NASEM: Reinventing the Right of Way: Policy, Technical, and Economic Implications of Siting Transmission Lines Along Transportation Corridors

Highway ROW Panel

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Office of Sustainability & Public Health

DEPARTMENT OF TRANSPORTATION

mndot.gov

Background Information: NextGen Highways and Transmission in Highway Rights of Way

What are Next Generation Highways?

Transportation corridors with the strategic co-location of:

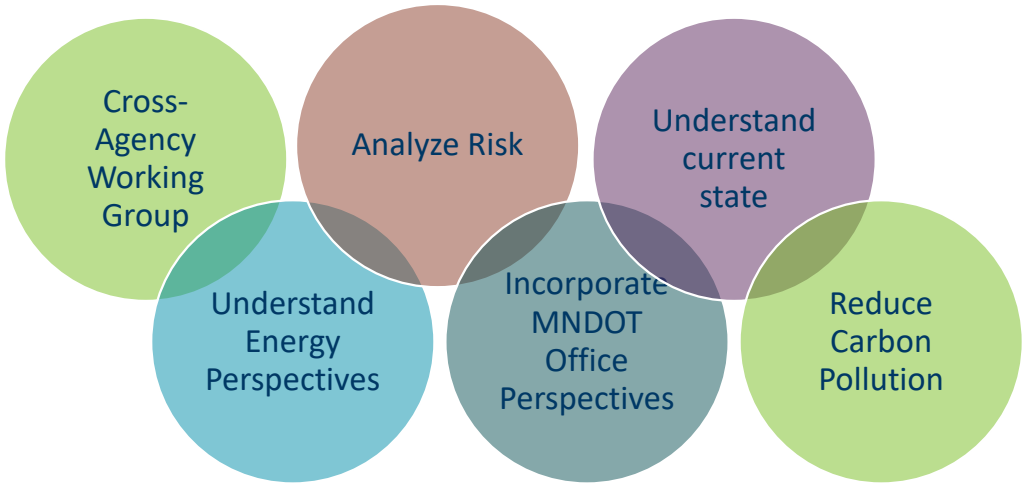
- Electric transmission lines (buried and above ground)
- Communications infrastructure

A 2022 Feasibility Study, led by NextGen Highways Team - the Ray, NGI Consulting, Great Plains Institute and other partners. This was a proactive planning project underwritten by philanthropy.

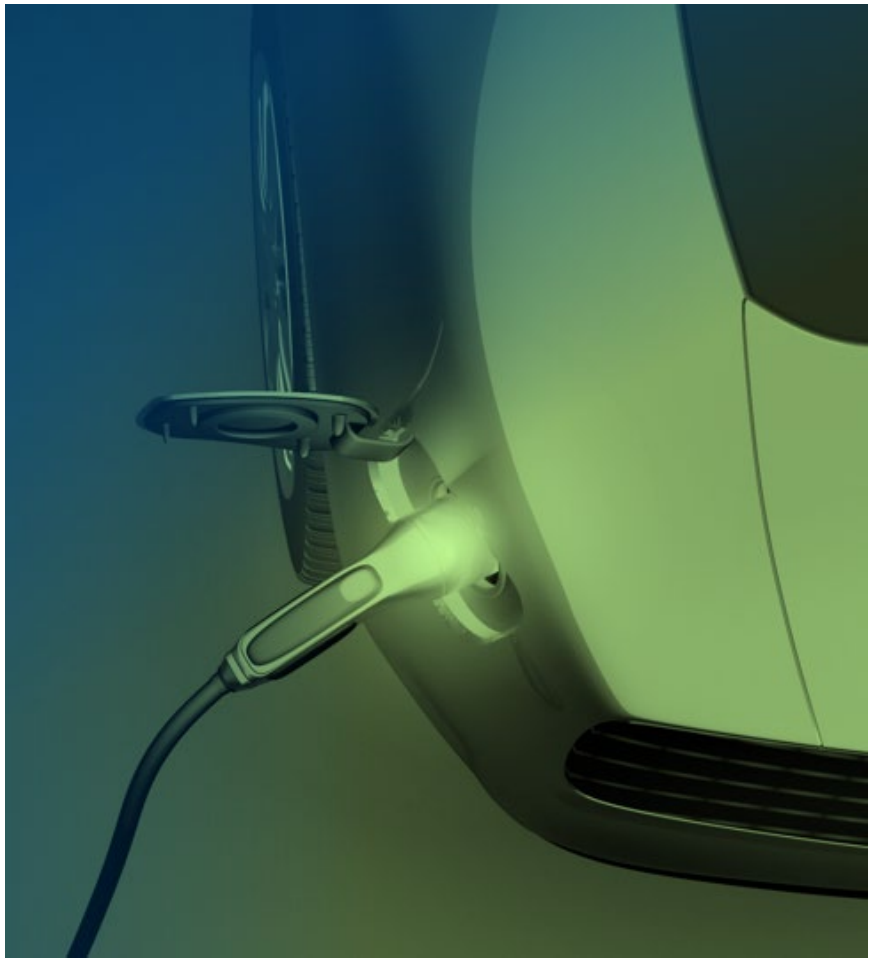
- ***Can use of highway rights of way for transmission help address significant decarbonization barriers for energy and transportation?***
- ***What are the technical, regulatory, and economic barriers for transmission lines in MnDOT Right of Way?***

August 2021- Minnesota Public Utility Commission asked MnDOT to analyze above-ground transmission in highway rights of way in addition to buried HVDC.

MnDOT Analysis of Transmission in ROW 2021 – Present



What problem is the Minnesota Dept of Transportation trying to solve? (Clean) Energy Needed for Electrification of Transportation



Electrification of transportation is a key component of MnDOT's **Carbon Reduction Strategy**

New Legislation: All electricity must come from 100% **Clean Energy by 2040** - law passed in MN 2023 Legislative session. Timelines under evaluation in the current 2025 Session.

There are strong benefits to the state of Minnesota to expand use of right of way for transmission to support energy decarbonization and the increased generation/transmission needed to support increased grid needs and the electrification of transportation.

Minnesota Power Needs Are Increasing & Connected to Economic Growth

ENVIRONMENT

Mega data centers are coming to Minnesota. Their power needs are staggering.

With at least 10 planned, these Big Tech projects could consume as much electricity as every home in Minnesota.

By Walker Orenstein
The Minnesota Star Tribune

JANUARY 10, 2025 AT 7:00AM

4/10/2025

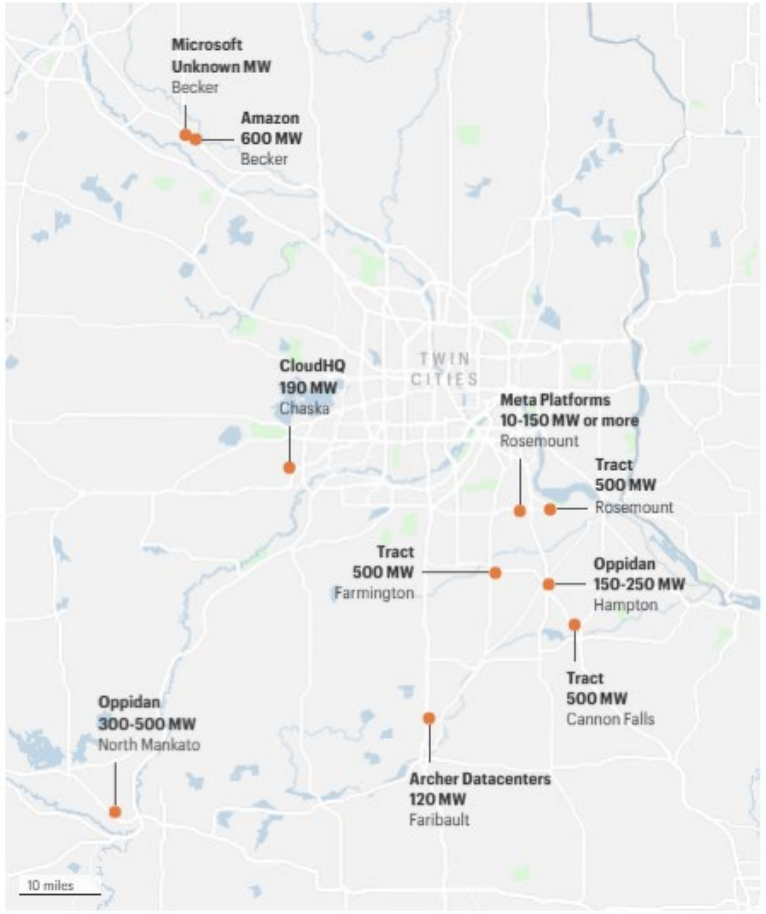
https://www.startribune.com/mega-data-centers-are-coming-to-minnesota-their-power-needs-are-staggering/601204129

Potential large-scale data centers

There are at least 10 potential huge data centers in various stages of development in Minnesota, with many clustered around Xcel Energy's coal plant in Becker and in the southern Twin Cities metro area.

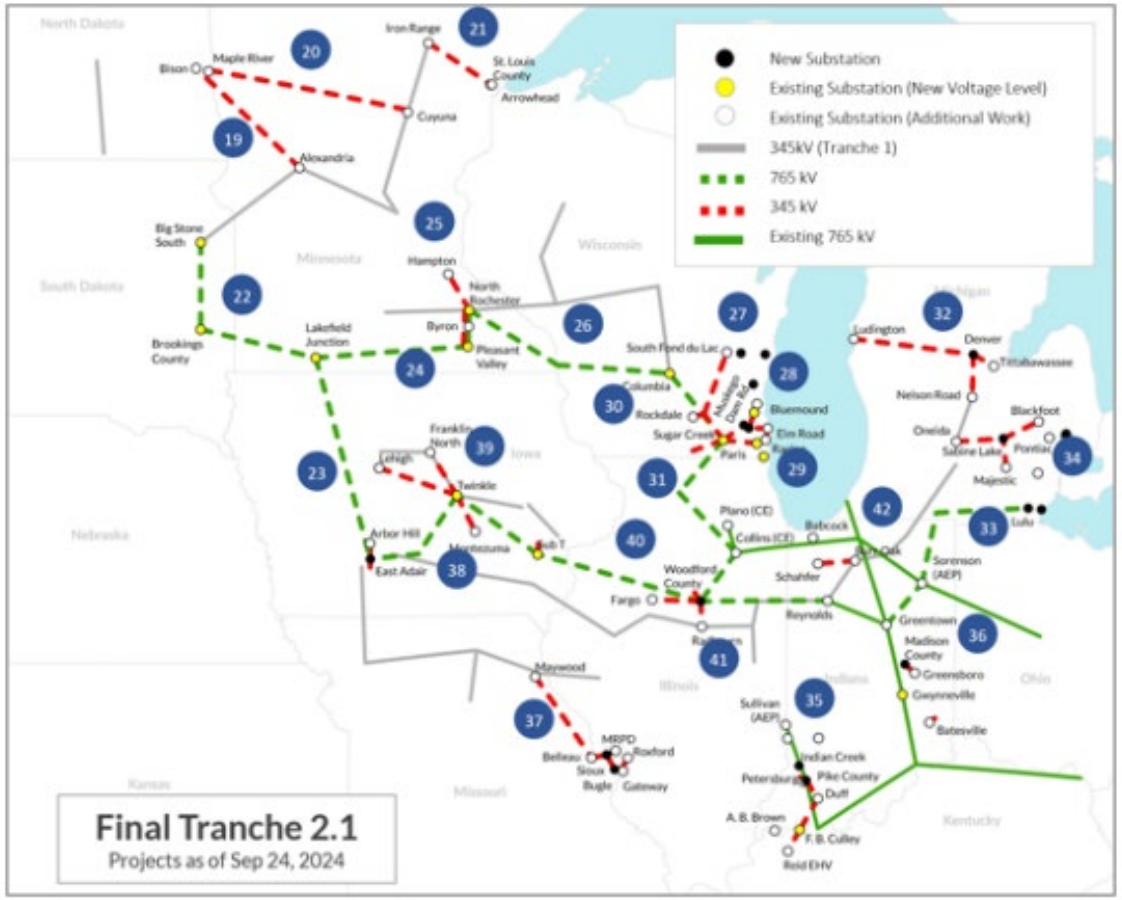
Hover/tap for detail

LOCATIONS AND ESTIMATED MEGAWATTS OF ENERGY DEMAND



A major buildout of transmission has arrived: MISO

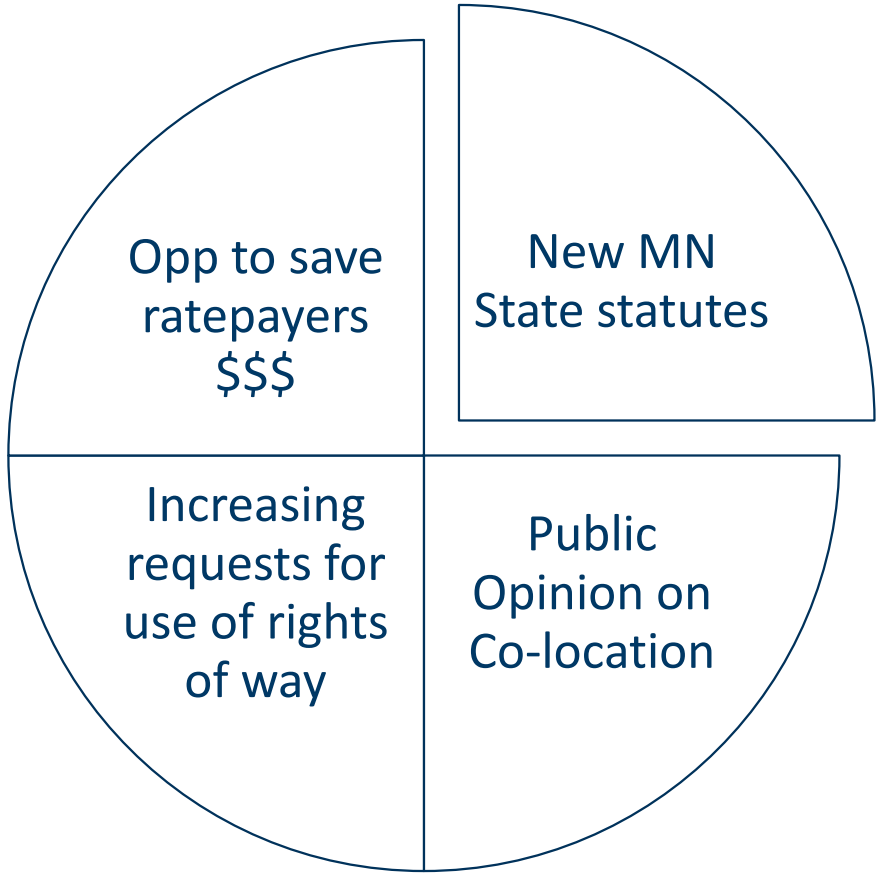
Tranche 2.1 - Approved



[Tranche 1: MISO](#) approved $10.3 billion in transmission investment [in July 2022](#), all of which are slated to be in service before 2030.

[Tranche 2: MISO](#) approved in Dec 2024 $21.8 Billion in additional transmission investment, including 24 projects and 323 facilities across the MISO Midwest subregion targeted to go in service from 2032 to 2034. It builds a 3,631-mile 765 kV and 345 kV backbones.

Utility Accommodation Approach: Early Coordination MnDOT is a Downstream Permitting Authority



Co-location

(transmission located within transportation facility) **MN recently expanded to Interstates & controlled access freeways**

Paralleling

(poles located outside of rights of way with arial encroachment in ROW) Reduces landowner impacts

Crossings

(well established accommodation)

What We Learned: Categories of Pressure Points for Added Transmission Infrastructure in Highway Rights of Way

Limit Future Right of Way Use for Transportation

Safety/Safety/Safety

Operations & Maintenance Impacts

Added Costs for DOT

Relocation if ROW is Needed

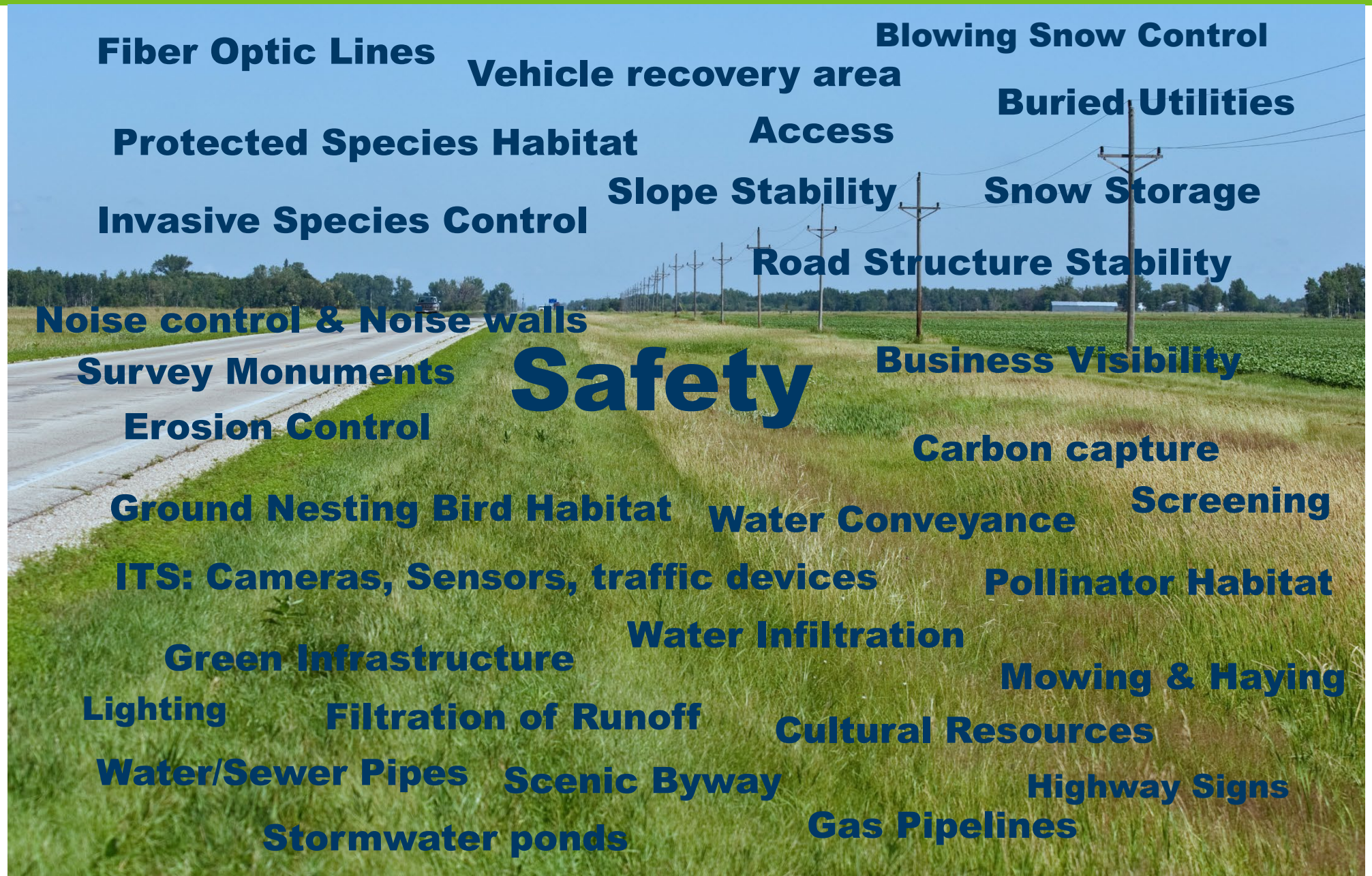
Impact to Scenic Viewsheds

Environmental Impacts

Vegetation Removal

What do you see?

Uses & Demands on MnDOT's Highway Roadsides



Utility Accommodation: 2024 Changes to Allowance of Transmission in MnDOT's Rights of Way

Article 3, Sections 17-22 of Chapter 127.

- High voltage transmission lines may be placed within MnDOT Right of Way which includes controlled access roadway/interstate right of way. Authority to deny the installation based on safety and/or the operations of the transportation facility.
- Requires the Commissioner to provide written reason for denials to the Legislature and the Department Commerce & PUC
- The legislation describes the current MnDOT utility coordination process. This specifically calls out the coordination will occur with utility transmission line owners through a "constructability report."
    - The Commissioner must at a minimum give the utility a 4-year advance notice for relocation of structures if right of way is needed for transportation system.

Article 3, Sections 17-22 of Chapter 127.

- For new interstate installations, MnDOT is responsible for 75% of relocation costs if the utility has a constructability report and MnDOT does not provide a 4-year advance notice.
- If MnDOT does meet all the requirements within this new legislation the utility is responsible for all relocation costs. All other utilities still retain full reimbursement within the interstate right of way.

New Resources for Early Coordination

DEPARTMENT OF TRANSPORTATION

Search MnDOT A to Z General Contacts

Land Management

Land Management Home | Right of Way Acquisition | Surveying & Mapping | Utility Agreements & Permits | Workshops & Training | Contacts

What we do

We provide resources to support successful utility accommodation and coordination on MnDOT right of way throughout all project stages, from planning to final construction.

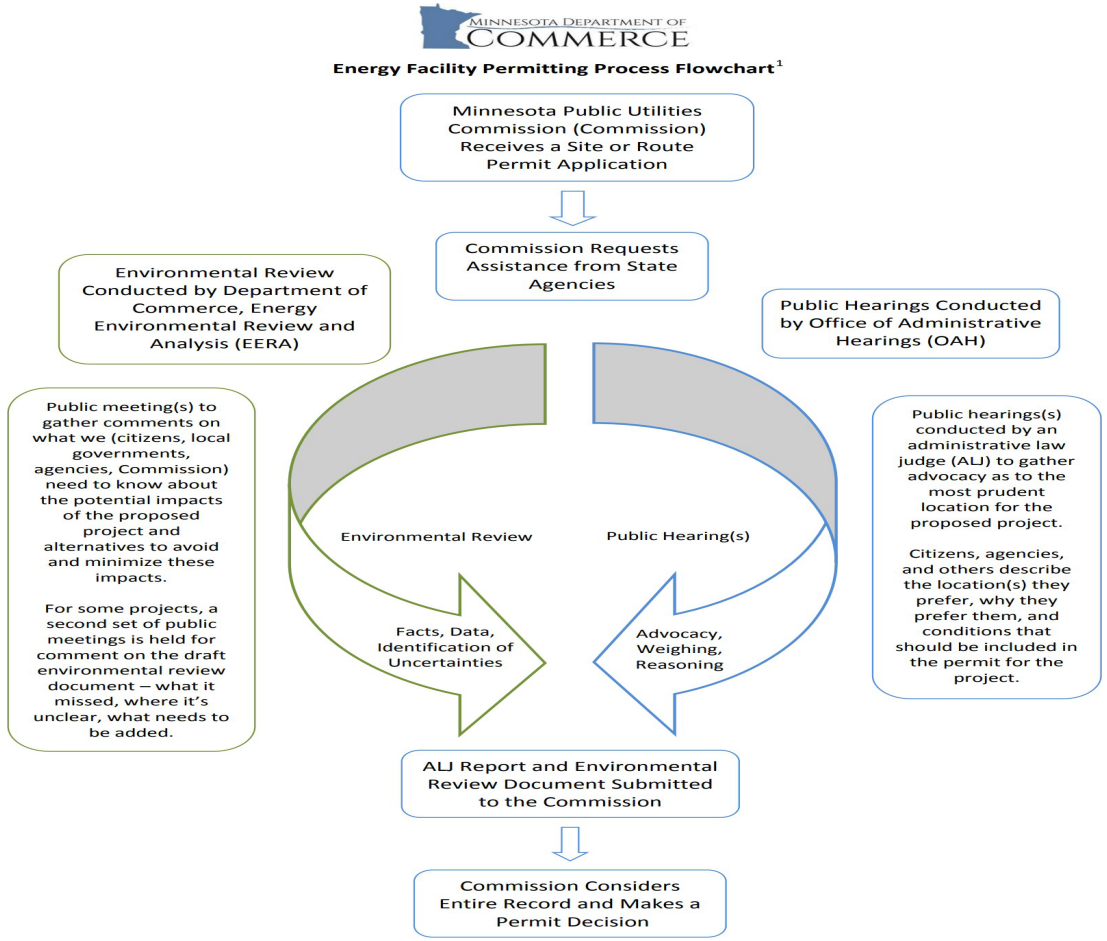
Utility Accomodation

Permit process flow chart

Utility agreements and permits

Resources

- Utility accommodation policy and guidance
- Permit information, special provisions and forms
- Online right of way permit applications
- Large energy facility project guidance
- Utility coordination and project delivery
  - Project managers
  - Consultants
  - Construction
  - Buy America
- Utility owners
- Local agencies
- Utility agreement and permit contacts



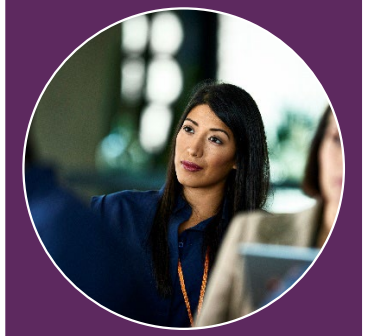
MnDOT AASHTO Moonshot Actions In Progress

New Resources for Early Coord. With Transmission Developers

Safety Analysis

Joint Training & TA with Sister Agencies: PUC & Commerce

Get the Word Out on Policy Shifts: MnDOT District Tour & Listening Sessions



Add Transmission Staff in Utility Permits Section

The Ray & ESRI Transmission Right of Way Tool: Multi Agency Working Group

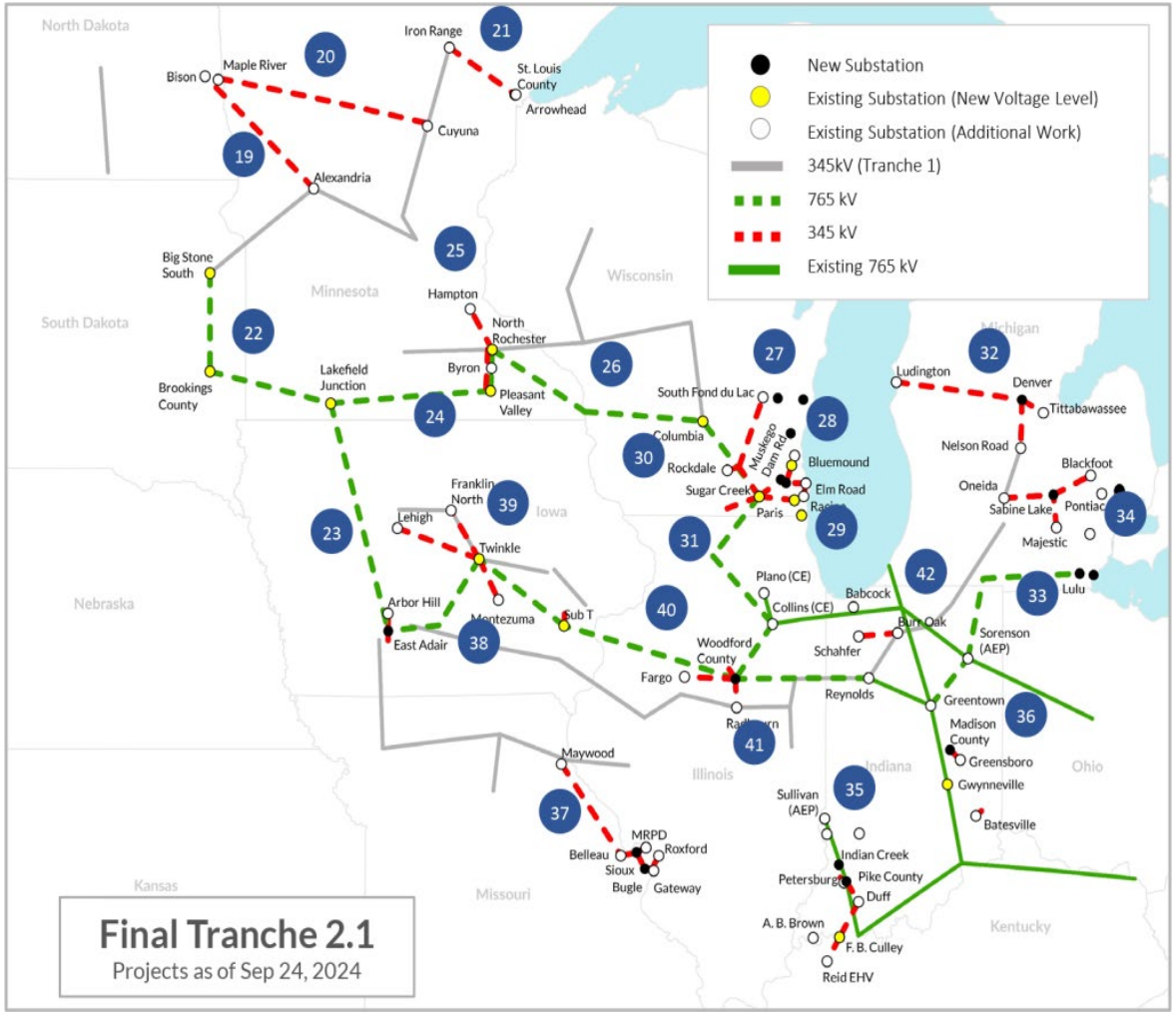
Tranche 1: Current State: Proposed HVTL Mileage in MN

2ND CIRCUIT	
ALEX-BIG OAKS	108 MILES
BROOKINGS-HAMPTON	95 MILES
TOTAL	203 MILES

NEW	
NRP	180 MILES
BIG STONE-ALEX	105 MILES
MMRT	120 MILES
MNEC	180 MILES
DPC	14 MILES
PILOT KNOB	9 MILES
CEDAR LAKE	7 MILES
DCW	7 MILES
TOTAL	622 MILES

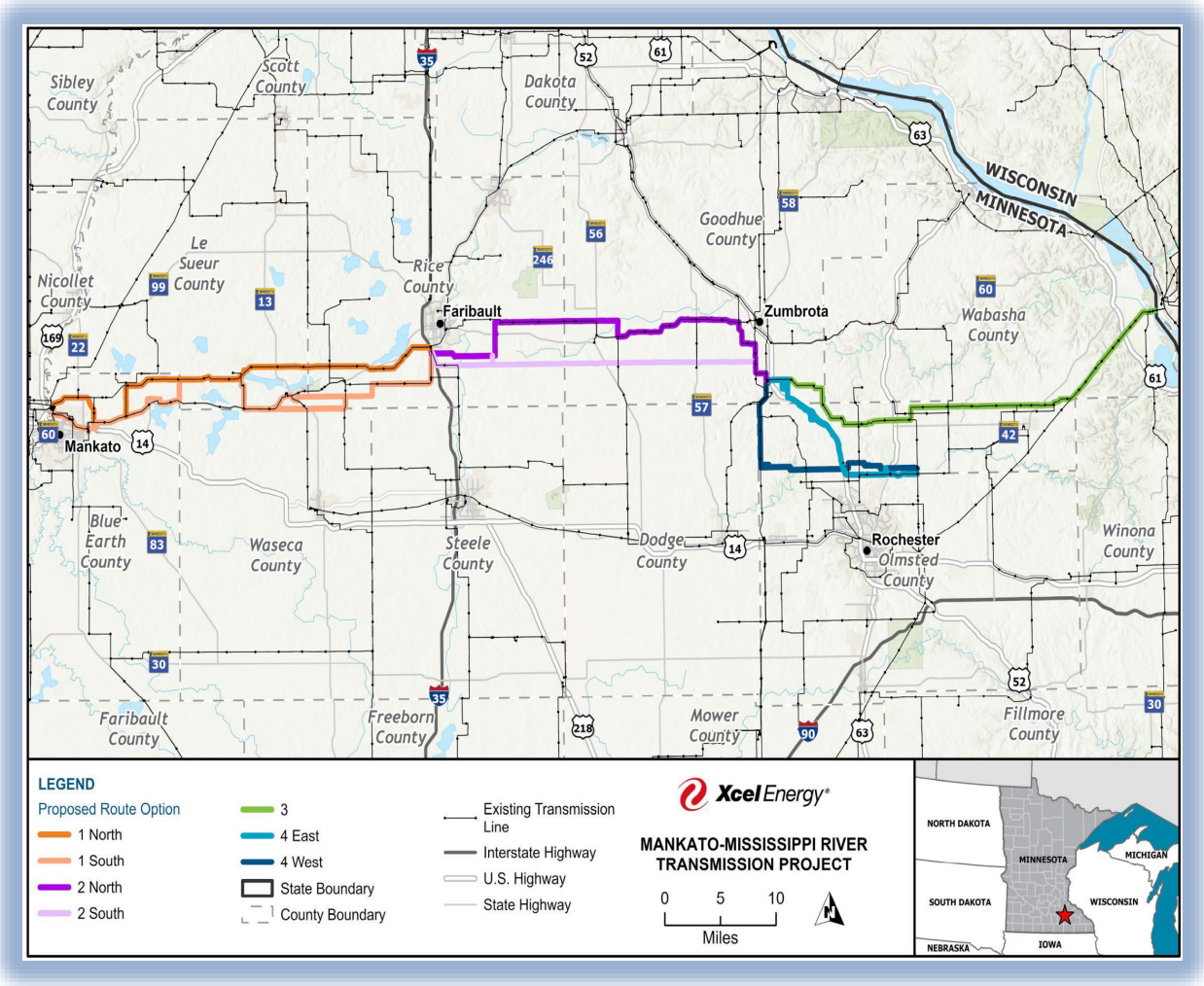
Tranche 2 Projects - 2025 Coordination Anticipated

1. Bison – Alex 345kV 2nd Circuit (LRTP Project #19)
2. Maple River – Cuyuna 345kV (LRTP Project #20)
3. Iron Range – St. Louis Co – Arrowhead 345kV (LRTP Project #21)
4. Brookings – Lakefield 765kV (LRTP Project #22)
5. Lakefield Jct – East Adair 765kV (LRTP Project #23)
6. Lakefield Jct – Pleasant Valley 765kV (LRTP Project #24)
7. Pleasant Valley – North Roch – Hampton 345kV 2nd Circuit (LRTP Project #25)
8. North Rochester – Columbia 765kV (LRTP Project #26)



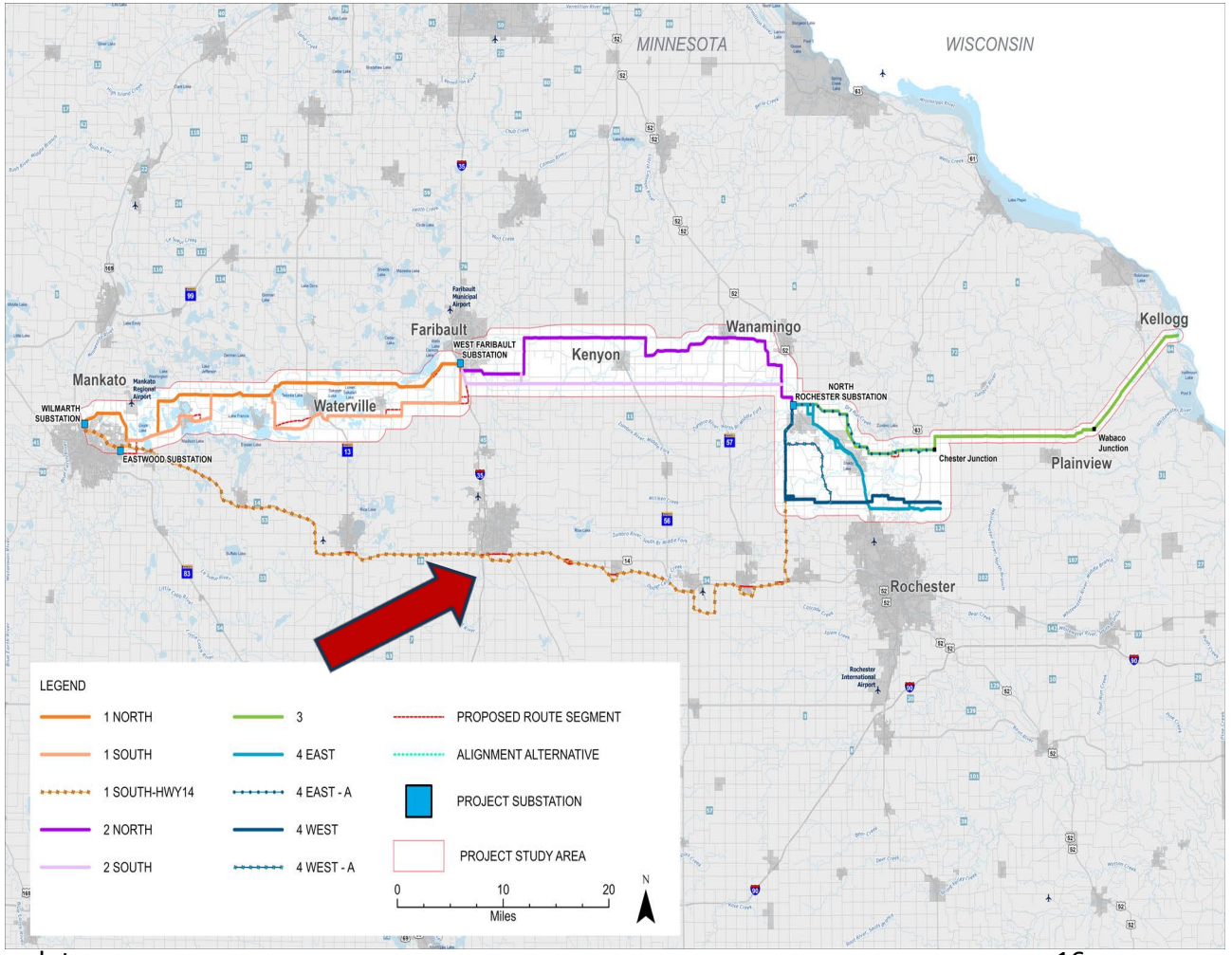
Case Study for Colocation

- Mankato – Mississippi River Project
  - Approx 120 miles of 345kV + 20 miles of 161kV
  - Effective early project coordination began 1.5 years before PUC application submittal.
  - Sample DOT comments in the PUC Project Docket: Mankato to Mississippi River Transmission Project 20253-216230-01
  - Four Segments:
    - 1 - Mankato – Faribault 40 miles 345kV
    - 2 - Faribault – Pine Island 35-40 miles 345kV
    - 3 - Pine Island – Kellogg 45 miles
    - 4 - Rochester Connector 20 miles 161kV



Case Study for Colocation

- Mankato – Mississippi River Project
  - Sample DOT Comments in the PUC Project Docket: Mankato to Mississippi River Transmission Project 20253-216230-01
  - Updates occurred during Public Scoping Comment period
  - Several route alternative/segments (RA/RS) were proposed
  - One proposed RS has potential to affect large portion of new US 14
    - Segment 1 AND Segment 2: Potentially replaced by landowner-suggested RS to place the line within/adjacent to US 14 for **~83 miles**
    - MnDOT and Xcel Energy participated in Early Notification Memo process for desktop review of new RS
    - Review submitted to DOC-EERA for inclusion/use in Draft EIS
    - MnDOT currently working with Xcel on Constructability Report per new legislation § 161.45.6



Closing: Current Pressure Points for Transmission in ROW

- Resistance is real and cultural in DOT's. We can overcome these issues if we can build trust/relationships.
- Pole locations needed for effective early coordination. We can't give determination on "permitability" of a route or a go-or-no-go without specific pole placement info.
- Relocation of Intelligent Transportation Infrastructure (ITS: fiber, cameras, sensors, traffic devices & the need for additional grounding)
- Impacts/relocation of existing utilities in the right of way
- Impacts/possible relocation of drainage structures/living & structural snow fences
- Future turn back segments/future interchanges not yet planned/programmed
- Impacts to scenic byways and scenic viewsheds
- Assumption of previously disturbed ROW/ Majority of ROW developed pre-NEPA
- Alternative Routes popping up late in the process proposed through PUC Permitting processes for Public Engagement/Stakeholder Engagement

Final Thoughts

- MnDOT To Do List:
  - Continue internal education on grid needs & impact to MN economy
  - Update MN Utility Accommodation Policy & Manual
  - Quantify cost impacts of transmission projects in highway ROW
    - Cost allocation- analyze Utility Permit Fee Authority and legislative pathways

- Macro Recommendations:
  - Add DOT utility permitting staff to address capacity issues at DOT's
  - Fund/Incentivize collaboration to build trust
    - If expanding state laws, fund Joint trainings DOT + Utilities + State Energy Offices + PUC
    - Set up regular executive/ staff consultation
  - Establish state-level Joint Offices of Energy & Transportation to improve coordination
  - Educate energy on key DOT concepts/requirements: UAP/clear zones/control of access, etc.
  - Assist energy in understanding safety/relocation/cost issues for DOT's.

Thank you

Minnesota Department of Transportation

Office of Sustainability and Public Health

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