7. Emerging Trends

This chapter summarizes some emerging national and global transportation trends that should be considered in implementing this plan. Some ideas on how to apply the listed emerging trends locally in the Duluth-Superior area are also provided.

Duluth-Superior Long-Range Transportation Plan

Sustainable Choices 2050

Introduction

This chapter summarizes some emerging national and global trends that should be considered in implementing this plan and the projects listed in Table 4.4 and Chapter 6. Some ideas on how to apply the listed emerging trends locally in the Duluth-Superior Metropolitan Interstate Council (MIC) area are also provided. Application of these emerging trends can help support and carry out the long-range vision of this plan and implement the goals and objectives identified in Chapter 2.

Right-of-Way Reallocation / Right-Sizing

In metropolitan or urban areas with flat or declining traffic volumes, roads may be overbuilt in terms of traffic capacity. To optimize space allocated for roadways to serve all transportation needs, to help mitigate reckless driving, and to reduce induced demand, some communities may have an opportunity to reallocate right of way, or stated another way, right size existing infrastructure.

Reallocating right of way in practice can vary from implementing complete streets principles by reallocating travel lanes into shared-use paths, bus-only lanes, separated bike lanes, or some combination. Applying complete streets principles is also a way to improve multimodal integration. Complete streets not only enhance street design, but also have a positive impact on the community. Pedestrianization, or implementation of pedestrian-only zones promotes walkability, reduces pollution, and contributes to vibrant urban spaces.

While reallocation of right of way can provide opportunities for increased connectivity and multimodal access, it can also reduce the amount of infrastructure a community must maintain, helping to reduce overall maintenance costs. Reallocation of right-of-way could mean reducing the number of existing lanes and potentially selling excess right-of-way to adjacent property owners. As an example, State DOTs often sell excess right-of-way that was acquired as part of a larger project. Note that these projects do require a larger upfront investment to reconstruct the roadway in order to right size it.

Some communities are also considering rightsizing freeways within downtown areas to improve connectivity between neighborhoods. The City of Milwaukee is currently redesigning WIS 175, from a freeway into an arterial that better integrates

into the existing street grid. The City of Milwaukee is also considering design concepts involving removing a portion of the existing elevated I-794 freeway and replacing it with an at-grade arterial.

Applicability to the MIC Area

Stakeholder engagement identified a desire for safer multimodal connections in the Duluth area particularly, including north-south and east-west connections. Opportunities to reallocate right of way may exist along London Road, 6th Avenue East, Woodland Avenue, and Rice Lake Road. These routes could potentially be enhanced to serve as possible multimodal connections. Intersections such as Superior Street and Lake Street could potentially be redesigned to be more pedestrian and bike-friendly. Looking into the future, additional opportunities could include improvements along the I-35 corridor, allowing for enhanced east-west multimodal connectivity and enhanced accessibility for all users.

Future-Proofing the Transportation Network

To best meet future demand and to promote sustainability, regional planning partners should be looking for opportunities to future-proof transportation infrastructure, and ultimately the transportation network. This involves several elements including dynamic adaptation, smart growth infrastructure, embracing innovation, and planning for evolving norms, travel patterns, and technological advancements. Planning for future transportation in itself could be considered a sustainable activity as we consider adapting our roads for autonomous vehicles requiring narrower roads and reducing maintenance costs over time.

Technology is rapidly evolving and new opportunities are constantly arising that enhance travel safety and more efficiently accommodate the movement of people and goods. Through the year 2050, transportation has the potential to undergo a considerable revolution with continuously improving data and data management. It is essential to integrate digital transformation technologies into transportation operations, leveraging real-time traffic data, the Internet of Things (IoT), and machine learning. By doing so, a region can keep residents

Definitions

Dynamic Adaptation – the ability of a system to automatically or autonomously modify its behavior during execution.

Smart Growth Infrastructure – infrastructure that aligns with smart growth principles of resiliency including creating dense, walkable, bikeable communities with a variety of housing options.

Data Management – including, AI and data integration, and increased data availability.

Internet of Things (IoT) – interconnection via technology of computing devices in everyday objects, enabling them to send and receive data

informed, reduce incident response times, and direct services to areas with the greatest need.

Applicability to the MIC Area

Technology and Intelligent Transportation Systems (ITS) solutions should be utilized, as appropriate, in the upcoming replacement of the Blatnik Bridge. Given the extended closure of the bridge, it will be important to manage traffic safely and efficiently in the region. It will also be important for first responders to have reliable travel routes to complete their everyday duties, including emergency response. Technology can be used to communicate important travel information and ultimately help mitigate some of the negative impacts from the extended closure.

Snow removal poses a significant challenge in northern states, but through the adoption of technology, improved transparency and response times can occur. Crowd-sourced mapping of transportation barriers during snow events can be used to identify locations where attention is needed. By involving road users, authorities can pinpoint areas that require snow plowing for both roads and sidewalks. This ensures safe and efficient routes not only for motorized vehicles but also for pedestrians, cyclists, and transit users.

Telematic technology can also play a crucial role in snowplow operations gathering statistics about performance, miles travelled, and time spent in motion versus idling while IoT technology provides real-time data on conditions and productivity. This empowers residents to plan journeys more sustainably and improves travel efficiency. By prioritizing viable transportation systems, the region can reduce environmental impacts and offer sustainable choices. With these considerations in mind, the MIC's strategies can create resilient and efficient transportation systems that benefit all users.

Smart Roads

Smart roads are a component of the smart cities concept, which applies to advanced information technologies to facilitate the planning, construction, and management of infrastructure. Smart roads include the roads themselves as well as supporting components like streetlights and traffic signals. Smart roads require extensive sensor networks that collect data on traffic

Definitions

Improved Transparency – opportunities to update the public on progress of snow removal (when/where locations are cleared)

Telematic Technology – monitoring cars, trucks, equipment, and other assets using GPS technology and on-board diagnostics.

plows, public transit systems, and more. While smart roads are undergoing research, and pilot projects are still evolving, this is a future concept that could become more prevalent in future updates of the MTP. Converting roadways to smart roads is also consistent with other technology features, such as the availability of real-time traffic management, adaptive signaling, and vehicle-to-infrastructure communication to ensure safer and more reliable traffic operations.

Autonomous & Connected Vehicles

Autonomous vehicles (AVs) and connected vehicles (CVs) represent a paradigm shift in transportation. Autonomous vehicles are advancing steadily and are anticipated by 2030 to account for around 12% of new passenger cars with gradual integration as technology matures.[1] These vehicles combine sophisticated software and hardware, operating without human control and communicating via short-range radio signals to maintain real-time awareness of nearby vehicles, thereby preventing crashes, reducing congestion, and reducing the space needed for motor vehicles. AVs and CVs generally consume less energy, reduce human error, and contribute to improved safety.

AVs are being piloted across the nation as shuttles and taxis including in Minnesota where an automated shuttle bus pilot project was conducted in the greater Minneapolis/St Paul area. AV shuttles range in capacity from 4 to 16 passengers, have ramps for ADA accessibility, and are fully electric with ranges of up to 14 hours. A current similar project is the goMARTI project in Grand Rapids, MN, which just received additional funding to continue. https://www.gomarti.com/. Additionally, autonomous trucks are being piloted throughout the US as a means to improve freight movement and increase safety for the traveling public.

Applicability to the MIC Area

Duluth-Superior aims to proactively plan for smart growth, infrastructure, testing, and deploying AVs and CVs on public roads. In the short to mid-term, the primary focus for the region will likely involve addressing the policy and infrastructure requirements. Robust infrastructure, including smart roads, reliable communication networks, and charging stations, is essential for successful AV and CV adoption and will

Sources

1 = https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/autonomous-drivings-future-convenient-and-connected

take years to plan for. The replacement of the Blatnik bridge may present an opportunity to consider some new technology features to accommodate AVs and CVs.

Last Mile Deliveries

As e-commerce and online shopping continue to surge, our aging transportation infrastructure faces additional strain, especially in last-mile logistics. However, our region is at the forefront of innovation, leveraging technology and AI to transform last-mile delivery operations.[1] Our region's adoption of these technologies aims to enhance residents' experiences and foster business prosperity. With our community at the forefront of decision-making, we have the opportunity to prioritize last-mile logistics solutions that minimize adverse effects while ensuring convenience for all residents. These approaches can lead to improved delivery efficiency, reduced traffic impact, optimized logistics, and enhanced service reliability

Applicability to the MIC Area

1. **Encouraging Route Optimization:** Working closely with stakeholders and leveraging AI algorithms can enhance data analysis, taking into account traffic patterns, weather conditions, and delivery windows. Real-time adjustments based on changing conditions result in faster deliveries and increased resident satisfaction.
2. **Providing Real-time Data:** Access to real-time data empowers our decision-makers. It serves as an evidence base for robust planning, allowing us to fine-tune operations and enhance sustainability efforts. Businesses benefit from streamlined processes, while our community enjoys a more efficient and eco-friendly delivery system.
3. **Electrification of Delivery Fleet:** Electric vans and bikes can be used in the context of goods movement. E-Vans combine AI-driven navigation with electric propulsion reducing emissions and noise pollution while cargo bikes, with their eco-friendly design, allow for efficient deliveries in city centers.

Shared Mobility

Shared mobility encompasses transportation services shared among multiple users, including ridesharing, fixed route transit,

Sources

1 = While there may not be a direct reference for this comment, Minnesota's adoption of autonomous buses is a pretty good indicator (https://dot.state.mn.us/automated/bus/index.html)

demand response systems, microtransit, carpooling, bike-sharing, scooter-sharing, and more. The concept aims to provide convenient, efficient, and cost-effective transportation options by allowing multiple users to utilize the same vehicle or mode of transportation at different times or for various purposes.

Shared mobility services are often facilitated through mobile applications, which allow users to locate, reserve, and unlock vehicles or rides. These services promote sustainability by reducing the need for private vehicle ownership, minimizing traffic congestion, and lowering carbon emissions. Additionally, shared mobility can enhance access to transportation in areas with limited public transit options and provide flexible solutions for short-distance travel.

Applicability to the MIC Area

Regional and state plans in both Minnesota and Wisconsin include goals of reducing vehicle miles travelled. By supporting shared mobility options, like leaf, a local electric scooter and bicycle rental service, the MIC can help achieve those goals leading to lower emissions and improved air quality. However, it is worth acknowledging some of the challenges associated with Shared Mobility, especially winter weather conditions that can make this option less attractive and more difficult to use during certain months.

Mobility Hubs

Mobility hubs serve as central points where users can seamlessly access multiple transportation modes. This growing trend offers integrated facilities such as parking, transit connections (bus and/or passenger rail), bike-share stations, lockers, and shared micro-mobility options (e-bikes, scooters). Real-time transit information and comprehensive wayfinding systems can enhance the utility of mobility hubs. The ultimate goal is to facilitate smooth transitions between travel modes, promoting efficient and sustainable mobility. In a region with an aging population, facilitating mobility for modes other than private automobiles can extend independence for residents.

Mobility hubs are being implemented across the nation in large metro areas and smaller municipalities. One example is Gilbert, AZ where a small-scale mobility hub has been implemented in its downtown Heritage District. Salt Lake City, UT is also developing a mobility hub to serve the North Temple corridor.

Applicability to the MIC Area

Downtown Duluth is a prime opportunity to examine the potential for a future mobility hub. As the Northern Lights Express is extended to the MIC area, the existing transit center could potentially be enhanced to provide seamless connections between trains, bikes, micromobility modes, and buses. In addition, the transit center could potentially be expanded to include electric chargers making sustainable travel more accessible, enhancing connectivity, and exemplifying a commitment to a greener, more connected, and sustainable future.

Micromobility

Micromobility represents small shared mobility devices such as bicycles, tricycles, cargo bikes and trikes, scooters, mopeds, and others. Micromobility devices can be docked, with devices located and secured to a network of stations, or can be dockless, with devices available to pick up, use, and drop off within a defined service area. These devices can also be human-powered or electrically powered. There is also the potential to include adaptive bicycles or tricycles that would expand access to shared transportation services for people with special needs or disabilities.

Applicability to the MIC Area

A holistic and successful micromobility ecosystem can be achieved through continued collaboration with micromobility providers. The MIC and public sector entities could take the lead in providing strategic vision, policy frameworks, and infrastructure planning. Meanwhile, private providers contribute their expertise, resources, and operational agility. Together, these collaborative efforts could position the region to be successful with the widespread adoption of this sustainable travel option.

Microtransit

Microtransit is an alternative transportation service that offers flexible, on-demand service with dynamic and pooled routing. It can be used best in low-density areas that would not be adequately served by fixed route service. Microtransit is a ‘curb-to-curb’ service for short and local trips, typically with vans or shuttles. Microtransit also provides flexibility of service including stop types. In some uses, providers choose

to use curb-to-curb service similar to paratransit service and in other zones or services "virtual stops" can be implemented. This is when a nearby stop location is provided in the app to allow for more efficient routing. This model directs riders to walk a block or two for pickup to allow for more direct routing for the vehicle operator.

Microtransit allows for first/last mile connections to fixed routes, encouraging the use of an existing transit service. Microtransit is an efficient transportation alternative that can be scaled to the demand. This allows the city to adjust zones based on the market after a trial or set period of time. Microtransit offers an opportunity to fill the gaps that fixed routes cannot fully cover in a convenient and affordable way. It provides a needed alternative to allow vulnerable and underserved populations the chance to connect with the community, have access to employment or education opportunities, and have reliable transportation to appointments.

Demand Response Transit

Demand response transit (DRT) is any system of transporting individuals not on a fixed route. DRTs can be public entities and usually provide rides to users when they call in advance with a specific pick-up and drop-off point. It is different than microtransit in that it doesn't include pooled routing. DRT can adapt to the needs of users offering flexible, affordable, and reliable alternatives to car use reducing the negative environmental impacts posed on the transportation network while ensuring the optimum service utilization if used efficiently.

Applicability to the MIC Area

DRT could be an effective option for the region as it has the potential to enhance services to lower-density neighborhoods, indigenous communities, aging populations, and regions where transit is needed but where it is difficult to support fixed route service, such as Hermantown or Rice Lake. Douglas County's Senior Connections Initiative and Duluth's STRIDE have identified and are working to fix this gap. Arrowhead Transit is also an option in the MIC area, but a gap remains. People in some stakeholder consults supported this type of service.

Justice40 Initiative

The Federal government and state governments are focusing on issues of environmental justice in infrastructure planning. The Duluth-Superior region is fully committed to the Justice40 Initiative, which aims to ensure that 40% of the overall benefits from federal investments reach disadvantaged communities—those that are marginalized, underserved, and disproportionately affected by pollution. In alignment with the United States Department of Transportation (USDOT), the MIC will leverage this initiative to strengthen communities through equitable transportation investments. All transportation measures will need to be carefully planned to ensure that underserved groups receive the benefits of both new and existing federal investments.

To achieve this, the MIC and local jurisdictions could employ approaches such as the use of the Climate and Economic Justice Screening Tool to identify disadvantaged communities and engaging with the community and consulting stakeholders to determine program benefits and track data related to benefits directed specifically to these vulnerable communities.

The overarching goal is to reduce inequalities across transportation systems, ensuring that all communities benefit from safe, efficient, and sustainable movement of people and goods. The Justice40 initiative not only promotes environmental equity but also contributes to a higher quality of life and economic prosperity for everyone. We want to ensure that access to alternative transportation modes is given to all members of the community and focus on extending services to rural and indigenous communities. Douglas County has been advancing in this stream with a mission to provide cost-effective services, ensuring equal access for all citizens. Moreover, MnDOT's Advancing Transportation Equity Initiative incorporates equity in transportation decision-making and aims to improve access and opportunities for underserved communities and reduce transportation disparities.

Applicability to the MIC Area

The MIC and local jurisdictions should regularly monitor the Justice40 Initiative to determine how best to integrate these key themes into future planning efforts:

1. **Decrease transportation insecurity:** ensuring that people

can reliably carry out their daily journeys.

2. **Alleviate environmental burden**: We will tackle pollution, exposure to hazardous facilities, water pollution, and challenges posed by the built environment.
3. **Address social vulnerability**: Identifying high-risk populations based on social conditions.
4. **Mitigate health vulnerability**: Addressing prevalent health conditions such as asthma, cancer, high blood pressure, diabetes, and mental health issues.
5. **Manage climate and disaster risk burden**: Assessing current and future risks related to climate change and natural disasters, considering potential losses from existing hazard exposure and vulnerability.
6. **Redress the delay of benefits to marginalized communities**. Assessing historic patterns of disinvestment in minority and low-income communities and prioritizing transportation system investments that directly meet the needs of these communities.

Zero Emission Vehicles

The transportation industry is committed to transitioning toward cleaner transportation through the adoption of zero-emission vehicles (ZEVs). ZEVs reduce greenhouse gas emissions, improve air quality, reduce energy dependence, and promote renewable energy. Supporting the adoption of ZEVs is being done by adding capacity to the existing electric grid, creating supporting infrastructure such as charging stations, and replacing fleet maintenance and transit vehicles with zero-emission options when possible.

Transit agencies across the country and internationally are implementing strategies to reduce emissions from their fleets by integrating more low- and no-emissions technologies. Zero-emission bus (ZEB) adoption in the United States is anticipated to accelerate due to increased funding availability to support ZEB purchases and increased adoption of emissions-reducing policies by local governments and municipalities. As of September 2022, 5,480 ZEBs are on the road nationwide[1], awarded, or on order, which is a 66 percent growth rate since 2021.1 California and the West Coast, including Oregon and Washington, account for 41 percent of all ZEBs nationwide.

Sources

1 = **https://calstart.org/zeroing-in-on-zebs-2023/**

However, nearly every state (except West Virginia and the Dakotas) has at least one ZEB on the road or on order; including Wisconsin, which has 60.

In addition to planning for electrification by adding capacity and charging, as ZEVs and sales of electric vehicles (EVs) continue to progressively grow nationwide, safety and the well-being of residents and community prosperity remain top priorities. The region can build capacity for emergency responders to effectively handle incidents involving ZEVs. Addressing potential hazards such as battery fires requires comprehensive safety protocols. Taking a holistic approach to safety ensures that ZEVs positively contribute to the transportation system.

Applicability to the MIC Area

Both Minnesota and Wisconsin Departments of Transportation have electric vehicle infrastructure plans including key corridors where charging stations are needed including along I-35, I-535, US 2, and US 53 in the MIC. The MIC could help support these plans as well as the regional and MN/WI state climate change goals by leading by example and promoting the installation of EV charging stations along these key corridors. In fact, the NEVI program is currently working to install charging stations in the MIC area. Additionally, the MIC could support the adaptation of ZEB by developing a Zero Emission Transition Plan for the DTA. The plan could work to identify key transitions between existing buses and ZEBs including fleet maintenance, charging, and infrastructure.

Electric Vehicle Infrastructure Plans

Minnesota

Electric Vehicle Infrastructure Plan | Let's Talk Transportation - MnDOT (state.mn.us)

Wisconsin

Wisconsin Electric Vehicle Infrastructure Plan Update 2023 (wisconsindot.gov)