



USING TRANSPORTATION RIGHTS-OF-WAY FOR ELECTRICAL TRANSMISSION

The **Center for Transportation Studies (CTS)**, the **Research & Innovation Office (RIO)**, and others at the University of Minnesota are engaged with a range of public and private partners around the critical issues of electrical power generation and transmission.

With energy demand growing due to the electrification of transportation and other sectors—as well as new demand from large data centers—the US faces a major challenge both in the production and distribution of electricity. There is growing national consensus that highway rights-of-way (ROW) present an ideal space for future transmission projects. This makes ROW among the most valuable and usable pieces of property owned by public agencies.

The Minnesota Department of Transportation (MnDOT) is a national leader in this space, actively working with peer states such as Wisconsin and national partners to explore the strategy. In April 2024, CTS and RIO jointly convened a workshop to understand the state of play in the innovative use of ROW and to explore ways to support needed research and work in the area. This convening brought together federal, state, and local agencies, utilities, academics, and national non-profit partners in energy and transportation.

In addition to this local workshop, CTS director Kyle Shelton also joined MnDOT peers at a national convening co-hosted by the American Association of State Highway and Transportation Officials (AASHTO) and the National Cooperative Highway Research Program Moonshot Energy Convening (NCHRP) in Washington D.C. in September 2024 to track similar work at a national scale (through NCHRP 20-24 (138) A). This work dovetails with recent changes to State of Minnesota law, which expanded use of highway rights of way for transmission. (Mn Statute 161.45)

This summary document primarily encapsulates elements from the April workshop, but draws information and insights from both events and previous publications.

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1 CTS / RIO APRIL WORKSHOP GOALS:

- Level-set for all involved around existing ROW and transmission work.
- Identify potential next steps for sharing lessons from Minnesota and Wisconsin with a wider audience both within and outside of the state.
- Identify potential avenues for UMN to support state-level and national work in generation, transmission, and use of ROW through research and convenings.

2 KEY QUESTIONS

- How to deal with the ways that the increasing electrification of the transportation system and other sectors is taxing our energy system as a whole?
- How are DOTs thinking about using their ROWs not just for electricity, but for the movement/application of other energy sources or uses?
- How to deploy and shape innovative strategies within utility accommodation policies for transmission in highway rights of way use at state and local level?
- How to support public utilities commissions and utilities themselves in embracing new approaches? And how to overcome key issues such as regulatory concerns, costs, coordination timelines, and long-term infrastructure planning powers?
- How to identify best sites for use of ROW for transmission or generation?



3 CTS / RIO APRIL WORKSHOP ATTENDEES:

More than 50 attendees included representatives from the following organizations:

- US Joint Office of Energy and Transportation
- White House Office of Science and Technology Policy
- AASHTO
- Minnesota Governor's Office
- Wisconsin and Minnesota Departments of Transportation
- Minnesota Department of Commerce
- Minnesota Public Utilities Commission
- Wisconsin Public Service Commission
- City of Saint Paul
- Hennepin County
- Otter Tail Power
- Great River Energy
- International Transmission Co.
- 3M
- The Ray
- ESRI
- Clean Grid Alliance
- Great Plains Institute
- Clean Energy Economy Minnesota
- NextGen Highways
- Fresh Energy

University of Minnesota representatives from the Minnesota Design Center, the Institute on the Environment, the Humphrey School of Public Affairs, the West Central Research and Outreach Center, UMN Extension, the Natural Resources Research Institute, and RIO.



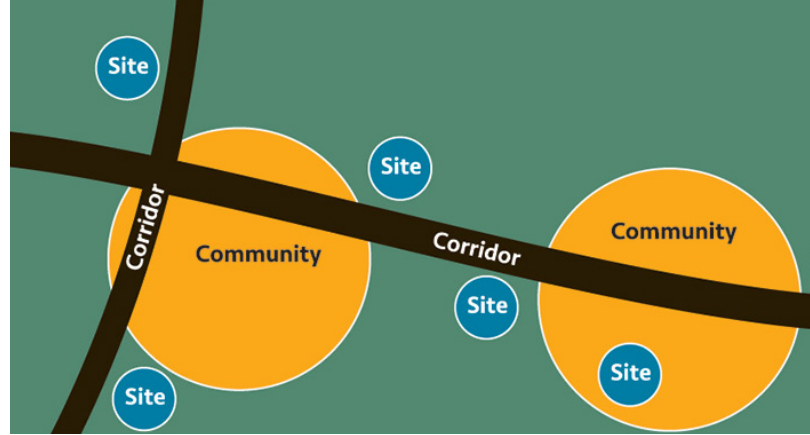
4 WORKSHOP PRESENTATIONS

A review of federal priorities and actions from the [White House Office for Science and Technology Policy](#) and the [Joint Office for Energy and Transportation](#).

Peer-sharing from the [Wisconsin and Minnesota Departments of Transportation](#) around their approaches to implementing ROW transmission in Wisconsin and exploring ways to enable their use in Minnesota.

Updates from both the [Minnesota Public Utilities Commission](#) and Wisconsin Public Services Commission about work done to date on ROW utilities location, lessons learned, and future potential opportunities and challenges.

Demonstration of existing tools for analyzing future ROW by workshop partners from [ESRI](#) and [The Ray](#). The representatives shared more about their work with ROW Solar and Transmission Suitability Mapping and ROW planning tools. These GIS and visualization communications tools can help bring more regulatory agencies, long range planning and public utilities to the table and build a wider range of non-traditional stakeholders. The tools help develop a common understanding of constraints and opportunities while expanding appreciation of different agencies' planning and coordination needs, unfamiliar infrastructure, and different interests.




5 KEY TAKEAWAYS

- A connection to existing state-level and federal plans (US DOT Decarbonization plan, Minnesota Climate Action Framework) is a critical step to enable the specific ROW discussion. Legislative action or regulatory action can help incentivize new approaches. State-level climate goals around lowered emissions can act as a critical lever as well, such as the Minnesota clean energy statute.
- There are a number of challenges in creating uniform guidance from FHWA down through states. A range of practices and regulatory systems will need to be updated and coordinated for a truly national level of practice.
- A key lesson from Wisconsin and Minnesota is that cooperation/action amongst several state-level departments is helpful in creating momentum and increasing coordination on PUC permits and downstream permitting of large energy projects in highway rights of way.
- Utilities and agencies each want certainty. There are ongoing challenges around the placement/relocation of utilities in the ROW, costs associated, liability and decision-making about future use of ROW. Legislative/regulatory changes can help mitigate these issues and set direction.
- Connecting large urban areas using transmission that goes through smaller communities should aim to empower and benefit these communities with facilities and investment that can leverage the new networks.
- While GIS tools such as from ESRI and The Ray exist and are in wide use, they continue to face data challenges around compiling and sharing needed localized information. As conditions on the ground change, updates will be necessary.
- Electricity generation and distribution on state-owned ROWs create opportunities for states to contribute to addressing their own demand, as well as creating avenues for potential revenues.





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6 NEXT STEPS

The following ideas and potential actions are all steps that could involve key roles for the University of Minnesota as a convener of shared discussions and/or contributor to research and outreach needs.

- Build on attendee consensus that additional discussion and shaping of a consistent approach is needed in Minnesota and beyond. Explore the suggestion of creating a state-level office, committee, or taskforce with a similar purview as the one held by the Joint Office for Energy and Transportation at the national level. This could include discussion of much more than ROW generation and transmission—such as various fuels and strategies for VMT and GHG reduction. This could be an important step in recognizing the interconnectedness of future infrastructure for transportation and energy.
- Expand peer exchange and learning amongst national, state, and local actors. It will be especially important to think about how to prepare professionals in one sector for detailed work with another (e.g. transportation professionals working for the first time in the energy space). Developing a shared language and understanding of different regulatory mechanisms will be foundational.
- Identify avenues for coordination among wider energy sector groups working in renewables, generation and distribution. Key to this is connecting with locally embedded actors supporting community-level learning and action.
- Continue monitoring the use of ROW for transmission. Plan additional convenings to troubleshoot or explore unforeseen issues.
- Help agencies, utilities, and communities understand what data they have or could collect, putting such data to work through information sharing and/or a data clearinghouse.
- Areas for additional research:
 - Guidance on issues such as scenic bylaws, undergrounding vs. aerial, and safety (analysis of transmission pole crash risk, employee safety), as they relate to the use of ROW.
 - Learning from parallel efforts such as broadband to apply lessons to transmission.
 - Exploration of uses/storage of ROW solar generation.
 - How to create and support systems for localized generation and distribution.
 - Track the costs incurred by added transmission borne by transportation agencies.
 - Impacts of transmission and generation efforts on other intelligent transportation systems and investments. What are the interactions between these systems? Quantification of the costs of grounding ITS equipment around transmission.
 - Addressing safety concerns raised by push toward electrification and transmission—especially around working in ROW and near power lines, EV batteries, and other electrical systems.
 - Tracking updates in legislative and regulatory action across the US.

