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Chapter 2: Regional/Long Range Transmission Planning

2.1 Futures

Long Range Transmission Planning (LRTP) begins with forward-looking planning scenarios called Futures, which capture a range of economic, political, and technological possibilities over a twenty-year period, provide potential resource mixes, and appropriately bookend future uncertainty. The Futures are based on member data, stakeholder input, state and federal policy, and technical and economic data like the Department of Energy's (DOE) National Renewable Energy Lab (NREL) Annual Technology Baseline. MISO defined multiple Futures which co-optimize several parameters to minimize total costs in achieving member goals, including peak demand plus reserve margin, annual energy, decarbonization goals and renewable portfolio standards/clean energy goals.

MISO began the Futures redesign process in early 2025 after completing our load forecast update in December 2024, with a compressed schedule for the Futures redesign process of nine months versus the historic 18-month timeframe. The recent federal budget action (One Big Beautiful Bill Act or OBBBA) impacted the federal policies modeled in the Futures, including load incentives and tax credits for new renewable generation. After evaluating the legislation, MISO committed to revising the Futures to remove the Production Tax Credits (PTC) and Investment Tax Credits (ITC) for wind and solar resources; this work is ongoing. MISO anticipates having preliminary expansions completed by the end of 2025; additional work will be conducted in 2026 to validate, or adjust, the Futures to appropriately reflect potential bookends of the resource and load on the system.

2.2 Long Range Transmission Planning (LRTP)

Under the Reliability Imperative's Transmission Evolution pillar, MISO is transforming how it plans for and manages the grid to address long-term challenges. As part of this effort, Long Range Transmission Planning develops backbone regional projects to ensure the transmission system is reliable, economic and compliant in the future based on state and utility policy and goals, projected conditions and industry trends. This is accomplished while demonstrating the identified transmission provides value that is consistent with MISO's Tariff criteria. Unlike the near-term focus of local planning, LRTP takes a 20-40 year view, offering a roadmap to guide future and near-term planning.

The overall LRTP effort is large and complex. It's a collaborative, region-wide effort that produces "least-regrets" portfolios – plans that account for policy, member goals, and uncertainty without resolving every siting or resource issue. With a goal of approving transmission on a 'just in time' manner, where the transmission is approved just prior to beginning its regulatory and construction processes, prior Midwest LRTP processes have led to phases of new backbone transmission portfolios that will provide a wide range of value to support MISO member plans. In the future, MISO will continue to collaborate with stakeholders in the South and Midwest to understand long-term issues and consider potential solutions, with the next phases of LRTP scheduled to begin in each region in 2026.



History

Long-term transmission planning was not new to MISO when LRTP launched in 2020. MISO's initial regional, long-term study began in 2008 to address the integration of renewable energy required by state Renewable Portfolio Standards. It resulted in the Multi-Value Project (MVP) portfolio of projects, which was approved in 2011 and fully constructed by 2024.

In 2019-2020, MISO began to formulate a strategy for LRTP. After cities, states, large commercial and industrial corporations and utilities started setting aggressive renewable and decarbonization goals, MISO members asked MISO to quickly move on long range transmission planning to align with their goals, preferences and investment decisions. In its own studies, like the Renewable Integration Impact Assessment (RIIA), MISO gained insight on significant system issues which would result from the continuing transition of the resource portfolio toward much higher weather-based renewable resources. Paramount to RIIA's findings was the fact that greater penetrations of renewable resources required new transmission to ensure system reliability. Additionally, the transmission buildout would provide better regional connectivity, transfer capability, and thereby reduce the amount of generation capacity that would be needed to meet resource goals.

The job of LRTP is to enable a reliable generation fleet as planned by MISO Members and states. Based on RIIA and the Futures which had been recently updated, MISO knew the industry drivers and high level issues which informed the development of a conceptual, indicative roadmap (see Figure 2.1: Indicative Roadmap). Among other things, the roadmap is an indication of the potential magnitude of transmission expansions that may be needed to maintain reliable and efficient operations under the expected Futures. It was contemplated by MISO planning staff as an extension of the existing grid that could provide logical connections that increase connectivity, close gaps between subregions and support a more resilient grid by enabling more transfers of bulk power flows. The roadmap is not a plan, but provides a basis to guide conversations and consider solutions to expected transmission issues. Although solutions in the roadmap may not ultimately meet the necessary requirements to become projects in MTEP Appendix A, the roadmap provided and continues to provide a conversation starter as the issues which drive solutions are defined.

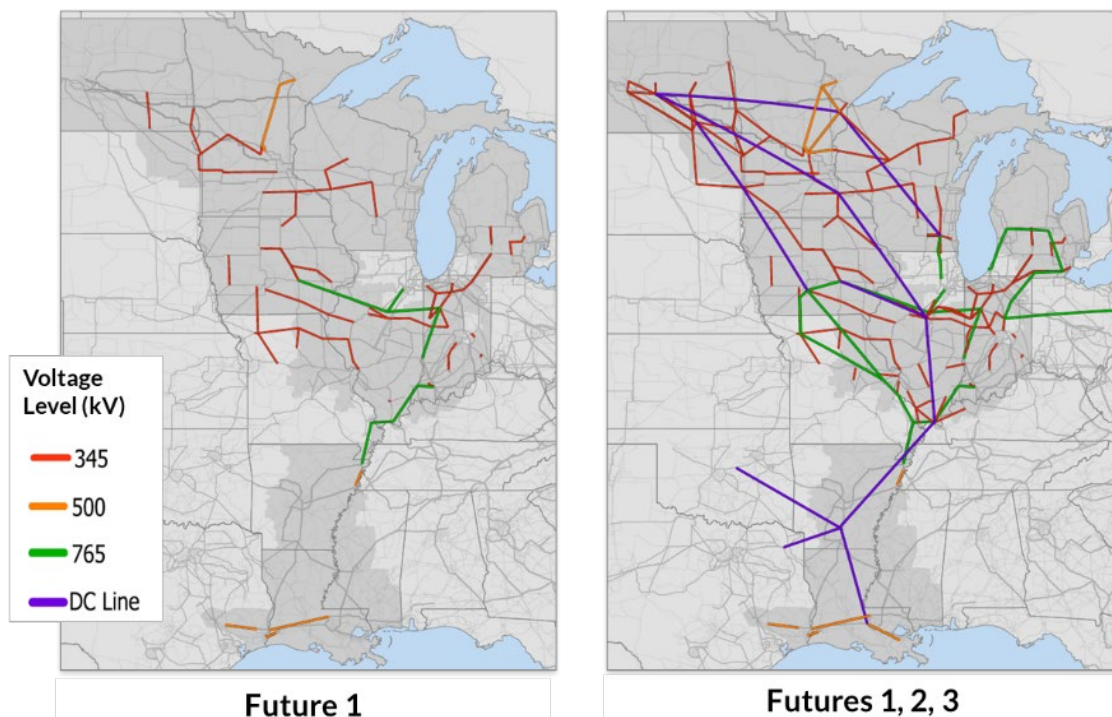


Figure 2.1: Indicative Roadmap

L RTP Investment Status – Tranche 1

Approved in July 2022 as part of MTEP21 Appendix A, the Tranche 1 portfolio totals \$10.3 billion, consists of 18 projects spread across the entire MISO Midwest subregion and benefits multiple states, MISO members and customers. With a Tariff requirement to provide benefits that are commensurate with costs, the full portfolio has a benefit-to-cost ratio of 2.6 - 3.8, which is well in excess of costs, and a benefit-to-cost ratio of at least 2.1 for every MISO zone. MISO's planning maximized the use of existing rights-of-way, which helped reduce the typical challenges in the regulatory process stemming from siting and acquisition of new rights-of-way.

As of September 2025, many projects are well into regulatory approval processes, with MISO supporting constructing Transmission Owners in these efforts. MISO will monitor the status of these projects through the build phase and utilize its variance analysis process to deal with any costs or schedule changes that exceed certain, established criteria, and other project scope or construction challenges that could put at risk getting the projects in service.



#	Project Name	State	Estimated In Service Date ¹		Status ²		Cost		Explanation ⁵
			MTEP Approved	Current Date	State Regulatory Status	Const.	MTEP Approved ³	September 2025 ⁴	
1	Jamestown - Ellendale	ND	2028	2028	●		\$439	\$439	
2	Big Stone South - Alexandria - Big Oaks	SD/MN	2030	2030	●		\$574	\$574	
3	Iron Range - Benton County - Big Oaks	MN	2030	2030	●		\$970	\$1390	Cost change under review; variance analysis will be implemented if required
4	Wilmarth - North Rochester - Tremval	MN/WI	2028	2028	◐		\$689	\$686*	
5	Tremval - Eau Clair - Jump River	WI	2028	2028	◐		\$505	\$505	
6	Tremval - Rocky Run - Columbia	WI	2029	2029	◐		\$1,050	\$1,050	
7	Webster - Franklin - Marshalltown - Morgan Valley	IA	2028	2028	◐		\$755	\$755	
8	Beverly - Sub 92	IA	2028	2028	○		\$231	\$231	
9	Orient - Denny - Fairport	IA/MO	2030	2030	◐		\$390	\$307*	
10	Denny - Zachary - Thomas Hill - Maywood	MO	2030	2030	●		\$769	\$506*	
11	Maywood - Meredosia	MO/IL	2028	2028	◐		\$301	\$301	
12	Madison - Ottumwa - Skunk River	IA	2029	2029	○		\$673	\$673	
13	Skunk River - Ipava	IA/IL	2029	2029	◐		\$594	\$592*	
14	Ipava - Maple Ridge - Tazewell - Brokaw - Paxton East	IL	2028	2028	●		\$572	\$572	
15	Sidney - Paxton East - Gilman South - Morrison Ditch	IL/IN	2029	2029	●		\$454	\$516*	
16	Morrison Ditch - Reynolds - Burr Oak - Leesburg - Hiple	IN	2029	2029	●		\$261	\$675*	Cost change under variance analysis review
17	Hiple - Duck Lake	IN/MI	2030	2030	●		\$696	\$520*	
18	Oneida - Nelson Rd.	MI	2029	2029	●		\$403	\$403	
Total							\$10,324	\$10,693	

Footnotes:

¹ Estimated ISD provided by constructing Transmission Owners.

² Costs stated in millions.

³ MTEP21 approved cost estimates provided by constructing Transmission Owners.

⁴ Current cost estimates provided by constructing Transmission Owners. This represents the estimated cost for ratebase purposes.

⁵ Explanation for cost variance beyond annual inflation escalation. See below for explanation.

State Regulatory Status Indicator Scale	
○	Pending
◐	In Regulatory Process or partially complete
●	Regulatory Process complete or no regulatory process requirements

Table 1.3-1: LRTP Tranche 1 approved project status dashboard as of September 2025.

LRTP Investment Status – Tranche 2.1

Tranche 2.1 portfolio (see Figure 2.2 and Table 2.1) includes 24 projects and 323 facilities across the MISO Midwest subregion estimated at \$21.8 billion and targeted to go in service from 2032 to 2034. As of September 2025, the applicable projects are being evaluated through the competitive process or in the design phase that precedes the regulatory process, with MISO supporting constructing Transmission Owners in these efforts. MISO will monitor the status of these projects through the regulatory and build phases, and utilize its variance analysis process to deal with any costs or schedule changes that exceed certain, established criteria, and other project scope or construction challenges that could put at risk getting the projects in service.

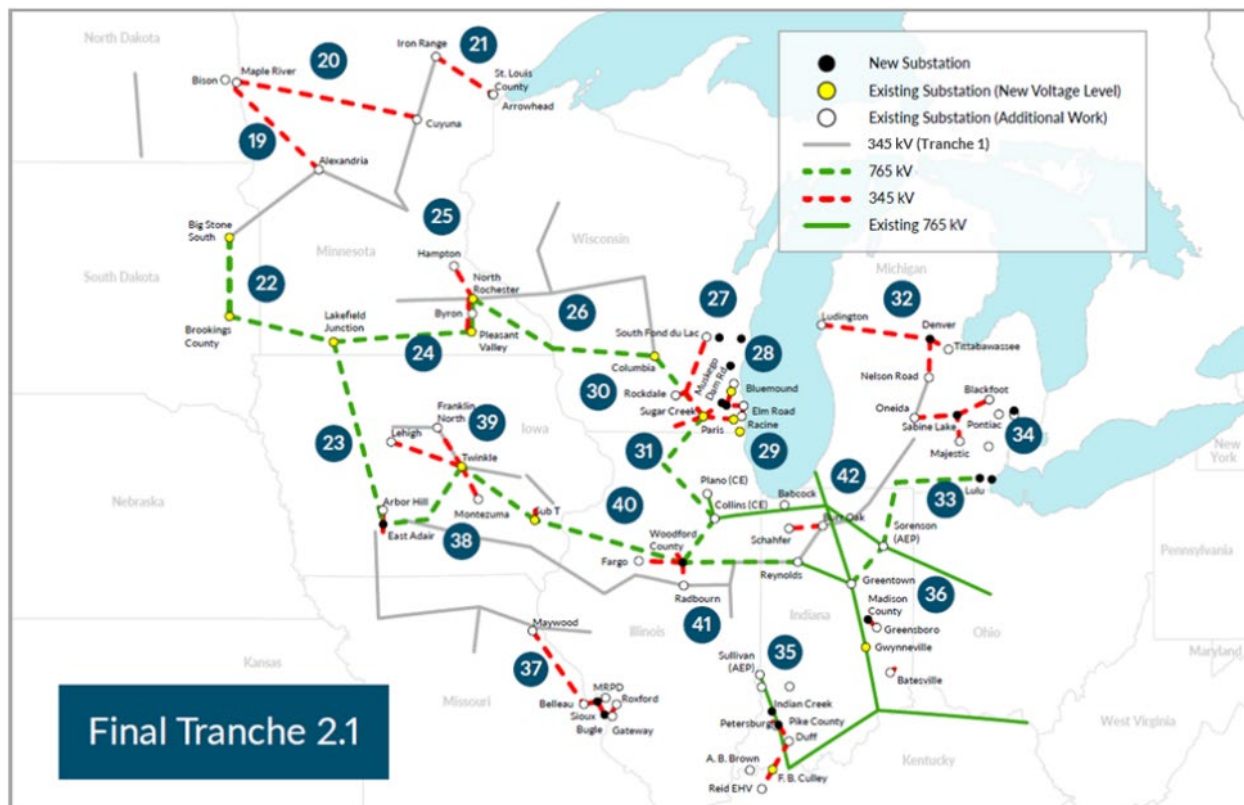


Figure 2.2: Tranche 2.1 Portfolio Map



ID	Project Name	Predominate kV	Targeted ISD	Est. Cost (\$M, 2024)
19	Bison - Alexandria	345	2032	\$216
20	Maple River- Cuyuna	345	2033	\$908
21	Iron Range- Arrowhead	345	2032	\$428
22	Big Stone South- Brookings County- Lakefield Junction	765	2034	\$1,459
23	Lakefield Junction- East Adair	765	2034	\$1,375
24	Lakefield Junction- Pleasant Valley- North Rochester	765	2034	\$1,195
25	Pleasant Valley- North Rochester- Hampton Corner	345	2032	\$222
26	North Rochester- Columbia	765	2034	\$1,924
27	Rocky Run- Werner - North Appleton	345	2032	\$212
28	South Fond du Lac- Rockdale - Big Bend - Sugar Creek - Kitty Hawk	345	2033	\$1,102
29	Bluemond - Arcadian - Waukesha - Muskego - Elm Road - Racine	345	2032	\$731
30	Columbia- Sugar Creek	765	2034	\$743
31	Sugar Creek - Collins	765	2034	\$733
32	Ludington - Denver - Tittabawassee & Nelson Road	345	2032	\$1,553
33	Greentown- Sorenson - Lulu	765	2033	\$1,310
34	Oneida- Sabine Lake- Blackfoot & Majestic	345	2032	\$600
35	Southwest IndianaKentucky	345	2032	\$743
36	Southeast Indiana	345	2032	\$578
37	Maywood - Belleau- MRPD - Sioux - Bugle	345	2032	\$881
38	East Adair - Marshalltown- Sub T	765	2034	\$1,583
39	Lehigh - Marshalltown- Franklin North & Montezuma	345	2032	\$588
40	Sub T - Woodford County- Collins & Reynolds	765	2034	\$2,298
41	Woodford County- Fargo & Radbourn	345	2032	\$422
42	Burr Oak- Schahfer	345	2032	\$68
Total Portfolio Cost			Total	\$21,868

Table 2.1: Tranche 2.1 Portfolio Projects

L RTP next steps

In 2026, MISO will build on the redesigned Future scenarios to evaluate the prospective needs in both the Midwest and South regions of the footprint.

In the Midwest, MISO staff will build on the extensive foundation of studies and collaboration since 2008, which led to Tranche 1 and 2.1. MISO will follow our established Tariff processes to analyze the needs in the Midwest, with those needs leading the way to potential transmission solutions in subsequent MTEP cycles.

MISO will also begin the journey toward an L RTP evaluation in the South region, focusing on the key concerns of reliability, load growth, and affordability. Similar to the Midwest, issues identification will lead the way, with an initial focus in Louisiana. MISO will work with stakeholders in the South to define the study and create a foundation for South-focus L RTP analysis, with a goal of understanding the issues and potential transmission and generation solutions.