two EHV paths between Baton Rouge and Waterford. Location of line provides geographic diversity that can be useful in restorations during Extreme Weather Events.
- Operational flexibility and preparing for future of generation in Amite South/DSG - Addressing generation retirements in Amite South, which could be accelerated by proposed EPA rules. Offers the opportunity to cut multiple sources into existing stations serving customers.
- Meet Local Planning Criteria for load serving capability - Increases Load Serving Capability in Amite South. Helps meet needs of increased block load requests on the west bank of the river by providing a new 500 kV and 230 kV path.

- Estimated Cost: \$1.44B

- Expected ISD: 12/6/2028

- Target Appendix: A in MTEP23



Entergy-LA – 23957 Amite South Reliability Project - Phase 2 – Project Justification

- **Other - Reliability Project**

- **Project description**

- Construct a 14-mile 230 kV line from the Willow Glen substation to the Conway substation.
- Construct a new 500 kV Station near Conway and install a 1200 MVA 500-230 kV Autotransformer.
- Build approximately 5 miles of 500 kV to cut the Willow Glen to Waterford 500 kV station into the new Conway 500 kV station.

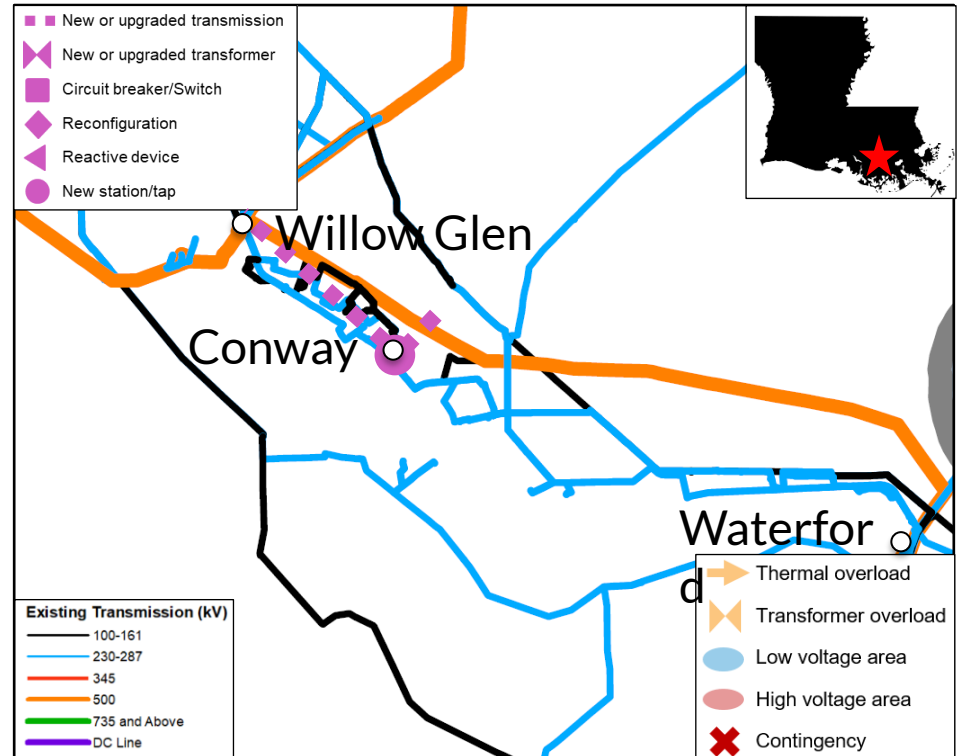
- **System Needs**

- Improved extreme event resilience - Provides an additional hardened path in the Industrial Corridor, that can be useful in restorations during events like a Hurricane. Reduces risk of extreme event involving Gypsy corridor.
- Operational flexibility and preparing for future of generation in Amite South - Addressing generation retirements in Amite South/DSG, which could be accelerated by proposed EPA rules. Provides opportunity to reduce radial exposure to industrial customers during outages.
- Meet Local Planning Criteria for load serving capability - Adds an additional source on the east bank of the river to address growing needs of new block load requests. Increases Load Serving Capability in Geismar area and Amite South.

- **Estimated Cost: \$290M**

- **Expected ISD: 2/12/2027**

- **Target Appendix: A in MTEP23**



Entergy-LA – 23959 Amite South Reliability Project - Phase 3 – Project Justification

- **Other - Reliability Project**

- **Project description**

- Construct a 40-mile 230 kV line from the Adams Creek substation to the Robert substation
- Station work at both Adams Creek and Robert including additional breakers to accommodate the new line.

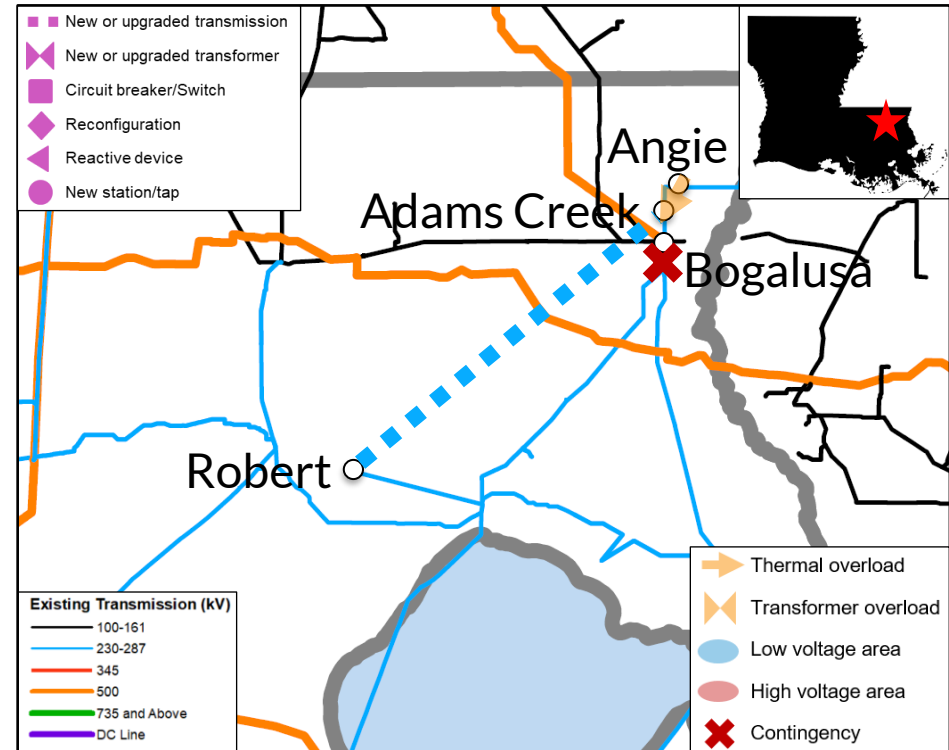
- **System Needs**

- NERC TPL-001-5 Reliability Standards and Entergy's Planning Guidelines and Criteria. P2.3 Internal Breaker Fault at Bogalusa 230 kV(S7582) overloads the Adams Creek to Angie 230 kV line.
- Meet Local Planning Criteria for load serving capability - Increases Load Serving Capability in Amite South
- Operational flexibility and preparing for future of generation in Amite South - Addressing generation retirements in Amite South, which could be accelerated by proposed EPA rules
- Improved extreme event resilience - Provides an additional hardened path into Amite South, that can be useful in restorations during Hurricane and other extreme weather events.

- **Estimated Cost: \$260M**

- **Expected ISD: 11/16/2027**

- **Target Appendix: A in MTEP23**



ETI – 23952 SETEX Area Reliability Project

– Project Justification

- **Baseline Reliability Project**

- **Project description**

- Construct Babel substation on the Layfield-Hartburg 500 kV line near the Toledo Bend Reservoir with 2 70 MVAR reactors. East of Lewis Creek, construct a 500-230-138 kV station named Running Bear
- Construct a new ~150-mile 500 kV line from Babel to Running Bear station
- Cut the Lewis Creek-Texas, Lewis Creek-Sheawill, and Lewis Creek-Caney Creek 138 kV, Lewis Creek-Porter and Lewis Creek-Peach Creek 230 kV, lines into Running Bear

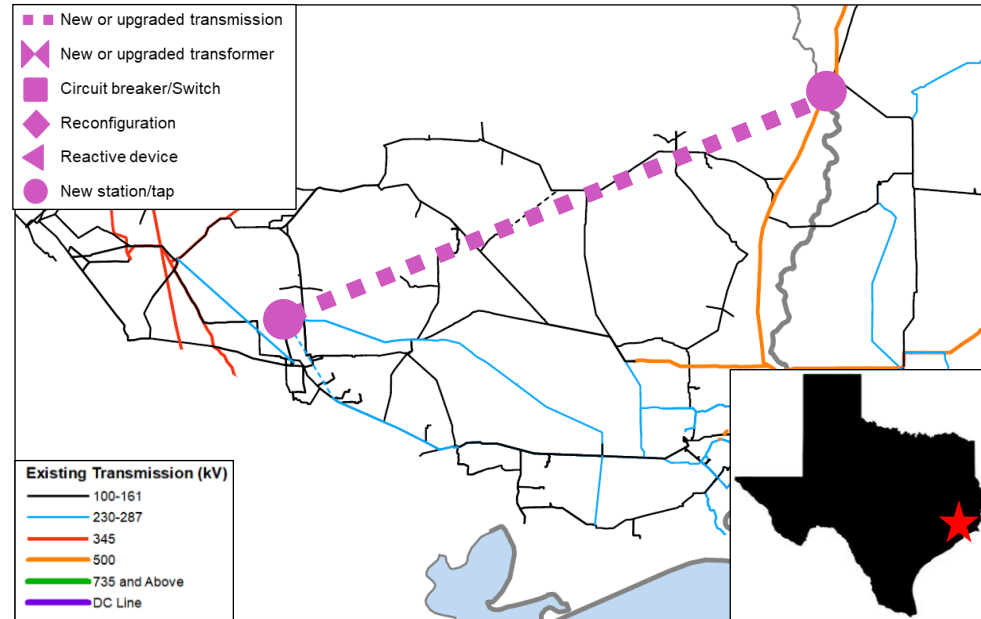
- **System Needs**

- P3: Loss of Montgomery County Power Station and Hartburg to Cypress 500 kV overloads multiple elements
- P3: Loss of Montgomery County Power Station and Rocky Creek to Crocket 345 kV overloads multiple elements

- **Estimated Cost:** \$1111 million

- **Expected ISD:** 12/19/2030

- **Target Appendix:** A in MTEP23



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