



**GRID
NORTH**
PARTNERS
an evolution of CapX2020

Making tomorrow's energy possible. Together.

Near-Term Congestion Relief Projects

January 3, 2024

Agenda

- Who is Grid North Partners?
- Why focus on near-term congestion relief?
- What near-term upgrades will be developed by Grid North Partners members? When?
- What's next?

CapX2020 Transmission Expansion 2004 - 2017

CapX2020 is a joint initiative that has successfully executed the upgrade and expansion of over 800 miles of transmission in 4 states

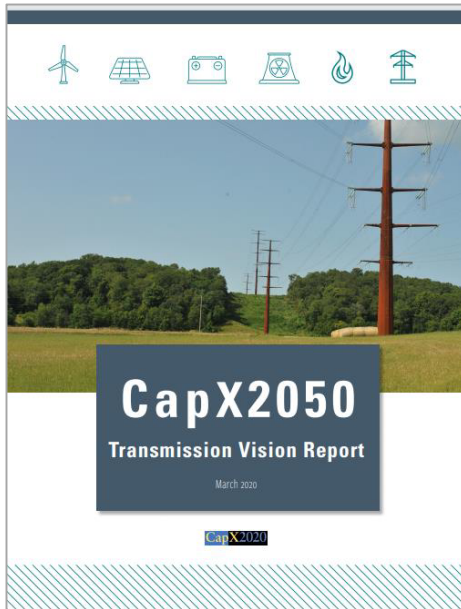
- Continued reliable service for customers
- Strengthened the transmission grid
- State Renewable Energy Standards
- New generation outlet
- Regional transmission support



Grid North Partners – an evolution of CapX2020

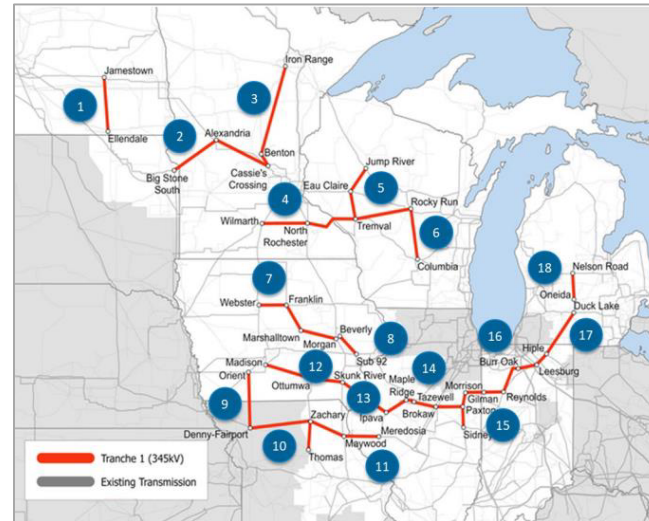
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CapX2050 Vision Report



Highlights challenges planners and operators may face as energy production evolves

MISO LRTP



Advocacy for regional approach. Collective and individual participation in MISO's study

Finding True North Symposium



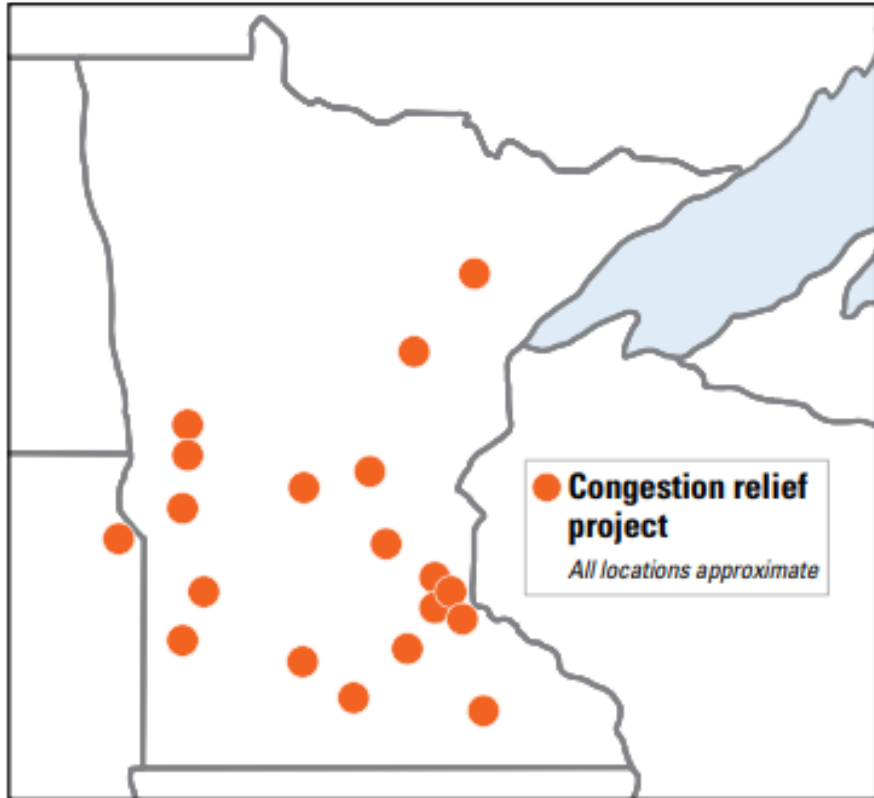
Open dialog on local community engagement, reducing development timelines, and operations

Grid North Partners Near-Term Congestion Study

- In recent years, congestion has risen beyond normal levels due to:
 - Generation construction outpacing the construction of transmission
 - Planned and unplanned system outages
 - Generation being built in areas formerly without generation
- Regional transmission is the long-term solution; however, development requires 8-10 years on average
- In 2023, Grid North Partners collectively undertook a study to identify and develop near-term solutions to incrementally resolve congestion
 - Collectively analyzed both historical and forward-looking congestion
 - Identified physical limiting equipment on every congested element
 - Forecasted congestion relief for each solution



Grid North Partners member utilities plan to individually construct 19 near-term solutions



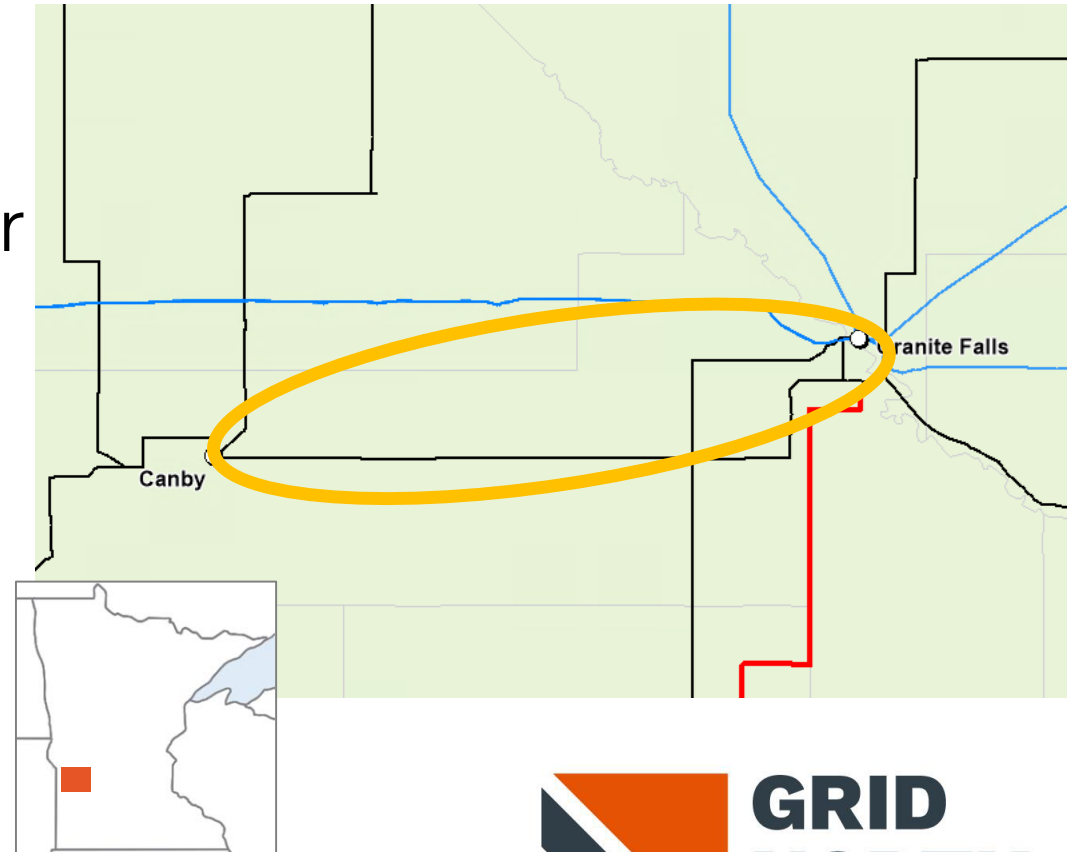
Project Highlights:

- 19 solutions
- Total cost: ~\$130 million
- Congestion benefits: >300 million (>2:1 B/C)
- Estimated in-service dates: 2023 – 2026
- Scope: Primarily upgrades of existing equipment
- Two of 19 require PUC permits (CapX2020 Brookings second circuits)
- Helps enable construction of LRTP projects

Otter Tail Power Near Term Congestion Relief Solutions

Canby – Granite Falls 115 kV

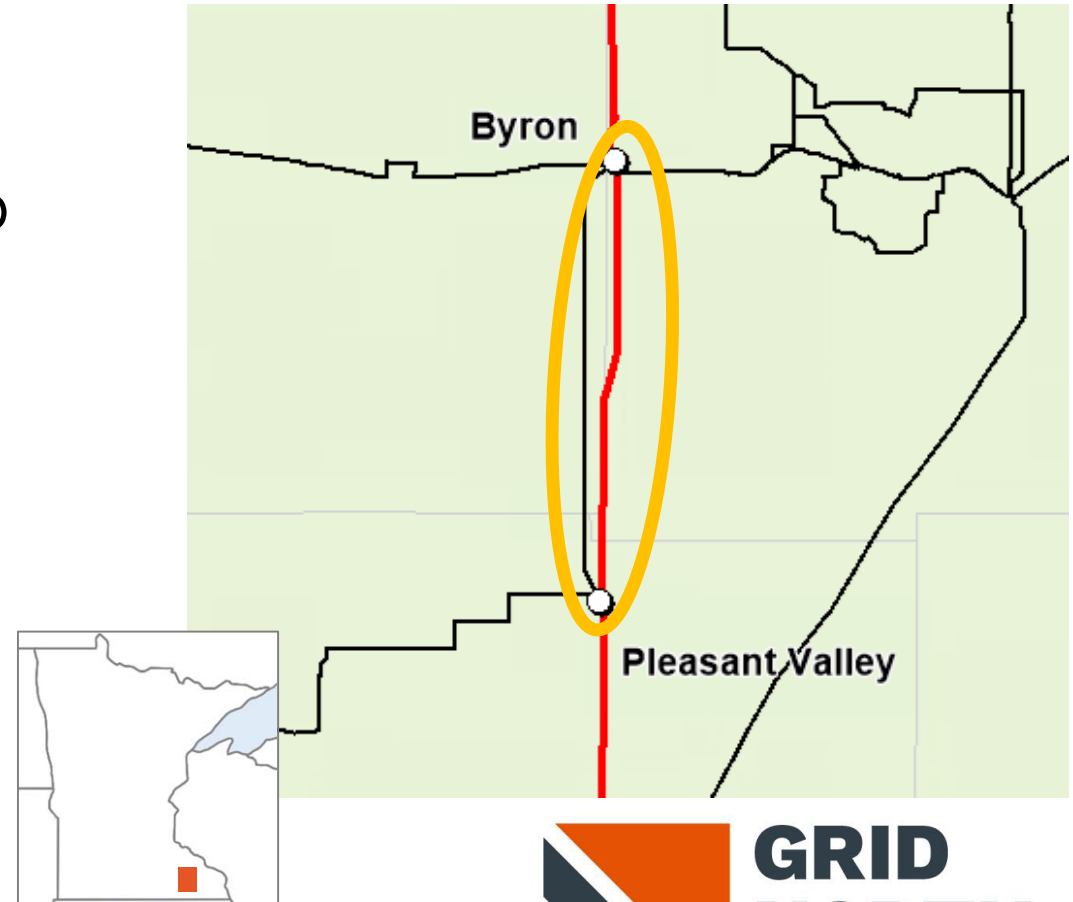
- Replacement of specific structures to increase conductor clearances
- Estimated at \$600,000
- In-service September 2023
- Increased summer/Winter continuous ratings on Canby – Granite Falls 115 kV line by 8/32 MVA



Great River Energy Near Term Congestion Relief Solutions

Pleasant Valley-Byron 161 kV

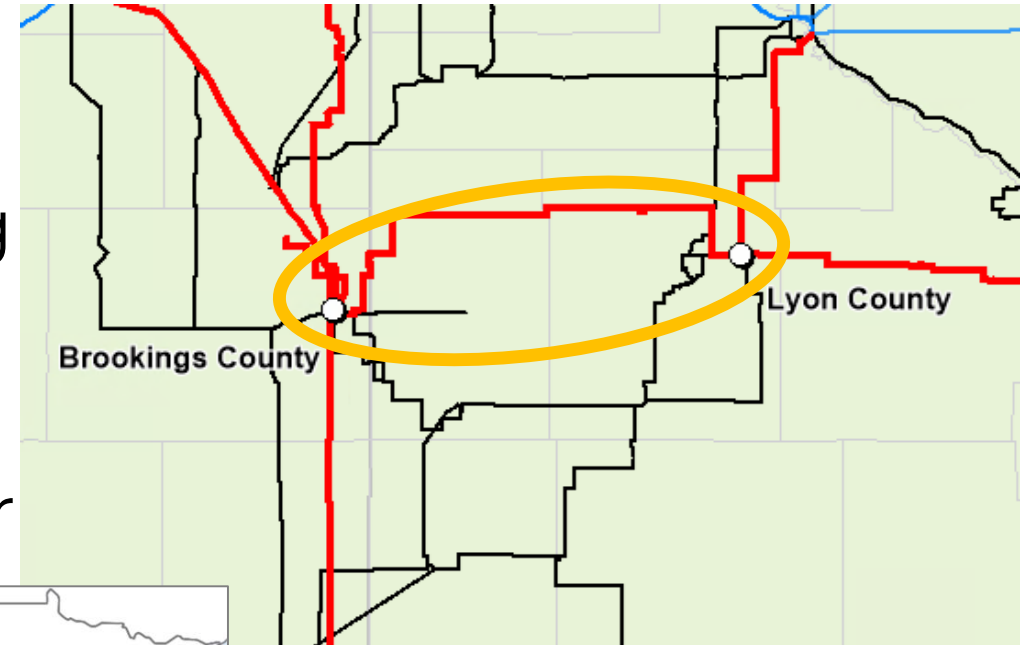
- Replace breakers and wave trap at Pleasant Valley.
- Estimated at \$1,400,000
- In-service by December 2025
- Increased continuous equipment ratings on Pleasant Valley-Byron 161 kV by 278.8 MVA. Line will be limited by conductor rating with AAR.



Xcel Energy Near Term Congestion Relief Solutions

Brookings County – Lyon County 345 kV 2nd Circuit

- Adding Second Circuit to existing structures
- Project has open docket
- See Certificate of Need for further information
- In-service Fall 2024, pending approval

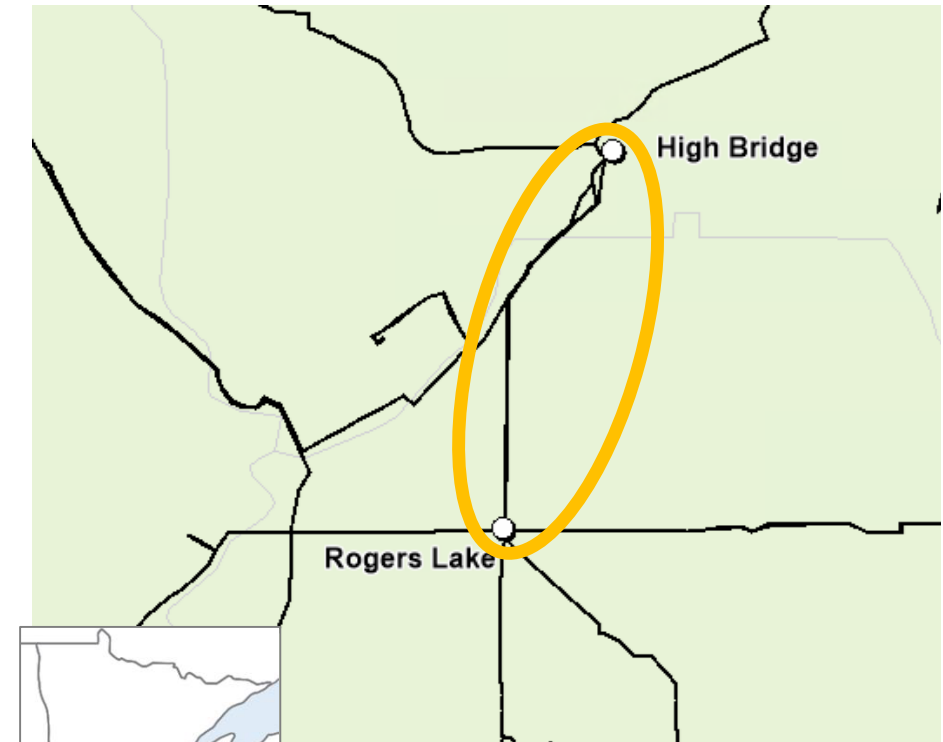


Xcel Energy

Near Term Congestion Relief Solutions

Rogers Lake - High Bridge 115 kV

- Di-bifurcated line from one single circuit using two separate stranded wires functioning as a single circuit into a double circuit facility
- \$1M
- Project completed October, 2023
- Market models treat double circuit as two individual circuits. The High Bridge – Merriam Park FLO Rogers Lake High Bridge constraint no longer binds

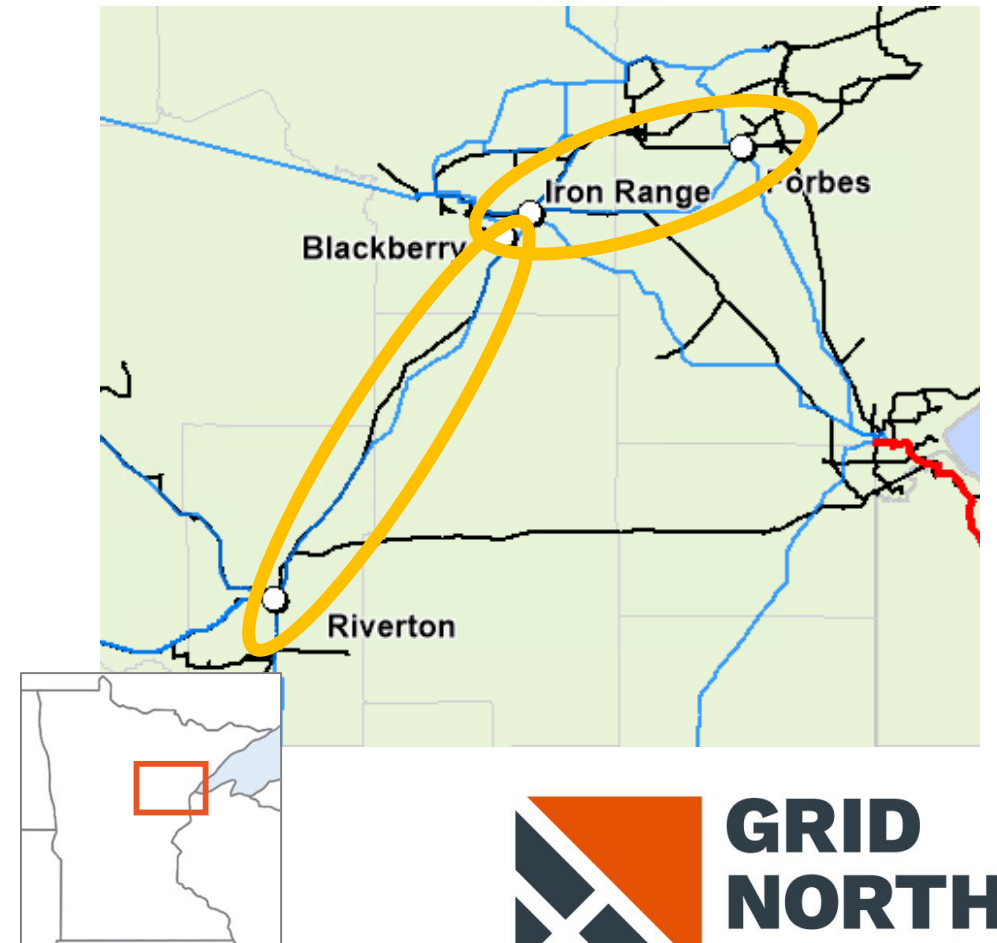


Minnesota Power Near Term Congestion Relief Solutions

Blackberry – Riverton and Forbes – Iron Range 230 kV Lines

- Identified in GNP study, one with recent congestion and one with projected congestion.
- Following analysis of all equipment within facilities, Ambient Adjusted Ratings (AARs) were developed, and EMS changes made for real-time use. AARs implemented in March 2023.
- AARs allow potential for increased ratings and reduced congestion as ambient conditions allow, without capital costs.

NOTE: MP calculates facility ratings based on seasonal weather assumptions, like most MISO TOs. AARs are facility ratings calculated using actual ambient temperatures, rather than the default seasonal assumptions. FERC Order 881 will require TOs to calculate AARs for all eligible transmission facilities by July 2025, in an automated, prescriptive manner. MP is aggressively working on a FERC Order 881-compliant facility ratings program to be ready by July 2025. MP has been calculating AARs in a limited, manual, non-FERC Order 881-compliant manner for many years. Facilities with identified congestion costs are enrolled (if eligible) and released if they are upgraded with higher ratings.



Next Steps

- The Grid North Partners member utilities will continue to identify and implement short-term and long-term congestion solutions that are economically justified, as well as work with policymakers and MISO to make changes
- Actively engaged and supporting MISO LRTP Tranche 2 efforts



Thank you

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