



Reliability Imperative: Long Range Transmission Planning

Board of Directors

July 25, 2022

Executive Summary



- Tranche 1 includes 18 projects in MISO's Midwest Subregion, totals \$10.3B in investment, supports system reliability and provides benefits in excess of costs
- The System Planning Committee voted to recommend approval of the MTEP21 Report Addendum: Long Range Transmission Planning (LRTP) Tranche 1 Portfolio by the full Board of Directors on June 30, 2022
- The vote for approval of Tranche 1 is before the Board of Directors

As part of MISO's Reliability Imperative, Long Range Transmission Planning 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

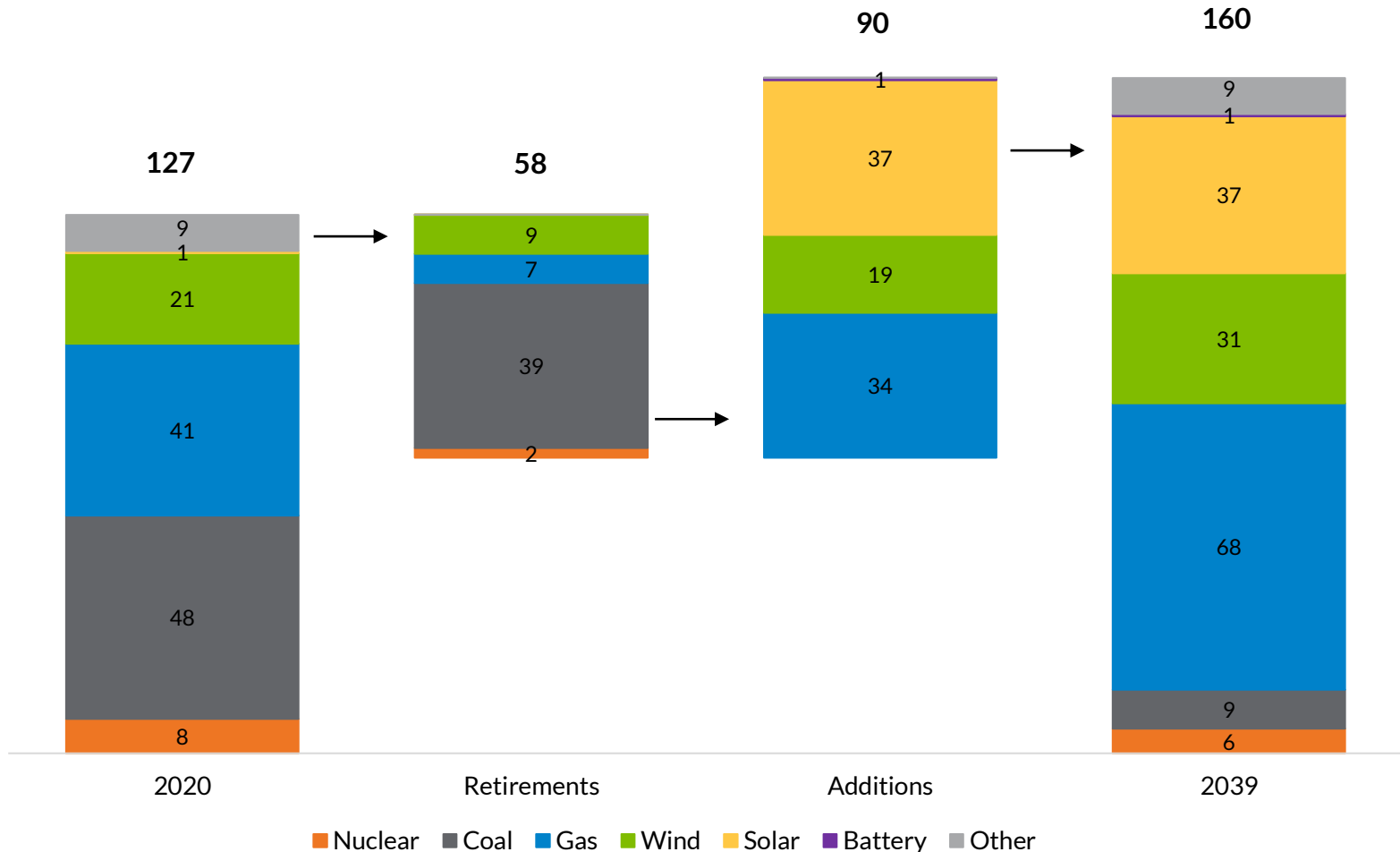
Flexible Resources



Allow more flexibility in the fuel mix for customer choice

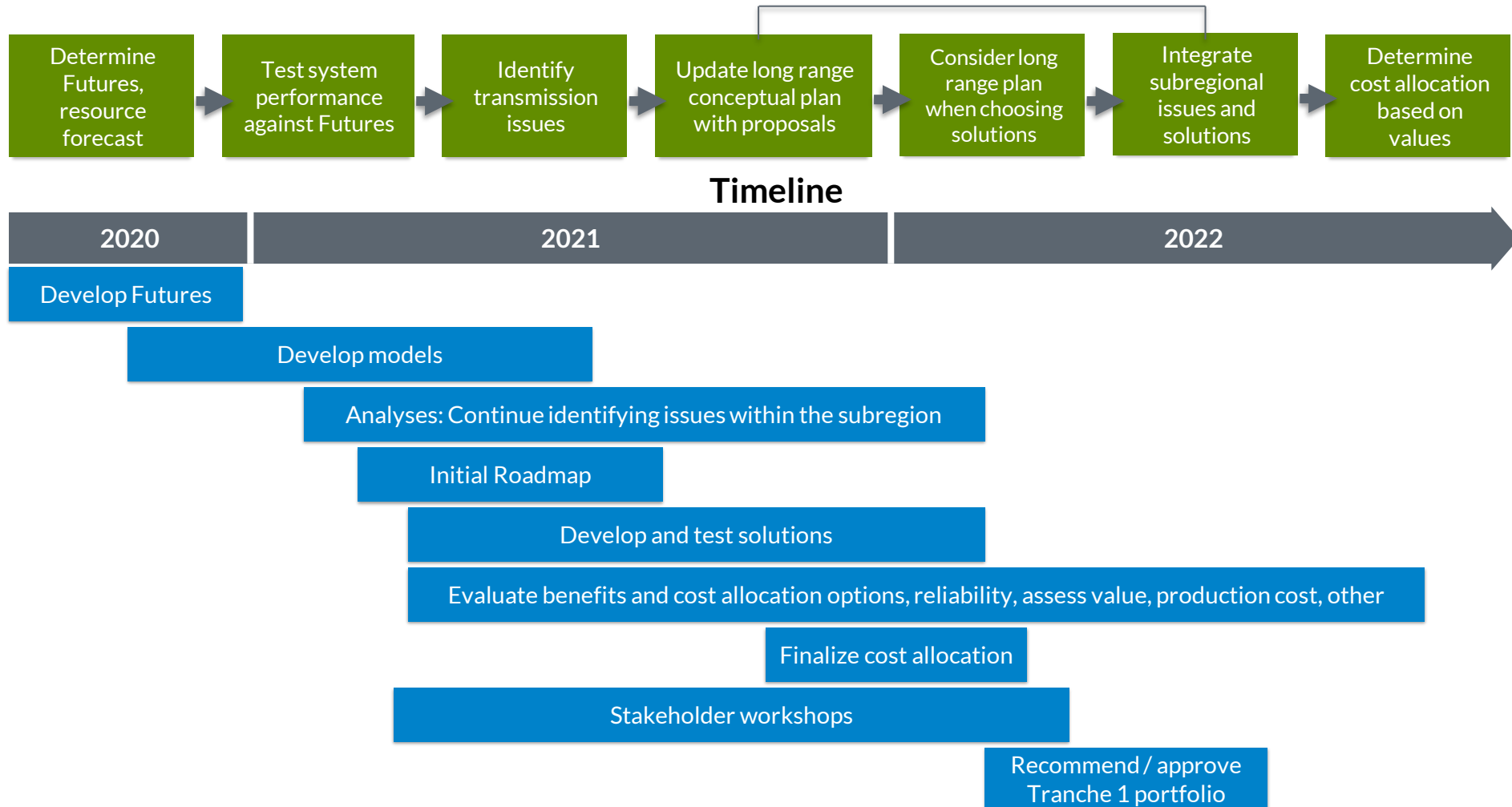
Tranche 1 provides a set of “least regrets” solutions focused on meeting portfolio changes of members and states as contemplated by Future 1

Future 1 - MISO Midwest Generation Installed Capacity (GW)



Tranche 1, the first set of Long Range Transmission Planning projects, is the culmination of more than two years of planning activities

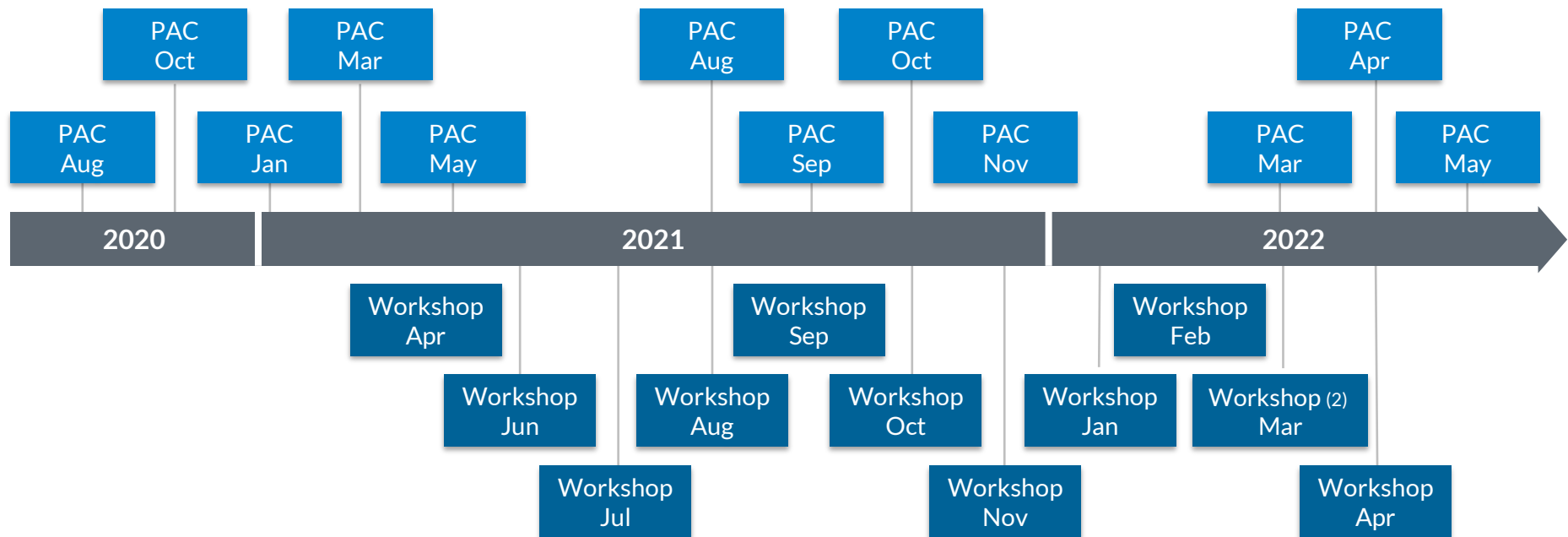
Long Range Transmission Planning Process



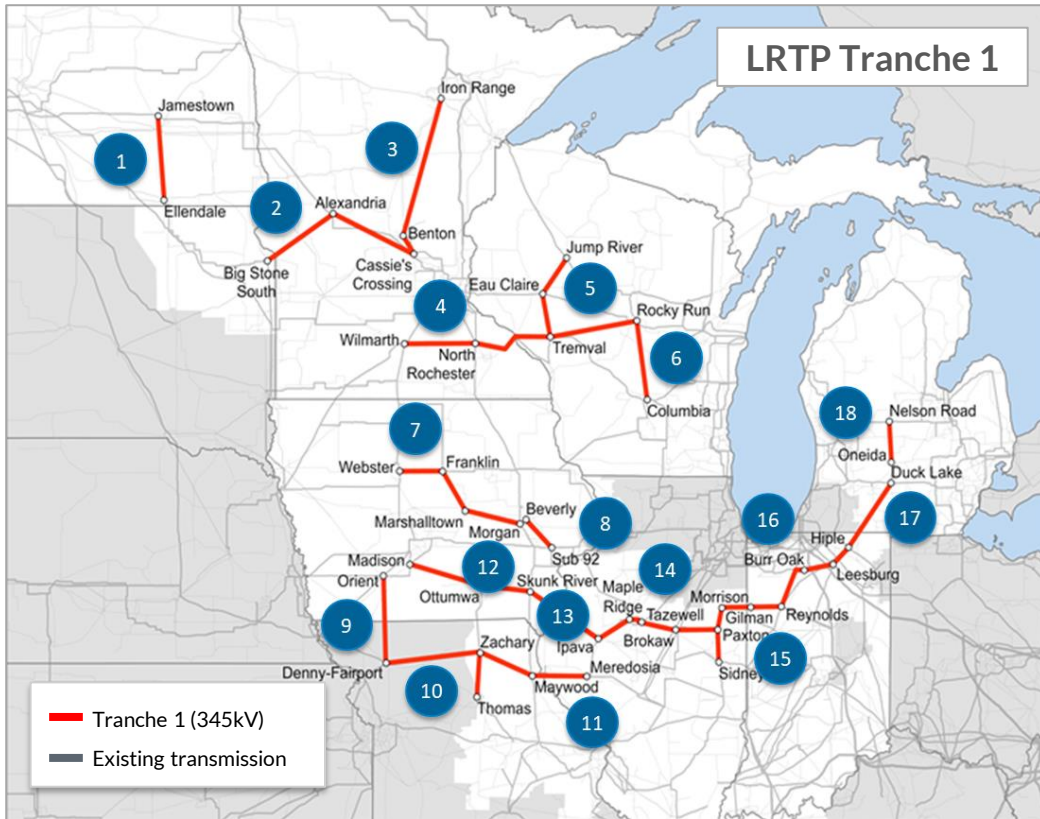
Stakeholder input has been critical and numerous meetings have provided opportunities for strong engagement throughout the process

Tranche 1 is the culmination of approximately:

 200+ internal and external meetings  200 - 300 attendees at each external meeting and workshop



Tranche 1 represents the first iteration and includes 18 projects across the MISO Midwest subregion estimated at \$10.3 billion



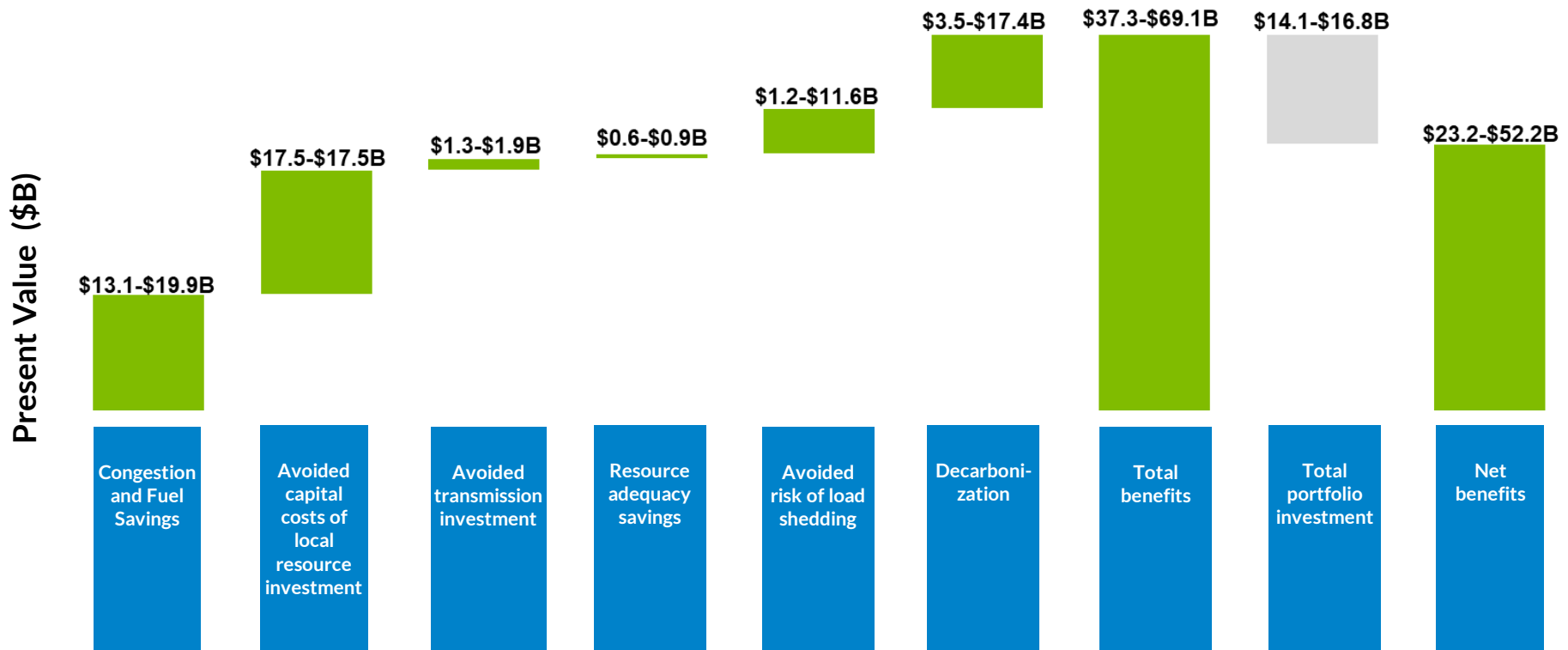
Assumption on all in-service dates is by 2030

ID	Project Description	Est. Cost (\$M, 2022)
1	Jamestown - Ellendale	\$439M
2	Big Stone South - Alexandria - Cassie's Crossing	\$574M
3	Iron Range - Benton County - Cassie's Crossing	\$970M
4	Wilmarth - North Rochester - Tremval	\$689M
5	Tremval - Eau Clair - Jump River	\$505M
6	Tremval - Rocky Run - Columbia	\$1,050M
7	Webster - Franklin - Marshalltown - Morgan Valley	\$755M
8	Beverly - Sub 92	\$231M
9	Orient - Denny - Fairport	\$390M
10	Denny - Zachary - Thomas Hill - Maywood	\$769M
11	Maywood - Meredosia	\$301M
12	Madison - Ottumwa - Skunk River	\$673M
13	Skunk River - Ipava	\$594M
14	Ipava - Maple Ridge - Tazewell - Brokaw - Paxton East	\$572M
15	Sidney - Paxson East - Gilman South - Morrison Ditch	\$454M
16	Morrison Ditch - Reynolds - Burr Oak - Leesburg - Hiple	\$261M
17	Hiple - Duck Lake	\$696M
18	Oneida - Nelson Rd.	\$403M
Total Project Portfolio Cost		\$10.3B

Current analysis indicates total economic benefits of the Tranche 1 portfolio significantly exceed costs

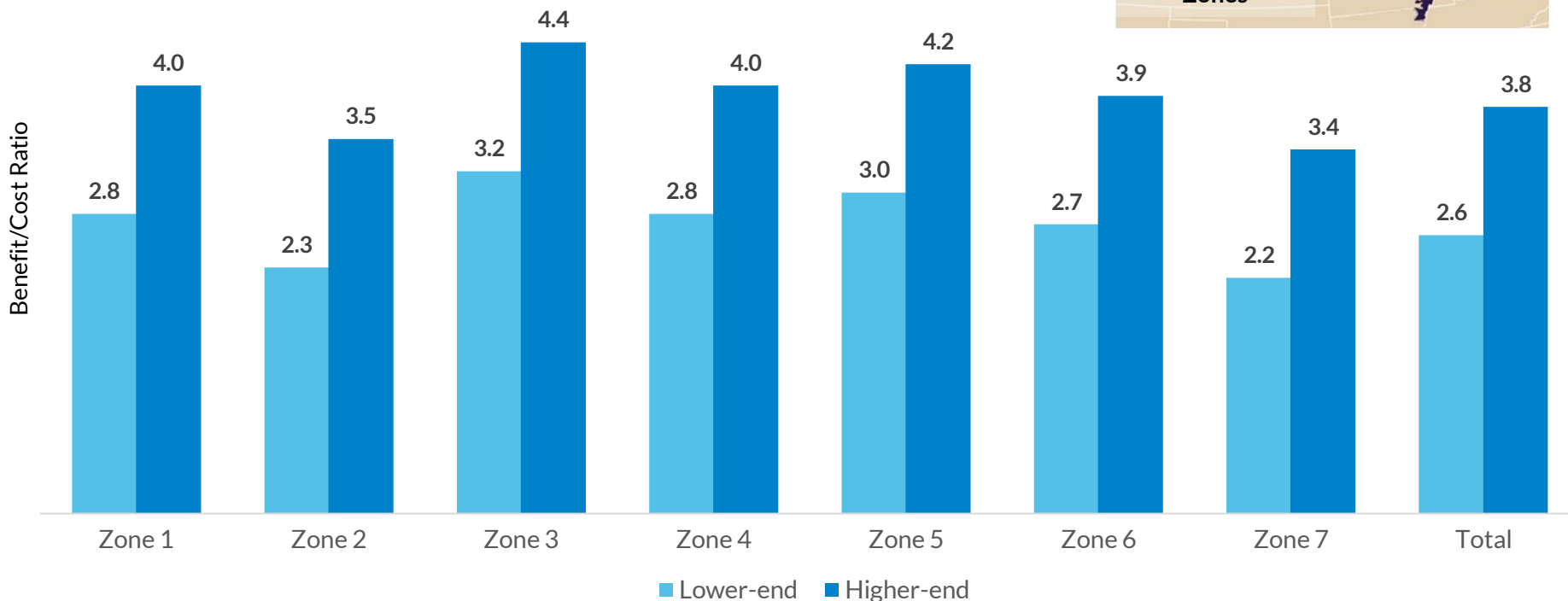
L RTP Tranche 1 Benefits vs. Costs 20 – 40-Year Present Value (2022 \$B)

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



Benefits will be broadly distributed across the Midwest subregion and deliver a benefit to cost ratio of at least 2.2 for all zones

Range of Benefit/Cost Ratio by Cost Allocation Zone (20-year present value, 6.9% Discount Rate)



MISO has addressed substantive stakeholder feedback which generally focused on support for Tranche 1 approval, concerns for benefit calculation details and comments on a wide range of other topics

Stakeholder comments	MISO response
<p>Support for Tranche 1 approval recommendation</p>	<p>MISO staff appreciates these comments and support of the MTEP21 Addendum and LRTP process for the Tranche 1 portfolio.</p>
<p>Benefit Metric Calculations</p> <p>Some comments expressed concerns about potential overstating of benefits as a result of the methods used to calculate the various benefit metrics. These concerns generally focused on two areas:</p> <ol style="list-style-type: none"> 1. Differences in reference cases (i.e., cases without LRTP transmission) 2. Avoided Risk of Load Shedding benefit 	<p>In developing the business case for Tranche 1, MISO used conservative methods to quantify multiple types of benefits related to the needs captured in Future 1. MISO discussed these methods extensively in multiple workshops, and stakeholders broadly agreed with the types of benefits captured:</p> <ol style="list-style-type: none"> 1. Differences in reference cases were used to highlight the difference in benefits of resource construction (Avoided Capital Costs) and deliverability (Congestion and Fuel Savings, Decarbonization) 2. Avoided Risk of Load Shedding benefits captures the mitigation of risks in alignment with NERC planning standards, focusing on risk reduction rather than probability
<p>Additional feedback</p> <p>Stakeholder feedback reflected a wide array of topics: Alternative solutions; details on specific information shared and the timeliness of making modeling data available; sequencing of projects; and challenges with understanding the vast amounts of data produced throughout the study</p>	<p>MISO appreciates all the feedback and responded to each individual comment. MISO did not see any comments which diminish our confidence that the Tranche 1 Portfolio provides significant reliability and economic value, or any alternatives that would need to be considered further prior to our recommendation of the portfolio for approval by the MISO Board.</p>

After reviewing the portfolio, substantive feedback and MISO responses, the System Planning Committee voted to recommend the approval of Tranche 1 to the full Board of Directors on June 30, 2022

“The System Planning Committee recommends to the Board that it approve the 18 projects in the MTEP21 Report Addendum: Long Range Transmission Planning Tranche 1 Portfolio and also approve the inclusion of the 18 projects into Appendix A of MTEP 2021.”

A motion to approve the MTEP21 Addendum and inclusion of the Tranche 1 Portfolio in Appendix A is now before the Board

“The Board of Directors moves to approve the 18 projects in the presented MTEP21 Report Addendum and approve the inclusion of those projects into Appendix A of MTEP 2021.”