

Qualitative and Quantitative Summary of Survey Findings

Final Report

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MONTANA
STATE UNIVERSITY

Western
Transportation
Institute

June 2023

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Qualitative and Quantitative Summary of Survey Findings		5. Report Date May 2023	6. Performing Organization Code
		8. Performing Organization Report No.	
7. Author(s) Jennifer MacFarlane, ORCID ID: 0009-0008-6139-8055		10. Work Unit No.	11. Contract or Grant No. 69A3551747122
9. Performing Organization Name and Address Western Transportation Institute 2327 University Way Bozeman, MT 59715		13. Type of Report and Period Covered Final Report	
		14. Sponsoring Agency Code	
12. Sponsoring Agency Name and Address Small Urban and Rural Tribal Center on Mobility Western Transportation Institute PO Box 174250 Bozeman, MT 59717			
15. Supplementary Notes U.S. Department of Transportation/OST-R 1200 New Jersey Avenue, SE Washington, DC 20590-0001			
16. Abstract Transportation significantly influences physical and mental health outcomes within a community (Federal Highway Administration, 2014), but are often overlooked (Litman, 2013) in rural transportation planning. Transportation performance management informs decision making to help achieve performance goals of the system (Federal Transit Administration, 2023). A 2022 audit of transportation planning documents in the ten most populous counties of Montana demonstrated a disparity in the use of health-related performance measures found within transportation plans from Metropolitan Planning Organizations (MPO) and local transportation plans from rural communities. Health Belief Model constructs were utilized in a mixed method survey to understand factors that could motivate the use of health-related performance measures in local transportation plans. Quantitative analysis was used to assess perceived threats of transportation planning on public health outcomes. Most survey participants agree that transportation planning and design impacts health behavior and outcomes and that poor transportation planning can result in serious consequences. This was especially true among participants who identify as planning professionals. Qualitative analysis was utilized to better understand the perceived benefits, barriers, and supports of including health-related performance measures in local transportation planning documents. Open-ended responses were coded and categorized into themes. Perceived benefits of including health-related performance measures in local transportation plan include improved public health outcomes, additional transportation options, evidenced based and data-driven decision-making, public support for active transportation projects, and holistic and collaborative efforts. Perceived barriers include limited resources, priorities, insufficient knowledge and skills, measures of success, limited coordination, difficulty to measure or foresee outcomes, jurisdiction, and skepticism of benefit. Finally, supports for the inclusion of health-related performance measures include a clear nexus between transportation and public health, public support, data and measurement systems, and priorities or requirements to do so. Prioritizing cross-sectoral collaboration between transportation planning and public health professionals may serve as a catalyst to address some of the barriers and needed supports identified by survey participants. The performance-based planning requirements of MPO's may serve as a guide to further integrate health-related performance measurement into transportation planning in the form of recommendations or guidance from state or federal agencies.			
17. Key Words Transportation, physical health, mental health, performance management, rural, planning, performance measures, public health		18. Distribution Statement	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No of Pages 18	22. Price

About the Western Transportation Institute

The Western Transportation Institute (WTI) was founded in 1994 by the Montana and California Departments of Transportation, in cooperation with Montana State University. WTI concentrates on rural transportation research; as stewards and champions of rural America, WTI also has a strong interest in sustainability. WTI research groups create solutions that work for clients, sponsors, and rural transportation research partners. WTI Research Centers include the Montana Local Technical Assistance Program, the National Center for Rural Road Safety, the Small Urban, Rural and Tribal Center on Mobility, the Federal-Public Lands Transportation Institute, and the West Region Transportation Workforce Center.

About the Small Urban, Rural and Tribal Center on Mobility

The mission of the Small Urban, Rural and Tribal Center on Mobility (SURTCOM) is to conduct research and provide leadership, education, workforce development and technology transfer in all transportation-related aspects of mobility for people and goods, focusing specifically on small urban, rural and tribal areas. Member institutions include the Western Transportation Institute at Montana State University, the Upper Great Plains Transportation Institute at North Dakota State University, and the Urban and Regional Planning program at Eastern Washington University.

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The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the information presented herein. This document is disseminated in the interest of information and exchange. The report is funded, partially or entirely, by a grant from the U.S. Department of Transportation's University Transportation Centers Program. However, the U.S. Government assumes no liability for use thereof.

Acknowledgments

We would like to thank the Montana Association of County Officials and the Montana Association of Planners for their assistance with survey distribution. We also express appreciation to the U.S. Department of Transportation for support of university-based transportation research.

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1 Introduction

The Federal Highway Administration acknowledges the impact transportation planning has on public health outcomes. “Transportation is an important part of the built environment and significantly influences physical activity, well-being, safety, and the ability of community members to access destinations that are essential to a healthy lifestyle” (Federal Highway Administration, 2014). Although the results of transportation planning impact physical and mental health, these health outcomes are often overlooked (Litman, 2013) in rural local transportation planning.

According to the Federal Transit Administration, transportation performance management is an approach to planning that uses performance measures that inform future decision making to achieve performance goals (Federal Transit Administration, 2023). Performance management can assist decision makers in analyzing current conditions, project prioritization and selection, system performance, and progress toward community transportation goals and priorities (Singleton, 2017).

A 2022 audit of local transportation planning documents in Montana demonstrated a difference in the use of health-related performance measures among transportation plans from metropolitan planning organizations (MPO) and local transportation plans from rural communities. All documents reviewed, regardless of MPO status, contained varying health-related guidance statements and reference data indicating some level of community interest in the impact of the transportation system and transportation planning on health outcomes. Planning documents from those counties containing an MPO include health related-performance measures, as required by law, whereas plans reviewed from those counties not containing an MPO did not utilize any health-related performance measures.

The Health Belief Model has been used to predict why actions are initiated to prevent or control illness conditions (Champion, 2008). On an individual level, if people believe they are susceptible to a condition, and that condition could result in serious negative consequences, they are more likely to engage in action to prevent that outcome, given the benefits of the preventative action outweigh the barriers (Champion, 2008). We explored the Health Belief Model constructs as they relate to the adoption of health-related performance measures in local transportation planning to measure and prevent adverse public health outcomes.

To better understand the factors supporting and preventing local government use of health-related performance measures in transportation planning, the research team administered a mixed-method survey among people involved in local transportation planning in the state of Montana throughout January and February 2023. Survey questions were based on Health Belief Model constructs (Champion, 2008) to further understand the dimensions of “threat” of public health outcomes related to transportation planning and design, and the benefits vs. barriers of including health-related performance measures in local transportation plans. The team also wanted to

further understand what factors support the adoption of this practice. An understanding of perceived threats to public health, benefits, and barriers of including health related performance measures in transportation plans and factors that support their use, may be informative in the development of resources to motivate local planning officials to adopt this practice in rural transportation planning efforts.

2 Methods

An online survey of participants involved in transportation planning in Montana was created using Qualtrics and distributed through an anonymous link to the membership of the Montana Association of Planners (MAP) and the Montana Association of County Officials (MACO). Respondents were eligible to take the survey if they had been involved in transportation planning within one or more of the ten most populous counties in the state of Montana. This requirement was chosen so that responses to this survey correlate with data found in an earlier local transportation plan audit conducted among the same counties in November of 2022. There were 45 people who opened the survey, with 32 total respondents and 19 complete responses to the survey.

To assess the perceived threat of transportation planning on health outcomes, survey respondents were asked two questions, Q3 “How strongly do you agree or disagree with this statement: Transportation planning and design impacts health behaviors and outcomes in each of the following health domains?” and Q4 “How strongly do you agree or disagree with this statement: Poor transportation planning and design can have serious consequences for individual and community health?” Quantitative analysis was performed in Qualtrics to understand overall results and results filtered by participants identifying as planners or planning consultants compared to participants identifying as elected officials and volunteers.

To better understand the perceived benefits, barriers, and support of including health-related performance measures in local transportation planning documents, the survey asked three open ended questions and performed content analysis to code responses and categorize them into themes. Open ended questions included:

- Question 5: “What are the possible benefits of including health-related performance measures in your community’s transportation plan?”
- Question 6: “What factors prevent or pose a barrier to the inclusion of health-related performance measures in your community’s transportation plan?”
- Question 7: “What factors support the inclusion of health-related performance measures in your community’s transportation plan?”

3 Results

To understand survey respondents' experience with transportation planning across Montana, survey participants were asked, "In which of the following Montana counties have you been involved in transportation planning?" Figure 1 illustrates the geographical spread of 43 responses including Gallatin (n=12), Missoula (n=8), Ravalli (n=6), Yellowstone (n=5), Flathead (n=4), Silver-Bow (n=3), Lake (n=2), Cascade (n=1), Lincoln (n=1), and Lewis and Clark (n=1). Some respondents indicated experience with transportation planning in multiple Montana counties.

Q1 - In which of the following Montana counties have you been involved in transportation planning?

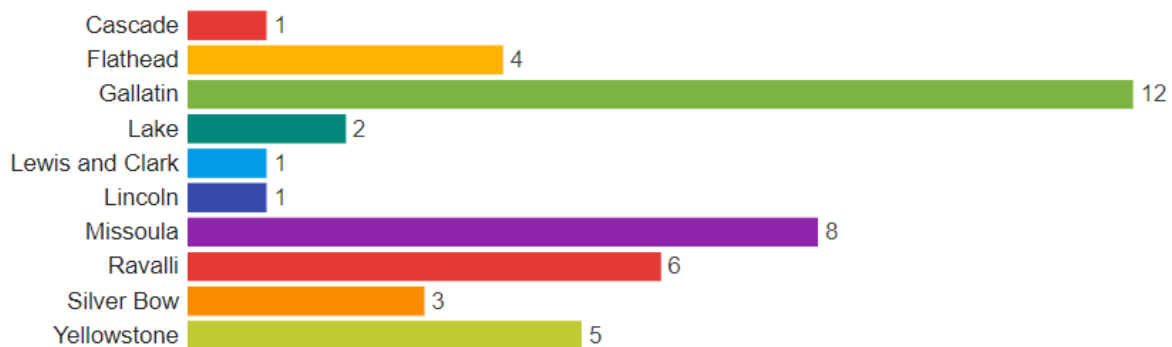


Figure 1: Geographic spread of responses

To understand the role of participants in local transportation planning, we asked "What were your roles in the transportation planning process?" Figure 2 illustrates the proportion of survey respondents by role within the planning process. The majority of respondents identified their role as planning staff (n=12), with the remainder identifying as volunteers (n=5), elected officials (n=2), and planning consultant (n=1). At least one survey respondent identified multiple roles within the transportation planning process.

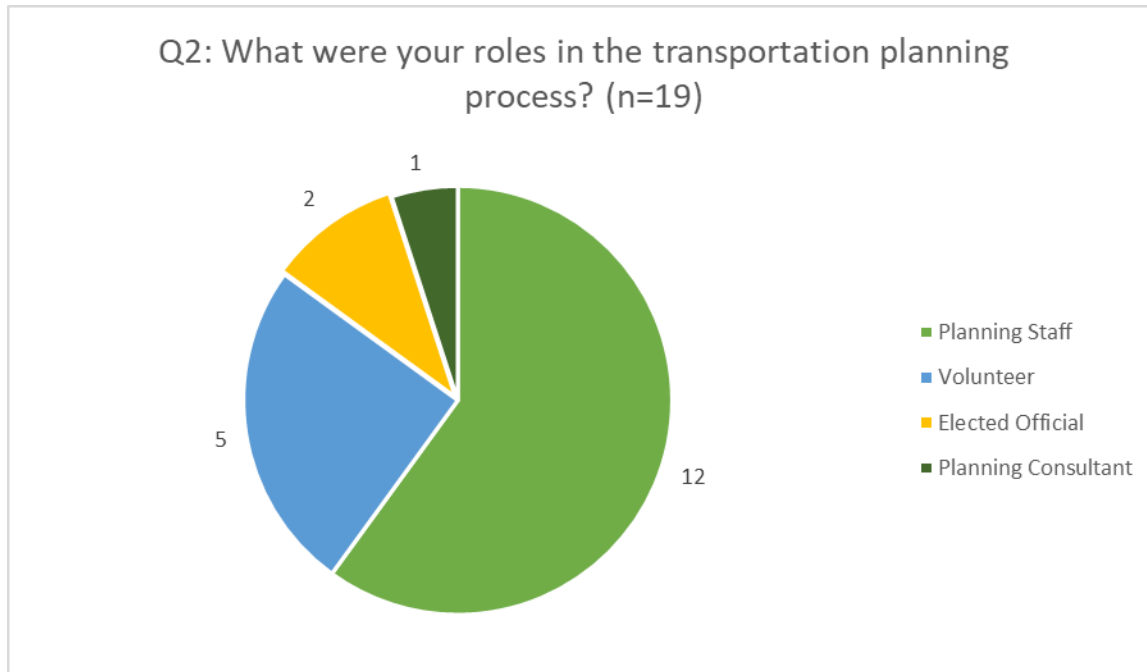


Figure 2: Proportion of survey respondents by role within the planning process.

Among participants who responded to Question 3 (n=19), the majority agree that “transportation planning and design impacts health behavior and outcomes” in the domains of general health (84%), safety (95%), air quality (84%), physical activity (89%), accessibility (95%), mental health (84%), and health equity (79%). These results are displayed in Figure 3.

Q3: “Transportation planning and design impacts health behaviors and outcomes in each of the following health domains?”

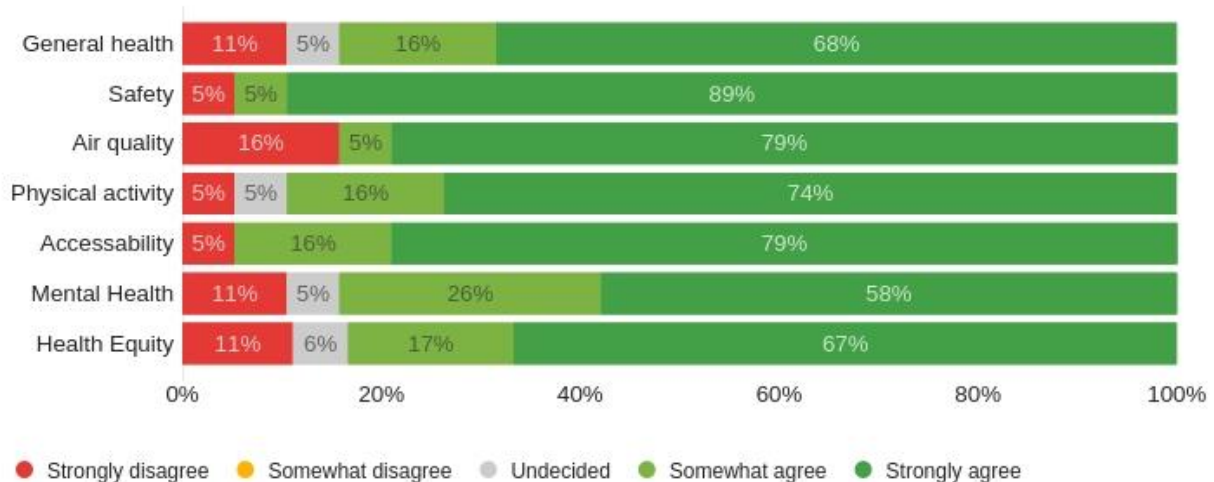


Figure 3: Responses to Question 3 of the Survey

All survey respondents who identify as planning staff or a planning consultant (n=13) either “agree” or “strongly agree” that transportation planning and design impact health behavior and outcomes in these domains, demonstrating consensus among this participant group. Any disagreement with this statement was among survey respondents who identified as a volunteer or elected official.

Results for Question 4 are displayed in Figure 4. The majority of survey respondents answered “strongly agree” or “agree” that “poor transportation planning and design can have serious consequences for individual and community health” in the domains of general health (79%), safety (100%), air quality (95%), physical activity (95%), accessibility (100%), mental health (84%), and health equity (89%). Similarly, to question 3, nearly all survey respondents who identify as planning staff or planning consultant (n=13) either “agree” or “strongly agree” that poor transportation planning and design can have serious consequences for individual and community health except in the domain of mental health where one respondent indicated they were “unsure.”

Q4: “Poor transportation planning and design can have serious consequences for individual and community health?”

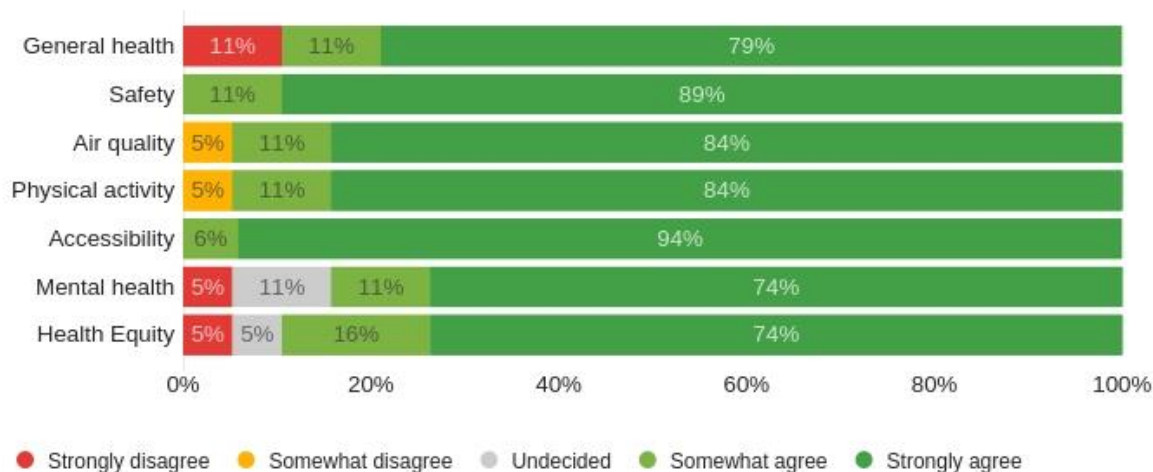


Figure 4: Responses to Question 4 of the Survey

Among participants who answered question 5 (“What are the possible benefits of including health-related performance measures in your community’s transportation plan?”) there was a strong sense of benefit that could be, or is already, realized from this practice. Perceived benefits of including health-related performance measures in local transportation plan themes are displayed in Table 1. Identified themes surround **holistic and collaborate efforts** that result in **better public health outcomes** from **additional transportation options**. Survey respondents also noted that improvements in documentation with health-related performance measures will allow for **evidence-based and data driven decision-making**, leading to **public support for active transportation projects**.

Table 1: Perceived benefits of including health-related performance measures in local transportation plans.

Question 5: What are the possible benefits of including health-related performance measures in your community's transportation plan?		
Theme	Definition	Participant Quotes
Improved Public Health Outcomes	Improved health and safety outcomes for the community, including outcomes relating to physical activity, mental health, and livability	<i>"Healthier people and transportation systems that lend themselves to more physical activity, like bike/ped connections"</i>
Additional Transportation Options	Diverse multimodal connections and transportation options that support a less car-dependent community	<i>"Integration of bike infrastructure and complete streets will encourage multi-modal approaches"</i>
Evidence Based and Data-Driven Decision-Making	Improvements in documentation and an evidence base to support problem identification, benchmarking, and goal setting	<i>"I would strongly recommend correlating these performance measures to health outcomes... results are both obvious and eye-popping. the neighborhoods without sidewalks, safe, comfortable, and convenient access to the bike network, and poor transit connectivity have higher rates of obesity and persistent poverty and worsened mental health."</i>
Public Support for Active Transportation Projects	Greater public support and political will to prioritize transportation projects that support improved health-related outcomes.	<i>"Would help local planners ensure local government leaders that including smart design and the inclusion of non-motorized, and transit is not money ill spent."</i>
Holistic and Collaborative Efforts	Improved ability to transcend traditional departmental and disciplinary silos and coordinate efforts for multifaceted benefits	<i>"Including health-related performance measures in our prioritization can help improve the health outcomes in [underserved] neighborhoods through taking into account more holistic benefits of transportation projects."</i>

Although the benefit of including health-related performance measures in local transportation plans are understood, survey respondents identified barriers preventing adoption of this practice. According to behavior change research, "barriers" are the strongest predictor of future adoption of a behavior (Champion, 2008). Table 2 displays perceived barriers that prevent health-related performance measures from being used in local transportation planning. These factors include **limited resources** such as time, funding and staff needed to accomplish the task. Additionally, **insufficient knowledge and skill** of persons involved in local transportation planning can be a barrier. The

priorities of decision-makers, funders, or preemptive policies and plans, and chosen **measures of success** are also barriers of changing practice to include health related performance measures in local transportation plans. **Limited coordination** with stakeholder groups, public health agencies, and complications of **jurisdiction** with the Montana Department of Transportation create a planning environment that limits the efficacy of local decisions and the ability to **measure or foresee outcomes** related to local transportation planning. Finally, some survey responses indicate a **skepticism of the benefit** indicating that some respondents do not perceive the benefit greater than the barriers that prevent adoption of this practice.

Table 2: Perceived barriers or obstacle to the inclusion of health-related performance measures in local transportation plans.

Question 7: What factors prevent or pose a barrier to the inclusion of health-related performance measures in your community's transportation plan?		
Theme	Definition	Participant Quotes
Limited Resources	Resources (time, funding, staff, etc.) are finite or not sufficient for the task.	<i>"Further, I would say funding is a large barrier locally. How is our city government to consider another metric in project prioritization if we can barely manage to fund baseline maintenance?"</i>
Priorities	Being regarded or treated as important or more important, including the priorities of decision makers, funding sources, or preemptive policies or plans.	<i>"Transportation planning's historic practices and values play a role in health-related performance measures [locally] and across the country."</i>
Insufficient Knowledge or Skills	Having a lack of knowledge, awareness, or skill to include or utilize health related performance measures and data.	<i>"I'm aware that some communities in our county have high rates of diabetes, though I have not considered how that may relate to our transportation planning efforts."</i>
Measures of Success	The current or historical measures that have been used to determine performance of a car-oriented transportation system	<i>"Every widening of state highways, MDT mind set of quickly pushing cars through town as a good measure of a quality transportation system."</i>
Limited Coordination	Limited coordination between stakeholders or stakeholder groups and the timing of the planning process	<i>"Lack of long-term coordination between transportation entities for intersecting facilities (state, county, municipal). Lack of buy-in or coordination with public health or healthcare entities in the region."</i>
Difficulty to Measure or Foresee Outcomes	The difficulty to measure or observe progress due to the length of time required for results to become apparent	<i>"With only incremental opportunities to change, most won't see improvement in our lifetimes."</i>

Question 7: What factors prevent or pose a barrier to the inclusion of health-related performance measures in your community's transportation plan?		
Theme	Definition	Participant Quotes
Jurisdiction	The governing body with official power to make decisions and judgements	<i>"...has a network of roads on the national highway system. This leads MDT to have regulatory status over the design of roads within our city."</i>
Skepticism of Benefit	Perceptions that the inclusion of health-related performance measures could have uncertain, dubious, or even negative impacts	<i>"...although including health-related performance measures may be beneficial to include... I think this should be done very carefully and thoughtful so as to avoid stigmatizing certain groups."</i>

Table 3 displays factors that support the practice of including health related performance measures in transportation plans. Survey responses indicate that a **clear nexus** or understanding of the connection between transportation planning and public health outcomes and **public support** to prioritize projects supporting positive health outcomes, contribute to the efficacy of practitioners to adopt this change in practice. Additional supporting factors include systems that support **data and measurement** and the **priorities or requirements** of funding sources, decision making bodies, or preemptive policies.

Table 3: Perceived factors that support the inclusion of health-related performance measures in local transportation plans.

Question 6: What factors support the inclusion of health-related performance measures in your community's transportation plan?		
Theme	Definition	Participant Quotes
Clear Nexus	A general understanding of the connection between transportation planning and health outcomes.	<i>"...nationally a clear link has been made between the built environment and health outcomes."</i>
Public Support	The public support and will of decision makers to prioritize transportation projects that support health-related outcomes.	<i>"I believe the public and Commissioners would generally be supportive of considering health in transportation planning."</i>
Data and Measurement	Systems and support for data collection and measurement of health outcomes over time.	<i>"...I believe the Community Health Needs Assessment discusses health and nutrition challenges in BSB and should be considered during the formation of transportation plans and associated policies and regulatory decisions."</i>
Priority or Requirement	The inclusion of health-related performance measures is prioritized or required by a decision-making body, funding source or preemptive policy or plan.	<i>"Health related measurement in transportation planning is highly important in Missoula's transportation planning and prioritization. This is highlighted through Missoula's Invest Health Neighborhoods being considered priority communities due to predictively lower health outcomes in three communities being Missoula's stand out spatial inequity."</i>

Finally, when asked if recommendations or guidance from federal or state transportation agencies would motivate the respondent's agency to include health-related performance measures in future transportation plans, 42% answered "yes," 47% answered "maybe," and 11% indicated "no."

4 Discussion

The Health Belief Model provided a framework to understand factors that support and prevent the inclusion of health-related performance measures in local transportation planning across the ten most populous counties in Montana. Survey results demonstrate differences between those respondents who identify themselves as transportation planners and planning consultants compared to those respondents who identified themselves as volunteers or elected officials. There is consensus among respondents who identify as planners that transportation impacts public health behaviors and outcomes in the domains of general health, safety, air quality, physical activity, accessibility, mental health, and health equity. The impact of transportation on public health behavior and outcomes and the consequences of poor transportation planning are less understood among participants who identified themselves as volunteers or elected officials.

Survey responses identified the benefits, barriers, and supports for the use of health-related performance measures in local transportation plans. Prioritizing cross-sectoral collaboration between transportation planning and public health professionals may serve as a catalyst to address identified barriers and needed support. Efforts to build a clear connection between transportation planning and health outcomes, including systems for data and measurement will result in public support and political will to require the practice of using health-related performance measures in transportation planning. Finally, the performance-based planning requirements of MPO's may serve as a guide to further integrate health-related performance measurement into transportation planning in the form of recommendations or guidance from state or federal agencies.

There are some limitations to this study that should be acknowledged. First and foremost, the sample size for this cross-sectional study was limited to 45 people who opened the survey, with 32 total respondents and 19 complete responses to the survey. The sample was a convenience sample of transportation planning volunteers, professionals, or elected officials from Montana's ten most populous counties. Participants were recruited through mass e-mail sent out by MAP and MACO, limiting the sample to only those individuals who subscribe to communications from those organizations. This sample may not be representative of all people involved in rural local transportation planning.

Additionally, qualitative analysis of anonymous and open-ended survey questions does not allow for participant follow-up, leaving room for researcher bias in determining meaning of open-ended text. Methods for gathering and analyzing qualitative data could be enhanced through interviews, focus groups, and using computerized software to code results.

Further research is needed to further develop resources and understand their impacts in addressing the barriers and supports that rural local governments need to adopt health-related performance measures in rural local transportation plans. This study did not

assess current cross-sectoral collaborations between transportation planning volunteers and public health agencies, nor did it assess the extent transportation plans were implemented or effectiveness of the plan. Further research into factors that influence implementation and the effectiveness of local transportation planning on public health outcomes in rural communities is needed.

These results identified an opportunity for the development of resources, education, or interventions to address barriers and increase support for the inclusion of health-related performance measures in local transportation plans. With supporting resources, planners could serve as champions to help educate elected officials and volunteers on the connection between transportation planning and public health, whereas systems for data collection should be developed to support measurement of health outcomes.

Cross-sector collaboration between planning participants and public health professionals may serve to support a stronger understanding of the relationship between transportation and public health while enhancing data and measurement, efficiently utilizing local government's limited resources, and bolstering knowledge and skill of planning staff, volunteers, and elected officials. Finally, requiring the use of health-related performance measures by funding sources or preemptive policies would serve to mandate this action, similar to the performance management requirements of MPOs.

5 Conclusion

Transportation performance management and the use of health-related performance measures serves as a tool to inform future project prioritization and decision-making based off community transportation goals and priorities (Federal Transit Administration, 2023) (Singleton, 2017). A 2022 audit of transportation planning documents in Montana demonstrates a disparity in the use of health-related performance measures between rural local governments as compared to MPO's, leaving rural local governments without a means to measure performance of rural transportation plans against community priorities.

Health Belief Model constructs were utilized to further understand the perceived threat of transportation planning on public health outcomes and factors that prevent and support the use of health-related performance measures in rural local transportation planning efforts. Survey responses from those participants who identified themselves as transportation planners and planning consultants demonstrate consensus that transportation impacts public health behaviors and outcomes across domains, whereas this impact is less understood among participants who identified themselves as volunteers or elected officials.

Identified barriers that prevent the use of health-related performance measures in rural local transportation plans include limited resources, priorities, insufficient knowledge or skill, measures of success, limited coordination, difficulty measuring and foreseeing outcomes, jurisdiction, and skepticism of the benefits. Factors that support the practice of using health-related performance measures include a clear understanding of the connection between transportation planning and health outcomes, public support, systems for data and measurement, and priorities or the requirement to do so.

Prioritizing cross-sectoral collaboration between rural local transportation planning participants and public health professionals may serve as a catalyst to address many of the identified barriers and needed supports for adopting health-related performance measures in transportation plans. Recommendations, guidance, or requirements of federal and state agencies, or priorities of preemptive policy may also influence adoption of this practice. Further research is warranted to understand what supports are most feasible in rural local transportation planning.

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