

Transportation Planning and Public Health: To What Extent is Health Considered in Rural Local Transportation Plans?

Final Report

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16. Abstract Transportation systems can impact both physical and mental health, but the effects of transportation planning decisions on health, beyond safety and air pollution, are often overlooked or undervalued (Litman, 2013). Although not the only factor contributing to health disparities, transportation systems serve as a modifiable variable contributing to health behaviors and outcomes (Nieuwenhuijsen & Khreis, 2019). Following a similar approach to Singleton and Clifton (2017), a review of transportation planning documents from the ten most populous counties within the state of Montana was conducted to analyze the extent that health was considered. A directed and summative approach was used to identify and code health-related guidance statements, performance measures, and reference data in the domains of general health, safety, air quality, physical activity, accessibility, mental health, and equity. Although all transportation plans contained health-related guidance statements and reference data, only those transportation plans from counties containing a metropolitan planning organization (MPO) included health-related performance measures. The inclusion of health-related guidance statements and reference data is evidence that local Montana communities are interested in the impacts of transportation planning on health behaviors and outcomes. Without the federal requirements that MPOs must follow, rural governments are not utilizing health-related performance measures to fully understand performance of the local transportation system related to their community's public health priorities. The existing performance management structure required of States and MPOs could serve as a guide for further integrating health-related performance measures into small urban and rural transportation planning and can assist local decision makers in analyzing progress toward community priorities (Singleton & Clifton, 2017).			
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1 Introduction

There is a strong understanding of how transportation planning impacts health behaviors and outcomes (Sandt et al., 2019). “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). Chronic diseases are not randomly distributed across the United States, suggesting that they are correlated with built and social environments (Fitzpatrick & Willis, 2020) (Nieuwenhuijsen & Khreis, 2019). Improving walking, cycling, and public transportation conditions can improve physical and mental health by increasing physical activity, supporting community cohesion, and decreasing stress (Litman, 2013). Transportation planning can impact both physical and mental health, but the effects of transportation planning decisions on health, beyond safety and air pollution, are often overlooked or undervalued (Litman, 2013).

Over the last century in the United States, land use mix has declined, increasing the segregation of uses. Distances between homes and everyday destinations such as school, work, and shopping increased, creating an environment designed for and dependent on motor vehicle travel, limiting active transportation and associated physical activity. As a result, sedentary lifestyles have become more normalized (Frumkin, 2016) and access to health services, healthy food, and recreation opportunities have been limited among disadvantaged populations (Litman, 2013). This geographic disparity is evident in Montana where residents of rural counties experience higher mortality rates for six of the ten leading causes of death as compared to residents of more urban counties (DPHHS, 2019). Between 2011 and 2015, the Montana Office of Vital Statistics reported that rural Montana residents had higher mortality rates due to unintentional injury, heart disease, diabetes and suicide as compared to residents who lived in more urbanized counties (DPHHS, 2019).

Although not the only factor contributing to health disparities within mostly rural states such as Montana, transportation systems serve as a modifiable variable contributing to health behaviors and outcomes in the population (Nieuwenhuijsen & Khreis, 2019). Transportation planning can serve as a tool to measure the impacts of land use and transportation on public health outcomes and to make structural changes that contribute to healthier behaviors (Nieuwenhuijsen & Khreis, 2019).

According to the Montana Association of County Officials (MACO), a Montana county with a population less than 35,000 residents is considered a rural county (Montana Association of Counties, 2023), whereas the Federal Office of Management and Budget (OMB) considers counties with an urban core of less than 50,000 people as rural (Health Resources and Services Administration, 2023). In communities of 50,000 or more residents within an urban core, formation of a metropolitan planning organization (MPO) is required for growth and transportation planning purposes. As of 2022, three Montana counties had established MPOs and are considered urban by OMB definition;

Missoula, Cascade, and Yellowstone. MPOs are not required of counties that meet the OMB definition of rural.

The use of performance management is required of MPOs in transportation planning. According to the Federal Transit Administration, transportation performance management is an approach to planning that uses system performance measures that inform future decision making to achieve performance goals (U.S. Department of Transportation, 2023). Performance Management can assist decision makers in analyzing current conditions, project selection, system performance, and progress toward transportation plan goals (Singleton & Clifton, 2017). MPOs and state Departments of Transportation (DOT) are required to develop performance based Long Range Transportation Plans (LRTPs) every four to five years (Department of Transportation, 2016).

Guidance statements and performance measures are two areas within transportation planning that can accomplish substantial structural changes (K. M. Fitzpatrick & Willis, 2012). Guidance statements are defined as the policy language that guides the implementation of the plan such as the vision, goals, objectives, and strategies (Singleton & Clifton, 2017). Performance measures assess plan performance and serve to inform decision makers and transportation agencies of the impacts of transportation plans and projects (Williams et al., 2017). Performance measures of safety, congestion, reliability, freight movement, environmental sustainability, and delay are required within Statewide and MPO LRTPs (Department of Transportation, 2017). Performance management is not federally required for transportation planning initiated by local governments without an MPO, or those communities with populations of less than 50,000 people.

The existing performance management structure required of States and MPOs can serve as a guide for integrating health-related performance measures into transportation planning and performance management (Singleton & Clifton, 2017). Some states and MPOs are going beyond minimum federal performance management requirements and are enhancing the measurement of transportation investment impacts on people's lives and public health (Transportation for America, 2015). The consideration and inclusion of the health impacts of transportation planning can influence the priorities and decisions made by local leaders (Litman, 2013) in areas that matter most to the public (Transportation for America, 2015). Transportation planning decisions that support walking, biking, and transit, can increase access to health services, healthy food, and recreation opportunities for all people (Litman, 2013).

Although not federally required, some rural local governments are also creating transportation planning documents to help guide decision making for locally owned transportation systems within their jurisdiction. The purpose of this study was to assess the extent public health impacts are considered in local transportation planning in Montana's small urban and rural communities. The study examined how health impacts are considered and the extent to which Montana's ten most populated counties are

integrating health related guidance statements, performance measures, and health data into local transportation planning documents and processes.

2 Methods

An internet public document search was conducted to find the transportation planning documents for governments within the ten most populous counties of Montana. Out of the ten most populous counties, nine had at least one transportation plan in place for a city or other defined area within the county. Only one, Lincoln County, did not have a transportation plan in place, but rather transportation goals and objectives were included as part of the most recent growth policy update. In the case that more than one community within each county had a transportation plan, the most populous community or community area plan was used for this audit. In total, nine transportation planning documents and one growth policy's transportation section were reviewed for inclusion of guidance statements and health-related performance measures across the domains of general health, safety, air quality, physical activity, accessibility, mental health, and equity.

Analysis of transportation planning documents followed a similar approach used by Singleton and Clifton in their 2017 review of long range transportation plans across 25 MPOs (Singleton & Clifton, 2017). After gathering plan documents, a directed approach using electronic searches for guidance statement and performance measure key terms was performed on each plan's text, followed by a summative content analysis to interpret the underlying context of the term (Hsieh & Shannon, 2005).

Guidance statements were required to provide a directive to decision makers rather than simply describe current or existing conditions. Search terms used to identify guidance statements included: "vision", "goal", "objective", "principle", "policy", "strategy", "recommendation", "outcome". Performance measures were required to measure or assess the plan's performance. Performance measure key search terms included: "performance measure", "metric," "indicator," "factor," "standard," and "target."

Terms of reference were then used to search for, identify, and code health-related guidance statements and performance measures into health domains. Terms of reference for each domain were sourced from previous transportation planning assessments related to general health, safety, air quality, physical activity, accessibility (Singleton & Clifton, 2017), mental health (Lee & Sener, 2016), and equity (Williams et al., 2017). General health terms of reference included key terms related to human health such as "population health," "community health," "public health," "livable," and "quality of life." Safety key terms included "safe" and "safety." After further review of planning documents, the terms "injury" and "fatality" were included in terms of reference to identify safety related guidance statements and performance measures. Air quality terms of reference included "air quality," "air pollution," and "emissions." Physical activity terms included "exercise," "physical activity," "walk," "bike" (verb), or "walking," "biking," and "bicycling." The accessibility domain included terms referring to the access of goods, services or destinations including: "access," "connect," "connection," "opportunity," "isolation," and "seclusion." Although the term "access management" includes the term "access," guidance statements identified as part of access

management strategies were categorized as safety, not an access term, because access management techniques are a safety strategy that ultimately limit conflict points by limiting access to locations (Gluck, 1999). The mental health domain included terms related to person's psychological health, mood, and self-perception (Lee & Sener, 2016). Mental health terms of reference include "mental health," "stress," "satisfaction," "noise pollution," "mental," "emotional" "psychological," "social well-being," and "well-being" (Lee & Sener, 2016). Equity terms of reference were sourced from previous research on the distributional effects of transportation plans among communities of concern (Williams et al., 2017). Equity terms included "low-income," "elderly" (older people), "disabled," "economically disadvantaged," "minority," "minor" (person under age 18), "children," "Youth," "Community of concern," "race," "ethnicity," "income," "zero-vehicle households," "limited English proficiency," "single parent household," "food stamps," school-aged children," "homeless," "special needs populations," and "Veterans" (Williams et al., 2017). Additional equity related terms found within the transportation planning documents were "poverty," "equitable," "rural," "underserved," "disabilities," and "ADA."

Contents of each plan were assessed for the context in which the "terms of reference" were utilized. Statements containing terms of reference were examined for being simply descriptive or providing guidance on implementation of the plan. Those statements that included one of the terms of reference listed above, but were simply descriptive in nature, were not considered guidance statements for this analysis, therefore excluded from the results. Data found within plans were categorized by if they were identified to assess plan performance or if they were included as a reference only. Those data identified to assess the plan's performance in meeting guidance statements were categorized as performance measures, whereas those data that were not identified to assess plan performance were categorized as reference data only.

Results were recorded in an Excel spreadsheet categorizing results as guidance statements, performance measures, or reference data, and coded for their relation to health domains. Figure 1 shows the relationship between search terms and terms of reference used to identify and categorize guidance statements and performance measures by domain.

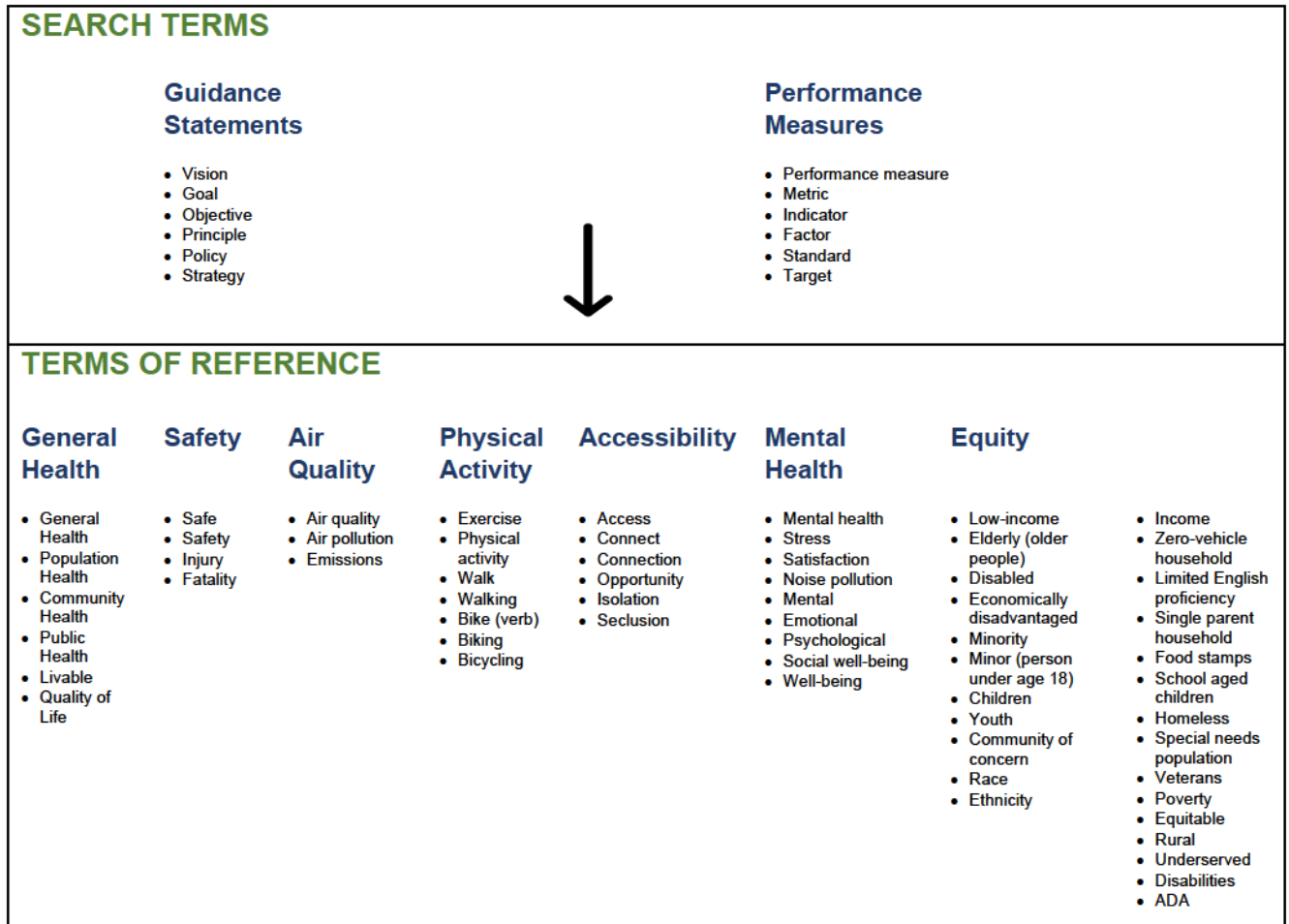


Figure 1: Search terms and terms of reference used to identify and categorize guidance statements and performance measures by health domain.

3 Results

Among the ten most populated counties in Montana, three include an MPO while the remaining seven counties do not. Although all transportation plans contained health related guidance statements and health related data, only those transportation plans from counties containing an MPO included health related performance measures. Table 1 shows the distribution of health-related guidance statements, performance measures, and health related data identified across the nine transportation plans and one growth policy reviewed.

County	Health Guidance Statements							Health Performance Measures							Health-related Data						
	Gen Health	Safety	Air Quality	Phy Activity	Accessibility	Mental Health	Equity	Gen Health	Safety	Air Quality	Phy Activity	Accessibility	Mental Health	Equity	Gen Health	Safety	Air Quality	Phy Activity	Accessibility	Mental Health	Equity
Cascade*	Y	Y	Y	Y	Y		Y		Y	Y					Y	Y	Y				
Flathead	Y	Y			Y		Y								Y		Y				
Gallatin	Y	Y		Y	Y		Y								Y		Y				
Lake	Y	Y		Y	Y		Y								Y						Y
Lewis and Clark	Y	Y	Y	Y	Y	Y	Y								Y		Y	Y			Y
Lincoln**		Y			Y																Y
Missoula*	Y	Y	Y	Y	Y		Y		Y	Y	Y	Y		Y	Y	Y	Y	Y			Y
Ravalli	Y	Y	Y	Y	Y		Y								Y						
Silver Bow		Y			Y		Y								Y		Y				Y
Yellowstone*	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y			Y	Y	Y	Y			Y

Table 1: Y indicates the distribution of health-related guidance statements, performance measures and reference data in the domains of general health, safety, air quality, physical activity, accessibility, mental health, and equity across transportation planning documents in the 10 most populous counties in Montana.

* Signifies that the county includes an MPO.

**Signifies county growth plan reviewed, transportation plan did not exist for this county.

3.1 Guidance Statements

Guidance statements related to safety and accessibility were found across all ten of the planning documents reviewed. Guidance statements related to equity were included in each of the nine transportation plans reviewed but were missing from Lincoln County’s growth policy. Eight of the ten planning documents included general health guidance statements except Lincoln and Silver Bow counties. Seven of ten planning documents included guidance statements related to physical activity apart from Flathead, Lincoln, and Silver Bow counties. Only four planning documents included guidance statements related to air quality. These include transportation plans from Lewis and Clark County in addition to those counties with an MPO: Yellowstone, Missoula, and Cascade.

Yellowstone and Lewis and Clark County’s long-range transportation plans included

guidance statements related to mental health and are notably the only two transportation documents that address all of the health domains.

3.2 Performance Measures

While all planning documents had some reference to health included within guidance statements, only those locations that contain an MPO included health-related performance measures. Cascade County included performance measures related to safety and air quality as required by the Moving Ahead for Progress in the 21st Century Act (MAP-21), but no performance measures are tied to the plan's guidance statements related to physical activity, accessibility, or equity. Missoula County included performance measures related to safety, air quality, physical activity, accessibility, and equity. Yellowstone County included health metrics in the domains of safety, air quality, physical activity, and accessibility. No mental health-related performance measures were found in any of the planning documents reviewed.

3.3 Health-related data

Health-related data used as a reference within transportation planning documents varies. All planning documents included data related to safety except Lincoln County's growth policy. Physical activity data was included in seven of the ten planning documents apart from Lake, Lincoln, and Ravalli counties. Equity data was included in six of ten planning documents except for Cascade, Flathead, Gallatin, and Ravalli counties. Accessibility data was included in planning documents from Lewis and Clark, Missoula, and Yellowstone counties. Air quality data was only included in planning documents created by the MPOs found in Cascade, Missoula, and Yellowstone counties. Among the planning documents reviewed in this audit, none included data that could be categorized to the general health or mental health domains.

4 Discussion

At the time of this study, three of ten counties (Missoula County, Yellowstone County, and Great Falls) included an MPO, while two others (Gallatin County and Lewis and Clark County) were beginning the process of establishing MPOs within their boundaries.

Although varied in content and structure, all ten planning documents reviewed in this audit were found to contain guidance statements related to at least two or more health domains. Additionally, all ten of the planning documents included health-related data, although this data did not always align with the plan's guidance statement or measure plan performance. The inclusion of this data could be presumed evidence that local Montana governments and planning agencies are interested in, considering, or at least acknowledge the impacts of transportation planning on health.

Health related performance measures were only found in planning documents from local governments with an established MPO. Ideally, guidance statements such as the vision, goals, objectives, and strategies identified in a transportation plan would tie to a performance measure. Performance measures serve to inform decision makers and transportation agencies of how well the plan has been implemented and the impacts of transportation plans and projects (Williams et al., 2017). MPOs are required to develop performance-based Long Range Transportation Plans (LRTPs), whereas rural local governments do not have these same requirements (Department of Transportation, 2016).

Local rural transportation plans vary in scope and content as many do not fall under the federal regulations required of MPOs and State DOTs. Although all planning documents reviewed in this study contained health-related guidance statements, only those planning documents from an MPO contained health related performance measures. Not surprisingly, since performance measures for safety and air quality are federally required and established practice for MPOs (K. M. Fitzpatrick & Willis, 2012), they were included in all MPO planning documents. However, performance measures for physical activity, accessibility, mental health, and equity were not always considered, leaving a less complete picture of the impact of the transportation system on public health. In rural areas not covered by an MPO, health-related performance measures were not found within any of the planning documents. This left smaller governments with overarching guidance statements of community priorities with no means to measure performance of the transportation system as it relates to those priorities.

Transportation practitioners cite challenges in identifying performance measures and setting targets in areas with external influencing factors such as public health, physical activity, mental health, and equity. Performance measures in these domains are not required through federal legislation, therefore multiple ways of defining and calculating the results for these issues combined with lack of experience setting local targets leads to uncertainty. External influencing factors can decrease a transportation agency's sense of efficacy in addressing the system's impact on health measures, but a thorough

understanding of external factors within each domain could benefit identification of policy and strategy to help address health outcomes (Grant et al., 2022).

There are some limitations to this study that should be acknowledged. First and foremost, the sample size was limited to ten transportation planning documents from Montana's ten largest counties. Several of these documents were created by the same consulting agency and contained exact language for some visionary principles, goals, and strategies. Some of the planning documents date back to over a decade ago and may not reflect current community priorities; the oldest being adopted in 2011. This sample may not be representative of all rural communities. Additionally, qualitative data was collected using key term searches and then analyzed for context. This method could leave room for bias in interpretation of key term context. Methods for gathering and analyzing qualitative data could be enhanced by using computerized software such as NVivo to ensure there are no gaps in data collected and analyzed.

Future research to understand factors that support or prevent the inclusion of health-related performance measures in transportation planning is warranted. This could include research to better understand the knowledge, attitudes, and beliefs of planning staff, elected officials, and community volunteers involved in the planning process, and to gain a thorough understanding of factors influencing their planning decisions. Additionally, investigating the influence of planning consultants on the development of community vision, goals, objectives, strategies, and performance measures could further provide insight into how health is considered in the planning process. This study did not assess the extent to which transportation plans were implemented or the 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 findings are evidence that performance-based planning requirements for MPOs serve to establish a minimum of how transportation system performance can be measured and as a tool to further investigate a more complete picture of the impacts on health. Guidance and recommendations related to performance-based planning may assist rural local governments in establishing performance-based transportation plans that measure the performance of the local transportation system as it relates to local public health priorities.

5 Conclusion

Transportation systems are a modifiable variable to make structural changes that benefit public health and address the social determinates of health (Nieuwenhuijsen & Khreis, 2019). Although transportation planning can impact health behaviors and outcomes (Sandt et al., 2019), the public health impacts of planning decisions are often overlooked (Litman, 2013). This transportation plan audit assessed the extent that health impacts were considered within transportation planning documents of the ten most populous counties in the state of Montana.

All documents reviewed, regardless of MPO status, contained varying health-related guidance statements and reference data indicating some level of interest in the impact of the transportation system on health outcomes in all localities. 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. This leaves rural local governments without a means to measure performance of their plan against community priorities.

Performance-based planning requirements of MPOs can serve as a guide to further integrate health-related performance measures into rural local transportation planning efforts. Further guidance and recommendations for performance-based planning may assist both small urban and rural governments to investigate the impact of transportation planning on public health behaviors and outcomes.

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