

# Qualitative and Quantitative Analysis to Advance Transportation

**Zachary Elgart, Principal Investigator**  
Transit Mobility Program  
Texas A&M Transportation Institute

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Research Report  
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# Qualitative and Quantitative Analysis to Advance Transportation

## FINAL REPORT

*Prepared by:*

Zachary Elgart with support from Todd Hansen, Ipek Sener, James Cardenas, Ben Ettelman, and Ahmadreza Mahmoudzadeh  
Transit Mobility Program  
Texas A&M Transportation Institute

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The research team recognizes that the work of our organization and research institution, the Texas A&M Transportation Institute, may have negatively affected marginalized communities in the past.

Recognizing disproportionate impacts on marginalized communities is the first step in transportation equity and social justice considerations, and we are committed to leveraging the power and resources that come with our roles in the industry to repair past wrongs, avoid future injustice, and give voice to the needs of people not always included in transportation research and planning.

The Texas A&M Transportation Institute's main offices are in unceded Tonkawa and Sana territories, and the agency benefits from the forced relocation of Indigenous peoples. The project's principal investigator lives and works in unceded Ankokisa, Karankawa, Coahuitecan, Atakapa-Ishak, and Esto'k Gna territories.

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## EXECUTIVE SUMMARY

On July 1, 2020, the Texas A&M Transportation Institute (TTI) initiated a research project, on behalf of the Minnesota Department of Transportation (MnDOT), titled *Qualitative and Quantitative Analysis to Advance Transportation Equity*. The project objectives were:

- Establish a detailed understanding of equity-related challenges and needs related to transportation performance measures throughout Minnesota.
- Identify or develop performance measures and equity-focused strategic actions<sup>1</sup> that could improve the ability for transportation equity in Minnesota to be assessed at the state level in a manner that achieves context-sensitive outcomes representative of the communities served.
- Facilitate the adoption of identified or developed equity performance measures and complementary strategic actions through a training program designed specifically for MnDOT that includes information detailing the appropriate use cases, data requirements, and other relevant considerations.

This research project synthesized previous research investigating equity assessments and equity-focused guidance or regulations, assessed MnDOT's current performance measures from an equity-first perspective, and leveraged directly collected community and staff expertise to achieve three outcomes: 1) new or updated performance measures; 2) creation of strategic actions designed to help MnDOT address issues of inequity discovered via the new or updated measure; and 3) a training program to assist with implementation of research findings.

## LITERATURE REVIEW

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The research team conducted a review of existing literature and relevant guidance or requirements for equity measurement and/or analyses to develop a comprehensive understanding of the current state of practice. This included identifying transportation equity definitions and highlighting opportunities to improve on current practice or transition concepts from fields adjacent to the transportation field (e.g., housing). The goal of this review was to produce an internal reference document to be used in future tasks as a compendium of ideas (e.g., to inspire and/or inform the development of equity-first performance measures).

The resource reviews were organized in three sections: 1) Definitions of equity; 2) Methods for assessing equity; and 3) Opportunities for improvement.

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<sup>1</sup> To facilitate direct intervention upon the discovery of a disparity, the research team will develop complementary strategic actions, associated with each performance measure concept, for improving equity if a disparity is discovered (some examples include: participatory budgeting; equity advisory groups; dynamic web-enabled community engagement; funding for grassroots initiatives to enhance equity; facilitation of transportation services with co-operative business models; or transfer of ownership and/or land rights to facilitate self-determination).

## EQUITY-FOCUSED REVIEW OF PERFORMANCE MEASURES

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Leveraging the perspective gained during the literature review, the research team conducted an equity-focused review of current MnDOT performance measures. The purpose of the review was to assess how each measure considered equity; identify inherent biases or limitations that might limit equity; and propose opportunities to improve, augment, or replace each measure to better incorporate equity in the performance measurement process. The equity-focused review of MnDOT performance measures resulted in three main findings:

1. Many of the performance measures that are currently reported at the state level could be reported at more locally focused scales (e.g., district, county, municipality, zip code).
2. Performance measure targets are not available for all performance measures and some that are available lack specificity, which limits effectiveness.
3. There is opportunity to more fully align the performance measures with MnDOT's five main objectives (Open Decision Making; Transportation Safety; Critical Connections; System Stewardship; and Healthy Communities)

Complementing the findings above, the research team developed high-level ideas to modify, complement, or improve the performance measures.

## FOCUS GROUPS AND A WORKSHOP

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Using the opportunities and performance measure concepts developed after the equity-focused review of MnDOT's performance measures, the research team conducted a series of focus groups and a workshop with the project's Technical Advisory Panel (TAP) to identify opportunities to improve these concepts or identify oversights. This process resulted in detailed feedback about current and potential performance measures.

## DEVELOP COMPLETE PERFORMANCE MEASURE CONCEPTS

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The research team's list of performance measures (including changes to existing measures and wholly new measures) was too long to allow the team to develop each as a complete measure MnDOT could implement. Therefore, a multi-phase prioritization process in which the project's TAP provided critical feedback was developed that identified five aspects of transportation equity (multimodal access and effectiveness, physical accessibility, infrastructure safety, affordability, and representation) as the highest priority. With the help of the focus group and workshop feedback, the research team proceeded to develop complete performance measure concepts (one for each priority aspect) in two categories—Traditional and Innovative. Traditional measures were developed as enhancements to existing performance measures while Innovative performance measures were entirely new ideas. Two macro-level performance measure improvements were also developed to improve the Performance Dashboard as a whole.

## TRAININGS

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To help MnDOT institutionalize the equity-first principles encompassed by the performance measures developed during this project, the research teams developed two training documents: a self-study guide and a PowerPoint presentation to be used in a small group setting. The training content was designed for use when training new staff or to refresh knowledge.

## IMPLEMENTATION

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The purpose of this project was twofold: to either amend existing performance measures or generate new measures that approach the task of performance measurement from an equity-first perspective; and to help MnDOT achieve context-sensitive outcomes supported by a training program to assist with adoption of the project outcomes. Therefore, the research team anticipated the following actions to implement this project's outcomes:

- 1) Update MnDOT's current performance measures, policies, and practices to reflect research findings.
- 2) Introduce new equity-first performance measures, policies, or practices as developed by this research project.
- 3) Integrate equity-first principles and performance measures into MnDOT's training programs and planning practices.
- 4) Development of training opportunities to ensure long-term success of the equity-first performance measures and related concepts/methods while empowering staff. This could include a regularly scheduled staff training program, mentorship, or peer review.

## FUTURE RESEARCH

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Equity is an ever-evolving condition. There are numerous research opportunities to expand on the foundations set by this project and further improve transportation equity in Minnesota. Some of these opportunities include:

- Equity-focused assessment of current funding allocation formulas and discretionary spending to determine opportunities to distribute transportation funding in an equity-first manner.
- Exploration of the legislation and policies required to implement a land-back program wherein MnDOT would transfer ownership of indigenous lands back to indigenous stewards for long-term management and self-determination.
- Calculation and documentation of the multi-generational wealth-deficits inflicted on marginalized communities in Minnesota by the transportation network and estimation of appropriate financial reparations.

# CHAPTER 1: INTRODUCTION

## 1.1 BACKGROUND AND PURPOSE

On July 1, 2020, the Texas A&M Transportation Institute (TTI) initiated a research project, on behalf of the Minnesota Department of Transportation (MnDOT), titled *Qualitative and Quantitative Analysis to Advance Transportation Equity*. The project objectives were:

- Establish a detailed understanding of equity-related challenges and needs related to transportation performance measures throughout Minnesota.
- Identify or develop performance measures and equity-focused strategic actions<sup>2</sup> that could improve the ability for transportation equity in Minnesota to be assessed at the state level in a manner that achieves context-sensitive outcomes representative of the communities served.
- Facilitate the adoption of identified or developed equity performance measures and complementary strategic actions through a training program designed specifically for MnDOT that includes information detailing the appropriate use cases, data requirements, and other relevant considerations.

The remainder of this chapter outlines the research methodology originally proposed by the research team as well as the modifications that occurred over the course of the project.

### 1.1.1 Research Methodology

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This research project synthesized previous research investigating equity assessments and equity-focused guidance or regulations, assessed MnDOT's current performance measures from an equity-first perspective, and leveraged directly collected community and staff expertise to achieve three outcomes: 1) new or updated performance measures; 2) creation of strategic actions designed to help MnDOT address issues of inequity discovered via the new or updated measures; and 3) a training program to assist with implementation of research outcomes. The originally proposed research methodology is outlined below, including which aspects of the methodology were executed during which project tasks. A summary of the modifications to the methodology is available in the next section.

- Synthesis of previous research and existing guidance/requirements (Task 2)
  - Establish a baseline understanding of current conditions and knowledge.
  - Outline the degree of freedom granted MnDOT for developing performance measures and strategic actions.
  - Identify potential or recommended goals and objectives for future equity performance measures.

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<sup>2</sup> To facilitate direct intervention upon the discovery of a disparity, the research team developed complementary strategic actions, associated with each performance measure concept, for improving equity if a disparity is discovered (some examples include participatory budgeting; equity advisory groups; dynamic web-enabled community engagement; funding for grass-roots initiatives to enhance equity; or, facilitation of transportation services with co-operative business models).

- Equity-focused review of MnDOT performance measures (Task 3)
  - Analyze each measure for consideration of equity and ability and/or likelihood to make equity considerations or inherent biases difficult to identify or address.
  - Document opportunities to improve, augment, or replace the measures to better incorporate equity.
- Identify and/or develop performance measures and strategic actions (Task 4)
  - Use two categories of performance measures:
    - 1) Processes and guidance for collecting qualitative data and implementing findings.
    - 2) New or modified quantitative processes that address limitations of current practice.
  - Develop complementary strategic actions for improving equity.
- Focus group reviews of performance measures and actions (Task 5)
  - Leverage local knowledge and lived experience through the facilitation of a focus group for general public participants.
  - Invite transportation insiders (MnDOT staff, project TAP members, and other industry professionals) to separate focus groups.
  - Process:
    - Present the performance measures and strategic actions developed under the previous task.
    - Collect feedback about the potential effectiveness and associated challenges and/or limitations of the proposed performance measures and strategic actions.
    - Request input on additional performance measures and strategic actions for consideration.
    - Produce refined performance measures and strategic actions.
- Trainings on performance measures and actions (Task 6)
  - Design trainings to facilitate adoption of performance measures and strategic actions.
  - Assemble the following training content:
    - A discussion of the most appropriate use-cases
    - A review of the required data sets
    - An example assessment (using actual MnDOT examples if possible)
- Document research benefits and implementation steps (Tasks 7 and 8)
  - Produce a final report that documents:
    - Research activities
    - Research findings
    - Recommended actions
    - Implementation opportunities

#### 1.1.1.1 Methodology Modifications

During the research project, the research team identified opportunities to improve project outcomes by altering the proposed methodology. Each change was approved by the MnDOT project management team before implementation. Table 1 describes each modification to the original methodology and the research team's rationale for the change.

**Table 1. Methodology Modifications and Rationale**

<b>Modification</b>	<b>Rationale</b>
<p><b>Identify and/or develop performance measures and strategic actions</b> – Revise the process for identifying or developing performance measures and strategic actions to incorporate more granularity in the outcomes (e.g., macro, traditional, and innovative measures) and an improved process (incorporating feedback from MnDOT project management staff and the project TAP) for prioritizing which opportunities would be more fully developed.</p>	<p>In previous tasks, the research team identified numerous opportunities to either enhance existing performance measures or develop new measures. However, the planned method for managing the work to either enhance or develop such measures in Task 4 (Identify or Develop Assessment Methods and Strategic Actions to Enhance Equity) was determined to be insufficient for the number of opportunities. Therefore, the research team developed a method that allowed for more nuance and incorporated a better process to obtain feedback on the results of prioritization.</p>
<p><b>Focus group reviews of methods and actions</b> – Instead of hosting focus groups with transportation professionals (MnDOT staff and other individuals in similar positions of influence, such as members of the project TAP), the research team developed and hosted a workshop.</p>	<p>Instead of hosting a focus group with small subset of transportation professionals, a workshop format allowed the research team to include more participants and spend more time on the topic. Additionally, the time savings derived from combining multiple focus groups into a single workshop allowed the research team to host additional general public focus groups.</p>

## 1.2 REPORT ORGANIZATION

This remainder of this report is organized in six chapters that outline the research processes and outcomes of the complete project. Content is presented in the following chapters:

- Review of Literature, Guidance, and Requirements
- Equity-Focused Review of MnDOT Performance Measures
- Performance Measure Focus Groups
- Complete Performance Measure Concepts
- Equity First Performance Measure Measurement Trainings
- Conclusion, Potential Implementations, and Future Research

## CHAPTER 2: REVIEW OF LITERATURE, GUIDANCE, AND REQUIREMENTS

The research team conducted a review of existing literature and relevant guidance or requirements for equity measurement/analyses to develop a comprehensive understanding of the current state of practice. This included identifying transportation equity definitions and highlighting opportunities to improve on current practice or transition concepts from fields adjacent to the transportation field (e.g., housing). The goal of this review was to produce an internal reference document to be used in future tasks as a compendium of ideas (e.g., to inspire/inform the development of equity-first performance measures).

The resource reviews were organized in three sections: 1) Definition of equity; 2) Methods for assessing equity; and 3) Opportunities for improvement. The research team employed the following five step search strategy to collect resources that included or could inform equity-first performance measures.

1. Brainstorm search terms and execute desktop search for relevant resources using the Transportation Research Board TRID database and Google
2. Request recommended resources from the project Technical Advisory Panel
3. Assign resources to each research team member
4. Research team conducts initial review of assigned resources to categorize content as "for deep review" or "for use as reference in future tasks"
5. Compile resource syntheses for each resource identified as "for deep review" using a template to streamline process and style

Using the process outlined above, the research team collected 208 resources representing seven categories (see Table 2). The deep review process included 108 resources. The remaining 100 resources were retained for potential use in future project tasks.

**Table 2. Resource Counts by Resource Type**

<b>Resource Type</b>	<b>Count</b>
Research	49
Guidance	22
Equity Assessments	20
Advocacy-oriented	10
Training	3
Internal processes or policies	3
Other (case law analysis)	1
<i>Total Reviewed</i>	<i>108</i>
<i>Total Retained for Future Tasks</i>	<i>100</i>
<b>Total Resources</b>	<b>208</b>

In addition to the resources in Table 2, the research team collected 24 regulatory related guidance/requirement documents. These documents are produced by various federal agencies (e.g.,



Federal Transit Administration or U.S. Department of Transportation) and outlined the basic requirements for equity analyses and strategies, as set forth by legislation or executive order, to ensure a federally funded transportation entity adheres to these requirements. These documents were not processed in the same manner as the rest of the literature because they are intended to help agencies, such as MnDOT, ensure their assessment methodologies meet minimum federal requirements, not to investigate/improve upon the concept of equity assessment. Instead, the research team reviewed, annotated, and retained these as a reference for future tasks.

The research team compiled the findings from the review of resources in a 164-page report, submitted to MnDOT during the project's Task 2 performance period. However, as the intent of this documentation was to supplement the research team's expertise and inform future tasks, the information is not relevant to this final report. The Task 2 report is available from MnDOT upon request.

## CHAPTER 3: EQUITY-FOCUSED REVIEW OF MNDOT PERFORMANCE MEASURES

Leveraging the perspective gained during the review of literature and guidance/requirements, the research team conducted an equity-focused review of current MnDOT performance measures. The purpose of the review was to assess how each measure considers equity; identify inherent biases or limitations that might limit equity; and propose opportunities to improve, augment, or replace each measure to better incorporate equity in the performance measurement process. The following sections describe the context for the review, the review methodology, and a summary of the review findings.

### 3.1 CONTEXT SETTING

Traditional transportation performance measures focus on how the system is operating to inform investment decisions. However, these types of performance measures are not designed to improve or elevate equity and cannot function as a part of a comprehensive equity framework. Equity-first performance measures are designed to augment traditional measures in order to highlight opportunities to improve conditions or access for marginalized and vulnerable groups and identify areas of oversight.

The review of MnDOT's performance measures highlighted opportunities to improve performance measures in a manner that advances transportation equity, centers people in decision making, and facilitates equitable outcomes. The research team referred to the definitions presented in Table 1 when executing the research methodology. Note that MnDOT proposed a transportation equity definition as part of the 2022 Statewide Performance Dashboard Transportation Plan. This information was not developed at the time this research project was completing the equity-focused review. The project team deferred to content in the 2017 SMTP.

**Table 3. Equity-Focused Review of Performance Measures – Definitions**

Term	Definition
<b>Equity</b>	<p>According to the 2017 update of the 2017 Statewide Performance Dashboard Transportation Plan (MnDOT 2017 SMTP):</p> <p>“Equity is fairness. It applies to people of all races, ethnicities, incomes, and abilities. It is not the same as equality, which means equal.”</p> <p>For the purposes of this research project, the research team established the following understanding of this definition:</p> <p>“For an outcome to be defined as equitable it must address the needs of the people it serves in a manner that considers and supports their unique circumstances, expectations, and abilities without introducing or reinforcing conditions that discriminate or bar people from experiencing its benefits.”</p>
<b>Objective</b>	<p>“A few key phrases that describe the goal that MnDOT and transportation partners are working toward.” (MnDOT 2017 SMTP)</p>
<b>Performance Measure</b>	<p>“A metric that measures progress toward a goal, outcome or objective. This definition covers metrics used to make decisions or evaluate the effectiveness or adequacy of a policy, strategy, or investment. A metric may be termed a performance measure without a target if MnDOT would evaluate and potentially change a course of action based on the metric’s trend or direction.” (MnDOT Performance Measures and Target Adoption Policy)</p>
<b>Target</b>	<p>“A desired outcome (what [MnDOT wants] to happen) ...It is a goal we continuously work to achieve.” (MnDOT Understanding Performance Measures document)</p>
<b>Success</b>	<p>Achieving high-performance compared to prior years and the measure’s target. (definition developed by TTI as part of the equity-focused review of performance measures)</p>

### 3.2 METHODOLOGY

This effort to review MnDOT’s performance measures was built on a series of questions (presented in Table 4) designed to interrogate each measure in a manner that achieves three outcomes:

1. Descriptions of the people that will experience benefits from success
2. Descriptions of the people that may experience unintended negative or neutral outcomes associated with success
3. Identification of opportunities to modify, complement, enhance, or suggest a new measure that could enhance equity

To ensure objectivity when developing responses to these questions the research team interpreted each performance measure and its associated objective as written, without referencing the supporting

documentation or supplemental discussion presented on the dashboard and in the 2017 SMTP. This interpretation may reflect the way in which community members could view performance measures. For performance indicators that have no defined targets, the research team responded to questions according to the measure’s implication—for example, “this measure implies that success is equivalent to 100 percent sidewalk accessibility.”

**Table 4. Equity-Focused Review of Performance Measures – Research Questions**

Question	Question Purpose
<b>How is success defined?</b>	This question sets the foundation for the subsequent questions. Performance measurement is intended to gauge progress towards achieving a specific goal or outcome (success). The response to this question outlines how the performance measure defines success.
<b>Who benefits from achieving success?</b>	Identifying the beneficiaries of a performance measure helps understand the purpose of the measure and its level of inclusivity/universality. Understanding who benefits makes performance measures less abstract.  The research team assumed that all measures capable of reducing expenditures benefit all taxpayers, therefore responses to this question do not include taxpayers as beneficiaries.
<b>If success is achieved, who is left out from the benefits?</b>	As with the above question, understanding who does not receive benefits takes performance measures from abstract concepts to factors capable of impacting people. Understanding how measures leave some people out helps develop measures that ensure the benefits of the transportation system serve everyone in ways that meet diverse needs.
<b>What are some opportunities to modify, complement, or otherwise enhance the measure to improve equity?</b>	This question is intended to generate examples of how the current performance measure could be improved or replaced.
<b>Could a locally-focused understanding of results for the performance measure, as written, contribute to equity improvements?</b>	Many aspects of transportation performance measurement can be better understood by displaying the data spatially. This method allows quick and simple comparison between multiple sets of information (for example, intersections or corridors with high crash rates compared to recent investments in safety oriented engineering in those locations).  This question complements the previous and is a binary yes/no question.

### 3.3 FINDINGS

The research team reviewed each MnDOT performance measure in the Performance Dashboard, as of February 2021, as well as any measure included in the 2017 SMTP but not presented in the dashboard (54 total measures) to answer the questions outlined in the methodology section above and tracked all findings in a spreadsheet that was used in later tasks.

In the following sub-sections, the research team presents general observations related to MnDOT performance measures and some high-level concepts for new performance measures.

#### 3.3.1 Locally Focused Visualizations

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Decisions made using only statewide information do not effectively consider local contexts and have the potential to result in outcomes that are not equitable and may introduce harm in some communities. The research team reviewed the MnDOT Performance Dashboard—a tool that was developed to inform MnDOT decision making and enhance the agency’s transparency by updating the public<sup>3</sup>—and identified opportunities to enhance understanding of local conditions. For example, it may be possible to reduce the number of fatalities statewide despite increased fatalities at specific intersections or along certain corridors. Without locally focused analysis of trends, these hot spots could go unnoticed.

Many of the performance measures that are currently reported at the state level could be reported at more locally focused scales (e.g., district, county, municipality, zip code, or transit agency). Changing the way data is visualized could allow more transparency and help pinpoint equity issues without any additional data collection. Furthermore, additional nuance within data visualizations (e.g., the location of possible sidewalk barriers such as signal boxes) complemented by access to the data that supports these visualizations (e.g., a data portal that allows public access to data) would contribute to equity by helping people understand conditions, track actions, and inform decision making<sup>4</sup>.

Of the 54 performance measures included in this review, the research team determined that—considering the benefits of open data and the equity-first perspective—46 could be improved with locally focused visualization of performance data.

#### 3.3.2 Performance Measure Targets

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Of the 54 performance measures included in this review, 22 did not have associated performance targets<sup>5</sup>. MnDOT’s Performance Measures and Target Adoption Policy notes that performance measures

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<sup>3</sup> Source:

[https://performance.minnesotago.org/application/files/7615/7479/4498/Performance\\_Graphic\\_withborder\\_002.pdf](https://performance.minnesotago.org/application/files/7615/7479/4498/Performance_Graphic_withborder_002.pdf)

<sup>4</sup> Source: <https://datasmart.ash.harvard.edu/news/article/equal-access-open-data-and-equity>

<sup>5</sup> A target is a specific performance level representing the achievement of a goal, outcome or objective. Source:

without targets are considered performance indicators<sup>6</sup>. However, this may not be clear or easily understood by many people looking at the Performance Dashboard. Lack of targets and limited clarity around terminology and tracking affect advancing equity through performance measurement. MnDOT may be able to improve equity if the following limitations are addressed:

1. Without a target, MnDOT's definition of success or progress remains nebulous.
2. Lack of definitions could result in flexibility and concession to political will or other external/special interest factors.
3. Setting targets obligates MnDOT (in consultation with the people that are directly affected) to decide who will benefit and how those benefits will be delivered.
4. Low performance for a target has the potential to catalyze action. The absence of a target negates this opportunity.
5. Describing the difference between measures and indicators and including information about how they are used in the MnDOT decision-making process could improve understanding of the process and help people track the agency's priorities and values.

### 3.3.3 Alignment with MnDOT Objectives

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MnDOT's performance measures are designed to track the agency's progress on five objectives:

1. Open Decision Making
2. Transportation Safety
3. Critical Connections
4. System Stewardship
5. Healthy Communities

According to the research team's observations, each objective includes performance measures that, in some fashion, address, reflect, or gauge the intent of the objectives, however none of them include performance measures that directly relate to all aspects of the objectives as written. For example, the Critical Connections objective is described as, "Maintain and improve multimodal transportation connections essential for Minnesotans' prosperity and quality of life. Strategically consider new connections that help meet performance targets and maximize social, economic and environmental benefits." However, none of the measures look at factors that might be defined as a new connection.

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<sup>6</sup> **Performance Measure:** A performance measure is a metric that measures progress toward a goal, outcome or objective. This definition covers metrics used to make decisions or evaluate the effectiveness or adequacy of a policy, strategy or investment. A metric may be termed a performance measure without a target if MnDOT would evaluate and potentially change a course of action based on the metric's trend or direction. **Indicator:** An indicator is a metric that provides meaningful information about the condition or performance of the transportation system but is neither managed to nor used to evaluate the effectiveness of policies, strategies or investments. *Source:* <https://www.dot.state.mn.us/policy/admin/ad006.html>

The research team considered the need to address all aspects of the objectives in later tasks when identifying and developing performance measures and strategic actions.

### 3.3.4 Proposed New Performance Measures

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The research team identified some preliminary concepts in the following list for new equity-first performance measures to address opportunities to modify, complement, or improve the performance measures. These concepts were later leveraged later tasks (described in Chapter 4).

Note: The research team drafted the proposed performance measures presented below using existing MnDOT terminology (e.g., “minorities”) to facilitate ease of comparison with current performance measures, where appropriate, despite TAP feedback that this language should be more inclusive. A transition to inclusive language (i.e., Black, Indigenous, and People of Color (BIPOC)) improves equity and the research team used such language in all future tasks.

- Compare the number of job applicants that self-identify as women and/or as a member of a minority community with rate of women and minorities in the workforce to gauge these groups’ rate of admission to the workforce.
- Compare the demographics of current trainees with the demographics of the applicant pool to understand whether the trainees represent the community or are enriched with members of certain groups.
- Track success rate of targeted businesses compared to the number of times they have proposed and the number of traditional proposals they competed against.
- Compare MnDOT efforts to improve access to contract opportunities with rate of success among targeted businesses.
- Track the number of projects let in areas identified as equity priorities to compare the number of projects that target community-priorities (such as improved access/safety or reduced emissions) with the number of projects that induce negative outcomes for those in specific proximity.
- Track the rate/type of safety-focused traffic enforcement by location.
- Track the number of infrastructure improvements made in areas of high safety need.
- Track the rate of adoption of the technology required to access the Allied Radio Matrix.
- Track congestion rates beyond the Twin Cities.
- Compare incident clearance times with demographic, location, and enforcement information to understand whether demographics (race/ethnicity, income, gender, age, and other factors) influence response times, whether certain segments of the transportation network received lower levels of clearance service, and if incident response escalates to enforcement actions (track demographics and location information).
- Track access to intercity bus or rail service and other options that are more affordable than air travel and do not require the same type of exposure to law enforcement.
- Track the number of curb cuts, accessible bus stops, and other accessibility features.
- Track rates of ADA compliance at the district, county, zip code, or other localized levels.

- Track transit rider satisfaction levels, access to destinations, total trip time, total trip cost, option availability, availability of service for vulnerable and marginalized communities, low-income fare existence and use rate, or presence of late-shift options.
- Track commuting options including walking, rolling, bicycling, and access to necessary internet and technology to support telework.
- Track bicycle and pedestrian crash/fatality rates, satisfaction levels with specifics (e.g., infrastructure such as a local bicycle path, policies, enforcement), access to destinations, total trip time, and accessibility.



## CHAPTER 4: PERFORMANCE MEASURE FOCUS GROUPS

Input from people using the Minnesota transportation network and Minnesota transportation insiders (industry experts and MnDOT staff from a variety of departments) is necessary to ensure the outcomes of this research project reflect the needs of the people of Minnesota. Therefore, the research team conducted a series of focus groups to share draft performance measures developed during earlier phases of the project to collect feedback on opportunities to improve these concepts. This section describes the participant recruitment strategy, the discussion guides, and a summary of findings.

### 4.1.1 Recruitment Strategy

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The research team worked with MnDOT staff to identify potential focus group participants, using the participant categories included in the initial project proposal (Grassroots/Community, MnDOT, and Other Entities) as a guide and referring to Community Conversations, project TAP, and MnDOT’s other outreach participant lists. After identifying potential participants, MnDOT staff distributed an email in November 2021 alerting recipients that focus groups were planned for the first quarter of 2022 and to expect more information. The research team drafted a recruitment email script that was used by MnDOT staff to initiate outreach with all potential participants in January 2021. This initial contact provided a brief description of the focus groups, shared an informed consent document, and requested a response to a scheduling poll from interest parties. The research team managed responses to questions from participants and all coordination. Recruitment materials are presented in Appendix A.

Recruitment efforts generated interest from 10 members of the public representing areas throughout Minnesota. Additionally, members of the project TAP and other transportation insiders (MnDOT staff and professionals in and around the transportation industry not already part of the TAP) expressed interest in contributing via a focus group setting. Focus groups with the public were held on February 22 and March 29, 2022, with five participants in each group. A focus group with the TAP and transportation insiders (referred to, henceforth, as “the workshop” to differentiate from public focus groups) was held on March 31, 2022—this group included MnDOT staff and representatives from the Other Entities category. All focus groups and the workshop were held virtually due to COVID-19 restrictions.

### 4.1.2 Discussion Guide

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The research team developed a discussion guide for the focus groups and a PowerPoint presentation for the workshop, as described in the following sections.

#### 4.1.2.1 Focus Groups

For each focus group, the group facilitator welcomed participants, reviewed the protocol for the focus group, described the project’s objective, and facilitated brief participant introductions. Following this procedure, the facilitator described a specific performance measure (e.g., “currently MnDOT tracks traffic fatalities and serious injuries however, based on their equity observations, the research team has proposed the following improvements”) and then asked the participants a series of questions:

1. Based on how I described that measure, do you think the measure represents you and your needs? Do you see yourself in it or benefitting from it?
2. What is missing from the performance measure?
3. What would you prefer to see in this measure, or instead of this measure?

At the end of each focus group, the facilitator asked a final question: “Do you have any other suggestions to MnDOT about how to improve transportation equity?” Appendix B presents the complete focus group discussion guide.

#### 4.1.2.2 Workshop

Workshop recruitment efforts showed that there could be as many as 20 participants, therefore, a traditional focus group dynamic would not be feasible. Instead, the research team developed a PowerPoint presentation intended to efficiently share observations about existing performance measures and complementary suggestions to make improvements to address these observations. Each of these information slides (see example in Figure 1) was followed by two interactive polls, using PollEverywhere software, that were designed to allow all attendees to submit a simple response without needing to devote time for everyone to respond verbally. The first poll asked respondents to select a visual representation of their sentiments after hearing about the measure in question (choosing from 5 different emoticons depicting happy, neutral, distressed, confused, or disappointed). The second poll asked participants to describe, “in a couple words”, what the measure might be missing and presented the responses in a word cloud where the size of the words showed how frequently that response was shared. When poll responses indicated improvement the research team asked participants to elaborate.

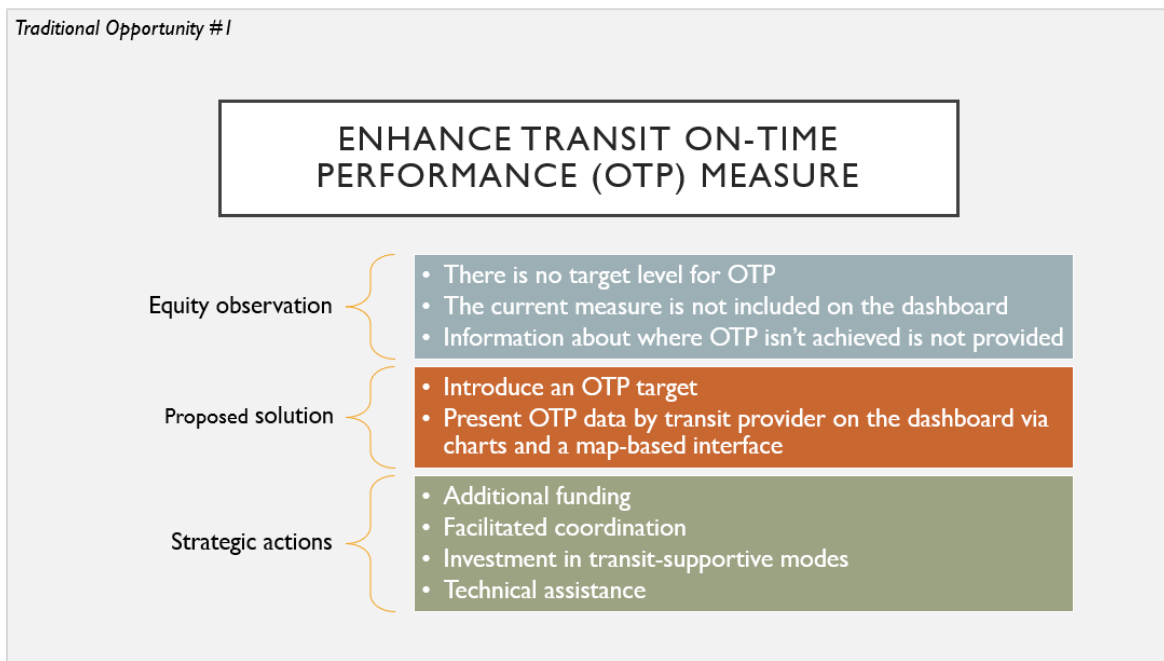


Figure 1. Example Performance Measure Summary

### 4.1.3 Findings

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Relevant findings are presented in two sections below to separate information collected from focus groups with the general public and the workshop conducted with staff and transportation insiders.

#### 4.1.3.1 Focus Groups

The research team consolidated and synthesized findings from both of the focus groups into the following list of paraphrased observations. To highlight opportunities for improvement this section only includes information identified as constructive criticism. Aspects of performance measures not specifically identified in this section were either not discussed by participants or met their expectations. Findings are presented without any implication of rank.

- Performance measures should help understand whether a roadway is adequate and safe for all modes of travel.
- Transit performance measures should include tracking populations who do not have transit access and measuring trip travel times. In rural areas, for demand-response type services, wait times should be more closely monitored as part of on-time performance.
- Health-related impacts, such as pollution along heavily traveled corridors and tracking the populations affected along freeways, should be represented in performance measures.
- MnDOT needs to be more transparent with sharing data to the general public in ways people can easily understand and embrace more community voices and focus on additional outreach methods.
- There is a need for more community specific input and feedback three critical aspects of safety and accessibility: safe, accessible environments for pedestrians; implementation of traffic calming; and, safe travel for different people with disabilities.
- The omnibus survey should track how communication on projects is delivered by MnDOT and how/by whom input is provided by for such projects.
- Emissions impacts to different communities need to be captured.
- Number of jobs alone is not a good measure for access; need to account for different types of destinations and their level of importance to different communities; 30 minutes for some modes is not very applicable in rural settings.
- Need to capture customer wait time outside of the acceptable window, and number of people impacted by bad on-time performance.
- Tracking of communication or public outreach and the rate of inclusion of traditionally underrepresented voices would be beneficial because, according to the participant's perception, MnDOT does a good job of communicating to the public once the project is underway, but not while the project is in the planning phase.
- On-time performance standard needs to be adjusted by mode and location, including rural areas, and somehow incorporate both origin and destination (in the case of demand response type services).

- Transit metrics should look beyond on-time performance to track no-shows that result from suspended routes or cancelled stops or routes.
- Tracking ADA sidewalk accessibility is meaningless until MnDOT has a detailed understanding of current conditions.
- MnDOT could track ADA accessibility at two levels: 1) level of accessibility of existing or new infrastructure; and 2) level of accessibility of the entire transportation system in Minnesota.
- Transit boardings are easy to measure but do not tell the whole story. Need to capture personal travel time, transfers and travel burden, and system connectivity.
- Demographic information presented in the dashboard or other public venues should be limited at fine-grain scales (e.g., as it relates to a specific crash type at a specific location) to protect privacy those involved and there should be some sort of controls to avoid introducing profiling/bias during collection of demographic information (e.g., first responders at a crash).
- Workforce performance measures should include information about a person's disability status to reveal how people with disabilities advance, or not, within the transportation industry.
- It is not obvious how the performance measures apply to rural areas.
- Performance measures should include first/last-mile connection for transit and other modes to better understand the complete trip as well as connections between rural areas and other parts of the state.
- Across the measures, MnDOT should incorporate a focus on people that do not drive because they represent a large portion of the population and are often stranded without many options.
- MnDOT has a role beyond keeping their own infrastructure in line, especially as it relates to questions of accessibility for people with disabilities—they need to set a moral example for other jurisdictions even if the DOT does not have jurisdiction.
- Performance measurement could take two complementary paths: 1) How are we ensuring what we do moving forward has the best chance of improving or ensuring equity? and, 2) How are we fixing the problems we have created in the past?
- Performance measures that track public perception need to account for non-drivers and times when drivers are not driving (e.g., If we took your car away today, how would you get to the doctor/store/school/work if you could not drive?). Similar questioning was also suggested for use in a planning scenario where decision makers could use the questions to look at their work from different perspectives.
- Zero emissions vehicle measures should also be inward facing to track MnDOT fleets and infrastructure.
- MnDOT should be tracking how well they adhere to the Complete Streets legislation enacted sometime around 2010 (per the participant's recollection).
- Measures should track funding by answering the following questions: How does MnDOT ensure that transportation spending is done in a way that considers questions of equity including considerations for political influence that leads to potentially imbalanced investments (e.g., rich neighborhoods getting projects first)? How does MnDOT make the funding that is available flexible and quickly accessible (participants gave an example of a pedestrian bridge that was

damaged in a crash and repairs were delayed because funds could not be reallocated)? Any funding performance measures should include consideration for level of funding per capita at a fine-grain level.

#### 4.1.3.2 Workshop

Similar to the focus group findings, the research team consolidated and synthesized workshop findings into the following list of paraphrased observations focused on constructive criticism. Findings are presented without any implication of rank.

- On-Time Performance would benefit from more detailed spatial data – going beyond provider level data to look at neighborhoods, demographic breakdowns, etc.
- Targets for on-time performance need to consider the ability to go to several destinations in one trip (known as trip chaining) and the fact that early arrivals can also be challenging because transit riders may have to wait longer for connections and could be exposed to uncomfortable conditions (e.g., weather); quality of the modal experience; and specific community needs including considerations for urban/suburban/rural areas as well as be relevant to unique modes such as demand response.
- ADA pedestrian compliance measures should look at network completion and whether the network gets you to a valued location. These measures would benefit from a dashboard showing all sidewalk facilities with information such as ownership and maintenance responsibilities and current level of compliance.
- Feasibility of tracking non-MnDOT infrastructure seems difficult and likely requires collaboration to achieve so this should be considered when developing targets.
- Fatalities and serious injuries measures present data collection challenges that need to be dealt with before meaningful results can be discovered. Concerns raised about presenting “bad” information about specific locations can create problems (diminished property values and deficit mindsets for example). So MnDOT should also collaborate with communities to amplify what they have and help find solutions that work for them. MnDOT needs to understand what is done with the information and how is it being communicated. Additionally, data collection tools should be accessible to people from different backgrounds and with different levels of English skill.
- Getting information about a person’s demographics is a complex data collection undertaking which will likely rely on multiple sources and coordination between jurisdictions. Additionally, the process should strive to ensure that data is not skewed by assumptions.
- Tracking infrastructural factors related to fatalities and serious injuries could benefit from combining multiple existing but disconnected datasets, and, for performance measurement purposes, this exercise could help identify which data is needed.
- Job accessibility measures would benefit from including information about the types of jobs that can be reached, the educational/experience required for those jobs, and whether those jobs provide a living wage (e.g., can people access jobs they are capable of being hired for and, assuming they are hired, will they earn enough to live on?) .

- Job accessibility measures should include measurements by mode.
- Workforce measures should incorporate people with disabilities and track changes for all groups at different job classifications (e.g., are you increasing percentages at all levels of the workforce or just entry level?). Turnover is also important to look at by demographics.
- Workforce measures should incorporate considerations for tenure as well as pay levels and educational background required. Improvements to the hiring process (strategic actions) should account for differences in experience and education as well as interview and communication skills.
- Workforce measures should present data about three groups: MnDOT staff; contractor staff; and owners of contracted companies.
- User experience measures could be more helpful if they were focused on mode.
- Electric vehicles (and other non-gas/diesel options) are not truly zero-emissions, and this should be clarified in the proposed measures and the measures should incorporate rates of CO<sub>2</sub> emissions based on the electric grid mix (e.g., how much electricity for electric vehicles is generated by coal powerplants versus natural gas or others?).
- Instead of the proposed multimodal access and impact measures it may be better, simpler, or both to measure reductions in single-occupancy vehicle, vehicle miles travelled.
- Multimodal access and impact should incorporate measures that track the location of active transportation facilities and efforts to coordinate with stakeholders.
- Community and built environment factors that impact ADA accessibility should also track whether active transportation facilities allow access to relevant destinations or connections to modes that do.
- In general, participants sought clarity about how MnDOT can share information about performance measures without losing the intended audience by making things either too dense/complicated or not specific enough (e.g., How can the data presentation be layered? What is presented up front and then how do provide access to more details for those who are interested?).

## 4.2 AMENDMENTS TO PROPOSED PERFORMANCE MEASURES AND STRATEGIC ACTIONS

The previous sections present a detailed summary of the feedback obtained during the focus groups and workshop. In order to leverage this information, the research team consolidated the findings to create simplified and actionable amendments for the 10 complete performance measure concepts as follows:

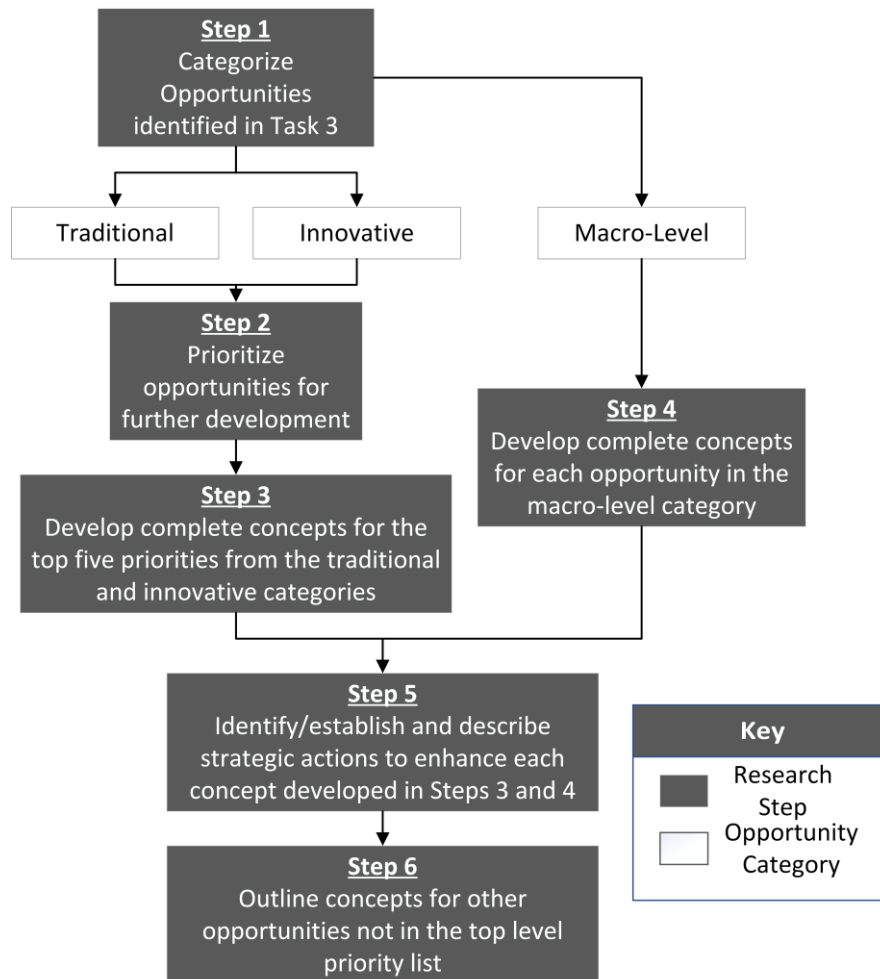
- Provide detailed spatial data at neighborhood levels
- Targets should consider impacts to chained trips
- Measure the network as a whole to gauge completion
- Present data to show success with planned projects and improvements to existing infrastructure
- Reflect safety level for all modes
- Utilize data collection and presentation strategies to ensure facts, not subjective information, is used

- Incorporate information about the types of jobs, rates of pay, and required skills
- Measure access for all modes
- Include information in workforce performance measures specific to unique job classifications
- Include contractor owners and upper-level staff in demographic data collection
- Track access to all types of destinations, by all modes, according to demographics
- Track travel time, mode transfers, travel burden, and connectivity
- Incorporate aspects of trip-time, wait-time, and number of people impacted by inferior performance
- Ensure relevance to rural areas with consideration for demand response
- Track missed trips due to suspended or cancelled service
- Incorporate measure of single-occupancy vehicle reductions
- Track access to valued locations
- Provide data on a dashboard including ownership and maintenance jurisdiction and current level of ADA compliance
- Incorporate context for exposure to emissions by location
- Track community insights on safety and accessibility
- Track representation of community in planning/decision-making
- Ensure non-driver perspective is captured
- Track experience and context by mode
- Track MnDOT's rate of vehicle/infrastructure improvements to reduce emissions
- Track rate of CO2 emissions for electric vehicles according to power source used to fuel
- Clarify definition of zero-emissions vehicles
- Incorporate data about disability as it relates to hiring, advancement, and tenure
- Introduce hiring practices that account for differences in experience, education, and communication skills

This list informed the development of final performance measure concepts, presented in the following chapter of this report, as well as the training modules created to support implementation of equity-first performance measure principles.

## CHAPTER 5: COMPLETE PERFORMANCE MEASURE CONCEPTS

Using the findings from the equity-focused review of performance measures and feedback from focus groups, the research team produced final concepts to either modify existing performance measures or augment the existing set of measures with new ideas. The research team developed a method to prioritize which opportunities would be developed as complete concepts<sup>7</sup>, working with MnDOT staff and the project TAP to refine the prioritization method and reach consensus. Opportunities that were not prioritized are also outlined within this chapter. Figure 2 presents the process to develop concepts to modify existing measures or develop new ideas.



**Figure 2. Process to Modify Existing Measures and Develop New Ideas**

<sup>7</sup> For the purposes of this task, a complete concept will include: a description of the measure including the benefits it provides; proposed metrics and targets; descriptions of the necessary data sets and level of data granularity; a description of the way the measure can be tracked, interpreted, and displayed to be equity-first; and other information as relevant to specific measures that would facilitate adoption.



## 5.1 PRIORITIZATION METHOD

The research team initiated the process of prioritizing the development of complete concepts by categorizing each opportunity in one of three groups: Macro-level, Traditional, and Innovative (see Table 5).

**Table 5. Opportunity Categories**

Category	Description
Macro-level	Opportunities for enhancement that are applicable across performance measures, altering the nature of performance measurement, documentation, or visualization, in general. For example, visualization of data sets, spatially, at multiple scales and layered with other data sets.
Traditional	Opportunities to adjust performance measures, such as congestion or VMT, that are common practice for DOTs.
Innovative	Opportunities to introduce performance measures and trend indicators that are new or not traditionally considered within the scope of DOTs.

After each opportunity was assigned to a category, the research team created a multi-factor ranking process to identify the five highest priority opportunities within the traditional and innovative groups. All macro-level opportunities were fully developed as there were only two. Each opportunity was scored in five categories, as presented in the list below. This list presents the name of the category followed by a question that defines the category and each of the potential ratings associated with the category with the scores assigned to each rating in parenthesis. The two opportunities that did not align with and support MnDOT's draft definition of transportation equity did not continue in the ranking process.

- **Alignment with MnDOT Equity Definition** - Does the opportunity align with MnDOT's draft definition of transportation equity?
  - Yes (1)
  - No (0)
- **Flexibility** - As MnDOT improves equity, how easily can the measure adapt to new expectations related to the change in equity context?
  - High flexibility (5)
  - Mid-high flexibility (4)
  - Mid flexibility (3)
  - Mid-low flexibility (2)
  - Low flexibility (1)
- **Catalytic Potential** - How much influence/positive change will the measure have?
  - Broad, society-level, change (5)
  - Beyond transportation but within public-sector (4)
  - Within the transportation sector (3)

- Beyond MnDOT but within associated government operations (2)
- Within MnDOT (1)
- **Data Availability** - Is the data available for use by MnDOT?
  - Collected by/available to MnDOT (5)
  - Collected by MnDOT partners (4)
  - Collected by other orgs (3)
  - Requires collection (2)
  - Source not yet determined (1)
- **Data Timeliness** - How recent/representative is the data?
  - Real-time source (5)
  - Multiple times per year reporting (4)
  - Annual reporting (3)
  - Estimates (2)
  - Extended time between collection (1)

## 5.2 PRIORITIZATION RESULTS

After calculating total scores for each opportunity, the research team determined that input from the project TAP and MnDOT staff would be required to identify final priorities because of numerous tied scores (e.g., within the innovative group of opportunities, 18 of the 20 total opportunities received “top 5” scores). To obtain TAP and staff feedback, the research team produced a PowerPoint presentation explaining the prioritization method and its preliminary results (available at: [https://transit-mobility.tti.tamu.edu/projectsandpublications/mndot\\_equity\\_perfmeasures/](https://transit-mobility.tti.tamu.edu/projectsandpublications/mndot_equity_perfmeasures/)) before requesting input via discussion and a survey-based ranking process made available to the TAP. The TAP’s survey simplified the feedback process by summarizing the list of opportunities developed by the research team into 13 broad aspects of transportation equity (e.g., affordability or transparency) and included an option to write in another priority. This format was designed to allow TAP members to efficiently provide feedback without first familiarizing themselves with the nuances of current MnDOT performance measures or the specifics of each opportunity developed by the research team. The survey included a single question, and the order of the response options was randomized each time the survey was loaded. See a survey screenshot in Figure 3.

The following question presents multiple aspects of transportation equity that could be covered by MnDOT's performance measures. Please help us identify priorities for our work under task 4 by prioritizing the options in a way that reflects your communities' needs. If you have any questions or a different format would be easier for you to access, please contact the project PI, Zachary Elgart, directly at: z-elgart@tti.tamu.edu

*If using a mobile device, landscape mode may be easier.*

Please prioritize the following aspects of transportation equity (*drag and drop each to move as needed*):

- 1 Representation (e.g. decision making bodies and DOT/contractor staff that reflect the communities they serve)
- 2 Technology (e.g. does the option allow people without specialized technology, such as smartphones, toll tags, vehicle automation, etc., to use it?)
- 3 Physical accessibility (e.g. for people using mobility devices)
- 4 Enforcement (e.g. policies and practices to reduce risk)
- 5 Gender and sexuality
- 6 Emissions and the environment
- 7 DOT investments (e.g. supporting contracts with Disadvantaged Business Enterprises (DBEs) and similar companies)
- 8 Banking access
- 9 Transparency (e.g. helping constituents understand and participate in the decision making process)
- 10 Other (please describe)
- 11 Infrastructure safety (e.g. design and engineering to improve safety for vulnerable groups)
- 12 Language/translation
- 13 Multimodal access and effectiveness (e.g. availability of transportation options other than personal autos that reach opportunities, operate at times beyond peak periods, and are useful for all trip purposes)
- 14 Affordability (e.g. how does the cost of the option impact the rest of a user's life?)
- 15 DOT/contractor hiring (e.g. using public funds to provide opportunities)

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**Figure 3. TAP Task 4 Prioritization Survey**

The TAP survey was available for responses from September 27, 2021, to October 5, 2021. When the survey closed, 14 unique responses were collected. To identify the five highest priority aspects of transportation equity, the research team calculated the average ranking for each option—the lowest

average represents the highest priority. Table 6 presents the scores for all aspects, with the top five highlighted. Two TAP members selected the write-in option as their highest priority, but only one provided a written response. Because of its similarity with the Multimodal access and effectiveness option, the written response<sup>8</sup> was included in that option’s score. Each of the scores submitted by the respondent that submitted a blank write-in option were considered to be one place higher than submitted (e.g., if something was ranked as fourth, the research team promoted it to third) and the write-in option rank was not included.

**Table 6. TAP Survey Results**

<b>Aspects of Transportation Equity</b>	<b>Average Priority Score</b>
Multimodal access and effectiveness	2.86
Physical accessibility	4.57
Infrastructure safety	4.93
Affordability	5.79
Representation	6.36
Transparency	6.43
Emissions and the environment	7.29
DOT investments	7.86
Language/translation	8.07
DOT/contractor hiring	9.14
Gender and sexuality	9.29
Technology	10.21
Enforcement	10.36
Banking access	12.86

The research team used the top five priorities, presented in Table 6, to guide the development of complete concepts using opportunities from the Traditional and Innovative categories as previously discussed. Additionally, the research team identified opportunities to implement macro-level interventions to help the Performance Dashboard and performance measurement process, as a whole, embrace an equity-first perspective. These macro-level opportunities are presented prior to the Traditional and Innovative sections because they account for some of the observations related to one or more of the Traditional or Innovative opportunities.

Each of the sub-sections within the three main sections that follow (Macro, Traditional, and Innovative) has a similar format and includes some or all of the following types of information:

- A discussion of the existing performance measures (where relevant)

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<sup>8</sup> One TAP respondent provided the following description of their top priority: “People can get where they need to go in a safe and reliable way, and they have options. Multimodal access to destinations with reasonable travel time length and reliability at not just peak period (transit, personal autos, bike, walk, ride hailing etc.)”

- Observations about the opportunities to enhance equity
- A description of the proposed changes to current practices
- A discussion of how the changes can improve equity
- A description of the measurement methods and data considerations
- A set of strategic actions MnDOT could leverage to address inequities the performance measures reveal

## 5.3 MACRO-LEVEL PERFORMANCE MEASURE IMPROVEMENTS

The objective of this research project is to identify and develop equity-first performance measures, however, the Performance Dashboard as a whole also presents opportunities to implement equity enhancements, as outlined in the following sections.

### 5.3.1 Locally Focused Data Reporting

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Equity considerations and improvements are focused on people. Therefore, the most valuable source of information is data that illuminates lived experiences, and, from the perspective of people using the transportation system, the most impactful change occurs at the neighborhood level. Currently, MnDOT's Performance Dashboard tracks and presents information at aggregated levels (e.g., statewide traffic fatalities or Metro area jobs accessible in a 30-minute transit trip) without giving people information about conditions and performance in specific locations (e.g., pedestrian fatalities at each intersection in the Rondo neighborhood or access to carshare in the Dakota communities).

Of the 56 MnDOT performance measures the research team reviewed, 46 present opportunities to report performance data at a more localized scale including each of the performance measures referenced in the Traditional Performance Measures section. This observation is also relevant to the proposed performance measures in the Innovative Performance Measures section later in this document.

Localized data reporting and visualization helps identify areas of need or risk and helps people and communities advocate for improvements. Figure 4 and Figure 5 present examples of such visualizations from the Broward County Metropolitan Planning Organization's transportation Performance Dashboard—each example offers people the ability to zoom in to view data at city-block scales, though the examples do not provide information about those locations other than the map's main subject. To further enhance the concept of localized data reporting, inclusion of map layers that present demographic, land-use, landownership, jurisdiction, and other equity-relevant information presents an opportunity to provide additional valuable context to all performance measures by showing who is impacted by the conditions being tracked and under what circumstances the conditions occur.

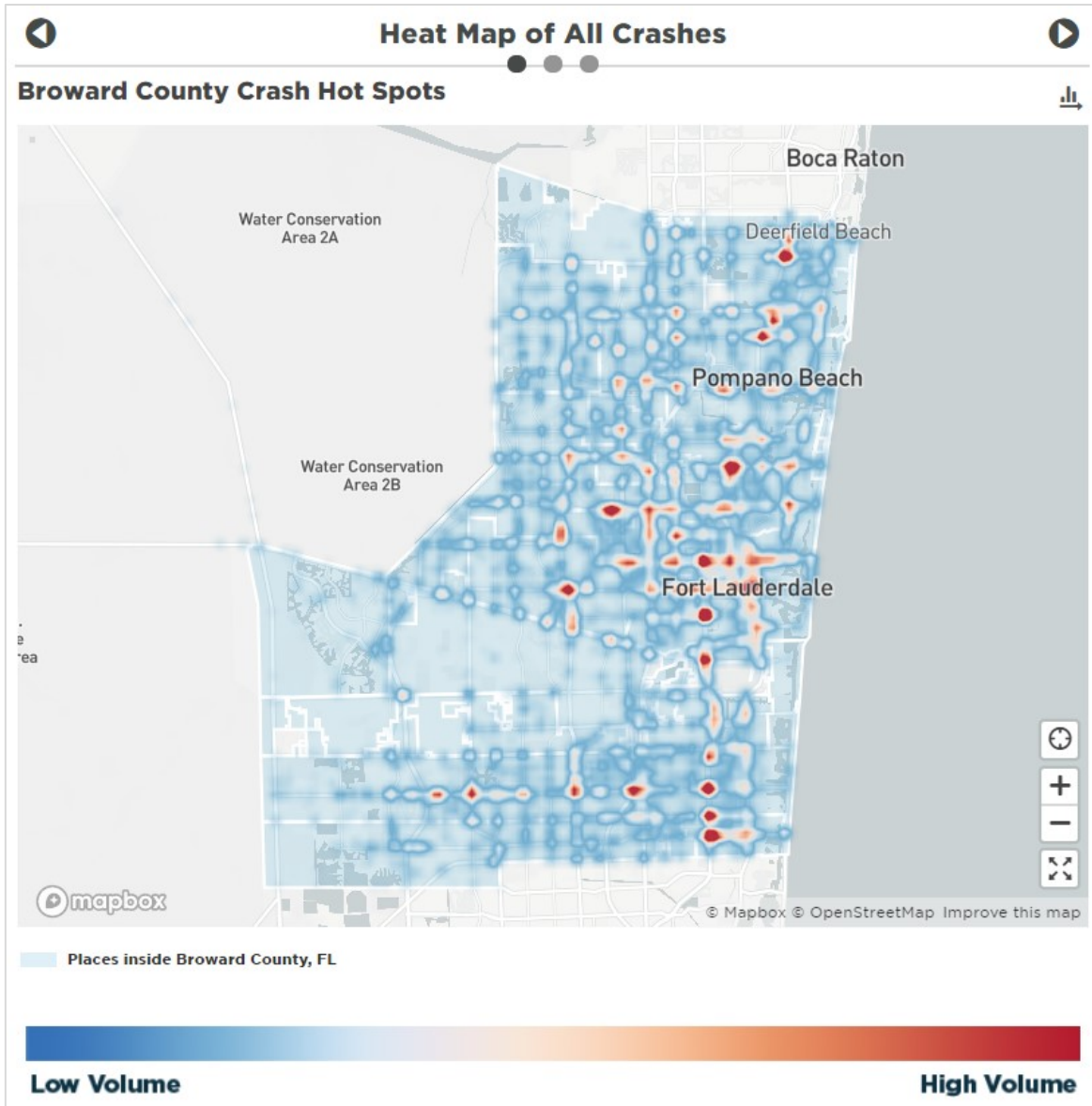


Figure 4. Screenshot of Broward County Metropolitan Planning Organization Crash Hot Spots Map <sup>9</sup>

<sup>9</sup> Source: <https://dashboards.mysidewalk.com/broward-mpo-performance-dashboard/safety>

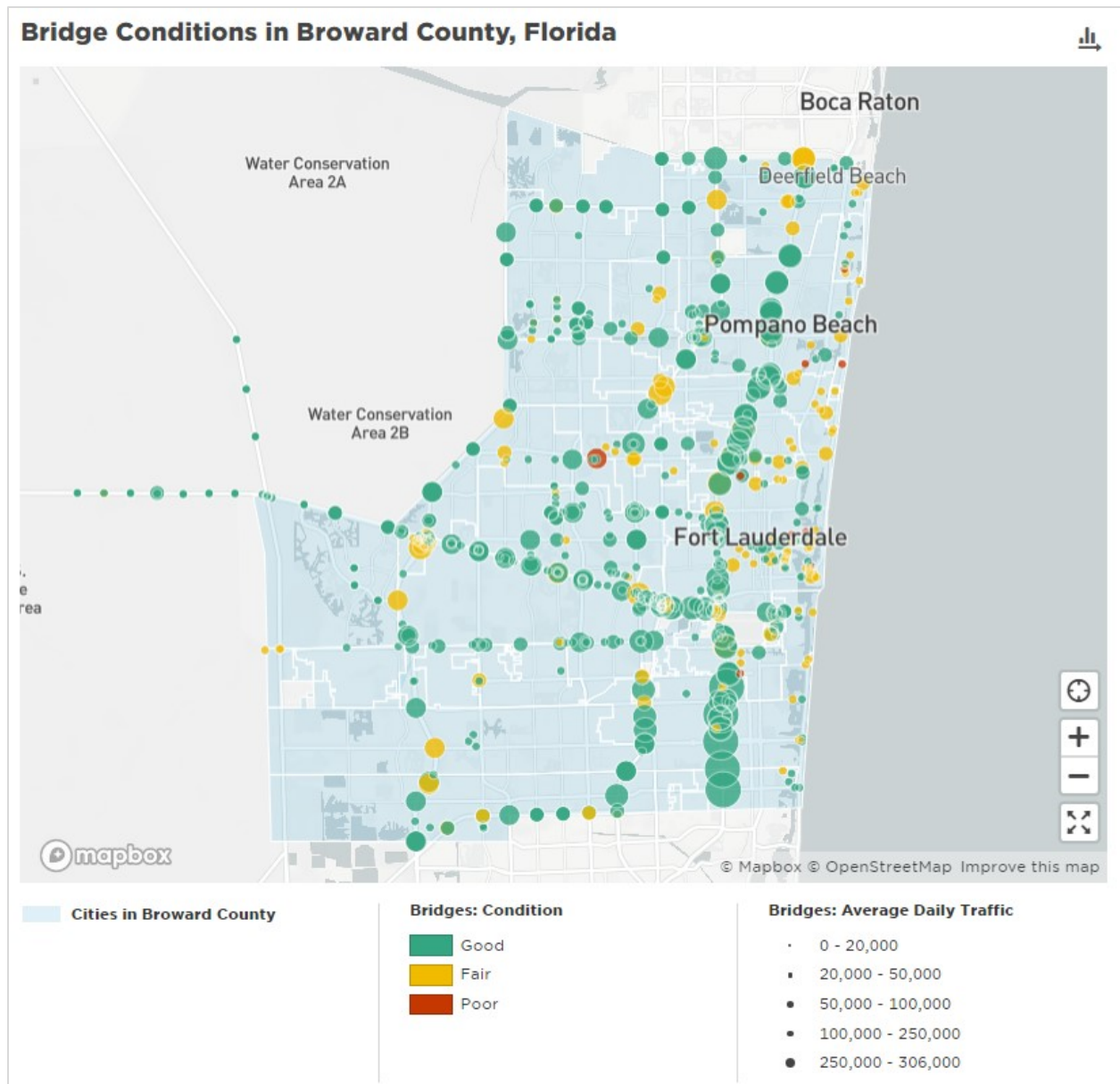


Figure 5. Screenshot of Broward County Metropolitan Planning Organization Bridge Conditions Map <sup>10</sup>

### 5.3.2 Data Access and Transparency

MnDOT's Performance Dashboard provides a level of transparency that is uncommon within the transportation industry, however, the data that support some performance measures is not provided in the dashboard. Comprehensive data access via an online database that stores at least 10 years of performance measurement data, down to the local level, has the potential to further enhance MnDOT's

<sup>10</sup> Source: <https://dashboards.mysidewalk.com/broward-mpo-performance-dashboard/infrastructure-conditions>

decision-making transparency and to allow people and communities to conduct their own performance analyses. Each of the traditional and innovative performance measure concepts presented in the following section would benefit from this level of data access and transparency.

## 5.4 TRADITIONAL PERFORMANCE MEASURES

The following sections outline existing MnDOT performance measures that present opportunities to integrate equity-first perspectives including descriptions of potential improvements, considerations for implementation of the improvements, and documentation of some complementary strategic actions that could be used by MnDOT to improve equity.

### 5.4.1 Enhance Transit On-Time Performance Measure

“Annual transit on-time performance within the Twin Cities and Greater Minnesota” (the frequency with which a transit operator reaches its scheduled stops at the scheduled time) is included in the 2017 SMTP as a performance measure supporting the Critical Connections objective (see Table 5-3 in that document). However, the 2017 SMTP does not propose a target for the measure. Reporting for the measure is described as documentation of the percentage and the trend; however, the 2017 SMTP does not indicate the time period these reports should cover.

#### 5.4.1.1 Equity Observations and Opportunities

Transit on-time performance (OTP) alone does not indicate high-quality or effective transit service without understanding: 1) what is considered to be an appropriate rate of OTP (e.g., 95 percent on-time); and 2) where transit operators are struggling to achieve the minimum OTP rate. Transparency is further hampered by not including the measure in MnDOT’s online Performance Dashboard.

#### 5.4.1.2 Potential Improvements

What should change and how/why should it change?

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The following modifications could improve the existing OTP performance measure so that it better measures performance from the perspective of equity:

1. **Introduce a target OTP level:** A specific target allows people that use transit and MnDOT to hold transit providers accountable for providing high-quality and reliable service. The 2017-2037 Greater Minnesota Transit Investment Plan<sup>11</sup> (GMTIP) established a target OTP, stating that, “90 percent of trips will be picked-up within the appropriate time window by 2025.” Therefore, the target adopted for this performance measure could come from the GMTIP. However, this target does not account for different service area types (e.g., urban versus rural) or modal distinctions (e.g., fixed route versus demand responsive). A more achievable and realistic OTP target could

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<sup>11</sup> Source: [https://minnesotago.org/application/files/7714/9426/4006/GMTIP\\_Final-Draft\\_042617.pdf](https://minnesotago.org/application/files/7714/9426/4006/GMTIP_Final-Draft_042617.pdf)



be developed by working directly with stakeholders (transit riders, transit operators, cities, counties, and private sector transit beneficiaries). It may be best to adopt multiple targets, possibly in a manner that mirrors the GMTIP's transit district designations.

2. **Present OTP on the dashboard and present data spatially:** Transit OTP is not included in the MnDOT Performance Dashboard, limiting transparency for the public and decision makers, and potentially hampering efforts to improve the quality of transit service in Minnesota. A spatial understanding of the service areas with poor performance could help identify areas of persistent low-quality transit service and help MnDOT prioritize its assistance to these transit agencies.

How would the changes improve equity?

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Transit provides a physically and financially accessible transportation option. However, service that is unreliable or infrequent can impair quality of life by introducing additional stressors (e.g., being late to appointments or missing opportunities) and force riders to invest large amounts of time in order to travel (e.g., waiting for a late bus while foregoing other activities)—issues which people using other modes, all else equal, would not be burdened with. Therefore, complementing an OTP measure with a target performance level could influence higher quality transit service and enhance the lives of transit riders through increased reliability and reduced time-burden. Furthermore, inclusion of transit OTP information on the dashboard that is presented spatially could improve modal visibility within MnDOT and enhances riders' and communities' ability to advocate for improvements.

#### 5.4.1.3 Implementation

**Measurement method:** On-time performance is a common performance measure for transit operators; therefore, this measure does not require a novel methodology. Instead, incorporation of OTP within the Performance Dashboard requires continued data sharing between transit operators and MnDOT.

**Data sources:** Transit agency performance tracking and reporting.

**Data access:** MnDOT currently collect performance data from Minnesota transit operators and publishes some of that information via resources available at the Transit in Minnesota website - <https://www.dot.state.mn.us/transit/serviceproviders.html>.

**Measurement frequency and data timeliness:** OTP is measured in real time for every transit stop, however consolidation of data (e.g., to provide a route- or agency- level summary) requires processing. Therefore, usable data can be made available daily but, realistically, could be expected on a monthly basis (in line with the Federal Transit Administration's National Transit Database reporting).

**Dashboard update frequency:** Report OTP monthly.

#### 5.4.1.4 Complementary Strategic Actions

What actions can MnDOT take to help mitigate inequities discovered by tracking this measure?

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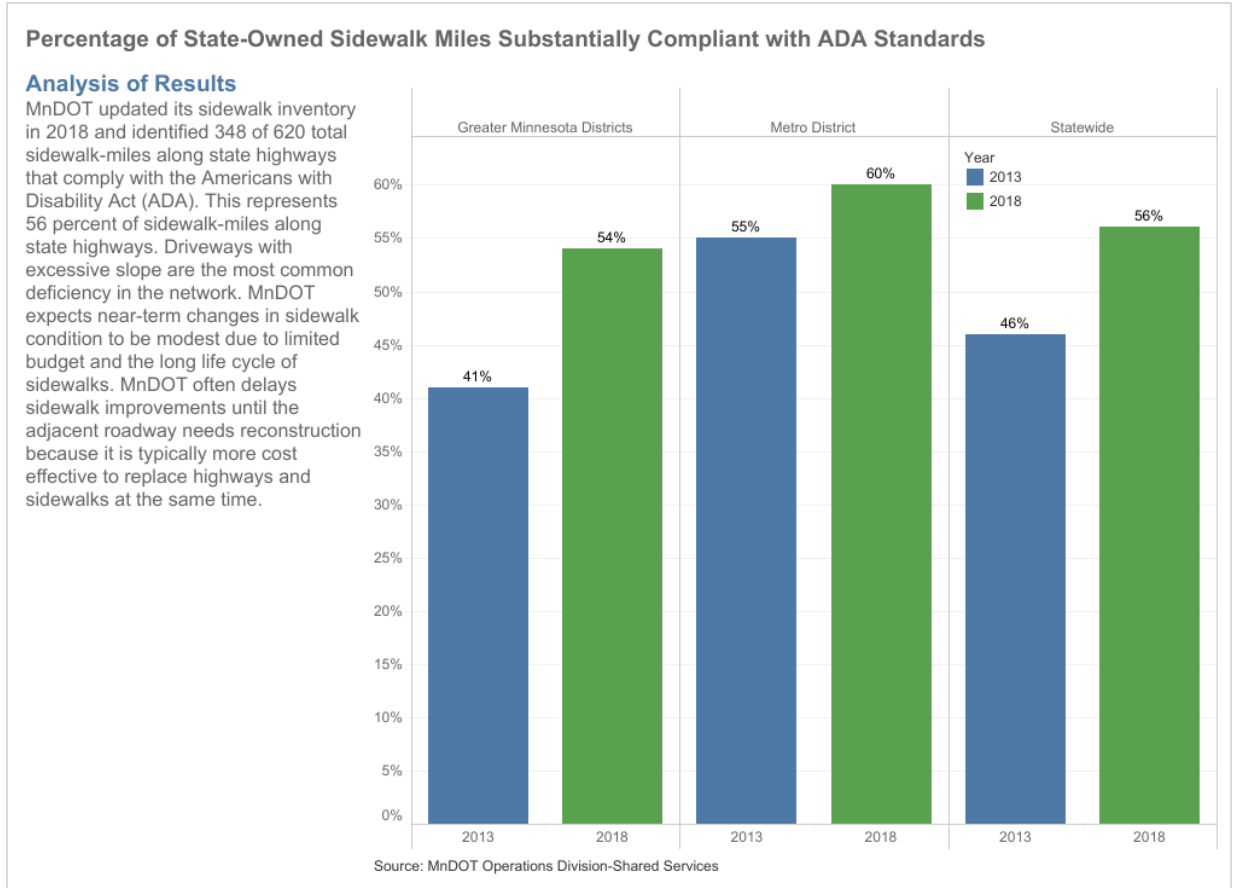
- Technical assistance and additional funding for transit planning and or operational improvements can contribute to higher rates of OTP by improving service efficiency, redesigning routes, updating dispatching practices, and supporting hiring additional drivers or purchasing more vehicles
- Facilitated coordination between local governments and transit operators to enhance transit access and/or throughput can improve OTP performance via interventions such as signal prioritization or bus only lanes although strategies will vary by the type of transit provided
- Investments in transit-complementary modes such as walking, rolling, and bicycling help to give transit riders other viable non-auto options

#### 5.4.2 Enhance ADA Pedestrian Compliance Measures

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The MnDOT Performance Dashboard tracks physical accessibility of the pedestrian network for people with disabilities via three performance measures within the Critical Connections objective—each is briefly described below.

MnDOT tracks the percentage of state-owned sidewalk miles that are substantially compliant with the Americans with Disabilities Act (ADA) accessibility standards (see Figure 6). Data is reported at three levels—statewide, for the MnDOT’s Metro District covering the Twin Cities metro area, and for the areas outside of the metro area—and at five-year intervals.



**Figure 6. Screenshot of MnDOT’s ADA Sidewalk Accessibility Performance Measure <sup>12</sup>**

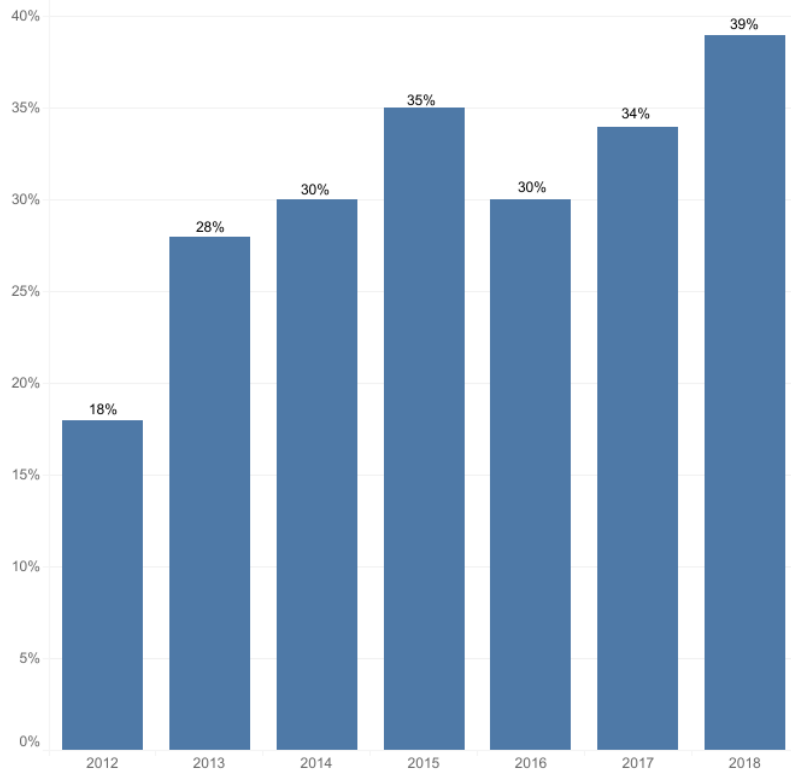
MnDOT tracks the percentage of state highway curb ramps that are compliant with ADA standards (see Figure 7). Data is reported statewide on an annual basis.

<sup>12</sup> Source: <https://performance.minnesotago.org/critical-connections/access/percentage-state-owned-sidewalk-miles-substantially-compliant-ada-standards>

### Percent of State Highway Curb Ramps That are Compliant With ADA Requirements

#### Analysis of Results

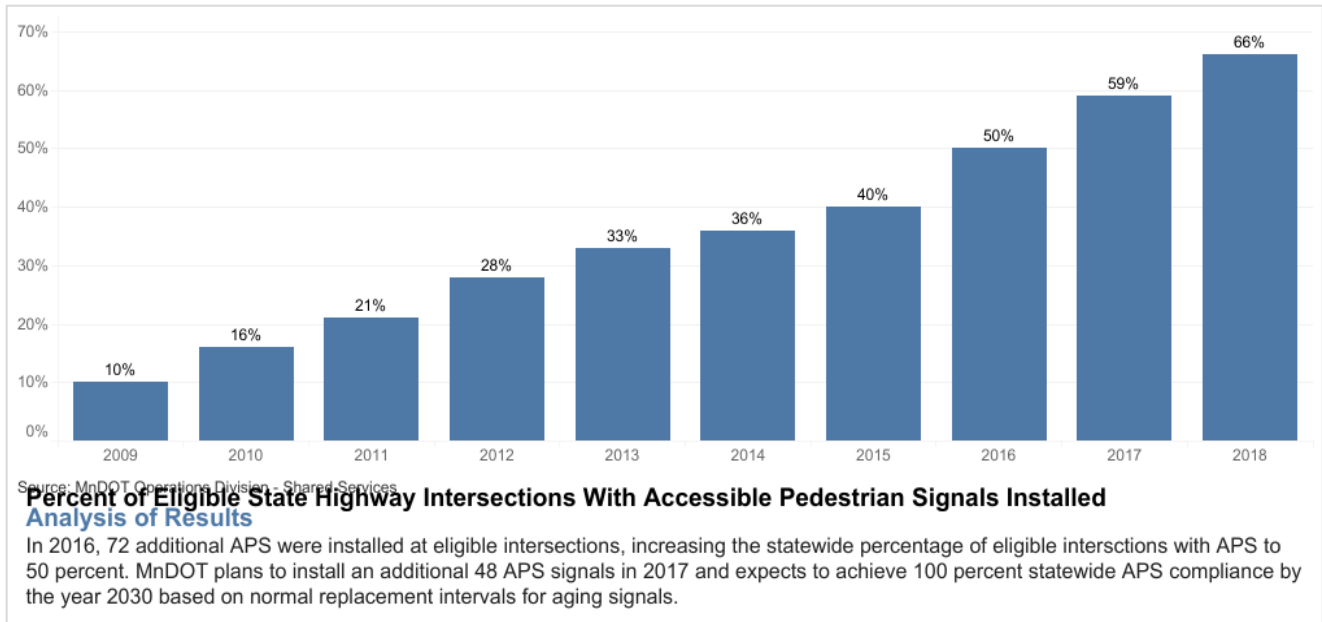
As of 2018, 39 percent of curb ramps on the state highway system were completely compliant with current ADA standards and 39 percent were compliant except for detectable warnings. The slight growth in compliant ramps is due in part to MnDOT adding new curb ramps and improving existing curb ramps at many locations that were previously served by one diagonal curb ramp are now served by two perpendicular ramps.



Source: MnDOT Operations Division - Shared Services

Figure 7. Screenshot of MnDOT's ADA Curb Ramps Performance Measure <sup>12</sup>

MnDOT tracks the percentage of eligible state highway intersection with accessible pedestrian signals (see Figure 8 – *formatting issues in original*). Data is reported statewide on an annual basis.



**Figure 8. Screenshot of MnDOT’s Accessible Pedestrian Signals Measure <sup>12</sup>**

#### 5.4.2.1 Equity Observations and Opportunities

The current ADA compliance measures focus on three critical aspects of the pedestrian network which directly impact physical accessibility for people with disabilities. However, none of the measures include a target year for full accessibility. Local context is not presented for any of the measures, which limits understanding of locations with especially low levels of accessibility. The sidewalk accessibility measure uses the term "substantially compliant" without presenting a definition of the term. Without a definition, this term has the potential to confuse the public due to its subjective nature and lack of reference to specific improvements required to achieve complete accessibility. Furthermore, while not within MnDOT’s authority, the accessibility measures do not provide information about non-MnDOT portions of the state’s transportation network. Much of the sidewalk network in Minnesota is under the jurisdiction of counties, cities, and townships.

#### 5.4.2.2 Potential Improvements

What should change and how/why should it change?

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The following modifications could improve the existing ADA compliance performance measures so that physical accessibility is better measured from the perspective of equity:

1. **Introduce target date for full accessibility:** A specific target allows people to better hold MnDOT and other responsible parties accountable for meeting their federal obligations. Currently, none of the accessibility measures includes a target date to achieve full accessibility.

2. **Introduce specifically defined terminology in the sidewalk accessibility measure to describe what is being measured:** A specific definition, such as “fully compliant with MnDOT’s ADA standards”, ensures that the performance measure data can be verified by non-MnDOT entities and provides transparency. Introducing specific definition to this measure also mirrors the specificity of the other accessibility measures. For instances, curb ramps and accessible pedestrian signals each have a specific definition.
3. **Track sidewalk improvements annually:** Providing annual information on the percent of state-owned sidewalks that are accessible (instead of the current practice of documenting status at five-year intervals) enhances transparency and better describes the time taken to achieve outcomes.
4. **Track status of accessibility within the rest of the transportation system:** Tracking the accessibility for the system allows MnDOT to influence improvements on behalf of all Minnesotans, regardless of jurisdiction, and may help MnDOT identify areas of need that could benefit from partnerships or improved funding access.
5. **Present accessibility data spatially:** A spatial understanding of the areas with poor accessibility could help identify areas of persistent low levels of accessibility and help MnDOT prioritize interventions in these areas.

#### How would the changes improve equity?

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Without accessible pedestrian transportation infrastructure that meets ADA standards, people with disabilities are physically barred from certain parts of their communities. Enhancing MnDOT’s accessibility performance measures will help identify areas of limited accessibility and direct funding to these areas as well as help people with disabilities and their communities advocate for better and faster improvements.

#### 5.4.2.3 Implementation

**Measurement method:** Measurement of curb ramps and accessible pedestrian signals should remain the same. The method of measuring sidewalk accessibility requires MnDOT to first establish a definition of what is being measured. For example, altering the sidewalk measure to instead track the rate of compliance with MnDOT’s existing ADA sidewalk standards<sup>13</sup> (instead of using the term “substantially compliant” to define what is measured) would allow the agency to leverage existing standards and project documentation. Measurement would require an ongoing process (counting projects completed in adherence with the standard each year) and a one-time network analysis (identification of sidewalks in-place prior to the standard that comply with the standard).

**Data sources:** MnDOT internal documentation

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<sup>13</sup> Available here: <https://www.dot.state.mn.us/ada/design.html>

**Data access:** Data created or collected and stored by MnDOT

**Measurement frequency and data timeliness:** Adherence to ADA-standards is measured on a per-project basis

**Dashboard update frequency:** Report levels of accessibility annually.

#### 5.4.2.4 Complementary Strategic Actions

What actions can MnDOT take to help mitigate inequities discovered by tracking this measure?

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- Reconfiguring project selection and funding processes could increase the rate at which the pedestrian network in Minnesota is made accessible—this would require two key interventions:
  - Place greater emphasis on accessibility improvements so that projects with an accessibility focus have a higher chance of selection and funding (either as standalone projects or as component of larger projects)
  - Reduce the influence of usable-life considerations so (currently, the description of the sidewalk measure on MnDOT’s dashboard highlights the long life of inaccessible sidewalks as a factor in the time it takes to improve accessibility)
- Facilitated coordination between local governments and MnDOT could improve connections between state-owned infrastructure and locally owned infrastructure.
- Technical assistance for consulting engineers, real estate developers, and others with responsibilities for project designs, can help ensure sidewalk designs meet standards and that the importance of accessibility is understood.

#### 5.4.3 Enhance Fatalities and Serious Injuries Measures

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MnDOT tracks annual traffic fatalities in the Performance Dashboard and established a goal to reduce fatalities to 225 or fewer by 2025, as shown in Figure 9. Serious injuries due to crashes involving motor vehicles are tracked and reported in a similar fashion with a goal to reduce injuries per year to 980 or fewer by 2025, as shown in Figure 10.

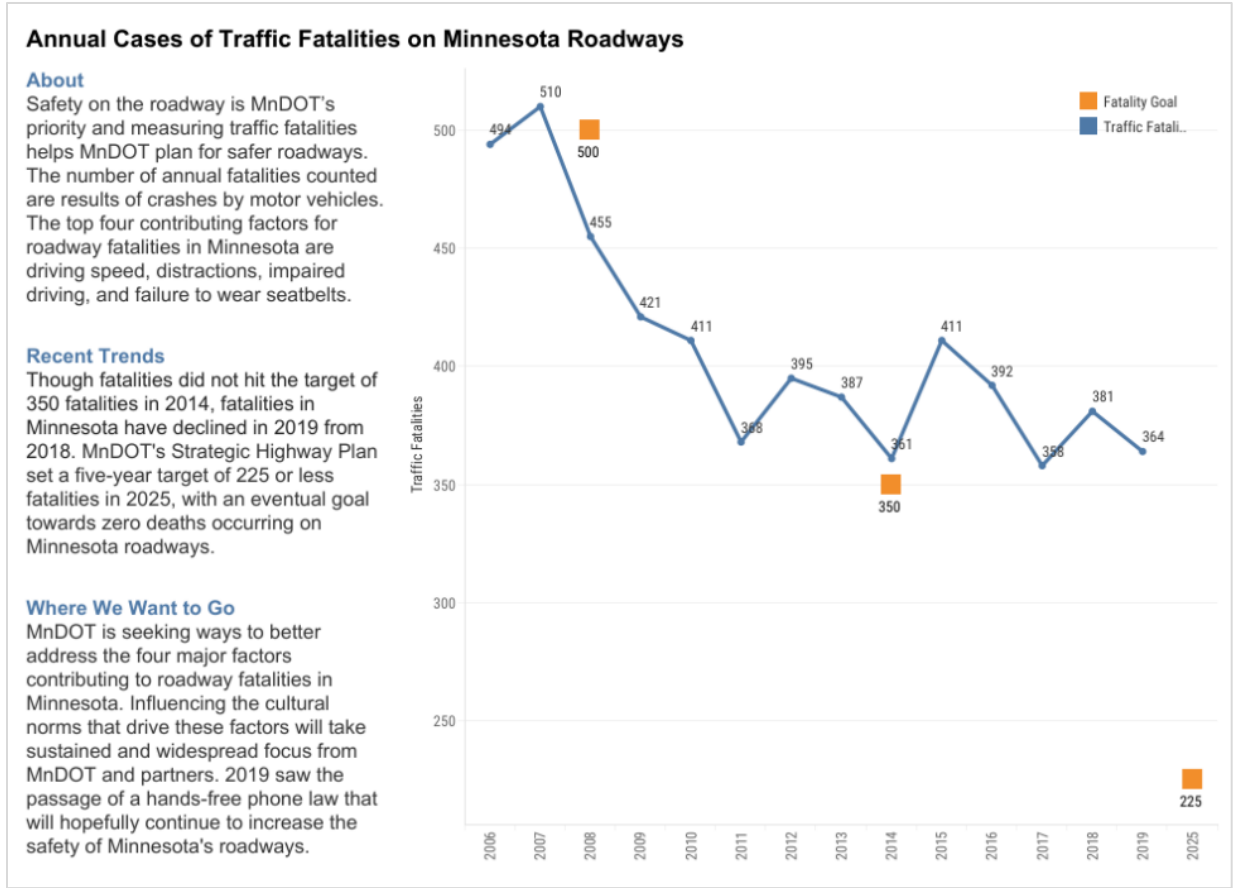


Figure 9. Screenshot of MnDOT's Traffic Fatalities on Minnesota Roadways Performance Measure <sup>14</sup>

<sup>14</sup> Source: <https://performance.minnesotago.org/transportation-safety/roadway-safety/total-number-fatalities-minnesota-roadways-resulting-crashes-involving-motor-vehicle-each-year>



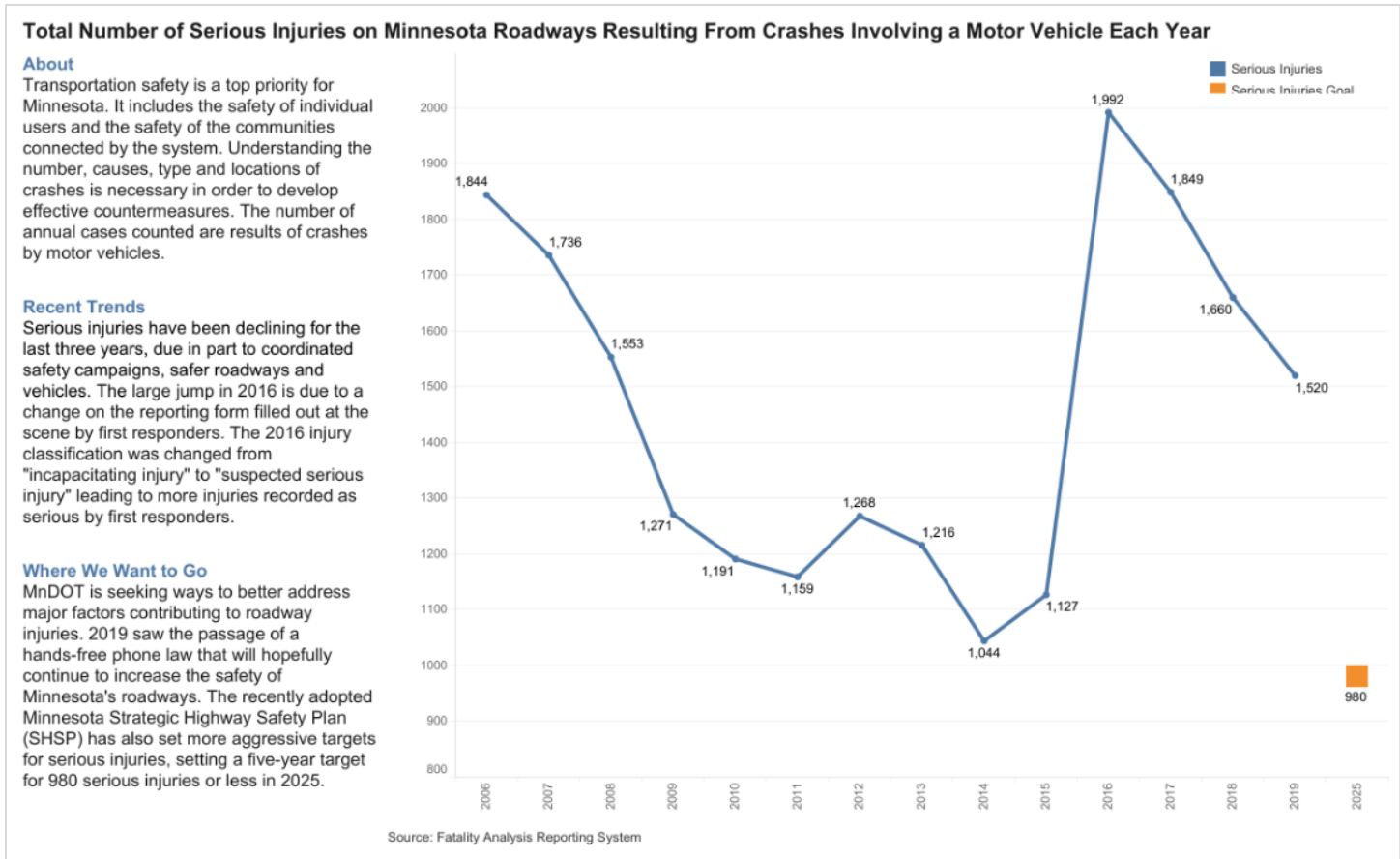


Figure 10. Screenshot of MnDOT’s Serious Injuries Involving Motor Vehicles Performance Measure <sup>15</sup>

MnDOT’s “Crash Facts” data and infographic provide more information about fatalities and serious injuries. The Crash Facts pages summarize behavioral factors related to the crash (impairment, unbelted occupants, speed, and inattention), driver type, engineering type (intersection, run-off, or head-on), percent of fatalities/injuries by population size and system type, and the number of fatalities/injuries by weather condition and month—see Figure 11 and Figure 12. The fatalities infographic compares fatality rates of nearby states, breaks down fatality data by vehicle type, and shows a map of the state indicating the rate of fatalities per 100 million vehicle miles travelled per county—see Figure 13.

<sup>15</sup> Source: <https://performance.minnesotago.org/transportation-safety/roadway-safety/total-number-serious-injuries-minnesota-roadways-resulting-crashes-involving-motor-vehicles-each-year>

# 2015-2019 CRASH FACTS

Between 2015 and 2019, more than 20% of crashes were due to impairment. A larger proportion of fatalities occurred in intersections, and fatalities are more frequent during clear weather conditions. A majority of crashes in the state are also in rural areas.

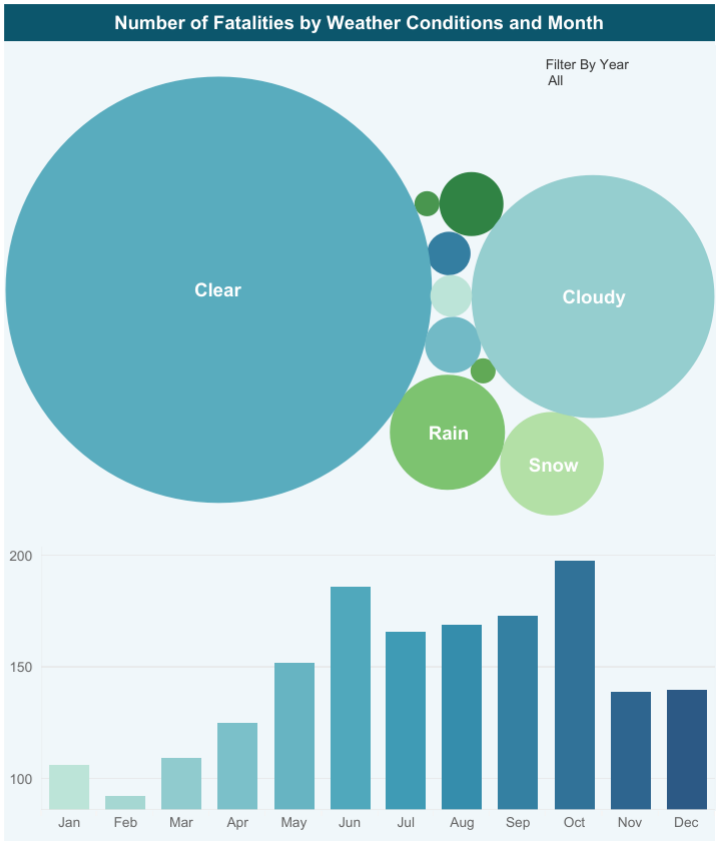
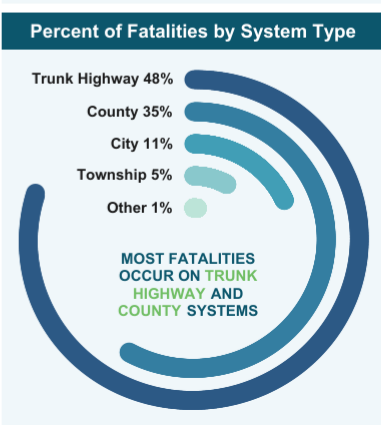
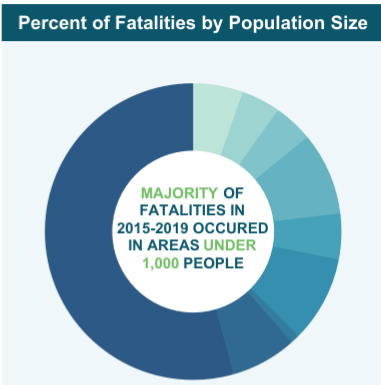
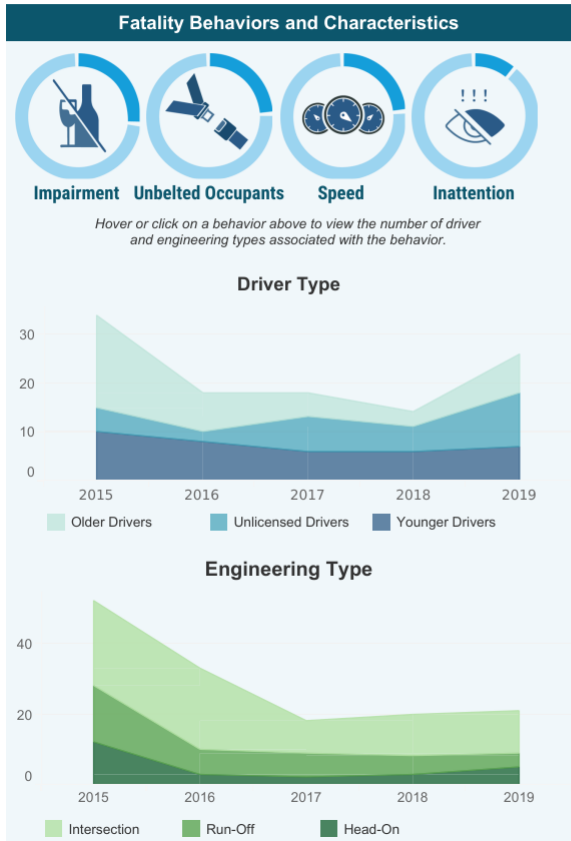


Figure 11. Screenshot of MnDOT's Fatal Crash Facts <sup>14</sup>

# 2015-2019 INJURY FACTS

Between 2015 and 2019, most serious injury crashes were due to impairment and speed. Similar to fatalities, most injuries occurred during clear weather conditions. However, most injuries occurred in populations and townships of all sizes, while fatalities were more prevalent in rural areas. Pedestrians have been more likely to be injured than bicyclists.

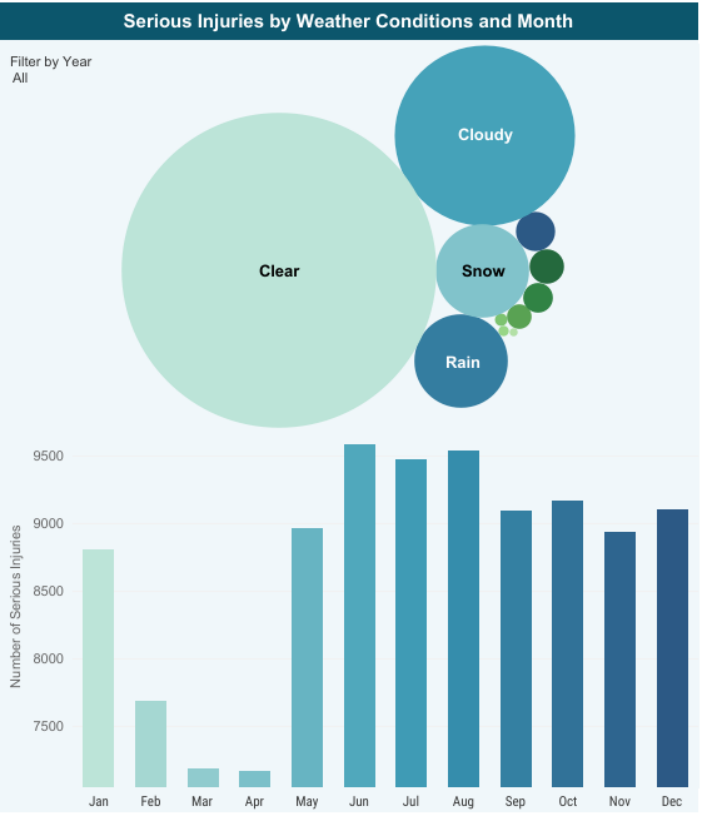
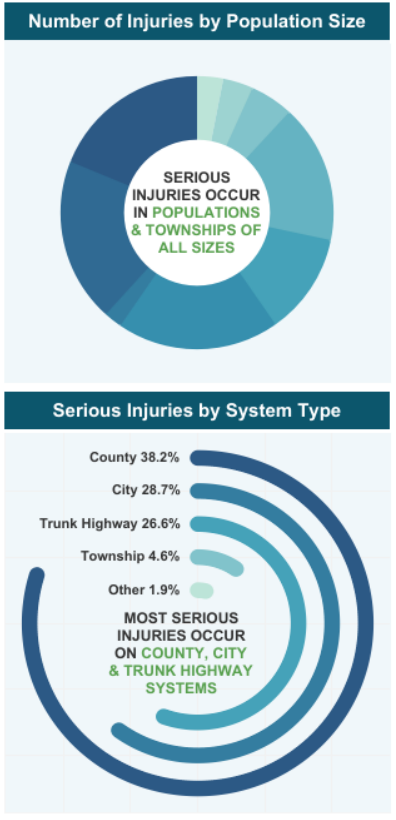
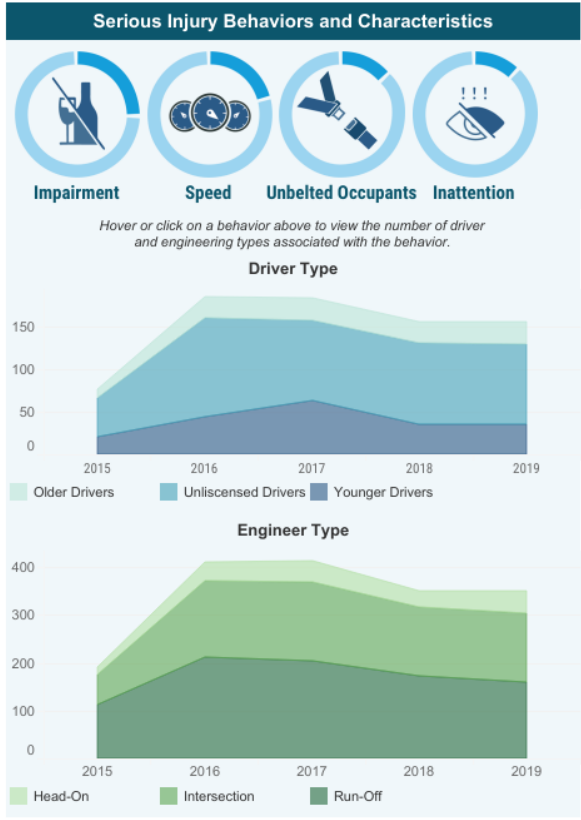
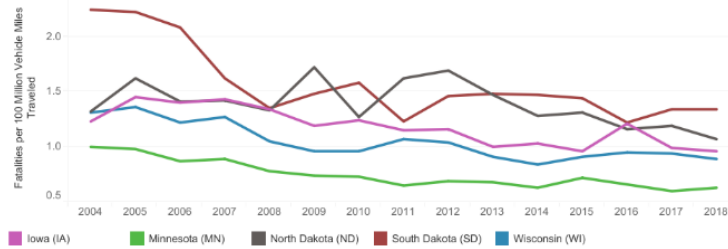


Figure 12. Screenshot of MnDOT’s Serious Injury Crash Facts <sup>14</sup>

Transportation safety is a **top priority** for Minnesota. It includes the **safety of individual users** and the **safety of the communities** connected by the system. Understanding the number, causes, type, and locations of fatal crashes vital in MnDOT's efforts to develop effective countermeasures.

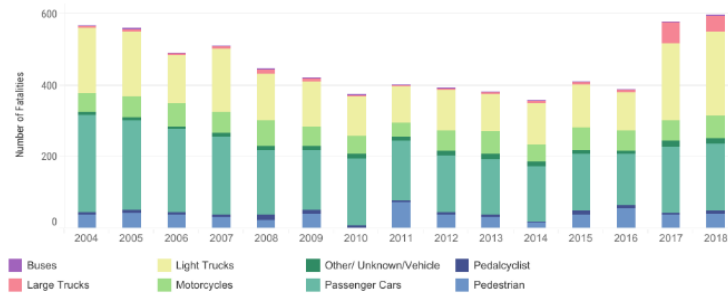
### Fatal Accident Rates of Nearby States

Source: Federal Analysis Reporting System

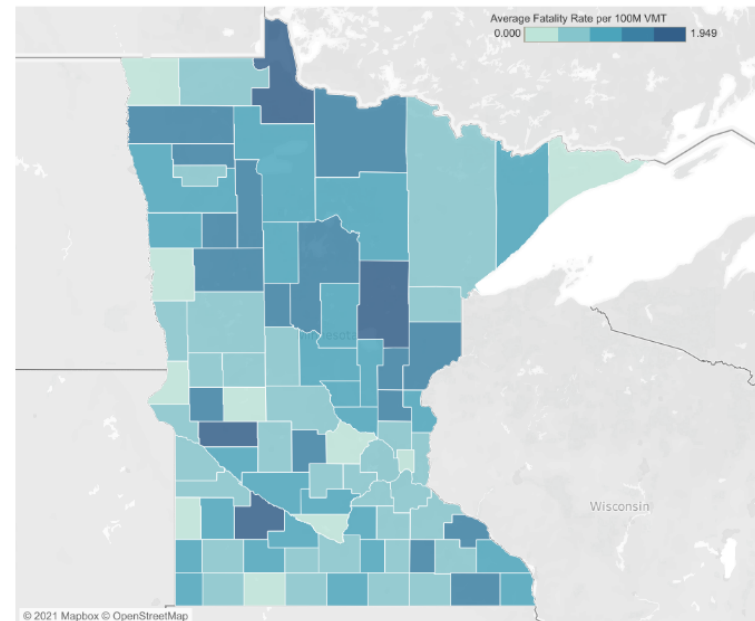


### Type of Vehicle in Highway Fatalities, MN

Source: Federal Highway Data



### Average Fatality Rate per 100 Million Vehicle Miles Traveled (VMT), 2016-2019



MINNESOTA HAS THE LOWEST FATALITY RATES COMPARED TO NEARBY STATES

RURAL COUNTIES EXPERIENCED HIGHER FATALITY RATES THAN THE METRO AREA

MOST FATAL CRASHES ON HIGHWAYS ARE PASSENGER VEHICLES

Figure 13. Screenshot of MnDOT's Fatal Crash Infographic <sup>15</sup>

#### 5.4.3.1 Equity Observations and Opportunities

MnDOT's fatality and serious injury performance measures present a high-level overview of the risks faced by people using roadways. This information is complemented by additional information that lends insight into the specifics of the crashes (e.g., vehicle type, fatality rates per county, weather, behaviors, etc.). However, the measures lack information about user and victim demographics, data about infrastructural crash causes (e.g., lack of sidewalks), and information about specific crash locations (e.g., at the intersection level).

#### 5.4.3.2 Potential Improvements

What should change and how/why should it change?

---

The following modifications could improve the existing fatalities and serious injuries performance measures so that safety is better measured from the perspective of equity:

1. **Track demographics:** Tracking the demographics (e.g., race/ethnicity, income, gender identity) of people involved in crashes as well as their role in the crash can provide additional insight about the levels of risk experienced by specific groups.
2. **Track infrastructural crash factors:** Information that better portrays the complete crash experience, including the infrastructural factors that may have influenced the crash outcomes (e.g., missing/malfunctioning signals or a lack of mid-block pedestrian crossings), helps engineers and people identify inherently dangerous facility designs.
3. **Present data with improved spatial granularity:** A spatial understanding, at fine-grain level, of the areas with high crash rates could help identify areas of high-risk (e.g., intersections or corridors) and help MnDOT prioritize its interventions in these areas.

How would the changes improve equity?

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Traffic violence disproportionately impacts marginalized communities including Black, Indigenous, and other People of Color (BIPOC), people with low incomes, older adults, children, people with disabilities, pedestrians, and bicycle riders<sup>16</sup>. Therefore, a detailed understanding of the people involved in crashes that result in fatalities and serious injuries can highlight which communities experience greater risk and identify opportunities to intervene. Similarly, documentation of infrastructural crash factors helps to pinpoint high-risk facilities or facility components to prioritize retrofitting of existing infrastructure or avoid implementation of such designs in new infrastructure. Finally, presenting the data spatially at a fine-grain level helps people and communities advocate for safety improvements.

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<sup>16</sup> Source: <https://www.ghsa.org/sites/default/files/2021-06/An%20Analysis%20of%20Traffic%20Fatalities%20by%20Race%20and%20Ethnicity.pdf>

### 5.4.3.3 Implementation

**Measurement method:** The changes outlined above do not require new methods of measurement—instead, they require new practices for data collection and reporting. If not already included in crash reports, demographic information and infrastructural factors should be documented.

**Data sources:** Crash reports and internal MnDOT sources (for infrastructural factors).

**Data access:** MnDOT currently has access to crash report data. To collect improved/additional content, coordination between MnDOT and relevant first responders throughout the state will be required.

**Measurement frequency and data timeliness:** Data is collected shortly after a crash occurs.

**Dashboard update frequency:** Report fatality and serious injury crash rates annually.

### 5.4.3.4 Complementary Strategic Actions

What actions can MnDOT take to help mitigate inequities discovered by tracking this measure?

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- Updated infrastructure design standards (e.g., elements that intentionally slow traffic, protected sidewalks and bike lanes, signalized pedestrian crossings at frequent intervals, and strategic reduction in lane miles and vehicular traffic volumes) could be implemented to enhance the safety of future projects and provide a guide to retrofit existing infrastructure
- Facilitation of community design workshops could help MnDOT learn about safety concerns and incorporate feedback from people that use the transportation system in the design of new infrastructure

### 5.4.4 Enhance Job Accessibility Measures

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MnDOT's Performance Dashboard publishes job accessibility data, generated by the Accessibility Observatory at the University of Minnesota and the Metropolitan Council, to track the performance of the peak hour transit and auto networks as well as bicycle accessibility throughout Minnesota.

MnDOT also provides supplemental information about transit and bicycle commuting in Minnesota via two resources on the dashboard: 1) infographics depicting the factors that contribute to job accessibility via transit, the Minneapolis-St. Paul Metro area transit network, and the 30- and 60-minute commute-sheds in the Metro area (see Figure 14); and 2) graphics showing 30-minute transit and bicycle commute maps for other major Minnesota metro areas (see Figure 15).

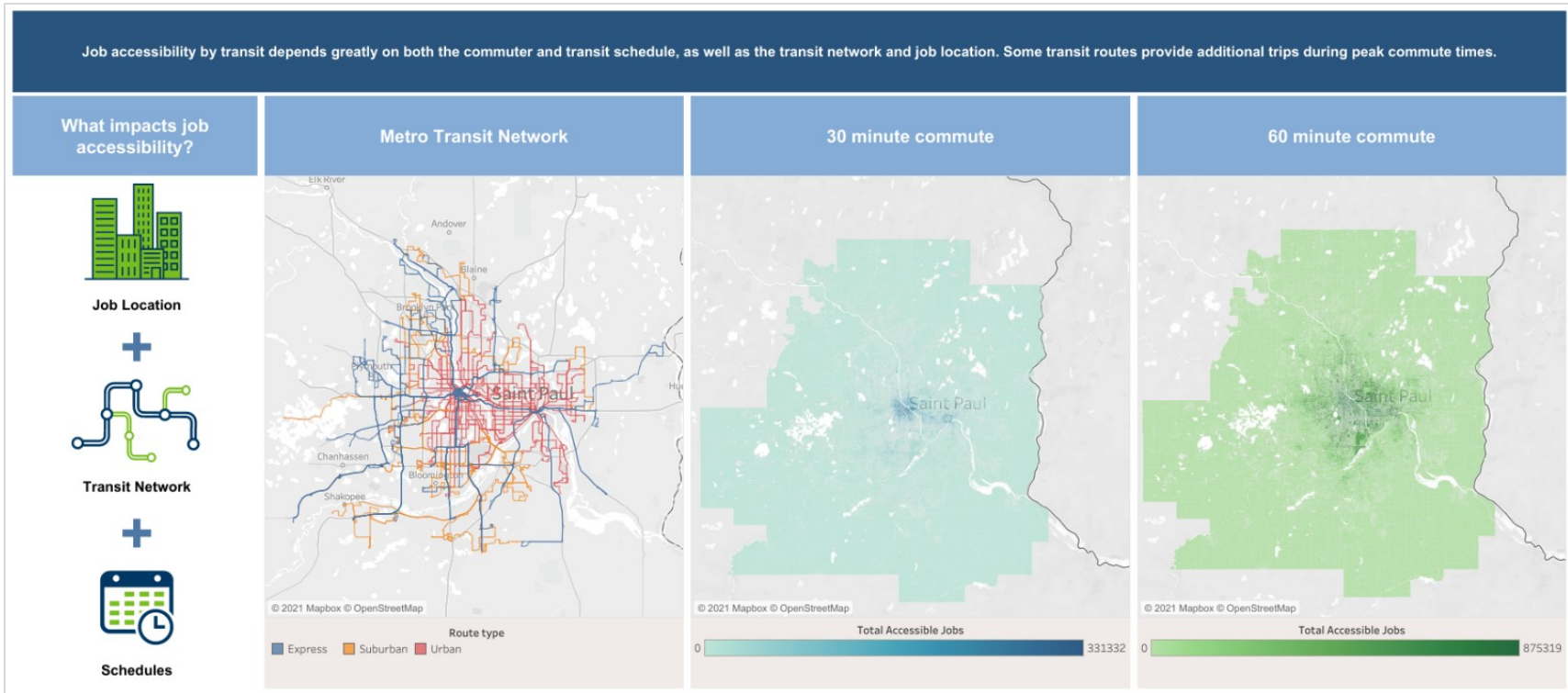


Figure 14. Screenshot of Transit Job Accessibility Infographic<sup>17</sup>

<sup>17</sup> Source: <https://performance.minnesotago.org/critical-connections/access>

# Snapshot of Job Accessibility by Transit, 2019

30 minute commute in major Minnesotan metros

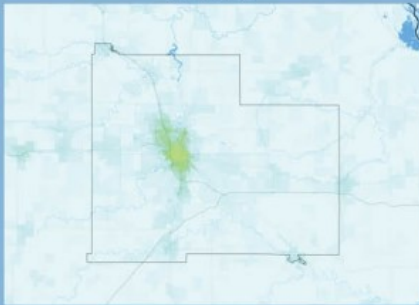
Duluth



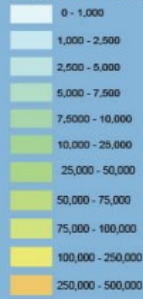
Fargo-Moorhead



Rochester



## Total Accessible Jobs





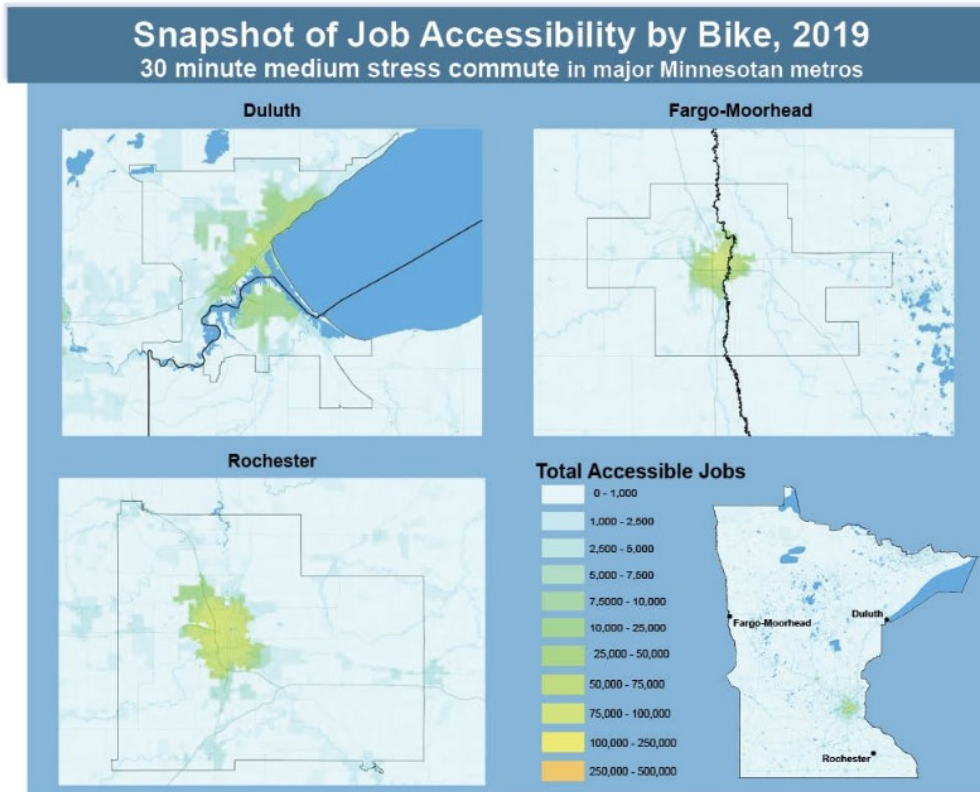


Figure 15. Screenshot of 30-minute Transit Commute Maps in Other Minnesota Metros <sup>17</sup>

#### 5.4.4.1 Equity Observations and Opportunities

In the current iterations, MnDOT’s job accessibility measures for transit, bicycle, and auto commute trips do not present historical data or any information about the time period represented by the data that is shown. Nor do these measures include a target level of accessibility. Furthermore, other modes (e.g., walking/rolling, taxi/transportation network companies (e.g., Lyft and Uber), carshare, bike/scootershare, telework and technology access) are not included in the measures and, despite having information for statewide accessibility, when the relevant dashboard pages load the focus is on the Minneapolis-St. Paul Metro area only and, for transit and auto commute trips this focus is on morning peak-hour travel.

#### 5.4.4.2 Potential Improvements

What should change and how/why should it change?

The following modifications could improve the existing job accessibility performance measures so that job accessibility is better measured from the perspective of equity:

1. **Introduce a target level of job accessibility and present historical data:** A specific target allows people to better hold MnDOT, and other responsible parties, accountable and historical data

provides temporal context. Currently, neither of the job accessibility measures includes a target level of accessibility or a time-period in which that target will be achieved.

2. **Track job accessibility via all modes including technology:** People travel to work in many ways, such as walking, rolling, using bicycles, sharing rides with friends or family, ridesourcing services or taxis, and many more. Therefore, tracking job accessibility via all modes is required to obtain a comprehensive understanding. Additionally, telecommunications technology facilitates access to jobs that are otherwise inaccessible (either due to distance or health and safety concerns, as the COVID-19 pandemic has recently underscored) therefore tracking access to the technology that supports telework is another factor in job access.
3. **Track job accessibility at times beyond peak commute hours and establish relevant job accessibility targets:** Jobs are available throughout the entire 24-hour day; therefore, people require access to jobs at times outside of the traditional AM and PM commute peaks. Introducing job accessibility targets for the entire 24-hour day and tracking job accessibility at non-peak times (e.g., early morning, late night, or mid-day) provides a more complete picture of accessibility.
4. **Present job accessibility data spatially:** A spatial understanding of the areas with poor job accessibility could help identify areas of persistent low levels of job accessibility and help MnDOT either prioritize interventions in these areas or encourage non-MnDOT service options (e.g., walking, bicycling, taking transit, etc.).

How would the changes improve equity?

---

Efficient and affordable access to a variety of employment opportunities helps people thrive within society. Introducing a target level of job accessibility via all transportation modes could guide infrastructure investments for communities that have limited job accessibility (e.g., new bike routes, subsidies for carsharing, permits for micromobility options, or additional funding for commuter buses) and influence planning decisions (e.g., locations of job centers, housing, and other elements of a community) that prioritize better connections. Establishing targets for job accessibility levels at times beyond peak commute hours helps improve access to jobs for people that work in sectors that do not follow traditional office hours (e.g., healthcare, service, manufacturing, warehousing, transportation, parents and caregivers, students) and further supports improvements to services, infrastructure, and planning. Performance level targets as well as historical and spatial data presentation helps commuters and their communities advocate for improvements.

#### 5.4.4.3 Implementation

**Measurement method:** The method for measuring job accessibility is already in place and can be applied to other modes and times of day as needed. The changes outlined above would require modifications to the data presentation methods—new modes, additional times of day, and improved mapping.

**Data sources:** The Accessibility Observatory at the University of Minnesota.

**Data access:** MnDOT has an existing relationship with the Accessibility Observatory.

**Measurement frequency and data timeliness:** Measurement frequency will remain unchanged from current practice.

**Dashboard update frequency:** Report job accessibility rates annually.

#### 5.4.4.4 Complementary Strategic Actions

What actions can MnDOT take to help mitigate inequities discovered by tracking this measure?

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- Technical assistance and additional funding for multimodal planning and or operational improvements can contribute to improved job accessibility via walking, rolling, bicycling, shared modes (e.g., carshare, ridesourcing, and micromobility), and transit
- Facilitated coordination between local governments and transit operators to enhance transit access to job centers or operate service outside of traditional peak commute times can provide more direct transit access to jobs
- Investments in modes such as walking/rolling helps improve the viability of these modes to access jobs
- Investing in- or facilitating access to- telecommunication infrastructure (e.g., ensuring everyone has access to highspeed internet) can help more people access telework opportunities as well as other resources such as education and healthcare

#### 5.4.5 Enhance Workforce Measures

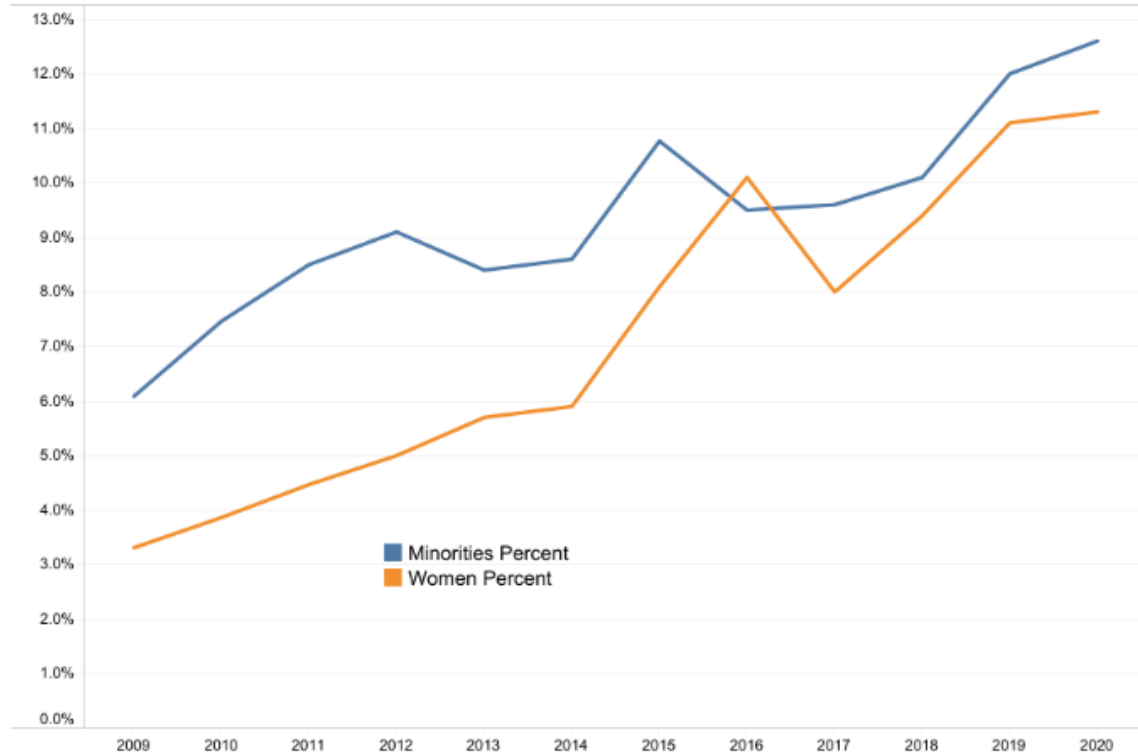
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MnDOT tracks the diversity of its workforce by identifying the percentage of contracted workers on federally funded projects that identify as either women or minorities (see Figure 16) and the percentage of workers at MnDOT that are either female or identify as minorities (see Figure 17). Additionally, MnDOT tracks the rate of participation in on-the-job training (see Figure 18) which is complemented by an infographic depicting trainee ethnicity, trade, employer, and gender during a single year (see Figure 19).

## Percent of Total Headcount for Women & Minorities in Highway Construction Workforce on Federally Funded Projects: One Week Snapshot

### Analysis of Results

Contractors working on a federal-aid highway construction project during the last payroll period in July must report their workforce by job category, gender, and ethnicity. During 2020, 11.3 percent of people working on a federal-aid highway construction project were women and 12.6 percent were minorities. By comparison in 2019, 11.1 percent of people working on a federal-aid highway construction project were women and 12.0 percent were minorities. Women and minority highway construction participation rates are also tracked at the county level to determine compliance with goals established through state and federal regulations.



Source: MnDOT Office of Civil Rights

Figure 16. Screenshot of MnDOT's Percent of Total Workforce on Federally Funded Projects that Identify as Women or Members of Minority Groups Performance Measure <sup>18</sup>

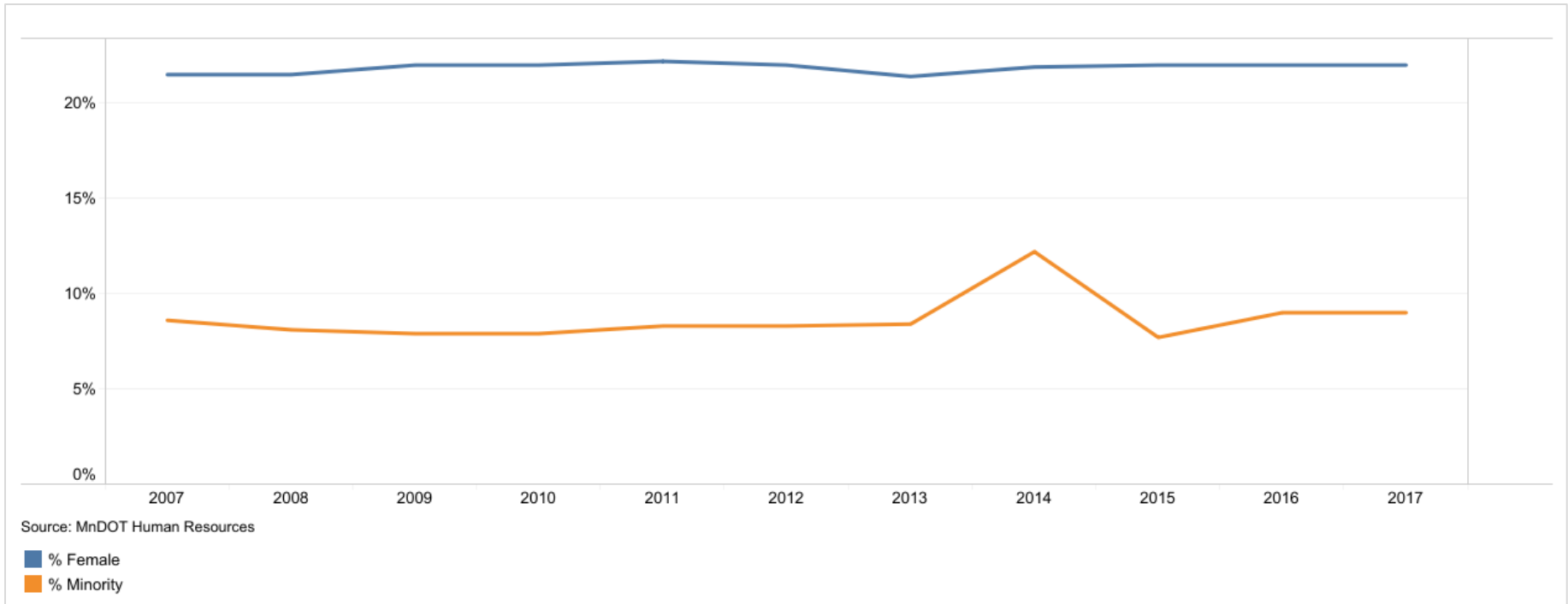


Figure 17. Screenshot of MnDOT’s Women and Minorities Working at MnDOT Performance Measure <sup>18</sup>

<sup>18</sup> Source: <https://performance.minnesotago.org/open-decision-making/workforce-diversity/annual-percent-minorities-and-women-highway-heavy-construction-workforce>

### Trainees Employed by Contractors Working on Highway Construction Projects Analysis of Results

This measure represents the number of trainees employed by contractors working on highway construction each calendar year.

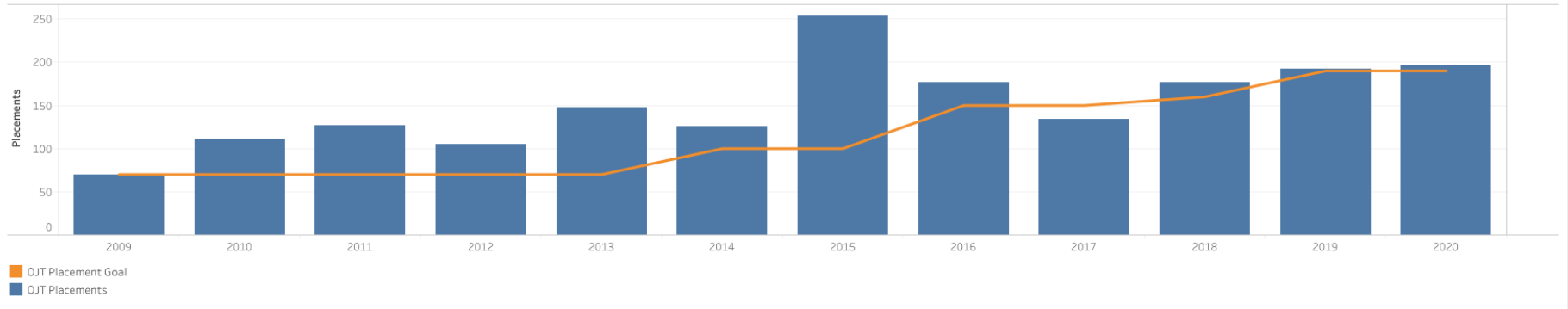


Figure 18. Screenshot of MnDOT's On the Job Training Performance Measure <sup>18</sup>

## 2020 ON THE JOB TRAINING PROGRAM

Training program to increase the pool of qualified people of color, women and disadvantaged individuals in the highway construction trades

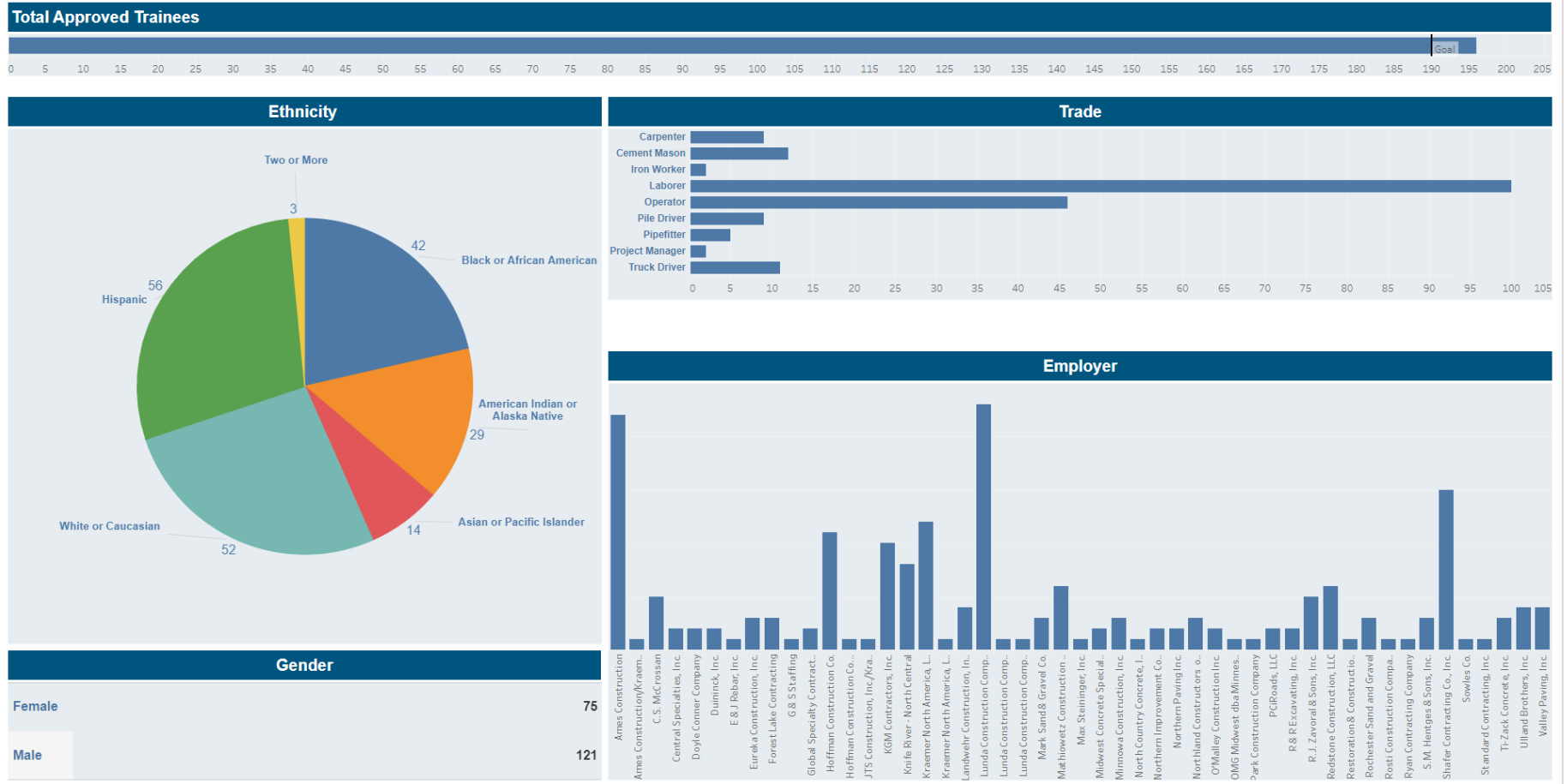


Figure 19. Screenshot of MnDOT's On the Job Training 2020 Infographic <sup>18</sup>

#### 5.4.5.1 Equity Observations and Opportunities

MnDOT's workforce performance measures track the inclusion of some traditionally underrepresented groups (women and "minorities") in the transportation industry by establishing hiring targets for contractors on federal projects and for MnDOT's internal operations. Additionally, the number of employees participating in on-the-job training is tracked. However, each of the measures present some opportunities to improve equity. Measures that track gender emphasize a binary gender perception (e.g., only women and men) instead of tracking and providing information about gender identities on a spectrum (e.g., women, men, non-binary/other, agender, genderfluid) and the internal workforce measure confuses biological sex (e.g., female, intersex, male) with gender. Measures that track race and ethnicity aggregate data under the term "minorities" which is not inclusive and does not provide any information about specific groups (such as those included in Figure 19). Additionally, the measure for on-the-job training does not track gender or race/ethnicity. The measure that tracks workforce inclusion in federally funded projects neglects projects that use other revenue sources and uses a one-week snapshot of the workforce to represent an entire year. None of the workforce measures include a target level of workforce participation for any of the groups tracked, nor do these measures provide the information spatially.

#### 5.4.5.2 Potential Improvements

What should change and how/why should it change?

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The following modifications could improve the existing workforce performance measures so that inclusion is better measured from the perspective of equity:

1. **Introduce a target level of workforce inclusion for each of the workforce measures** (*including targets for groups outlined in following modifications*): A specific target allows people to better hold MnDOT and other responsible parties accountable. Currently, none of the workforce measures includes a target level of workforce participation for any of the groups tracked or a time-period in which that target will be achieved. It is likely that a public engagement process would result in the best targets, however the current demographics of MnDOT's districts can provide a starting point for these discussions.
2. **Refine data collection and presentation to be inclusive of all genders**: Updating gender terminology (and, therefore, the data that is tracked) so that it is representative of all genders acknowledges the spectrum of identities within our communities and helps ensure the transportation workforce is representative.
3. **Refine data collection and presentation to be inclusive of all races/ethnicities**: Updating race and ethnicity terminology (and, therefore, the data that is tracked) so that it is representative of all races and ethnicities acknowledges community diversity and helps ensure the transportation workforce is representative.
4. **Update the measure that tracks on the job training so that it includes gender and race/ethnicity data**: Training opportunities are critical to career advancement and help to



ensure that traditionally underrepresented groups within the transportation industry are retained long term.

5. **Update the measure that tracks inclusion on federally funded projects to track other projects:** Tracking all types of projects, regardless of revenue sources used, will fully capture the level of workforce diversity and inclusion achieved by MnDOT's contractors.
6. **Update the measures that track inclusion on federally funded projects and within MnDOT's workforce to present quarterly statistics:** Presenting quarterly data would help track workforce trends that would otherwise be missed in annual statistics, such as rapid turnover.
7. **Present workforce inclusion data at the project level for all projects that will last at least six months:** Providing information about workforce inclusion at the project level (e.g., Rethinking I-94) helps to understand whether the workforce benefits generated by a project are realized by the community the project directly impacts.
8. **Present workforce inclusion data spatially:** A spatial understanding of the areas with low levels of inclusion could help identify opportunities for MnDOT and its contractors to enhance recruitment among traditionally underrepresented groups.

#### How would the changes improve equity?

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The transportation industry is a large employment resource that provides stable jobs with room for growth. However, these opportunities are not necessarily accessible, or as accessible, to everyone. Establishing target levels of workforce inclusion informed by community demographics and input will help make the workforce representative of the community. Increasing the specificity of the data collected and reported (e.g., improving gender identity and race/ethnicity data) will better reflect community members' individual identities. Adding detail to the way the results are presented (e.g., at the project level and spatially) will help to ensure the benefits of the workforce inclusion efforts are available throughout Minnesota.

#### 5.4.5.3 Implementation

**Measurement method:** The method for measuring workforce inclusion is already in place. The changes outlined above would require modifications to the data collection and presentation methods—improved gender information and specific race/ethnicity information (as shown in Figure 19). Data collection and target setting are completed by a different state-level agency—the Department of Human Rights. Work would need to be coordinated across agencies.

**Data sources:** MnDOT Office of Civil Rights and MnDOT Human Resources.

**Data access:** MnDOT collects the information directly.

**Measurement frequency and data timeliness:** Within MnDOT, measurement occurs during the process of employee intake (or separation). For MnDOT contractors the process is likely the same. Data collection (or reporting, in the case of contractors) should be adjusted to facilitate quarterly dashboard updates.

**Dashboard update frequency:** Report workforce inclusion quarterly.

#### 5.4.5.4 Complementary Strategic Actions

What actions can MnDOT take to help mitigate inequities discovered by tracking this measure?

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- Collaboration with high schools, colleges, and universities (including those in rural and tribal communities) to offer internships and other opportunities to learn about or train for a career in transportation, especially if targeted to groups that are underrepresented in the workforce, could help attract candidates.
- Facilitation of Diversity, Equity, and Inclusion trainings within MnDOT and with MnDOT contractors could help improve inclusion and hiring practices.

## 5.5 INNOVATIVE PERFORMANCE MEASURES

The above sections present potential equity-first improvements for existing performance measures. However, even with these improvements, existing performance measures do not illuminate some transportation equity issues. To complement the current performance measures, the research team developed additional performance measures that introduce innovative concepts to the traditional transportation performance measure process, as outlined in the following sections.

*\*\* Note: A community engagement process prior to implementation, and at regular intervals after implementation, of any proposed performance measures and targets will help ensure that the measures realistically represent the needs of the people and that the performance measures evolve along with changing needs. \*\**

### 5.5.1 Multimodal Access and Impact

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Access to multi-modal transportation options and connections—defined as transportation modes that are not single-occupancy personal vehicles (SOVs), such as public transit, bicycles, walking, rolling, bike and scootershare, carshare, carpool, vanpool, ridesharing, or ridehailing—helps to facilitate travel without the need for a personal vehicle. Currently, MnDOT tracks some aspects of multi-modal performance: transit on-time performance, span of service, job accessibility, and ridership; ADA accessibility of sidewalks, curb ramps, and pedestrian signals; and survey responses indicating the perception of safe environments for bicycling and walking.

#### 5.5.1.1 Equity Observations and Opportunities

MnDOT's current multi-modal performance measures help to understand and improve the transportation network for people that do not use personal vehicles. However, many aspects of the multi-modal travel experience are not tracked and therefore, not considered in decision-making or made available for people and communities to advocate for improved conditions. The following aspects

of multi-modal transportation present opportunities for MnDOT to establish relevant performance expectations and to collect information that better describes the user experience and incorporates local context (each should incorporate indicators of the travel experience for people with disabilities):

- Access to destinations – what level of accessibility is possible via all non-SOV modes, by time of day and day of week?
- Total trip time – how long does a typical trip take to complete via non-SOV modes (including wait times and trips that could not be complete due to circumstances beyond a person’s control such as lack of snow clearance from curb ramps) and how does that compare to SOV trips, by time of day and day of week?
- Total trip cost – how much does a typical trip cost via non-SOV modes and how does that compare to SOV trips, by time of day and day of week?
- Option availability – which non-SOV options are available in what locations, at what times of day, and on what days per week?
- Availability of service for vulnerable and marginalized communities – how does the availability of, and access to, non-SOV options differ according to demographics?
- Satisfaction levels – do the available non-SOV options meet the needs of the people that have access to them and, if not, what could be better?
- Affordability – what is done to ensure access to non-SOV options for people with limited transportation budgets?
- Long-distance access to destinations – what level of long-distance accessibility is possible via non-SOV and non-air options (e.g., intercity bus and passenger rail) and how does it compare to SOV and air travel?

#### 5.5.1.2 Potential Improvements

What measures should be added to MnDOT’s current program and how will those improve equity?

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**Community Connectivity** – Measures access to destinations and availability of service options, at the census tract level, for each hour of the day and day of the week, measured and reported quarterly.

- *Destination access target:* access to at least one of each of the critical destinations (grocery stores, educational institutions, healthcare facilities, and job centers) by a non-SOV mode from each census tract.<sup>19</sup>

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<sup>19</sup> It is important to note that this target cannot account for the quality of the destinations that are accessible (e.g., whether those options meet a person’s or a community’s specific needs) nor can it track the “match” between people that have access and the opportunities available at the destination (e.g., access to a tech-focused job center may not be helpful for people without that skillset). Considerations for quality and match should be incorporated in broad planning and coordination efforts.

- *Option availability target:* at least one non-SOV option available at any time of day in all census tracts within census-designated urbanized areas and from 5am to 12am in all other areas (or whatever is determined to be the mean “open hours” for critical destinations in these areas).

The Community Connectivity performance measure will help the public and decision makers gauge the quality of the multi-modal transportation network in Minnesota while illuminating spatial and temporal barriers to access at the census tract level. This information will facilitate strategic transportation improvements to enhance access to critical destinations for everyone, with the largest impacts likely felt among (and possibly first implemented in) traditionally marginalized and vulnerable communities. Of note, is that presence of a destination doesn’t imply that the destination meets the cultural, social, religious, etc. needs of community members. Work to identify destinations should be completed in collaboration with the community.

**Personal Investment** – Measures the personal costs (temporal and fiscal) incurred by using Minnesota’s multi-modal transportation network compared to the costs for SOV trips by tracking the time and financial investment required to make a set of standard trips (e.g., to travel 2/5/10/20 miles away from the center point of each MnDOT district), measured and reported for week days, Saturdays, and Sundays monthly.

- *Time cost target:* Multimodal trips take no more than 110 percent of time required for a comparable SOV trip, including the time required to wait for pickups.
- *Financial cost target:* Multimodal trips cost no more than 50 percent of the costs of a comparable SOV trip

The Personal Investment performance measure will facilitate direct comparison between the efficiency and affordability of SOVs trips (the transportation network’s default mode) with non-SOV options to highlight differences in performance of each mode and inform investments to improve non-SOV modes (modes which often provide transportation service to a high percentage of people that identify as being from marginalized and vulnerable groups, such as people of color and people with low incomes).

**Supportive Policies** – Measures the presence and impact of initiatives to support access to non-SOV transportation options for people with limited transportation budgets. Measurement is achieved by identifying policies and practices (from both public- and private-sector transportation providers) to reduce the user cost of transportation and tracking the number of participants in each program compared to the number of eligible participants within the entity’s service area, measured monthly and reported annually.

- *Policies and practices target:* all transportation providers offer support to people with limited transportation budgets.
- *Initiative impact target:* 75 percent of the eligible participants use the supportive options available to them.

The Supportive Policies performance measure will help MnDOT monitor the presence and success of efforts to reduce financial barriers to non-SOV options and support development of lessons learned (via supplemental data collection from initiatives that achieve the initiative impact target) to inform other efforts.

**Service Effectiveness** – Measures, via MnDOT’s regular surveys, the level of satisfaction with non-SOV transportation options (sampling people that use various options and non-users with statistically significant representation of all genders, races/ethnicities, income levels, and disability statuses). This data will help understand overall satisfaction (with supporting information pertaining to unmet needs, areas for improvement, high-demand options, and perceptions of safety). Measurement will be done via survey and findings will be reported after data collection, with findings organized by demographics.

- *Satisfaction target: 90 percent satisfaction within each demographic subcategory*

The Service Effectiveness performance measure will give a voice to members of the public that often do not receive as much attention from decision-makers as people that use SOVs and help MnDOT understand how to ensure the non-SOV options available in Minnesota meet the needs of the people that choose to use these options.

**Interstate Travel** – Measures accessibility to inter-region and inter-state destinations via intercity bus and passenger rail options by tracking departures from each MnDOT district (according to time of day and day of week) and the number of unique destinations available, each measured and reported quarterly.

- *Interregion departures target: Six departures per day to other regions of Minnesota*
- *Interstate departures target: Three departures per day to other states*
- *Interregion destinations target: Access to four destinations in other regions of Minnesota*
- *Interstate destinations target: Access to ten other states*

The Interstate Travel performance measure will help MnDOT encourage the development (or, at least, maintenance) of long-distance travel options that are more affordable than either SOV or air travel and that do not require as much risk of exposure to law enforcement by marginalized and vulnerable individuals.

Combined, these measures will facilitate better understanding of where and when people are forced, by a lack of reliable and affordable options, to either invest in and rely on SOVs in order to access their communities or potentially forego access.

#### 5.5.1.3 Data Considerations

**Error! Reference source not found.** Table 7 summarizes the data considerations for the Multi-Modal Access and Impact performance measures.

**Table 7. Data Considerations – Multi-Modal Access and Impact Performance Measures**

<b>Measure</b>	<b>Data Requirements</b>	<b>Data Sources</b>	<b>Data Access</b>
<b>Community Connectivity</b>	<ul style="list-style-type: none"> <li>– Route, stop, service area, and span of service information for each mode</li> </ul>	<ul style="list-style-type: none"> <li>– Service providers</li> <li>– Public entities (bike and pedestrian networks)</li> </ul>	<ul style="list-style-type: none"> <li>– Some data potentially available via open-source databases (e.g., transit information and bikeshare locations) but other data requires agreements, collection, and coordination with data holders</li> <li>– MnDOT data may require interdepartmental coordination</li> </ul>
<b>Personal Investment</b>	<ul style="list-style-type: none"> <li>– Service schedules for each mode</li> <li>– Average cost of service for each mode</li> </ul>	<ul style="list-style-type: none"> <li>– Service providers</li> <li>– Model standard trips</li> </ul>	<ul style="list-style-type: none"> <li>– Same access as previous measure in table</li> </ul>
<b>Supportive Policies</b>	<ul style="list-style-type: none"> <li>– Public-sector programs, policies, ordinance, and legislations</li> <li>– Private-sector programs, policies, and initiatives</li> <li>– Participation rates in public and private options</li> </ul>	<ul style="list-style-type: none"> <li>– Service providers</li> <li>– Public entities</li> </ul>	<ul style="list-style-type: none"> <li>– Same access as previous measure in table</li> </ul>
<b>Service Effectiveness</b>	<ul style="list-style-type: none"> <li>– Survey responses</li> </ul>	<ul style="list-style-type: none"> <li>– MnDOT collects this information directly</li> </ul>	<ul style="list-style-type: none"> <li>– Same access as previous measure in table</li> </ul>
<b>Interstate Travel</b>	<ul style="list-style-type: none"> <li>– Route, stop, service area, and span of service information for each mode</li> </ul>	<ul style="list-style-type: none"> <li>– Service providers</li> </ul>	<ul style="list-style-type: none"> <li>– Same access as previous measure in table</li> </ul>

**5.5.1.4 Complementary Strategic Actions**

What actions can MnDOT take to help mitigate inequities discovered by tracking this measure?

**Community Connectivity** – Facilitation of coordinated transportation and land-use planning efforts could help improve connectivity and introduce entities that might not otherwise collaborate on such efforts.

**Personal Investment** – Planning for transit priority or improved bike and pedestrian connectivity, for example, can help to reduce the time burden of non-SOV travel. Incentives and subsidies (either provided by or facilitated by MnDOT) to private-sector non-SOV options, such as bikeshare, scootershare, carshare, and ridehailing services, could help financial costs for riders. Participatory

budgeting programs at the local, regional, and state levels could help allocate funding to support incentives and subsidies designed to reduce financial burdens from non-SOV options.

**Supportive Policies** – Facilitation and sponsorship of activities to learn about and develop supportive policies that can be implemented by transportation providers could increase the prevalence and success rate of such programs. Participatory budgeting programs at the local, regional, and state levels could help allocate funding to enable supportive policies.

**Service Effectiveness** – MnDOT could facilitate workshops and other coordinated efforts to improve service effectiveness with both public- and private-sector transportation providers, using the findings from this measure to guide the workshop objectives.

**Interstate Travel** – MnDOT could encourage and incentivize additional stops for intercity bus and passenger rail service either through financial investments or via coordinated planning and grant-writing efforts with regional and local governments.

### 5.5.2 Community and Built Environment Factors that Impact ADA Accessibility

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ADA accessibility is impacted by numerous factors in and adjacent-to the transportation network, including physical infrastructure (e.g., sidewalk condition and provision of accessible transit-access infrastructure) and jurisdictional limitations (e.g., right-of-way or adjacent property ownership and land-use designations). Currently, MnDOT tracks accessibility performance for three built environment elements: ADA-compliant sidewalks, curb ramps, and pedestrian signals.

#### 5.5.2.1 Equity Observations and Opportunities

MnDOT's current ADA performance measures help to ensure a minimum level of accessibility is available to people with disabilities who use state-owned infrastructure to either walk or roll. However, many aspects of the ADA experience are not tracked and therefore, not considered in decision-making or made available for people to advocate for improved conditions. The following aspects of ADA accessibility present opportunities for MnDOT to establish relevant performance expectations and to collect information that better describes the user experience and incorporates local context:

- Accessible bus stops – how many bus stops are accessible to people using wheelchairs or other mobility devices?
- Pedestrian connections to accessible bus stops – how many accessible bus stops can be reached via accessible pedestrian infrastructure?
- Sidewalk and multi-use path design and condition – with what frequency are sidewalks and paths interrupted or designed/maintained in ways that reduce accessibility?
- Land ownership and use designation – what entity controls the right-of-way and what land-use designation is adjacent?
- Infrastructure investment requirements – how is development leveraged to improve accessibility via funding for new infrastructure?

- Presence of people with disabilities – where are people with disabilities located and what types of disabilities are present (and at what frequency)?

### 5.5.2.2 Potential Improvements

What measures should be added to MnDOT’s current program and how will those improve equity?

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**Transit Supportive Facilities** – Measures provision of bus stops and pedestrian connections to bus stops that are ADA-compliant, measured and reported annually.

- *Accessible bus stop connections target:* all pedestrian connections to bus stops meet ADA accessibility standards.
- *Accessible bus stops target:* all bus stops meet ADA accessibility standards.

People with disabilities often rely on public transit to meet their transportation needs, however, due to infrastructural deficiencies, their opportunity to use fixed route transit (often more convenient and less costly than ADA-paratransit options) is curtailed. The Transit Supportive Facilities performance measure will help identify barriers to fixed-route transit access for people with disabilities. This information will help prioritize the implementation of more transit supportive infrastructure to help people with disabilities travel with fewer barriers and encourage partnerships between MnDOT, transit agencies, local jurisdictions, and landowners.

**Sidewalk and Path Conditions** – Measures frequency and location of conditions, in otherwise accessible environments (e.g., incomplete sidewalk ), which impede accessibility. The measure would count three aspects of accessible sidewalks and paths—unmitigated driveway interruptions, extreme slopes, and pavement maintenance issues that reduce usability—counted per quarter mile and reported annually. Unmitigated driveway interruptions are defined as those interruptions without an ADA-compliant section of sidewalk or path adjacent to the vehicle egress slope. Extreme slopes are locations/sections of sidewalks or pathways where the slope that runs in the direction of travel or those that run perpendicular to the direction of travel are beyond ADA compliance

- *Unmitigated driveways target:* all driveways incorporate mitigations to ensure ADA accessibility.
- *Extreme slope locations target:* all infrastructure is without extreme slopes other than those locations where topography forces extreme running slopes.
- *Maintenance issues target:* no more than five percent of the network is impacted by maintenance issues at any one time.

The Sidewalk and Path Conditions measure will help identify locations within the pedestrian network in Minnesota that present barriers to people with disabilities providing people that use the system, communities, and decision-makers with better information about the level of accessibility provided by existing infrastructure and help direct investments accordingly.

To provide context for the above performance measures, all findings should be presented on a map that incorporates data layers presenting: information about people with disabilities (rates and types of



disability); land ownership information (both for the right of way and adjacent property); nearby land-use designations; information about requirements for infrastructure investment by developers; and all relevant jurisdictions associated with a particular facility. Combined with the performance measure data, collection and presentation of these data at the neighborhood level will facilitate assessment of whether needs are being met and contribute to strategic interventions to improve ADA accessibility in areas of especially high need.

### 5.5.2.3 Data Considerations

Table 8 summarizes the data considerations for the Community and Built Environment Factors that Impact ADA Accessibility performance measures.

**Table 8. Data Considerations – Community and Built Environment Factors that Impact ADA Accessibility Performance Measures**

Measure	Data Requirements	Data Sources	Data Access
<b>Transit Supportive Facilities</b>	<ul style="list-style-type: none"> <li>– Location of bus stops and accessibility status</li> <li>– Location of bus stop connections and accessibility status</li> </ul>	<ul style="list-style-type: none"> <li>– Service providers</li> <li>– Public entities (sidewalks and paths)</li> </ul>	<ul style="list-style-type: none"> <li>– Some data potentially available via open-source databases (e.g., MPO geographic information systems) but other data requires agreements, collection, and coordination with data holders</li> </ul>
<b>Sidewalk and Path Conditions</b>	<ul style="list-style-type: none"> <li>– Mitigation of driveways</li> <li>– Location of extreme slope</li> <li>– Location of maintenance issues</li> </ul>	<ul style="list-style-type: none"> <li>– Public entities</li> </ul>	<ul style="list-style-type: none"> <li>– Same access as previous measure in table</li> </ul>

### 5.5.2.4 Complementary Strategic Actions

What actions can MnDOT take to help mitigate inequities discovered by tracking this measure?

- Grant programs for accessible bus stops/bus stop connections and improved sidewalk and path conditions as well as in-kind engineering and design assistance could help local entities and transit agencies update their infrastructure.
- Participatory budgeting programs at the local, regional, and state levels could help allocate funding for ADA infrastructure improvements.

### 5.5.3 User Experience and Local Context

Understanding how people experience their transportation network and within what context that experience takes place is a critical component of equity improvements. Currently, MnDOT tracks responses to a variety of questions from the agency’s Omnibus survey. The survey helps to gauge the public’s perception of the agency’s performance including a question that measures respondents’ perceptions of walking and bicycling safety, as shown in Figure 20.

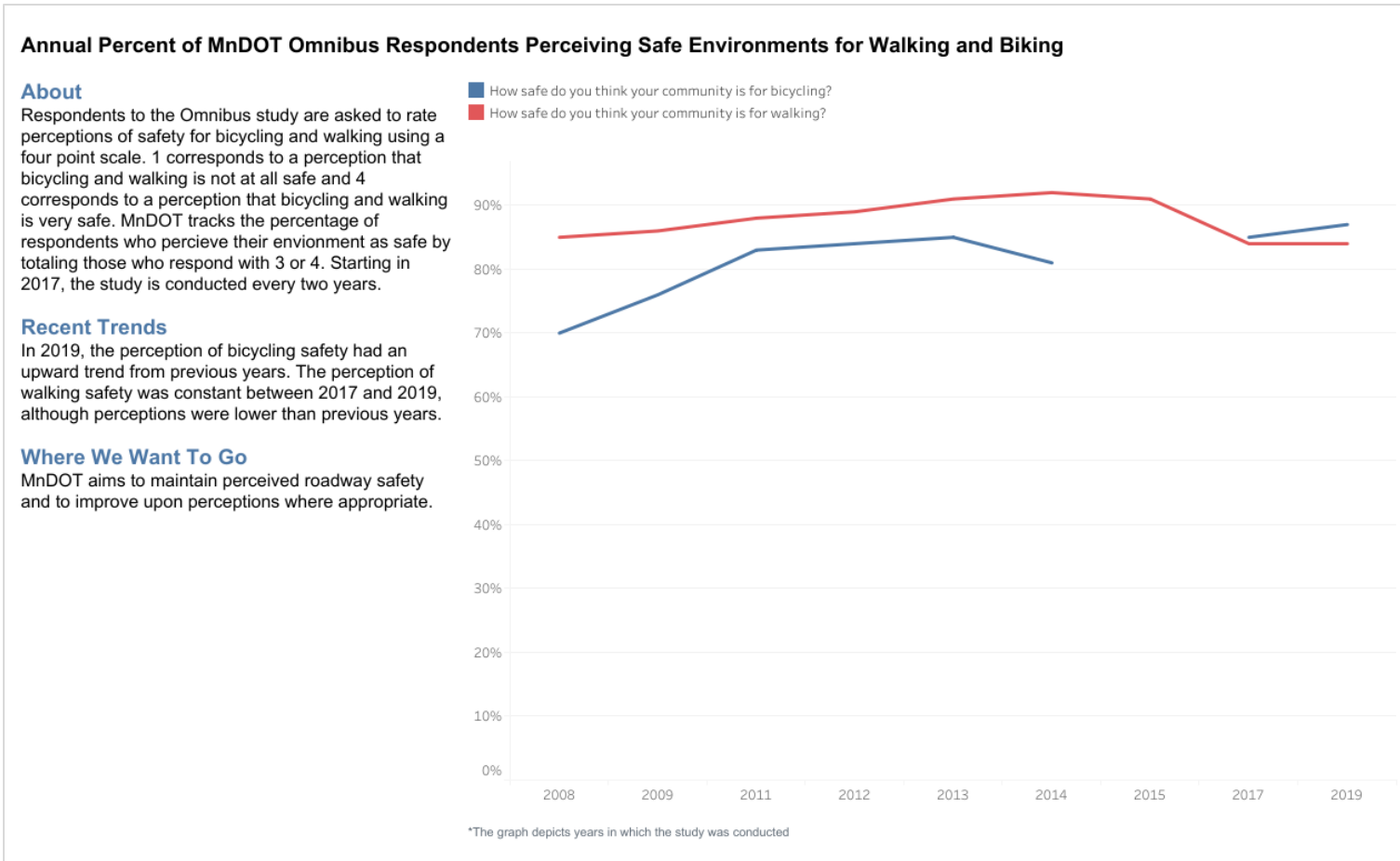


Figure 20. Screenshot of MnDOT’s Annual Percent of MnDOT Omnibus Respondents Perceiving Safe Environments for Walking and Biking Performance Measure <sup>20</sup>

<sup>20</sup> Source: <https://performance.minnesotago.org/healthy-communities/healthy-people/annual-percent-mndot-omnibus-survey-respondents-perceiving-safe-environments-bicycling-walking>

### 5.5.3.1 Equity Observations and Opportunities

MnDOT's safety perception performance measure presents a state-wide summary of respondents' perceptions of safety for walking and bicycling within their communities. However, this is the only survey data tracked that is designed to understand user experience. Additionally, the safety perception measure does not elaborate on the context and perspective from which the response is made, provide actionable information, or provide perceptions about other non-SOV modes (e.g., public transit, bike and scootershare, carshare, carpool/vanpool, ridesharing, or ridehailing). The following aspects of perception present opportunities for MnDOT to establish relevant performance expectations and to collect information that better describes the user experience and incorporates local context:

- User perspective – what is the respondent's race/ethnicity, age, gender, home location, disability status/type, and trip purpose (recreation VS utility)?
- Neighborhood scale – what are the results at local levels?
- Frequency of participation – how often do the respondents actually walk, roll, or bicycle (and on what types of facilities)?
- Expectations – was the experience in line with the expectations (e.g., as provided by MnDOT's bike infrastructure comfort level scale)?
- Access to destinations – does the infrastructure facilitate trips to the destinations the person wants to access in the way they want to access them?
- Experience with share modes – how does the travel experience change when using shared modes?

### 5.5.3.2 Potential Improvements

What measures should be added to MnDOT's current program and how will those improve equity?

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**User Expectations** – Measures how well the transportation network matches the expectations of people that use the system by asking survey respondents to rate how well their experience using various components of the transportation network (e.g., bicycle lanes, multi-use paths, sidewalks, transit, bike and scootershare, etc.) aligns with their expectations for that component.

- *Expectations target*: expectations for each component included in the survey should be met at least 80 percent of the time.

The User Expectations performance measure will quantify the expectations of people using the transportation network to identify transportation modes and components of the transportation network that are not meeting expectations.

**Mode Viability** – Measures how well the transportation network meets the needs of people that use it by asking survey respondents to identify the transportation options available to them and rate how well and how safely each option works to help them complete their preferred trips.

- *Needs met target*: at least two options are considered viable by all respondents.

- *Safety target*: at least two options are considered safe by all respondents.

The Mode Viability performance measure will help MnDOT gauge the usefulness of transportation modes identified by people that use the modes as well as those that respondents do not perceive as available and safe for them. This would help to refine the transportation network so that it better reflects the needs of the people that use it and to track the impacts of MnDOT’s efforts on people’s daily lives.

To provide context for the above performance measures and identify groups with low levels of satisfaction with the transportation network, all findings should be presented on a map that presents findings at the local neighborhood scale and includes filters to view results by demographic categories (race/ethnicity, age, gender, disability status/type, and trip purpose/type) as well as supplemental data layers presenting crash/fatality rates/locations by mode and data on how much people use the facility by mode.

### 5.5.3.3 Data Considerations

Table 9 **Error! Reference source not found.** summarizes the data considerations for the User Experience and Local Context performance measures.

**Table 9. Data Considerations – User Experience and Local Context Performance Measures**

Measure	Data Requirements	Data Sources	Data Access
<b>User Expectations and Mode Viability</b>	– Survey responses	– MnDOT collects this information directly	– May require interdepartmental coordination

### 5.5.3.4 Complementary Strategic Actions

What actions can MnDOT take to help mitigate inequities discovered by tracking this measure?

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Facilitation of coordinated service planning and provision of professional development opportunities for planners and service providers could improve the frequency with which people that use the system rate the transportation network as meeting or exceeding their expectations and needs. Coordinated service planning could result in new commuter vanpools or regional bikeways. Professional development could help staff understand what the public wants, how to collect further information, and what their options are for implementing enhancements.

### 5.5.4 Zero Emissions Vehicle Access and Use

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Transportation emissions and the associated climate impacts result in acute and long-term health and quality of life consequences experienced first and most heavily by marginalized and vulnerable communities. Currently, MnDOT tracks environmental impacts of transportation via data showing emissions by vehicle type, vehicle miles traveled, and total annual fuel use.

#### 5.5.4.1 Equity Observations and Opportunities

MnDOT's Performance Dashboard provides state-wide information about some components of transportation emissions and shows that low-capacity surface transportation modes (SOVs and heavy trucks) cause the majority of transportation emissions. However, the current performance measures lack information about the use and availability zero emission vehicles (vehicles that do not contribute to emissions at during vehicle operation) nor is there information about the infrastructure required to support the complete life cycle of these vehicles<sup>21</sup>. A lack of information limits MnDOT's ability to responsibly facilitate growth of these modes and, by association, reduce the harms imparted by the transportation system on marginalized and vulnerable communities.

#### 5.5.4.2 Potential Improvements

What measures should be added to MnDOT's current program and how will those improve equity?

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**Zero Emission Vehicle Use** – Measures the rate of zero emission vehicle use by tracking vehicle miles traveled (VMT), measured at the district level and reported annually.

- *Use target:* zero emissions vehicle represent 50 percent of VMT in 10 years

The Zero Emission Vehicle Use performance measure will present the rate of vehicle adoption and highlight opportunities to encourage higher levels of adoption.

**Zero Emission Vehicle Access and Affordability** – Measures the level of access to zero emissions vehicles by tracking the costs to own or share such vehicles, measured at the district level and reported annually.

- *Affordability target:* equivalent or less costly than fossil-fuel powered alternatives.

The Zero Emission Vehicle Access and Affordability performance measure will provide insight into the financial barriers to zero emission vehicle use.

**Zero Emission Vehicle Infrastructure** – Measures the prevalence of zero emissions vehicle charging and fueling points and tracks the percentage of the electrical grid that has been upgraded to support electric vehicle charging, measured at the district level and reported annually.

- *Charging and fueling point target:* sufficient charging and fueling points to enable travel distances equivalent to fossil fuels vehicles

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<sup>21</sup> Complete life cycle infrastructure includes (but is not limited to) the sources of power to charge the vehicles and locations of power substations required to support a zero emissions fleet, the environmental and social impacts associated with battery production, and the locations and processes for recycling and disposal of vehicles (especially batteries and other e-waste).

- *Electrical grid target:* 50 percent of the grid is upgraded to support electric vehicle charging within five years

The Zero Emission Vehicle Infrastructure performance measure will help track infrastructure upgrades to ensure that zero emission vehicle adoption is not curtailed by lack of charging or fueling facilities.

**Zero Emission Vehicle Re-use and Recycling** – Measures availability and impact of vehicle re-use and recycling programs for zero emissions vehicles, measured at the district level and reported annually.

- *Availability target:* all vehicle recycling programs and services have the ability to accept zero emissions vehicles.
- *Impact target:* 90 percent of vehicle components, including propulsion systems, are reused or recycled.

The Zero Emission Vehicle Re-Use and Recycling performance measure will help reduce the impact of new vehicle technologies by encouraging an environmentally friendly end-of-life process for zero emissions vehicles.

**Zero Emission Vehicle Emissions at Fuel Source** – Measures the emissions generated by the source of a zero emission vehicle fuel (e.g., emissions from electricity generation).

- *Emissions target:* zero emissions vehicles are fully powered by zero emissions sources (e.g., wind or solar power) in 20 years

The Zero Emission Vehicle Emissions performance measure will present the secondary emissions associated with zero emissions vehicle fuel sources (e.g., electricity, hydrogen, etc.). to encourage use of zero emissions fuels sources for zero emissions vehicles.

#### 5.5.4.3 Data Considerations

Table 10 **Error! Reference source not found.** summarizes the data considerations for the Zero Emissions Vehicle Access and Use performance measures.

**Table 10. Data Considerations – Zero Emissions Vehicle Access and Use Performance Measures**

<b>Measure</b>	<b>Data Requirements</b>	<b>Data Sources</b>	<b>Data Access</b>
<b>Zero Emission Vehicle Use</b>	– VMT by zero emission vehicles	– MnDOT collects this information directly	– Some data potentially available via open-source databases (e.g., average vehicle ownership data for zero emission vehicles) but other data requires agreements, collection, and coordination with data holders
<b>Zero Emission Vehicle Access and Affordability</b>	– Zero emission vehicle ownership costs – Zero emission vehicle carsharing costs	– Vehicle manufacturers – Carsharing companies – U.S. Department of Energy	– Same access as previous measure in table
<b>Zero Emission Vehicle Infrastructure</b>	– Location of vehicle charging ports – Location of vehicle fueling stations – Capacity of the electrical grid	– Vehicle manufacturers – Power companies – Fuel companies	– Same access as previous measure in table
<b>Zero Emission Vehicle Re-use and Recycling</b>	– Capabilities of vehicle recycling programs and services	– Vehicle recycling program/service operators	– Same access as previous measure in table
<b>Zero Emission Vehicle Emissions at Fuel Source</b>	– Types of fuel used by the zero-emissions vehicle fleet	– Vehicle sales data	– Same access as previous measure in table

**5.5.4.4 Complementary Strategic Actions**

What actions can MnDOT take to help mitigate inequities discovered by tracking this measure?

- Subsidies and other incentives could help improve the affordability of zero emission vehicles (either for ownership or shared vehicle programs), encourage the implementation of supporting infrastructure, and support the establishment of vehicle re-use and recycling initiatives.
- Access to state owned property, or state-facilitated access to property held by other jurisdictions or land owners, could help to improve the availability of charging/fueling locations or facilitate improvements to the electrical grid.

### 5.5.5 Inclusion and Representation

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Traditionally, the transportation industry has employed and been led by a group of people that were not always representative of the communities they serve—men who were majority white. Such conditions, combined with systemic structural inequities, have created a transportation network that privileges the needs of some, disregards the needs of others, and frequently bars women and people of color from the good pay and long-term security associated with jobs in the transportation industry. To successfully serve the entire community, the transportation industry must reflect the community. MnDOT currently tracks inclusion and representation within its workforce by tracking the gender and race or ethnicity of contractor employees on federally funded projects and among MnDOT staff as well as the rate of contractor employee participation in on-the-job training opportunities—as discussed in the section titled Enhance Workforce Measures above.

#### 5.5.5.1 Equity Observations and Opportunities

Tracking workforce inclusion is critical to improving representation within the transportation industry. However, MnDOT’s current performance measures do not account for some critical parts of workforce inclusion or broader questions of representation. The following aspects of inclusion and representation present opportunities for MnDOT to establish relevant performance expectations and to collect information that better describes the complete employment life cycle and representativeness within MnDOT and the Minnesota transportation industry:

- Success rate – how many people, by demographic category\*, apply for opportunities compared to the number that are hired or promoted?
- Pay parity – how do pay rates for similar roles differ between people by demographic category\*?
- Tenure – how long do people stay in the industry in Minnesota, by demographic category\*?
- Discrimination – what are the statistics for discrimination complaints and investigations?
- Hiring – who is doing the hiring and how do their demographics\* compare to successful candidates?
- Decision-making – who is making decisions and how do their demographics\* compare with the communities they serve?

*\* Note: Demographic categories includes race/ethnicity, gender, age, educational attainment, disability status/type, and relevant occupation category from the U.S. Bureau of Labor Statistics.*

#### 5.5.5.2 Potential Improvements

What measures should be added to MnDOT’s current program and how will those improve equity?

**Successful Applicants** – Measures the rate of successful hire or promotion compared to the number of applications submitted, by demographic category, measured at the MnDOT district and contracted project level and reported quarterly.



- *Successful applications target:* rates of hiring or promotion for each demographic category that reflect the demographic make-up of the community served.

The Successful Applicants measure will highlight areas where recruitment practices may not meet the needs of potential employees that have not traditionally been included in the transportation industry and areas where hiring/promotion practices may favor some people over others.

**Wealth Development** – Measures pay parity between each demographic category by measuring average pay rates, access to retirement plans or pensions, healthcare, child care, and parental leave total and for each job classification (e.g., temporary, part-time, full-time) and job type, measured at the MnDOT district and contracted project level and reported quarterly.

- *Pay parity target:* fair compensation to ensure a living wage, within job classification and type categories, without more than a five percent difference (to account for job performance and experience) between demographic categories.

The Wealth Development measure will help identify differences in compensation and access to wealth generation tools for the transportation workforce in Minnesota to support initiatives to achieve pay parity which contributes to short-term quality of life improvements and long-term multi-generation wealth development and stability.

**Employee Retention** – Measures the time employees stay within the transportation industry within each demographic category, measured at the MnDOT district and contracted project level and reported quarterly.

- *Retention target:* 90 percent retention for early career employees (0-3 years) and employees of any tenure from demographic categories that are underrepresented; 80 percent retention for all others.

The Employee Retention measure will help identify issues with retaining employees that have not traditionally been included in the transportation industry, help create work environments that encourage and reward diverse perspectives and experience and help to place such individuals in positions of increasing responsibility where they can influence hiring and decision making.

**Discriminatory Behavior** – Measures the rate of discriminatory behavior within MnDOT’s workforce by tracking frequency and severity of complaints about discrimination (on the basis of race or ethnicity, gender, disability, language proficiency, and inclusive of sexual harassment) and the frequency with which actions are taken to address the complaints, measured at the MnDOT district level and reported quarterly.

- *Discrimination complaints target:* no complaints
- *Actions taken target:* 100 percent of complaints are addressed to satisfaction

The Discriminatory Behavior measure will help MnDOT track rates of discriminatory behavior and its reactions to such issues and identify districts where discrimination occurs.

**Decision Makers** – Tracks the demographic make-up of decision-making bodies and director level staff, via required self-reporting, measured upon appointment or hire or promotion of individuals at the MnDOT district and contracted project level, reported annually.

- *Decision makers target:* decision makers (whether members of an appointed board or hired in a director level role) reflect the community they serve.

The Decision Makers measure helps assess how well those with decision-making power represent the communities they serve which can impact decisions about how and where to improve the transportation network and how to allocate funding for such improvements.

### 5.5.5.3 Data Considerations

Table 11 summarizes the data considerations for the Representation performance measures.

**Table 11. Data Considerations – Representation Performance Measures**

Measure	Data Requirements	Data Sources	Data Access
<b>Successful Applicants</b>	<ul style="list-style-type: none"> <li>– Number of applications submitted and successful</li> <li>– Demographic information for all applicants</li> </ul>	<ul style="list-style-type: none"> <li>– MnDOT and its contractors collect this information directly</li> </ul>	<ul style="list-style-type: none"> <li>– MnDOT data may require interdepartmental coordination</li> <li>– Data from contractors will require agreements, collection, and coordination</li> </ul>
<b>Wealth Development</b>	<ul style="list-style-type: none"> <li>– Compensation, including all benefits, for all job classifications and types</li> <li>– Demographic information for all employees</li> </ul>	<ul style="list-style-type: none"> <li>– Same sources as previous measure in table</li> </ul>	<ul style="list-style-type: none"> <li>– Same access as previous measure in table</li> </ul>
<b>Employee Retention</b>	<ul style="list-style-type: none"> <li>– Time employed for all employees</li> <li>– Demographic information for all employees</li> </ul>	<ul style="list-style-type: none"> <li>– Same sources as previous measure in table</li> </ul>	<ul style="list-style-type: none"> <li>– Same access as previous measure in table</li> </ul>
<b>Discriminatory Behavior</b>	<ul style="list-style-type: none"> <li>– Count, level of severity, and action take for all discrimination complaints</li> <li>– Demographic information for all employees</li> </ul>	<ul style="list-style-type: none"> <li>– Same sources as previous measure in table</li> </ul>	<ul style="list-style-type: none"> <li>– Same access as previous measure in table</li> </ul>

Measure	Data Requirements	Data Sources	Data Access
<b>Decision Makers</b>	– Demographic information for all decision-makers	– Same sources as previous measure in table	– Same access as previous measure in table

5.5.5.4 Complementary Strategic Actions

What actions can MnDOT take to help mitigate inequities discovered by tracking this measure?

- **Successful Applicants** – Targeted recruitment and workforce development initiatives focused on people not traditionally included in the transportation industry could help better prepare potential applicants for success. Internal policy changes could revise what type of experience and education are sought by the hiring process (e.g., a person without a college degree but with 10 years of transportation grant management experience has highly valuable knowledge that could be applied to a planning position).
- **Wealth Development** – A comprehensive audit of MnDOT’s pay structures, including benefits of all kinds, could help highlight deficiencies and contribute to revisions that reward lived experience or other factors beyond formal education and years of experience and ensure long-term stability for employees. Revised human resources policies and practices could reduce instances of implicit bias and other built-in issues related to pay parity.
- **Employee Retention** – Programs to facilitate professional development and foster a sense of belonging could help keep employees on-board and engaged.
- **Discriminatory Behavior** – Zero tolerance policies, complemented by swift action, are required to address issues related to discriminatory behavior.
- **Decision Makers** – Similar to the Successful Applicants measure, targeted recruitment and workforce development initiatives focused on people not traditionally included in the transportation industry could help with creating decision-making bodies and hiring and promoting director level staff that reflect their communities.

**5.6 ADDITIONAL OPPORTUNITIES TO ENHANCE EQUITY WITHIN MNDOT PERFORMANCE MEASUREMENT**

As discussed in the Prioritization Method section, it was not possible to pursue further refinement and development of each of the opportunities to enhance equity identified by the research team. The following two sections present additional ideas that could help MnDOT’s performance measurement program further integrate an equity-first perspective.

**5.6.1 Traditional Opportunities**

- Update the dashboard to include qualitative data collected from surveys displayed with associated performance measures.
- Add to the existing business measures to include the number of DBE/Veteran/Targeted business proposals received compared to the number of “traditional” proposals.

- Enhance the existing freeway reliability measures with a structured definition of reliability (e.g., what is it and who experiences it?) and the ability to check reliability to or from different origins and destinations.
- Expand the existing congestion measure to look beyond the Minneapolis Metro area.
- Add information about where incident clearance times or bare lane targets are not met to the clearance and bare lane measures. The measures could be complemented by information focused on giving perspective to the experience of Black, Indigenous, and Other People of Color in these situations. For example, the measure could track whether these groups wait longer for service response or if the situation escalates into a more involved interaction. This data reporting could include a process for tagging each incident with some demographic information and the duration of the incident to spot lengthy incidents by group.
- Broaden the infrastructure inspection measures so that they look at rate/percentage of inspection in equity target areas or otherwise illuminate disparities.
- Reformat the native seed planting measure to include projects of all sizes.

### 5.6.2 Innovative Opportunities

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- Measure public engagement meetings and other outreach according to specific targets (e.g., X number of meetings in equity priority communities, Y number attendees from communities of color, etc.).
- Measure how MnDOT works to encourage and support (e.g., outreach, training, assistance with business process development, support for new businesses needing licenses etc.) DBE/Veteran/Targeted businesses to participate in procurements. Compare findings with contract awards.
- Measure how traditional proposals incorporate DBE/Veteran/Targeted businesses as sub-contractors or similar and rate/frequency of award to these proposals.
- Measure that gauges the speed of project letting in equity priority areas compared to statewide average (are areas of high need receiving the attention they require?).
- Measure safety enforcement and interventions spatially to understand the rate and type of enforcement by locations (including information about demographics) and the number of infrastructure improvements made in areas identified as high need (e.g., those with the highest rate of fatalities and serious injuries).
- Track locations of fatalities and serious injuries and compare those to how recently infrastructure projects or interventions occurred in those locations.
- Introduce a measure to complement or replace existing congestion measure that is more inclusive of all modes and is not peak-hour centric.
- Measure quality of bicycle lanes and associated infrastructure on state-owned roads.
- Measure ride quality and satisfaction for all modes, not just motorized vehicles.
- Measure investments in non-auto infrastructure investments on state network (e.g., transit facilities, bike lanes, sidewalks, etc.).

- Replace criteria pollutants measure with a measure that will spatially distribute each specific criteria pollutant and indicate potential exposure of people using the roads and people who live nearby and the associated environmental impacts (e.g., rate of increased warming) of the emissions.

## CHAPTER 6: EQUITY FIRST PERFORMANCE MEASURE MEASUREMENT TRAININGS

To help MnDOT institutionalize the concepts of transportation equity encompassed by the performance measures developed during this project the research teams developed training materials to facilitate the implementation and adoption of the equity-first principles in support of the performance measure concepts presented in a previous chapter. The basic training content is designed for transfer to MnDOT for future use when training new staff or to refresh knowledge. The following sections include a detailed outline of the training content, a summary of the multifaceted training design created by the research team, and a description of the training supplements.

### 6.1 TRAINING CONTENT

The training developed by the research is designed to first establish a basic understanding of transportation equity and the concept of equity-first performance measurement before applying equity-first principles to sample performance measures. Table 12 presents a complete outline of the training content.

**Table 12. Training Content Outline**

Module	Content
Introduction and overview	<ol style="list-style-type: none"> <li>1) <b>Outline the purpose of the training</b> <ol style="list-style-type: none"> <li>a) To help MnDOT institutionalize transportation equity considerations in the agency’s performance measurement processes</li> </ol> </li> <li>2) <b>Review training agenda and expected outcomes for participants</b> <ol style="list-style-type: none"> <li>a) A working understanding of transportation equity and how equity relates to performance measurement</li> <li>b) Comfort with the concept of equity-first performance measurement</li> <li>c) Experience applying the equity-first concept to two performance measure tasks—improving a current measure and creating a new measure</li> </ol> </li> </ol>
What is transportation equity?	<ol style="list-style-type: none"> <li>3) <b>Participation opportunity - What do the attendees think?</b> <ol style="list-style-type: none"> <li>a) Begin this module with a discussion of the training participants’ personal understanding of what transportation equity means. <i>What comes to mind when you think about equity?</i></li> </ol> </li> <li>4) <b>MnDOT’s definition</b> <ol style="list-style-type: none"> <li>a) Review MnDOT definition of transportation equity: <i>Transportation equity means the benefits and burdens of transportation systems, services and spending are fair and just, which historically has not been the case. Transportation equity requires ensuring underserved communities, especially Black, Indigenous and People of Color, share in the power of decision making.</i></li> </ol> </li> </ol>

Module	Content
<p><b>Why is equity in performance measurement important?</b></p>	<p><b>5) Participation opportunity - What do the attendees think?</b>  a) Begin this module with a discussion of the training participants’ perspective of why equity is important to include as an aspect of performance measurement. <i>What comes to mind when you think about equity in performance measurement?</i></p> <p><b>6) Performance measurement is a decision-making tool</b>  a) Performance measurement is part of the decision-making process; therefore, performance measures that represent the needs of everyone are critical to ensure the transportation network serves everyone.  b) Review how performance measurement influences MnDOT’s decision-making and funding processes</p> <p><b>7) Performance measurement is a repair tool</b>  a) Identification and tracking of current conditions resulting from historic decisions and their impact on today’s transportation network allows MnDOT to address the results of past decisions made in an unjust manor  b) Review a high-level history of unjust decisions and highlight how today’s performance measurement can influence repair</p> <p><b>8) Understanding equity in all aspects of transportation provision is helpful in MnDOT’s overall response to equity-related mandates</b>  a) Public agencies that receive federal funding are required to meet specific equity-related requirements and report statistics; therefore, performance measurement that accounts for equity considerations can help MnDOT meet these kinds of requirements  b) Review relevant requirements and highlight how performance measures help MnDOT maintain compliance</p>

Module	Content
<p>The equity-first approach to performance measurement</p>	<p><b>9) What is equity-first performance measurement?</b></p> <p>a) A question-based, iterative, approach to bringing equity to the process of improving and developing performance measures—equity-first performance measurement reframes the question of “how is the transportation network working?” to prioritize context and the diverse needs of the people using the network</p> <p><b>10) Improving existing performance measures to include equity-first perspectives</b></p> <p>a) Traditionally, DOT performance measurement has been focused on tracking progress towards a goal; therefore, improving existing measures requires consideration for who would experience the benefits of the goals established by the DOT and how to improve the measure so that the goal is inclusive and the experience of the people previously missing out is also tracked and considered</p> <p>b) Imagine circumstances that would indicate “success” (improved conditions or a goal that has been achieved—e.g., reduced fatalities) according to the performance measure’s targets, <i>regardless of whether success has yet been achieved in reality</i>, and ask:</p> <p>i) Who benefits from the success?</p> <p>ii) Who didn’t get to experience success or experienced a burden in order to ensure the success?</p> <p>(1) If some people aren’t represented, how can the measure be adapted to address everyone’s needs?</p> <p>iii) If the <i>adapted</i> performance measure identifies an inequity, what strategic actions could be taken to address this issue (e.g., reallocation of funding to support projects in an area with high levels of traffic violence)?</p> <p><b>11) Developing new equity-first performance measures</b></p> <p>a) New performance measures present an opportunity to focus on aspects of the transportation network that are not traditionally prioritized and on the needs of communities that have not historically had a voice in transportation decision making</p> <p>b) When establishing new performance measures, ask:</p> <p>i) Whose needs are not currently considered in the existing performance measures (e.g., people that do not drive cars, people with lower incomes, or people of color in a community that experienced redlining)?</p> <p>ii) What are the transportation needs of the people identified in the previous question (e.g., safety interventions in a historically redlined community)?</p> <p>iii) To establish a target level of performance for the needs identified, what information is needed (e.g., locations of intersections and corridors within historically redlined communities that were the site of a fatality or serious injury and capital project tracking complemented by a target to improve safety in redlined communities by 2025)?</p> <p>iv) How can data collection/processing be conducted so that the objective of the new performance measure is met, and the results are representative and context-sensitive (e.g., data collection and presentation at a local level to give fine-grain understanding of progress)?</p> <p>v) If the performance measure identifies an inequity, what strategic actions can be taken to address this issue (e.g., reallocation of funding to support projects in an area with high levels of traffic violence)?</p>



Module	Content
<p><b>Data to support equity-first performance measurement</b></p>	<p><b>12) Specific - Data that is granular enough to comprehensively represent that which it represents.</b>  <i>a) Example: data about the workforce that includes pay scales and educational requirements</i></p> <p><b>13) Context-sensitive - Data that considers secondary circumstances that might inform/influence the primary information.</b>  <i>a) Example: data about the workforce that includes job location and time-of-day for shifts</i></p> <p><b>14) Representative - Data that includes enough detail to completely understand a community.</b>  <i>a) Example: data about the workforce that includes information about gender, race or ethnicity, disability, educational attainment, etc.</i></p> <p><b>15) Timely - Data that is new enough to appropriately capture the community it is used to represent.</b>  <i>a) Example: data about the workforce that reflects current conditions as much as possible</i></p>
<p><b>Application of equity-first concepts</b></p>	<p><b>16) Interactive application of lessons learned</b>  a) This training section will be implemented as a discussion-based activity and will include two opportunities to apply equity-first concepts (specific measures and needs to be selected according to the training participants' areas of responsibility within MnDOT):  i) Improve an existing performance measure  ii) Develop a new performance measure in response to an identified need</p>

**6.2 MULTIFACETED TRAINING APPROACH**

In consultation with MnDOT’s project managers the research team learned that training needs related to transportation equity and performance measurement vary within the agency and that one training methodology is not appropriate for all audiences. Instead, some potential trainees needed an actionable understanding while others only required a cursory understanding of the subject matter for operational awareness. To account for the diverse needs of MnDOT’s staff, the research team developed a multifaceted training concept that is designed to be meaningful and useful to staff with varying degrees of equity impact. Table 13 presents solutions to each of the identified training needs. The training presentation and self-education manual are available at: [https://transit-mobility.tti.tamu.edu/projectsandpublications/mndot\\_equity\\_perfmeasures/](https://transit-mobility.tti.tamu.edu/projectsandpublications/mndot_equity_perfmeasures/).

Table 13. MnDOT Training Needs and Solutions

MnDOT Need	Solution
<p><b>Actionable understanding</b></p>	<p><b>One-on-one meetings with project principal investigator:</b> Working with MnDOT project management staff, the research team identified planning managers that lead development of plan elements (e.g., the current effort to update the freight plan) to coordinate one-on-one or small team trainings that covered the general training content in a conversational manner before the attendees and facilitator worked collaboratively to review work-in-progress concepts from an equity-first perspective. The meetings lasted approximately two hours.</p>
<p><b>Cursory understanding or refresher</b></p>	<p><b>Research team contribution to existing peer-to-peer results-based accountability exercises:</b> The MnDOT project management team informed TTI’s research team that the concept of results-based accountability had recently become a touchstone in their organizational culture and that some staff have led multiple workshops on the subject. The project’s principal investigator worked with these staff to incorporate equity-first performance measurement concepts into their existing workshop.</p> <p><b>Self-education manual:</b> According to the research team’s experience with adult learning, self-guided training is a valuable component of any training program. Therefore, the research team produced a high-level guidance document designed to succinctly explain the equity-first performance measurement concept, including documentation of its benefits and the reasons its needed. The goal of this document was to enable any MnDOT staff to learn more about these concepts and to allow those that have experienced more in-depth training to refresh their memory of the lessons as needed.</p> <p><b>Generalized slideshow presentation for future MnDOT-led trainings:</b> The research team developed a slideshow presentation to aide in facilitation of the one-on-one meetings described previously. A version of this presentation, including speaker notes and attributions where relevant, was produced to support MnDOT’s use in future trainings and workshops with staff or stakeholders. After completing the slideshow, the research team estimated this type or training might require around three hours, however guidance on content prioritization to support adaptation to short meetings is included. This slideshow may also be useful as another self-education resource.</p>

## CHAPTER 7: CONCLUSION, POTENTIAL IMPLEMENTATIONS, AND FUTURE RESEARCH

The benefits of measuring and addressing the inequity of the transportation network in meaningful and effective ways cannot be underestimated, even though quantification of the benefits themselves may be difficult, if not impossible (especially at scale and under real-world conditions).

Since the project was initiated, it generated the following benefits:

- Engagement with transportation stakeholders via:
  - Seven TAP meetings or workshops
  - Two focus groups with members of the public
- A detailed synthesis of the current state of practice for equity assessment including unique definitions of equity and opportunities to improve on current practice or transition concepts from non-transportation equity assessments to the transportation field.
- A comprehensive review of MnDOT’s current performance measures outlining all opportunities to implement equity-first enhancements to existing measures.
- Twelve complete performance measure concepts<sup>22</sup> in three categories:
  - Two macro-level performance measure concepts designed to improve the way performance measurement is communicated by MnDOT
  - Five traditional performance measure reconfigured as equity-first performance measures
  - Five innovative performance measures that provide frameworks for incorporating equity-first metrics (e.g., availability of service for marginalized or vulnerable groups, total trip cost, or user expectations for the service or network) in MnDOT’s performance measurement portfolio
- A comprehensive training presentation designed for use during internal training events at MnDOT as well as self-study professional development complemented by a self-education manual.

With project completion, the project’s outcomes will continue to provide the following benefits:

- Acknowledging inequity and working to address and correct it helps change culture and builds trust within the communities MnDOT serves.
- Performance measures that clearly consider context and account for community needs help align MnDOT goals with taxpayer expectations and empower affected communities to improve outcomes and contribute firsthand expertise.
- Inclusion of underrepresented voices in transportation planning and implementation processes will lead to an accrual of improvements within currently underserved communities.

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<sup>22</sup> A complete concept includes: a description of the measure including the benefits it provides; proposed metrics and targets; descriptions of the necessary data sets and level of data granularity; a description of the way the measure can be tracked, interpreted, and displayed to be equity-first; and other information as relevant to specific measures that would facilitate adoption.

- MnDOT is an important source of transportation funding in Minnesota, and as such MnDOT's effort in targeting today's investment to address historical disinvestment and neglect is invaluable. This process will be supported by the current project through the updated and new performance measures, trainings, and other outcomes of this project.

Furthermore, by integrating previous findings from MnDOT-sponsored research projects and other agency initiatives, this research project has improved the return on these previous investments.

## 7.1 POTENTIAL IMPLEMENTATION STEPS

As outlined above, the purpose of this project was to either amend existing performance measures or generate new measures that approach the task of performance measures from an equity-first perspective and help MnDOT achieve context-sensitive outcomes supported by a training program to assist with adoption of the performance measures and strategic actions. Therefore, the research team anticipates the following actions to implement this project's outcomes:

- 1) Update MnDOT's current performance measures, policies, and practices to reflect research findings.
- 2) Introduce new equity-first performance measures, policies, or practices as developed by this research project.
- 3) Integrate equity-first principles and performance measures into MnDOT's training programs and planning practices.
- 4) Development of training opportunities to ensure long-term success of the equity-first performance measures and related concepts and/or methods while empowering staff. This could include a regularly scheduled staff training program, mentorship, or peer review.

## 7.2 OPPORTUNITIES FOR FUTURE RESEARCH OR TECHNICAL ASSISTANCE

Equity is an ever-evolving condition. There are numerous research opportunities to expand on the foundations set by this project and further improve transportation equity in Minnesota. Some of these opportunities include:

- Equity-focused assessment of current funding allocation formulas and discretionary spending to determine opportunities to distribute transportation funding in more of an equity-first manner.
- Exploration of the legislation and policies required to implement a land-back program wherein MnDOT would transfer ownership of indigenous lands back to indigenous stewards for long-term management and self-determination.
- Calculation and documentation of the multi-generational wealth-deficits inflicted on marginalized communities in Minnesota by the transportation network and estimation of appropriate financial reparations.

**APPENDIX A**  
**FOCUS GROUP AND WORKSHOP RECRUITMENT MATERIALS**

## ***Focus Group Recruitment Email Template***

Dear X,

As part of a research project funded by Minnesota Department of Transportation (MnDOT), we would like to invite you to a focus group that would be hosted by researchers from Texas A&M Transportation Institute (TTI).

You are being asked to participate because your thoughts are very important to help us to advance transportation equity in the region.

If you agree to participate, you will be asked to join a 120 min virtual focus group together with others to share your opinions about draft equity-first transportation measures and your experiences using the transportation network in Minnesota, you will be paid for your time and expertise.

For more information, please see the attached information sheet that was approved by TTI's Institutional Review Board **[Add IRB number/date of approval]**.

If you agree to participate, please respond to the following poll to indicate your interest and availability by XXX, and we will contact you for scheduling the workshop. If American Sign Language (ASL) interpretation would improve your experience in the focus groups, please respond to this email to let us know.

Thanks!

## ***Focus Group Informed Consent Document***

**Title of Research Study:** Qualitative and Quantitative Analysis to Advance Transportation Equity

**Principal Investigator:** Zachary Elgart

**Funded/Supported By:** This research is funded/supported by Minnesota Department of Transportation.

### **Why are you being invited to take part in a research study?**

You are being asked to participate because your thoughts are very important to help us and your local officials advance transportation equity in the region.

### **What should you know about a research study?**

- Someone will explain this research study to you.
- Whether or not you take part is up to you.
- You can choose not to take part.
- You can agree to take part and later change your mind.
- Your decision will not be held against you.
- You can ask all the questions you want before you decide.

### **Who can I talk to?**

If you have questions, concerns, or complaints, or think the research has hurt you, talk to the project's principal investigator, Zachary Elgart, at 737-932-1481 or [z-elgart@tti.tamu.edu](mailto:z-elgart@tti.tamu.edu).

This research has been reviewed and approved by the Texas A&M Institutional Review Board (IRB). You may talk to them at 1-979-458-4067, toll free at 1-855-795-8636, or by email at [irb@tamu.edu](mailto:irb@tamu.edu), if:

- You cannot reach the research team.
- Your questions, concerns, or complaints are not being answered by the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research participant.
- You want to get information or provide input about this research.

### **Why is this research being done?**

This project aims to establish a detailed understanding of current challenges and needs related to transportation equity assessment throughout the state of Minnesota. In this respect, the project will identify or develop assessment methods and equity-focused strategic actions that will improve the likelihood that transportation equity in Minnesota and facilitate the adoption of identified or developed equity assessment methods and complementary strategic actions through a training program designed specifically.

### **How long will the research's workshop last?**

We expect that you will be in this focus group for about 120 minutes.

**How many people will be studied?**

We expect to have three to five groups and enroll about 6 residents per focus group.

**What happens if I say “Yes, I want to be in this research”?**

You will be asked to join an online focus group. Before the session starts, the moderator will provide an introduction and the instructions to follow. You will then be asked whether you agree to participate. If you agree, you will talk with others about transportation measures and may share information about your experiences—both good and bad—using the transportation network in Minnesota. Discussion may involve talking about times where you: struggled to get somewhere, felt unsafe, experienced bias, or felt like you lacked a voice. But, you will never be required to provide a response if a subject makes you feel uncomfortable.

The focus groups will be audio recorded to aid with data analysis. Recording will be required for participation. The audio recordings will be kept on TTI's secure servers. We will not share these recordings with anyone outside of the immediate research team or TAMU Compliance.

The focus group will take around 120 minutes. If you agree to take part in this research study, we will pay you \$50 for your time and effort. If you decide to leave earlier than anticipated focus group time, the compensation for participation will be pro-rated according to the time that you stay in the focus group at the discretion of the research sponsor.

**What happens if I do not want to be in this research?**

You can leave the research at any time and it will not be held against you.

**What happens if I say “Yes”, but I change my mind later?**

You can leave the research at any time and it will not be held against you. You will not be asked to explain the reason for your withdrawal; however, we will ask for your permission to use the data collected until withdrawal.

**Will being in this study help me in any way?**

You will get no direct benefit. The study results will help agencies to improve transportation equity in your region.

**What happens to the information collected for the research?**

Efforts will be made to limit the use and disclosure of your personal information, including research study and other records, to people who have a need to review this information. We cannot promise complete privacy. Organizations that may inspect and copy your information include the TAMU HRPP/IRB and other representatives of this institution as well our sponsor, Minnesota Department of Transportation.

The results will be published and presented in an aggregate form. None of the information collected will be attributed to specific individuals.



## ***Workshop Recruitment Email Template***

Dear X,

As part of a research project funded by Minnesota Department of Transportation (MnDOT), we would like to invite you to a workshop that would be hosted by researchers from Texas A&M Transportation Institute (TTI).

This project aims to establish a detailed understanding of current challenges and needs related to transportation equity assessment throughout the state of Minnesota. You are being asked to participate because you are an expert in the field, and we are interested in learning from your professional expertise and experience in methods and strategic actions that would be helpful to advance transportation equity.

If you agree to participate, you will be asked to join a 90 min virtual workshop together with other transportation professionals employed by **[Select based on the group: MnDOT and other transportation industry stakeholders in the State of Minnesota]**.

The purpose of these workshops is to: 1) Present the performance measurement methods and strategic actions developed under the earlier tasks of the project, 2) Collect feedback about the methods' and strategic actions' potential effectiveness and associated challenges/limitations; and 3) Request input on additional methods and strategic actions for consideration.

For more information, please see the attached information sheet that was approved by TTI's Institutional Review Board **[Add IRB number/date of approval]**.

If you agree to participate, please respond to this email, and we will contact you for scheduling the workshop.

Thanks!

## ***Workshop Informed Consent Document***

**Title of Research Study:** Qualitative and Quantitative Analysis to Advance Transportation Equity

**Principal Investigator:** Zachary Elgart

**Funded/Supported By:** This research is funded/supported by Minnesota Department of Transportation.

### **Why are you being invited to take part in a research study?**

You are being asked to participate because you are an expert in the field, and we are interested in learning from your professional expertise and experience in methods and strategic actions that would be helpful to advance transportation equity.

### **What should you know about a research study?**

- Someone will explain this research study to you.
- Whether or not you take part is up to you.
- You can choose not to take part.
- You can agree to take part and later change your mind.
- Your decision will not be held against you.
- You can ask all the questions you want before you decide.

### **Who can I talk to?**

If you have questions, concerns, or complaints, or think the research has hurt you, talk to the project's principal investigator, Zachary Elgart, at 737-932-1481 or [z-elgart@tti.tamu.edu](mailto:z-elgart@tti.tamu.edu).

This research has been reviewed and approved by the Texas A&M Institutional Review Board (IRB). You may talk to them at 1-979-458-4067, toll free at 1-855-795-8636, or by email at [irb@tamu.edu](mailto:irb@tamu.edu), if:

- You cannot reach the research team.
- Your questions, concerns, or complaints are not being answered by the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research participant.
- You want to get information or provide input about this research.

### **Why is this research being done?**

***This project aims to establish a detailed understanding of current challenges and needs related to transportation equity assessment throughout the state of Minnesota. In this respect, the project will identify or develop assessment methods and equity-focused strategic actions that will improve the likelihood that transportation equity in Minnesota and facilitate the adoption of identified or developed equity assessment methods and complementary strategic actions through a training program designed specifically.***

**How long will the research’s workshop last?**

We expect that you will be in this workshop for about 90 minutes.

**How many people will be studied?**

We expect to have two workshops and enroll about 30 stakeholders per workshop.

**What happens if I say “Yes, I want to be in this research”?**

You will be asked to join a 90 min virtual workshop together with other transportation professionals employed by the project sponsor, Minnesota Department of Transportation, and other transportation industry stakeholders in the State of Minnesota. The purpose of these workshops is to: 1) Present the methods and strategic actions developed under the earlier tasks of the project, 2) Collect feedback about the methods’ and strategic actions’ potential effectiveness and associated challenges/limitations; and 3) Request input on additional methods and strategic actions for consideration.

The workshops will be audio recorded to aid with data analysis. Recording will be required for participation. The audio recordings will be kept on TTI's secure servers. We will not share these recordings with anyone outside of the immediate research team or TAMU Compliance.

**What happens if I do not want to be in this research?**

You can leave the research at any time and it will not be held against you.

**What happens if I say “Yes”, but I change my mind later?**

You can leave the research at any time and it will not be held against you. You will not be asked to explain the extent of your withdrawal; however, we will ask for your permission to use the data collected until withdrawal.

**Will being in this study help me in any way?**

***We expect the methods and strategic actions identified and developed under this study will be of benefit to transportation professionals like you in conducting your work related to transportation equity.***

**What happens to the information collected for the research?**

Efforts will be made to limit the use and disclosure of your personal information, including research study and other records, to people who have a need to review this information. We cannot promise complete privacy. Organizations that may inspect and copy your information include the TAMU HRPP/IRB and other representatives of this institution as well our sponsor, Minnesota Department of Transportation.

Findings from the workshops will be used to refine the performance measures developed and inform the trainings and other products produced in the project. None of the information collected will be attributed to specific individuals. The results will be published in the final project report in an aggregate form and you will be sent a copy of the report upon its completion. The findings might also be published in peer reviewed journals or presented in conferences and webinars upon approval from the sponsor.

**APPENDIX B**  
**FOCUS GROUP DISCUSSION GUIDE**

## WELCOME/INTRODUCTIONS

Thank you all for participating in this workshop today. My name is Zachary Elgart and I work at the Texas A&M Transportation Institute. I will be the moderator for this discussion.

## PROTOCOL

Before we get into the discussion, let me make a couple of comments about the focus group protocol. First, as you know from reading your consent forms, we are audio recording the discussion. This is just to be sure we have all of your comments correctly noted for our analysis. We will never quote any of you by name in our results and reports, so feel free to give your honest opinion. Because of the recorder, and to help our note taker, I ask that you talk one at a time and please speak loudly enough that we and the recorder can hear you clearly.

I encourage you to talk a lot, be candid, and enjoy the discussion.

## INTRODUCTION

MnDOT aims to establish a detailed understanding of current challenges and needs related to transportation equity assessment throughout the state of Minnesota. As part of this effort, we are interested in hearing your experiences using the transportation network in Minnesota and thoughts about how to better integrate equity into the transportation measurement and decision-making process. The discussion will follow a rough structure where I will describe a transportation performance measure and ask you all some questions. However, I want to be sure we explore your comments thoroughly, so our structure is flexible

Introduction/Icebreaker: Before we get into the discussion, I want to take a minute for us to learn something about each other unrelated to the focus group – please tell us your name, your preferred pronouns, and your favorite way to spend free time. I'll start us off.

So that we all start on the same page, for the purposes of this discussion "transportation equity" is defined as: *Transportation equity ensures the benefits and burdens of transportation spending, services, and systems are fair and just, which historically has not been the case. Transportation equity also requires sharing power in decision-making with people, especially Black, Indigenous, and People of Color.*

## DISCUSSION QUESTIONS

*\*\*The following questions will be used to collect information about a series of performance measures and will be repeated after each measure is described.\*\**

1. Based on how I described measure X, do you think the measure represents you and your needs? Do you see yourself in it or benefitting from it? *[provide example of benefits as needed – more frequent transit services, more options for commuting to work without a car, etc.]*
2. What is missing from the performance measure?
3. What would you prefer to see in this measure, or instead of this measure?

## WRAP-UP/CLOSING

Do you have any other suggestions to MnDOT about how to improve the transportation equity?