



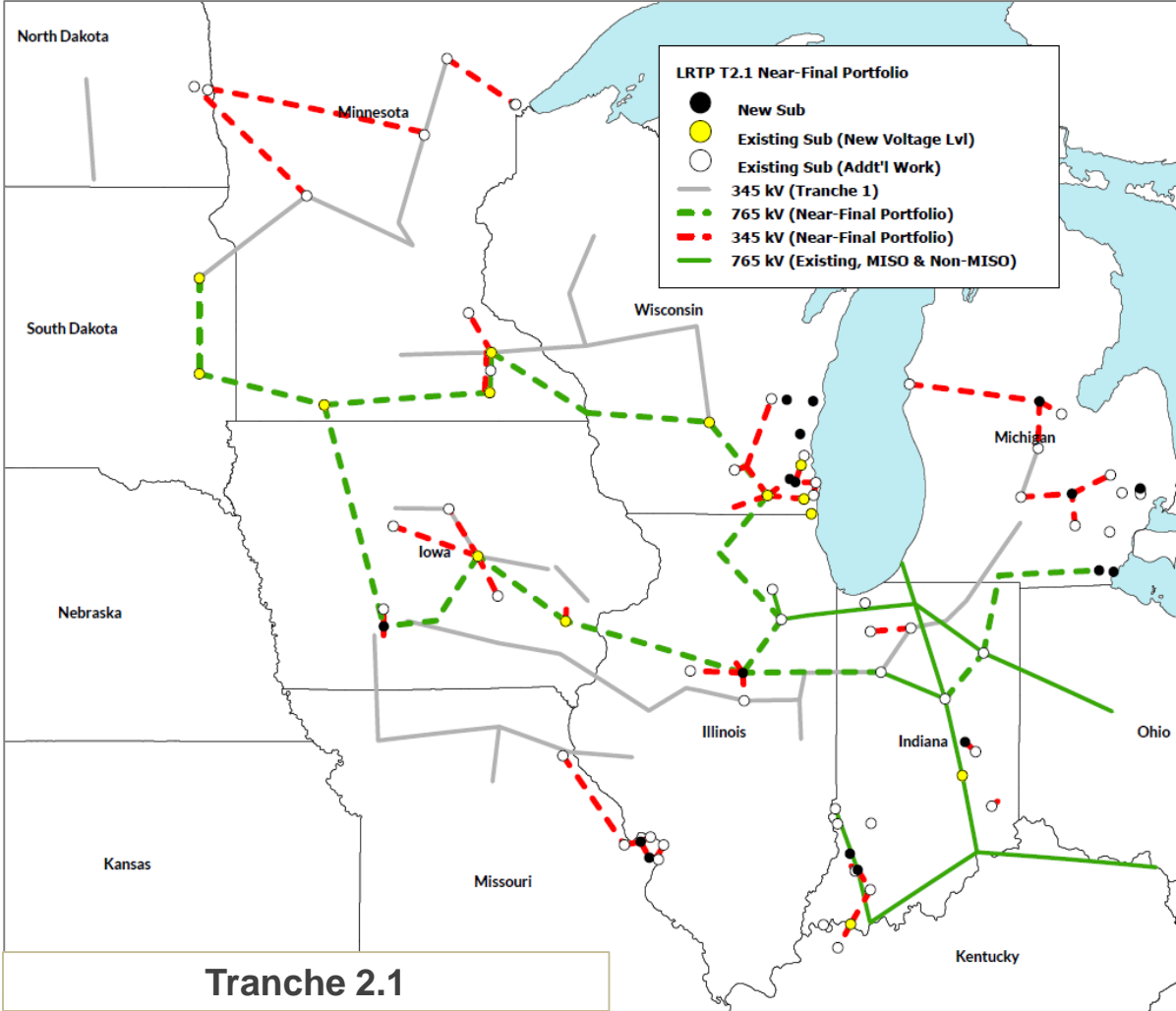
MISO LRTP Tranche 2.1 Update



MISO LRTP Tranche 2.1: Overview of projects along the MISO/PJM seam

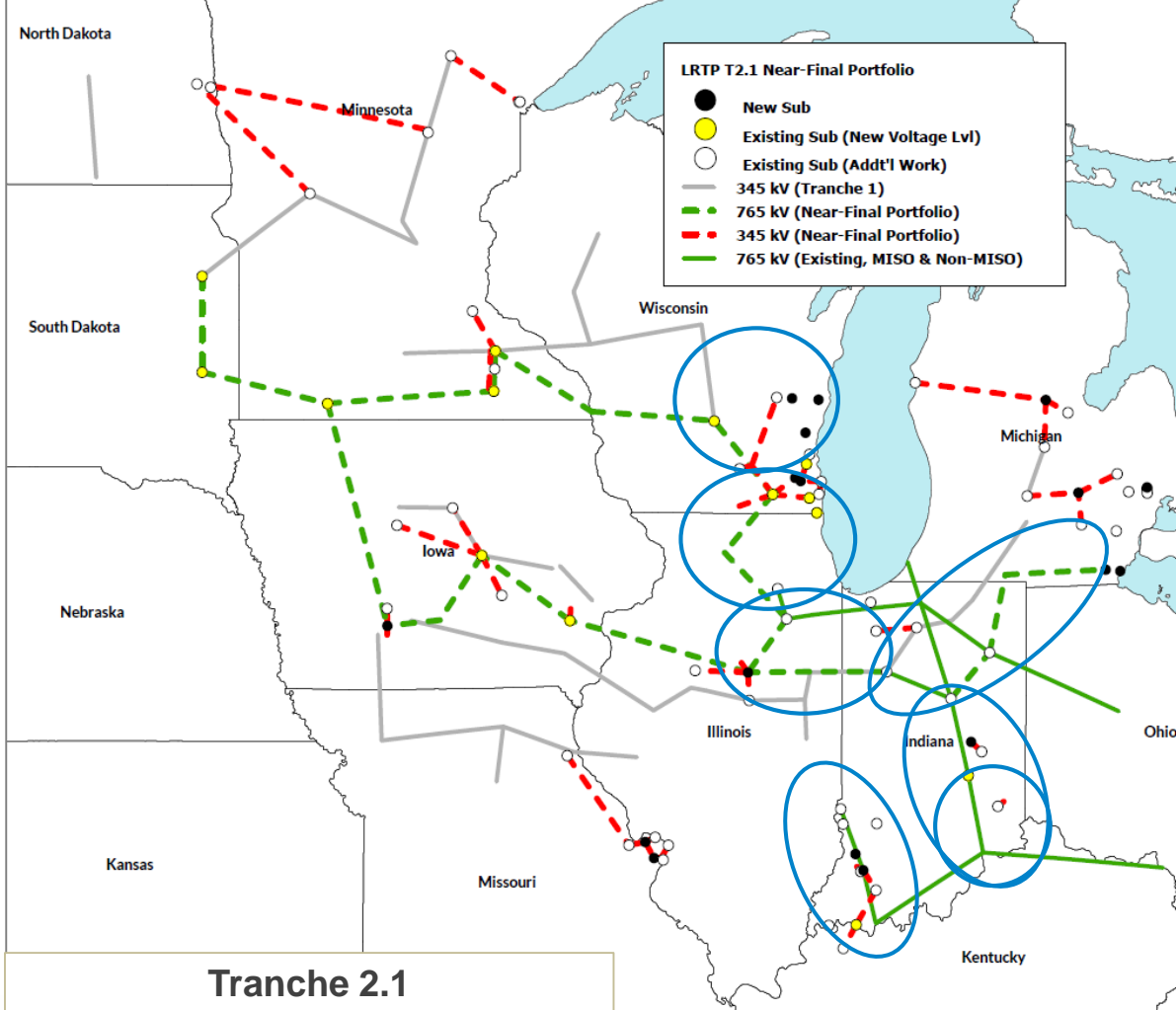
MISO's Tranche 2.1 Project Overview

- Tranche 2.1 will increase the reliability and resiliency of the MISO system while providing benefits in excess of costs
- Creates a 765 kV transmission backbone to support high system transfers under generation and weather patterns
- Resolves thermal and voltage violations throughout the Midwest subregions
- Helps resolve wide area congestion and reduce economic price separation
- Enables significant new generation, to support MISO member plans and goals



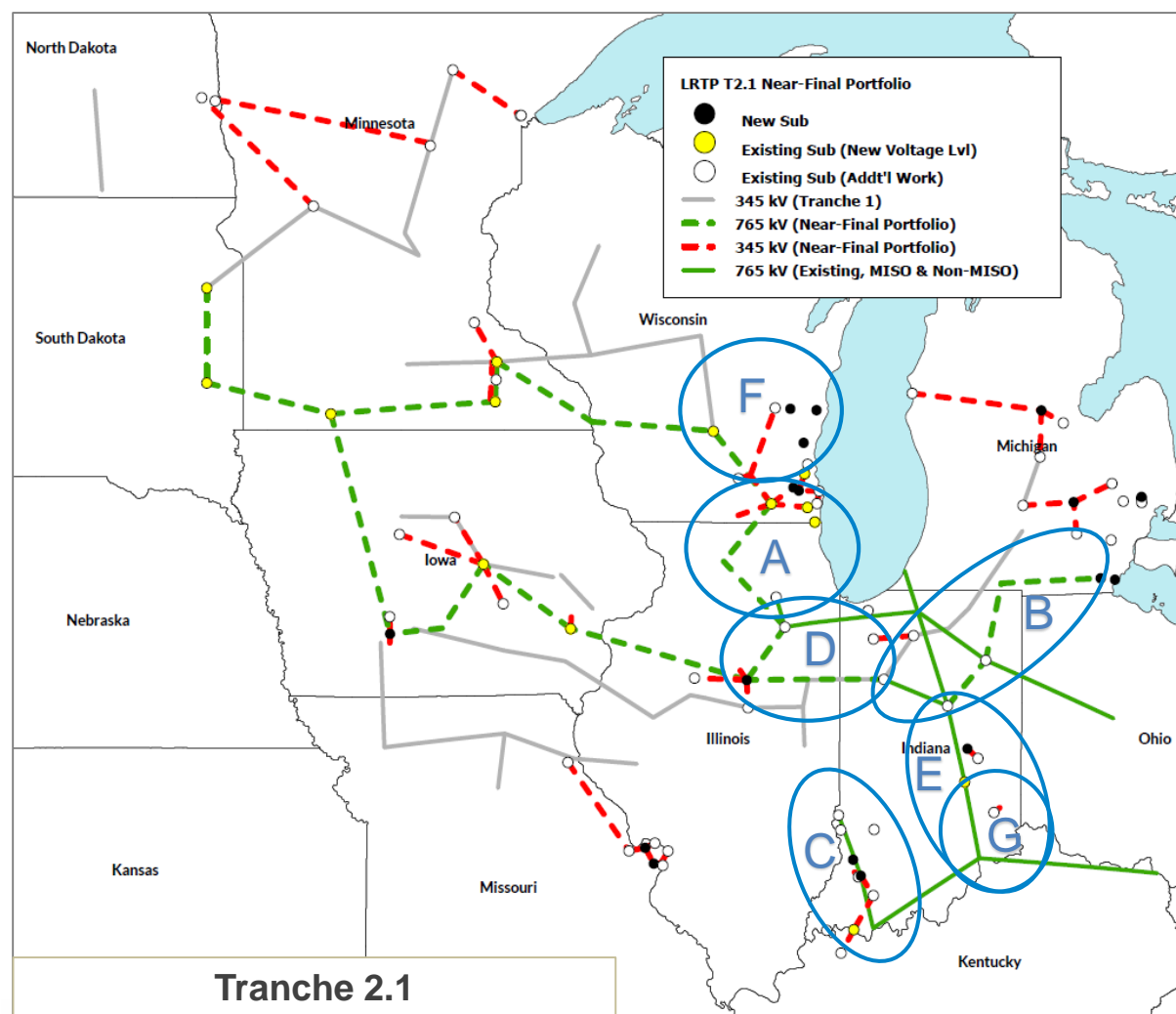
Tranche 2.1 culminated in 24 projects; 7 of which involve connecting w/ PJM transmission system

| ID | Project Description | kV | ISD |
|----|--|-----|------|
| 19 | Bison – Alexandria | 345 | 2032 |
| 20 | Maple – Cuyuna | 345 | 2032 |
| 21 | Iron Range – Arrowhead | 345 | 2032 |
| 22 | Big Stone South - Brookings County - Lakefield Junction | 765 | 2034 |
| 23 | Lakefield Junction - East Adair | 765 | 2034 |
| 24 | Lakefield Junction - Pleasant Valley - North Rochester | 765 | 2034 |
| 25 | Pleasant Valley - North Rochester - Hampton Corner | 345 | 2032 |
| 26 | North Rochester – Columbia | 765 | 2034 |
| 27 | Rocky Run - Werner - North Appleton | 345 | 2032 |
| 28 | South Fond du Lac-Rockdale-Big Bend-Sugar Creek -Kitty Hawk | 345 | 2032 |
| 29 | Bluemond - Arcadian - Waukesha - Muskego - Elm Road – Racine | 345 | 2032 |
| 30 | Columbia - Sugar Creek | 765 | 2034 |
| 31 | Sugar Creek – Collins | 765 | 2033 |
| 32 | Ludington - Denver - Tittabawassee & Nelson Road | 345 | 2032 |
| 33 | Greentown - Sorenson – Lulu | 765 | 2033 |
| 34 | Oneida - Sabine Lake - Blackfoot & Majestic | 345 | 2032 |
| 35 | Southwest Indiana-Kentucky | 345 | 2032 |
| 36 | Southeast Indiana | 345 | 2032 |
| 37 | Maywood - Belleau - MRPD - Sioux – Bugle | 345 | 2032 |
| 38 | East Adair - Marshalltown - Sub T | 765 | 2034 |
| 39 | Lehigh - Marshalltown - Franklin North & Montezuma | 345 | 2032 |
| 40 | Sub T - Woodford County - Collins & Reynolds | 765 | 2033 |
| 41 | Woodford County - Fargo & Radbourn | 345 | 2032 |
| 42 | Burr Oak - Schahfer | 345 | 2032 |



There are several areas of interest from T2.1, shown below in the 7 groups that involve MISO connecting w/ PJM transmission system

| Group | Facility |
|-------|--|
| A | [MISO] Woodford County–[PJM] Collins–[MISO] Sugar Creek 765 kV* |
| | [MISO] Woodford County 345 kV substation* Tap [PJM] Powerton–[PJM] Nevada 345 kV & [PJM] Powerton–[PJM] Katydid Rd 345 kV |
| B | [MISO] Greentown–[PJM] Sorenson–[MISO] Lulu 765 kV* |
| | [MISO] Laplaine Creek 345 kV substation Tap [PJM] Lemoyne–[MISO] Maple 345 kV & [PJM] Lallendorf–[MISO] Monroe 345 kV |
| C | Tie [MISO] Dresser–[PJM] Sullivan–[MISO] Fairbanks 345 kV* |
| | [MISO] Pike County 765 kV substation Tap [PJM] Sullivan–[PJM] Rockport 765 kV |
| | [MISO] Indian Creek 345 kV substation Tie [PJM] Sullivan–[MISO] Petersburg 345 kV & [MISO] Merom–[MISO] Dresser 345 kV |
| D | [MISO] Babcock 345 kV substation Tap [PJM] Olive–[PJM] University Park North 345 kV |
| | [MISO] Gwynnville 765 kV substation Tap [PJM] Greentown–[PJM] Jefferson 765 kV |
| E | [MISO] Madison County 345 kV substation Tap [PJM] Fall Creek–[MISO] Sunnyside 345 kV & [PJM] Fall Creek–[MISO] Noblesville 345 kV |
| | [MISO] Batesville 345 kV substation Tie [PJM] Tanners Creek–[MISO] Hanna 345 kV |
| | [MISO] Lakeview 345 kV substation Tap [PJM] Zion Energy Center–[MISO] Pleasant Prairie 345 kV |
| G | Upgrade [PJM] Greendale–[PJM] Miami Fort 138 kV |





MISO LRTP Tr2.1: PJM Upgrades – MISO Legal Framework

MISO/PJM Tranche 2.1 Coordination - Overview

- MISO consulted with its stakeholders, PJM Transmission Owners, and PJM regarding Tranche 2.1 areas of interest in Q2 of 2024 to review reliability impacts to the PJM system
- PJM performed an initial reliability ‘no-harm’ analysis with impacted transmission owners (next presentation)
- Preliminarily, “PJM Upgrades” are the upgrades necessary to address reliability impacts of Tranche 2.1 facilities on the PJM system, and will consist of tie lines (the proposed aspects of Tranche 2.1 that extend into PJM’s footprint) and the supporting transmission in PJM’s footprint required based on PJM’s do no harm analysis once triggered
- MISO will fund the PJM Upgrades to address reliability impacts

- FERC recognized in Order No. 1000 that regional transmission planning process must identify consequences for other transmission planning regions, such as upgrades that may be required in another region.
- FERC accepted MISO's proposed Order 1000 compliance approach, on a case-by-case basis, to work with the constructing neighboring-region transmission owner to determine by mutual agreement whether all or a portion of such required network upgrades will be paid by MISO

Classification of the PJM Upgrades and Cost Allocation

- PJM Entities will own/operate the PJM Upgrades
- PJM Upgrades will be classified as Supplemental Projects as provided under the PJM Tariff and the costs of such build will be paid for by MISO.
- In accordance with the MISO Tariff, network upgrades needed to relieve applicable reliability criteria violations that are projected to occur as a direct result of the development of MVPs may be cost shared in accordance with the MVP cost allocation provisions (See Tariff Attachment FF, Section II.C)

- The PJM Upgrades will be under PJM's functional control, and will be included in the PJM Transmission System
- MISO intends to pursue construction and funding agreements with PJM and PJM TOs to fund and assign construction responsibility to the applicable Transmission Owner
- The funding agreements are FERC-jurisdictional and will be submitted to FERC for approval. MISO, the PJM TOs, and PJM will make filings to amend their respective tariffs to implement the above understandings, if necessary



PJM Update on Analysis of MISO Tranche 2.1

November 22 , 2024

- Initial review nearing completion to identify the magnitude of reliability impacts to the PJM system of MISO Tranche 2.1 interconnections with PJM.
 - PJM and MISO worked together to build consensus on assumptions for review in Q2 and Q3 of 2024
 - Review to include PJM Reliability Criteria + PJM TO Criteria (FERC 715)
 - PJM to provide MISO with a high level estimate of violations but no solutions as part of this initial review
 - Initial review indicates reliability impacts on the PJM system that need further review to validate
- Official Do No Harm analysis will follow PJM's Attachment M-3 process for evaluating the impact of supplemental projects on PJM's system.

PJM SME/Presenters:

Michael Herman, Michael.Herman@pjm.com

Asanga Perera, Asanga.Perera@pjm.com



Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com