

# Equity Considerations in Asset Management: Case Studies



© Applied Pavement Technology, Inc.



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

**FHWA-HIF-23-033**

**Federal Highway Administration**

**Office of Stewardship, Oversight and Management  
1200 New Jersey Avenue, SE  
Washington, DC 20590**

### **Notice**

This document is disseminated under the sponsorship of the U.S. Department of Transportation (USDOT) in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in this document.

The U.S. Government does not endorse products, manufacturers, or outside entities. Trademarks, names, or logos appear in this report only because they are considered essential to the objective of the document. They are included for informational purposes only and are not intended to reflect a preference, approval, or endorsement of any one product or entity.

### **Non-Binding Contents**

The contents of this document do not have the force and effect of law and are not meant to bind the public in any way. This document is intended only to provide clarity to the public regarding existing requirements under the law or agency policies. However, compliance with applicable statutes or regulations cited in this document is required.

### **Quality Assurance Statement**

The Federal Highway Administration (FHWA) provides high-quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

### **Credits**

Unless otherwise noted, Applied Pavement Technology, Inc. is the source for all images in this document. The FHWA has an unlimited right to use the images contained in this document.

**Technical Report Documentation Page**

<b>1. Report No.</b> FHWA-HIF-23-033		<b>2. Government Accession No.</b> None.		<b>3. Recipient's Catalog No.</b> None.	
<b>4. Title and Subtitle</b> Equity Considerations in Asset Management: Case Studies				<b>5. Report Date</b> April 2023	
				<b>6. Performing Organization Code</b> None.	
<b>7. Author(s)</b> Kathryn A. Zimmerman, APTech Brad Allen, APTech				<b>8. Performing Organization Report No.</b> None.	
				<b>10. Work Unit No. (TRAIS)</b> None.	
<b>9. Performing Organization Name and Address</b> Applied Pavement Technology, Inc. 115 W. Main Street, Suite 400 Urbana, IL 61801				<b>11. Contract or Grant No.</b> Contract No. 693JJ319D000023/ Order No. 693JJ320F000210	
				<b>13. Type of Report and Period Covered</b> Final Report Case Study, June 2020 to October 2021	
<b>12. Sponsoring Agency Name and Address</b> Federal Highway Administration 1200 New Jersey Ave SE Washington, DC 20590				<b>14. Sponsoring Agency Code</b> None.	
				<b>15. Supplementary Notes</b> Laura Lawndy (COR), Nastaran Saadatmand and Tashia Clemons (Technical Leads)	
<b>16. Abstract</b> <p>Transportation agencies regularly consider trade-offs between investment options to address competing priorities with limited resources. Inadequate funding for all needed transportation improvements forces agencies to make difficult decisions across asset classes, such as mobility improvements versus preservation or on-going maintenance versus system expansion projects. The results of these decisions can have a positive impact on one performance measure but a negative impact on another. For instance, increasing funds to address mobility issues through the construction of new roads and bridges can divert needed funding from planned long-term asset management activities that are vital to minimize the life cycle costs necessary for sustainable system performance. In this example, the investment to address mobility improves traffic reliability measures but may lead to lower asset conditions.</p> <p>In addition to factors such as system preservation, mobility, and safety when making transportation investment decisions, equity is also an important consideration. Interest in finding ways to strengthen equity considerations is growing, as evidenced by its prominence at the 13<sup>th</sup> National Conference on Transportation Asset Management sponsored by the Transportation Research Board (TRB) in August 2021 and the TRB Advancing Transportation Equity Conference held virtually in September 2021.</p> <p>The FHWA’s Transportation Asset Management Expert Task Group (TAM ETG) recognized the importance of equity as an emerging topic and prepared this document to explore existing initiatives underway in State, local, and regional transportation agencies to better consider equity in asset management decisions. The results indicate that equity considerations are more common in transportation planning activities than in asset management decisions impacting project selection. Therefore, the document presents suggestions for advancing the consideration of equity in asset management investment decisions.</p>					
<b>17. Key Words</b> Transportation Asset Management, Equity, Investment Planning, Investment Priorities				<b>18. Distribution Statement</b> This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161	
<b>19. Security Classify. (of this report)</b> None.		<b>20. Security Classify. (of this page)</b> None.		<b>21. No of Pages</b> 30	<b>22. Price</b> None.



## TABLE OF CONTENTS

<b>CHAPTER 1: INTRODUCTION .....</b>	<b>1</b>
Introduction.....	1
Emphasis on Inclusion and Diversity in Transportation.....	2
<b>CHAPTER 2: DEFINING AND ADVANCING TRANSPORTATION EQUITY.....</b>	<b>5</b>
Introduction.....	5
Defining Transportation Equity and Its Fundamental Principles .....	5
Frameworks for Addressing Transportation Equity .....	8
<b>CHAPTER 3: RETHINKING POLICIES AND PRACTICES .....</b>	<b>13</b>
Introduction.....	13
California DOT.....	13
Minnesota DOT .....	13
Oakland, CA .....	14
North Front Range Metropolitan Planning Organization.....	14
Seattle Department of Transportation .....	15
Equity Analysis in Regional Transportation Planning Processes.....	16
Chicago, IL .....	17
Massachusetts DOT .....	18
Boston Region Metropolitan Planning Organization (MPO) .....	18
<b>CHAPTER 4: MOVING FORWARD.....</b>	<b>19</b>
Introduction.....	19
Framing Questions .....	19
Setting the Direction for Research and Practice.....	20
Next Steps .....	23
<b>REFERENCES.....</b>	<b>25</b>

## **LIST OF FIGURES**

<b>Figure 1. Differences in meaning between equality, equity, and justice.....</b>	<b>6</b>
<b>Figure 2. Potential impacts of inherent bias in the variables used for transportation planning decisions. ....</b>	<b>11</b>

## CHAPTER 1: INTRODUCTION

### Introduction

Transportation agencies regularly make trade-off decisions between investment options to address competing priorities with limited resources. Inadequate funding for all needed transportation improvements forces agencies to make difficult decisions across asset classes, such as mobility improvements versus preservation or on-going maintenance versus system expansion projects. The results of these decisions can have a positive impact on one performance measure but a negative impact on another. For instance, increasing funds to address mobility issues through the construction of new roads and bridges can divert needed funding from planned long-term asset management activities that are vital to minimize the life cycle costs necessary for sustainable system performance. In this example, the investment to address mobility improves traffic reliability measures but may lead to lower asset conditions.

Today, these same agencies are recognizing that some transportation planning and programming practices can have negative impacts on underrepresented communities. With a commitment to account for diversity, equity, and inclusion in current and future transportation investments, some transportation agencies are re-examining their planning and programming practices to account for both the positive and negative equity impacts those investments have on a broad range of communities. A quick web search indicates that some State DOTs, including California, Minnesota, Oregon, Washington State, and Wisconsin specifically reference diversity and inclusion in their agencies' strategic goals (Caltrans 2021; MnDOT 2019a; ODOT 2023; WSDOT n.d.; WisDOT 2021).

Addressing equity is also a strategic priority at the Federal level. The FY 2022-26 U.S. Department of Transportation (USDOT) Strategic Plan includes equity as one of its six strategic goals. Secretary of Transportation Pete Buttigieg stated that the Administration's priority encompasses efforts to "finally address major inequities – including those caused by highways that were built through Black and Brown communities, decades of disinvestment that left small towns and rural main streets stranded, and the disproportionate pollution burden from trucks, ports, and other facilities" (AASHTO 2021a). The U.S. DOT and Federal Highway Administration (FHWA) have established strategic and leadership priorities that promote equity, emphasizing the importance of making the transportation system accessible to all users and providing more equitable choices across all transportation modes<sup>1</sup>.

On May 25, 2021, the USDOT published a Request for Information (RFI) on Transportation Equity Data in response to Executive Order 13985.<sup>2,3</sup> The RFI specifically seeks input regarding the availability of potential data and assessment tools in the transportation sector that can support the USDOT's evaluation.

The FHWA's Transportation Asset Management Expert Task Group (TAM ETG) initiated this case study to explore how State, local, and regional transportation agencies are considering equity in asset management investment decisions. The TAM ETG explored the topic using a broad definition of asset management beyond that required under 23 U.S.C. 119 for pavements and bridges on the National Highway System (NHS). This expansive approach explored how

---

1 FHWA. 2021. *Policy on Using Bipartisan Infrastructure Law. Resources to Build a Better America*. Memorandum.

[https://www.fhwa.dot.gov/bipartisan-infrastructure-law/building\\_a\\_better\\_america-policy\\_framework.cfm](https://www.fhwa.dot.gov/bipartisan-infrastructure-law/building_a_better_america-policy_framework.cfm).

2 USDOT. 2021. *Request for Information on Transportation Equity Data*. Federal Register. Notice.

<https://www.federalregister.gov/documents/2021/05/25/2021-10436/request-for-information-on-transportation-equity-data>

3 USDOT. 2021. *Request for Information: Transportation Equity Data*: <https://www.regulations.gov/document/DOT-OST-2021-0056-0001>

equity is being addressed in planning and programming decisions, investment planning, and project programming. The results of the case study found evidence of policy- and planning-level initiatives to better consider affordable and equitable access to transportation options. There was less information available on how equity is being accounted for in asset management evaluations and investment decisions. These findings indicate there is a need for ways to integrate equity into asset management, and lessons can be learned from work being done by some agencies in planning and programming. Based on these findings, suggestions are provided for advancing the state of the practice.

### **Emphasis on Inclusion and Diversity in Transportation**

The increasing emphasis on equity, inclusion, and diversity in transportation is due in part to the realization that historical transportation investments have sometimes negatively impacted underrepresented communities through disinvestment and systemic barriers that have limited opportunities for some people. The planning and construction of the nation's Interstate highway system is commonly referenced as an example of these practices since many highways were routed directly through underrepresented neighborhoods, "producing lopsided and skewed patterns of infrastructure development" (Archer 2021).

In addition to impacts related to planning and design, transportation user costs are also reported to weigh more heavily on low-income households. One study found that "transportation expenses consume 16 percent of income for residents with low incomes, compared to 6 percent for high-income residents" (Larson 2021). Larson suggests these disparities are influenced by several factors, including the distance low-income residents live from job locations and inefficient and unconnected transit options. Larson also provides statistics showing that low-income households tend to be more reliant on transit than other households since buses and trains are used for access to jobs, education, and other vital services. She also notes that a dependence on lower-cost forms of transportation, such as walking or cycling, also introduces safety risks to users.

The use of technology may also introduce disparity among transportation users if underrepresented populations do not have easy access to the equipment needed or credit services. Transportation systems that rely on credit cards or online fare options are examples of how reliance on technology can impact accessibility to transportation options in some situations.

The Bipartisan Infrastructure Law (BIL), enacted as the Infrastructure Investment and Jobs Act (IIJA) (Public Law 117-58) on November 15, 2021, includes program funding addressing many of these equity-oriented approaches to infrastructure development. A White House statement said: "This Bipartisan Infrastructure Deal will rebuild America's roads, bridges and rails, expand access to clean drinking water, ensure every American has access to high-speed internet, tackle the climate crisis, advance environmental justice, and investment in communities that have too often been left behind" (The White House 2021) (emphasis added). As an example of its equity-oriented initiatives, BIL includes provisions regarding local hiring preferences for construction jobs.<sup>4</sup> Also, noteworthy is an Executive Order issued on advancing racial equity and support for underserved communities.<sup>5</sup> New guidance on public involvement further illustrates the commitment to increasing the participation of underrepresented communities in transportation

---

4 FHWA. 2022. *Hiring Preferences*. <https://www.fhwa.dot.gov/construction/hiringpreferences/>

5 The White House. 2021. *Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government/>



decisions.<sup>6</sup> Additionally, the Federal government has established a goal to direct a percentage of certain Federal investments to disadvantaged communities that have traditionally been overburdened by pollution under the Justice40 Initiative.<sup>7</sup>

The examples of equity initiatives identified through this effort provide insights into key approaches that show promise for advancing the consideration of equity in asset management investment decisions.

The case studies featured in this document are organized by the following topics:

- Chapter 2: Defining and Advancing Transportation Equity – These examples focus on agencies that have taken steps to establish definitions and have recognized the need to improve the understanding of transportation equity in existing planning processes.
- Chapter 3: Rethinking Policies and Practices – These examples explore steps that agencies have taken to modify legacy policies and practices to better consider equity factors in decisions.
- Chapter 4: Moving Forward – This section builds on the experiences from the cases studies to opine on a direction for the transportation asset management community to consider in the future.

In addition to its initiatives related to equity, BIL includes other important provisions related to asset management, including those noted below:

- Transportation asset management plans are now required to consider weather and resilience. Guidance is available from the [FHWA State Asset Management Plan Under BIL Memo](#).
- The Bridge Investment Program and Bridge Formula Program provide billions of dollars to address bridge needs. Fact sheets are available from the [Bipartisan Infrastructure Law website](#).
- The Deputy Administrator issued a memo (December 2021), [Policy on Using Bipartisan Infrastructure Law Resources to Build a Better America](#), describing a framework for building a better America that improves the condition, resilience, and safety of road and bridge assets consistent with transportation asset management plans.

<sup>6</sup> USDOT. 2022. *Promising Practices for Meaningful Public Involvement in Transportation Decision-Making*. [https://www.transportation.gov/sites/dot.gov/files/2022-10/Promising\\_Practices\\_for\\_Meaningful\\_Public\\_Involvement\\_in\\_Transportation\\_Decision\\_making.pdf](https://www.transportation.gov/sites/dot.gov/files/2022-10/Promising_Practices_for_Meaningful_Public_Involvement_in_Transportation_Decision_making.pdf)

<sup>7</sup> The White House. 2022. *Justice40*. <https://www.whitehouse.gov/environmentaljustice/justice40/>



## CHAPTER 2: DEFINING AND ADVANCING TRANSPORTATION EQUITY

### Introduction

This chapter addresses the foundational issues associated with efforts to address transportation equity, including definitions and a summary review of rules and regulations impacting these efforts.

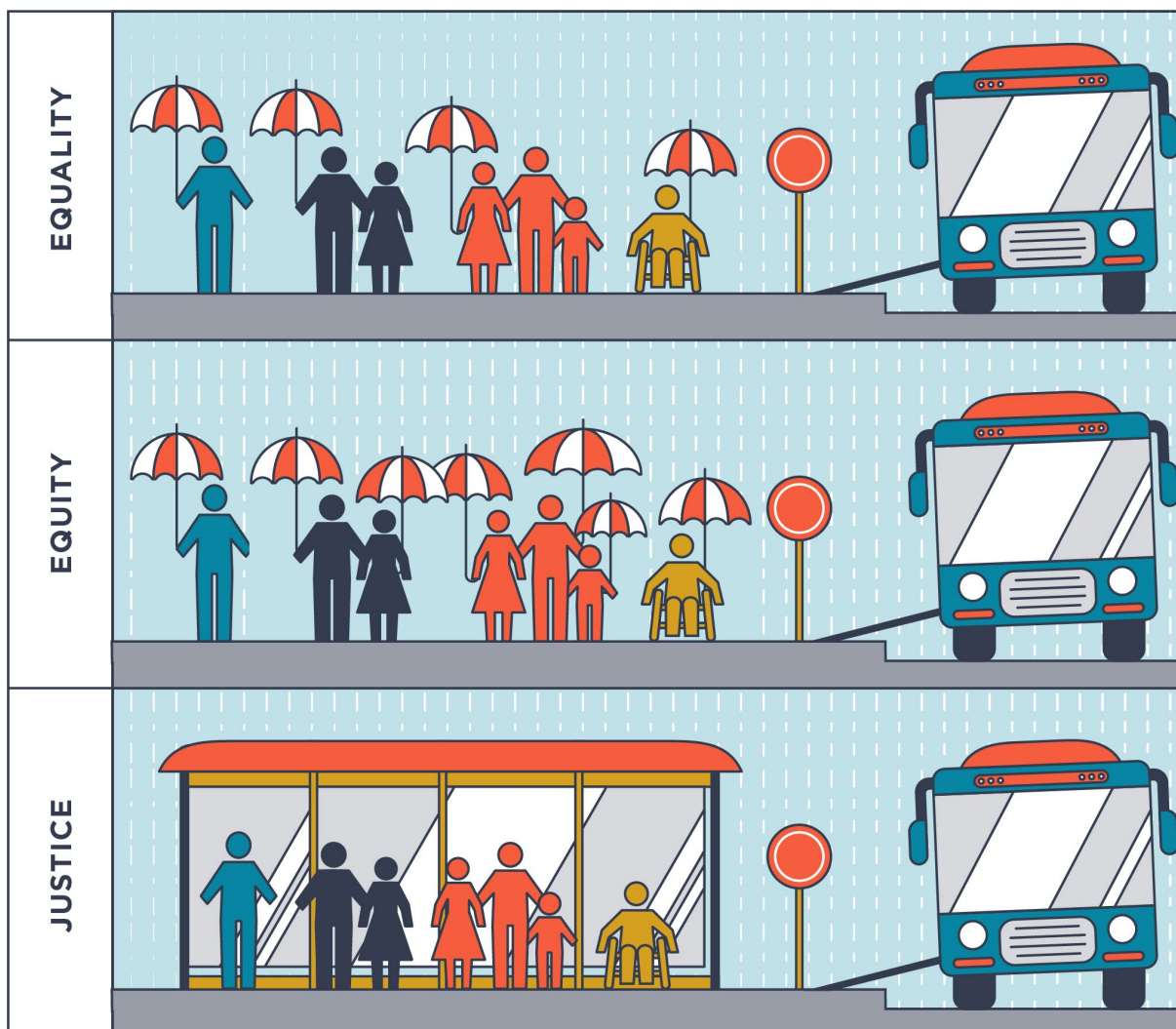
### Defining Transportation Equity and Its Fundamental Principles

The Minnesota DOT (MnDOT), in partnership with the Center for Transportation Studies at the University of Minnesota, conducted research under [MnDOT's Advancing Transportation Initiative](#) to identify practical steps to reduce disparities and inequities in transportation that impact the ability of underserved or underrepresented communities to have equitable access to transportation options that are affordable, reliable, efficient, safe, and easy to use. The study applied a broad definition to underserved and underrepresented communities, including communities of color, indigenous communities, older adults, people with disabilities, women and youth, rural residents, and people with limited access to cars. The study obtained input from local communities through focus group discussions and surveys. These efforts resulted in a working definition of equitable transportation that includes:

- “Transportation systems that support multimodal options that are affordable, sustainable, reliable, efficient, safe, and easy to use.
- Quality transportation services that are accessible to all populations for reaching destinations independently, if needed; and
- Transportation decision-making processes that incorporate inclusive public engagement to reduce the long-standing socioeconomic disparities experienced by underserved and underrepresented communities” (Van Dort et al. 2019).

Recent studies have supported a broad definition of underserved populations. For instance, a study conducted by the Transit Cooperative Research Program (TCRP) defined the term *equity* as a broad concept that addressed a wide range of populations. This was compared to the term *environmental justice*, which traditionally references low-income and minority populations. The TCRP study expanded the populations represented by the term *equity* to include additional vulnerable populations, such as households without cars, persons with disabilities, low-English literacy populations, older people who may have mobility issues, young people, and other specific groups, such as Native Americans (Twaddell and Zgoda 2020a).

The differences in meaning between equality, equity, and justice are frequently conveyed using images, such as the one shown in figure 1. As shown in the graphic, equality focuses on providing the same amount of something or the same items to all, such as the distribution of one umbrella for each family. Equity focuses on adjusting what is provided to individuals to ensure that everyone gets what they need to enjoy a particular benefit, such as each individual getting an umbrella in this example. Justice, on the other hand, focuses on removing the need for adjustments by addressing the underlying inequities up front. In this example, that means providing a shelter that avoids the need for umbrellas.



©Applied Pavement Technology, Inc. 2021

Figure 1. Differences in meaning between equality, equity, and justice.

A study was conducted for the Colorado DOT (CDOT) to steer the development of an environmental justice planning process (Van Orden and Grauberger 2002). The study provided CDOT with recommendations for enhancements to public involvement among low-income and minority populations, suggested changes to existing documents for enhancing CDOT's consideration of environmental justice and included strategies for better integrating environmental justice in the statewide and regional planning process. The authors' recommendations were founded on the three fundamental principles of environmental justice set forth in Executive Order 12898 (1994)<sup>8</sup>. These environmental justice principles are:

- “To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority and low-income populations.

<sup>8</sup> Executive Office of the President. 1994. *Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*. Federal Register. Executive Order 12898. <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>

- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations” (Executive Order 12898).

Researchers from the University of Minnesota’s Center for Transportation Studies have found a shift in transportation equity efforts (Van Dort et al. 2019). Traditional methods focused primarily on compensation approaches that provided resources to targeted population groups. More recent efforts were found to be more focused on the structural inequities inherent in existing practices and the specific transportation inequities that affect underserved and underrepresented communities where they live. Van Dort et al. (2019) identified a total of 24 transportation programs addressing these issues at the Federal, State, regional, and local levels. The programs identified through the study are listed in the call out box. The authors noted these programs involved improvements to:

- Engagement processes – designing processes that facilitate the participation of traditionally underserved and underrepresented communities to discuss transportation needs and possible solutions.
- Available opportunities – initiating programs and policies that provide increased access to opportunities that further social and economic priorities for underserved and underrepresented communities.
- Sustainable and health transportation options – creating programs that provide reasonable alternatives to minimize automobile dependency and support more active transportation options.

#### **Transportation Programs Addressing Transportation Equity Issues (Van Dort, et.al. 2019)**

- Atlanta Regional Commission Equitable Target Area Index
- Baltimore City Department of Planning Equity in Planning Committee
- Boston Region Metropolitan Planning Organization Transportation Equity Program
- Center for Rural Policy
- City of Minneapolis 20-Year Streets Funding Plan
- City of Oakland Department of Transportation’s Strategic Plan
- Delaware Valley Regional Planning Commission Indicators of Potential Disadvantage
- Environmental Protection Agency Creating Equitable, Healthy, and Sustainable Communities
- Equity principles incorporated into the Metropolitan Council’s Regional Solicitation
- Hennepin County’s Address Disparities Program
- Los Angeles County Metropolitan Transit Authority Consent Decree (in force 1996-2010)
- Metro Transit Everyday Equity Initiatives
- Metropolitan Council Equity Advisory Committee
- Metropolitan Council Joint Disparities Study
- Metropolitan Council Metro Stats Program
- Metropolitan Washington Council of Governments Equity Emphasis Areas
- Minnesota Compass Program, Wilder Research
- Minnesota Department of Health "Advancing Health Equity in Minnesota" implementation process
- North Central Texas Council of Governments Transportation and Environmental Justice Program
- Policy Link National Equity Atlas
- Polk County, Florida Neighborhood Mobility Audits
- Pratt Center for Community Development Transportation Equity Project
- San Francisco Metropolitan Transportation Commission/Association of Bay Area Governments Regional Equity Working Group
- Seattle Department of Transportation - Transportation Equity Program

- Equity spending – integrating the promotion of equity issues in the prioritization of infrastructure projects across the system.
- Collaboration and coordination – collaborating and coordinating with stakeholders to advance equity initiatives.
- Evaluation metrics – creating a framework for evaluating policy, program, and project implementation using both quantitative and qualitative performance metrics.

## Frameworks for Addressing Transportation Equity

### *Federal Approaches*

There are numerous Federal legal authorities that provide mechanisms for addressing equity in transportation. For example, Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin under any program or activity receiving Federal financial assistance. Recipients of funds from the USDOT must ensure compliance with this statute.

Several Executive Orders issued by Presidents of the United States build on the principles of the Civil Rights Act by directing Federal agencies to implement civil rights related policies and procedures in carrying out their activities. One example is Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This 1994 Executive Order directs each Federal agency to make the achievement of environmental justice a part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.<sup>9</sup>

Orders issued by the USDOT illustrate the steps taken to respond to Executive Order 12898. For example, the USDOT issued its original *Environmental Justice Order* on April 15, 1997. This Order established a general framework, procedures, and commitment to promoting the principles of environmental justice in all DOT programs, policies, and activities. [FHWA Order 6640.23A](#), *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, updated policies and procedures that FHWA uses in complying with Executive Order 12898 (FHWA 2012). It replaced FHWA Order 6640.23 from 1998.

On May 16, 2021, the USDOT issued a revised *Environmental Justice Order*, [DOT 5610.2C](#), (USDOT 2021). Among other internal management improvements, this Order establishes guidance for each Operating Administration and the responsible officials for other DOT components to “determine whether programs, policies, or activities for which they are responsible will have an adverse human health or environmental effect on minority and low-income populations and whether that adverse effect will be disproportionately high” (USDOT 2021). These requirements will be administered so that the risk of discrimination and disproportionately high and adverse effects are identified early in the development and planning of a program, policy, or activity so that positive corrective action can be taken. The following information will be obtained where relevant, appropriate, and practical for the implementation of these requirements (USDOT 2021):

---

<sup>9</sup> Executive Office of the President. 1994. *Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*. Federal Register Executive Order 12898. <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>

- The population served and/or affected by the program, policy or activity by race, color, national origin, and income level.
- Proposed steps to guard against disproportionately high and adverse effects on persons on the basis of race, color, national origin, and income level.
- Present and proposed membership by race, color, national origin, in any planning or advisory body that is part of the program, policy, or activity.

### **Other Approaches**

The search conducted by the TAM ETG found evidence that some State and local transportation agencies have incorporated equity considerations into their existing programming and planning activities. As discussed earlier, CDOT initiated a study in 2002 to recommend enhancements to better incorporate environmental justice into its regional and statewide transportation planning processes. The study involved a review of practices in other State and regional transportation agencies and the development of specific recommendations for CDOT to consider, including the types of demographic information needed to evaluate minority and low-income population needs and impacts. Van Orden and Grauberger (2002) reported that the agencies interviewed as part of the study used U.S. Census race, ethnicity and income data as the basis for identifying minority populations and households by income. They also noted that agencies varied in terms of the level of analysis conducted, with some agencies conducting data-rich economic analyses and other agencies describing a “good-faith” effort to incorporate environmental justice principles into their planning processes. Van Orden and Grauberger (2002) noted that best practices related to the incorporation of environmental justice in the planning process involved:

- The ability to quantify adverse impacts in measurable ways.
- Using measurable performance indicators as part of a performance-based planning process.
- Incorporating criteria related to environmental justice into the analysis of project alternatives and the project selection process.
- Focusing on the coordination of policies and strategies.

In 2021, the Colorado State Legislature passed Senate Bill 21-260, which concerns the sustainability of the State transportation system through dedicated funding and new initiatives to support existing infrastructure, and it was signed into law on June 17, 2021<sup>10</sup>. In addition, the legislation supports the development of initiatives to modernize infrastructure to better support the adoption of electric motor vehicles and mitigate environmental and health impacts related to transportation system use (Colorado Senate Bill 21-260)<sup>10</sup>. As part of the legislation, a new Environmental Justice and Equity Branch was established in the Engineering, Design, and Construction Division of the Colorado DOT. This Branch is tasked with working with underrepresented and disproportionately-impacted communities during the early phases of transportation capacity projects to ensure that they participate fully in transportation decisions that impact their quality of life (Colorado Senate Bill 21-260, Section 28)<sup>10</sup>.

The Victoria Transport Policy Institute (VTPI) in Canada conducted a research study that included an analysis of estimated transportation costs to evaluate the impacts that transportation planning decisions can have on communities and the challenges with how to define and measure

---

<sup>10</sup> Colorado State Legislature. 2021. Senate Bill 21-260. [https://leg.colorado.gov/sites/default/files/2021a\\_260\\_signed.pdf](https://leg.colorado.gov/sites/default/files/2021a_260_signed.pdf)

these impacts. Based on the study's findings, Litman proposes that these impacts can be caused by bias that may favor some users over others or tend to harm underrepresented communities. Litman (2021) illustrates this point by suggesting a measure related to mobility or congestion (such as delay time) typically favors populations that drive to their workplace over people who do not work or who use other modes of transportation to commute. The study suggests evaluating transportation improvements based on accessibility rather than mobility to better consider the number of accessible services and jobs, different modes of travel (including transit and walking), travel time, and financial budgets (Litman 2021).

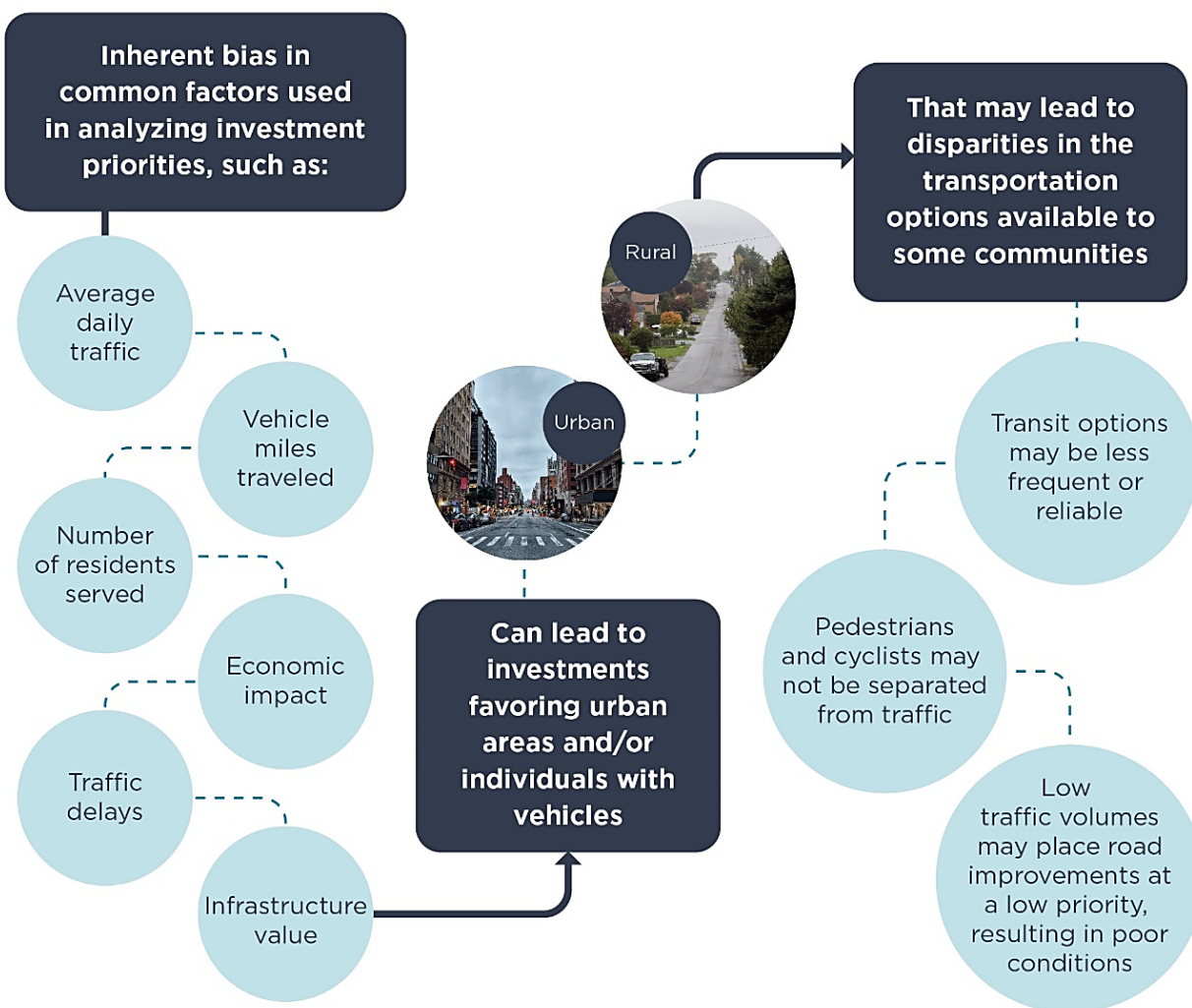
Litman (2021) further illustrates the potential impacts of biased variables on planning decisions with the examples listed below:

- Conventional planning efforts favor mobility (motorized modes) rather than accessibility (transit).
- Conventional travel surveys tend to undercount short trips and non-commute trips, which skews planning and funding toward motorized modes.
- Traditional economic evaluations of transportation alternatives tend to overlook many indirect costs associated with roadway capacity expansion and the full benefits associated with alternate modes.
- Funding levels and low local matching requirements for roadways may favor investments in existing facilities over alternative modes of travel.
- Lower income and other underserved communities may tend to receive less than a fair share of transportation investments and services.
- Land use policies that require generous parking and setback requirements lead to more automobile-dependent communities that have poor access for non-drivers.

The potential impacts of inherent bias in the variables used for transportation planning decisions are illustrated in figure 2, which was created by the TAM ETG. Litman (2021) also discusses the complexity in making tradeoff decisions between different equity objectives.

Litman illustrates this with an example in which an increase in public transit services may produce different outcomes for factors such as local air and noise pollution, commute times, and job opportunities when compared to improvements to pedestrian safety that reduce traffic speeds. Therefore, Litman suggests that identifying the specific objectives the agency is trying to achieve should be a priority. He stresses that managing these tradeoff decisions and defining the objectives to be achieved can be difficult, especially when different communities place different levels of importance on competing objectives. He illustrates this point with the difficulty in making tradeoffs between economic efficiency objectives (such as efforts to reduce congestion, crashes, and pollution problems) with social equity objectives that address basic mobility needs for non-drivers. He proposes that community needs and values should factor into these types of decisions.





©Applied Pavement Technology, Inc. 2021

Figure 2. Potential impacts of inherent bias in the variables used for transportation planning decisions.

Members of the TAM ETG recognize that State transportation agencies already see similar complexities in decisions between competing strategic initiatives related to safety, mobility, and asset management. From their perspective, asset managers' ability to compete for funding against other agency priorities demands innovative ways to convey the benefits to system preservation. For example, investments in asset preservation not only improve asset conditions, but may also contribute to safety and economic development objectives. Therefore, the TAM ETG proposes that improving agencies' ability to quantify the contribution that asset improvements have to these other agency objectives may increase the likelihood that asset management projects are funded. The TAM ETG also envisions asset management investments contributing to an agency's equity objectives but is not aware of appropriate measures for quantifying the links between asset management investments and equity.

To enhance the consideration of equity factors in transportation planning, Litman (2021) suggests use of the following types of information:

- Agency budgets and reports that indicate public expenditures by jurisdiction and mode, and on facilities targeted to serve particular groups.
- Census and survey data (such as level of mobility, portion of budget devoted to travel, and degree to which people lack basic access), separated by geographic, demographic, and income category.
- Traffic accident injury and assault rates by group.
- Records of services to accommodate people with disabilities and other special needs.
- The degree to which underrepresented people are considered in transportation planning.
- Records showing the frequency that underrepresented populations experience problems or file complaints.

Over time, Litman (2021) suggests the cumulative impacts of past planning and investment decisions have created inequitable distributions in terms of the types of facilities available in different communities and the level of access to transportation that is available. The VTPI study concludes with suggestions for overcoming biases in transportation planning criteria through reforms to planning and investments, pricing reforms (e.g., higher fuel tax or distance-based fees), and more comprehensive equity analysis approaches to address historical inequities and prevent them in the future. These suggestions allow transportation agency investments to support the safety, health, and quality-of-life for all persons and communities.

## CHAPTER 3: RETHINKING POLICIES AND PRACTICES

### Introduction

This chapter summarizes recent activities that transportation agencies have initiated to improve the consideration of transportation equity in their policies and practices.

### California DOT

In 2021, when Toks Omishakin was California DOT's (Caltrans') Director, he spoke on Capitol Hill at a Hearing held by the Transportation and Infrastructure Subcommittee of the U.S. Senate Committee on Environment and Public Works (EPW) to discuss the ways transportation agencies are incorporating equity into infrastructure programs. Omishakin suggested that to address transportation equity, the transportation community needs to "listen to communities affected by inequity and implement change accordingly by altering the ways we evaluate and make investments in transportation" (AASHTO 2021b). For Caltrans, this means the following (AASHTO 2021b):

- Expanding public transportation to meet the needs of a diverse and aging population, including quality transit service in rural communities.
- Developing and investing in passenger rail and transit projects that support inclusive job development opportunities in the trades.
- Growing the "clean transportation sector" to address the disproportionate effects of pollution on minority and under-served communities.
- Investing in safer multimodal and active transportation facilities on community highways, trails, and streets.
- Enhancing maintenance and operational investments on all highways and prioritizing under-served and rural communities, including tribal governments.

These initiatives represent a blended approach to integrating equity into agency operations, with the initiatives focused on transportation development, environmental, and asset preservation issues.

### Minnesota DOT

In 2016, MnDOT began rethinking its I-94 corridor from St. Paul into Minneapolis under an initiative titled *Rethinking I-94*. Construction that occurred in the 1960s resulted in the loss of homes, disconnected neighborhoods, and community distrust with the agency (MnDOT 2016). The rethinking efforts involved ongoing community engagement with the impacted neighborhoods to identify strategies to reconnect the neighborhoods, revitalize the communities, and provide a voice to underrepresented populations on transportation decisions that impact their lives.

The initiative involved an innovative, comprehensive, and human-centered engagement process to build a common understanding between MnDOT and the I-94 communities and users. Public engagement efforts have been organized around the eight pillars of livability: health, environment, economics, sense of place, safety, connections, equity, and trust (MnDOT 2017). The project website indicates that MnDOT is following the National Environmental Policy Act

(NEPA) process and expects to have revised goals, purpose and need statements, and project evaluation criteria in calendar year 2022.

## Oakland, CA

A self-organized, grassroots advocacy organization called [Connect Oakland](#) has established a vision to reconnect neighborhoods with the downtown area and reposition Oakland as the transportation hub for the Bay Area region while also improving the resilience of the transportation system (Connect Oakland 2015). The vision provides a strategy for transforming the Interstate 980 freeway into a boulevard to reconnect West Oakland with the downtown area through the reestablishment of 12 city streets. The vision proposed by Connect Oakland includes changes to the transportation planning processes to mitigate, in part, harm related to the development of I-980 through an underrepresented community that required the demolition of “503 houses, 4 churches, 22 businesses, and 142 jobs (TRB 2021).”

According to a TRB webinar on “Addressing Justice in Transportation” that was conducted on June 28, 2021, the City of Oakland has included a vision for I-980 in its Downtown Specific Plan but does not have sufficient funds to move the plan forward (TRB 2021, City of Oakland 2019). The speaker indicated that Caltrans has committed \$500,000 to study the freeway’s removal and the City is hiring a Community Organizing Fellow to develop a strategy for public engagement to explore the topic. The I-980 initiative reportedly involves a large consortium of government agencies at all levels, including Federal, State, and local transportation agencies, representatives from transit and rail agencies, and others.

Connect Oakland offers the following suggestions for other agencies that are interested in considering the effect of highways on urban communities as part of the transportation planning process (TRB 2021):

- Evaluate the effect of new highways in terms of who it will serve, how it will impact nearby communities, what alternate strategies are available, and so on.
- Create a framework and metrics for evaluation. The framework should provide an objective approach for analyzing transportation options that produces measurable effects and benefits. Factors that might be considered include economic disparity on each side of the highway, environmental impact, community disconnections that may result, other strategies to increase capacity, regional importance of the highway, traffic volumes, and political constituency from the businesses or residents in the area.

## North Front Range Metropolitan Planning Organization

The North Front Range Metropolitan Planning Organization (NFRMPO) initiated a study to develop an Environmental Justice Plan that would enhance the consideration of environmental justice in transportation planning initiatives across Northern Colorado. During the development of the Plan, feedback was provided by both FHWA and the Federal Transit Agency (FTA). The feedback from these agencies specifically pointed to the need to evaluate existing public outreach activities to better seek out the needs of traditionally underserved populations.

As part of the Plan’s development, the study evaluated current methods for analyzing environmental justice and noted strengths, weaknesses, and areas for improvement. The study noted that over decades, development patterns have prioritized vehicle and goods movement over quality-of-life factors such as noise, pollution, safety, and inclusion (NFRMPO 2021).

Improved efforts directed at community engagement will focus on building partnerships, being interactive and fun, understanding the needs of the communities, establishing strong communication channels, using plain language, and getting comfortable being uncomfortable.

In addition, the report identifies specific recommendations for NFRMPO and its member agencies to consider as strategies to improve the region's regard for environmental justice. The recommendations include the following (NFRMPO 2021):

- Projects located in, or within ¼ mile of, or adjacent to an area with a substantial environmental justice population are considered environmental justice projects.
- The benefits and burdens of each project must be examined individually, regardless of whether it is an environmental justice project. Benefits can include reductions in travel time, improved air quality, expanded employment opportunities and other similar positive impacts. Burdens can include impairment or death, pollution or soil contamination, destruction, or disruption of man-made or natural resources, and other types of adverse impacts on the community.

NFRMPO (2021) provides several examples to illustrate the types of benefits and burdens that might be considered for roadway projects. For example, the list of possible actions includes three types of road improvements: a new road, roadway expansion, or resurfacing. The new road provides improved connectivity and mobility, which could lead to lower travel time. However, the new road may create barriers within or between neighborhoods, provide limited benefits to those without cars, and could lead to increased traffic noise. An expansion project provides benefits in terms of reduced travel time and the potential for adding bicycle or transit lanes, but it might lead to higher traffic speeds and noise pollution. The last option, resurfacing, promotes system preservation, slows deterioration, and has the potential for bike lanes, but does not address pedestrian needs and requires detours and diverted traffic during construction. These types of benefits and burdens are described for all activities and examined as part of the planning process.

The study resulted in the development of a project-based equity-assessment framework focused on inclusion. NFRMPO (2021) indicates the application of the framework was a key factor in the region's ability to more proactively identify and address project elements that may impact underrepresented populations. This framework includes the use of questions early in the planning process to evaluate unintended consequences, identify populations that benefit or are burdened by the project, and consider how adaptations can be made to decrease negative impacts or enhance positive impacts. As a result, environmental justice factors are considered earlier in the planning process so there is adequate time to consider alternate approaches.

### **Seattle Department of Transportation**

The City of Seattle established a Race and Social Justice Initiative (RSJI) in 2004 to advance social justice through the development of more equitable policies, programs, and planning practices. Several programs emerged from this initiative, including the Seattle Department of Transportation's development in 2017 of the Transportation Equity Program, which the City claims was the first of its kind in the United States. This was followed by Resolution 31773, passed by the City Council in 2018, providing support for transportation equity and directing the Seattle DOT to create a Transportation Equity Workgroup made up of community members who have been most impacted by transportation inequities in the past.

The Seattle DOT's Transportation Equity Program sets the department-wide policy and strategic direction for establishing transportation systems that are equitable, safe, environmentally sustainable, accessible, and affordable to low-income and underrepresented communities (Seattle DOT 2022). Key components to the Plan involve building engagement and accountability, eliminating racial disparities, and addressing the long-term effects of displacement from prior inequities.

The program is linked to the City's Vision Zero initiative, which is targeted at improving road safety by changing road design rather than enforcement. Since most crashes were in or near diverse communities, this coordinated approach creates a more equitable and safe system. Funding for the program benefits from a measure approved by voters in 2014 called the Seattle Transportation Benefits District. This initiative increased the vehicle license registration fee and the sales tax to improve transit availability and access, added annual free-floating car share permit fees, and designated a limited allocation of the budget for the program by the City Council (Singer 2018). The 2018 resolution by the City Council secured funding for the program.

Since system affordability was identified as the most acute issue to be addressed, early initiatives under the program focused on this issue, as noted below (Singer 2018):

- Income-eligible residents have been enrolled in programs for pre-paid transit cards.
- High school students at Seattle Public Schools receive transit passes.
- Community engagement has begun with community-based organizations and service providers working with vulnerable and underrepresented populations to provide funding for training on low-cost ways to travel in the City.

Perhaps the biggest revelation early in the program was the importance of building a shared understanding of the vision and goals for transportation equity. This understanding is being built through the engagement processes that enable agency staff to understand people's needs and priorities.

### **Equity Analysis in Regional Transportation Planning Processes**

A recent TCRP study developed a five-step framework for conducting an equity analysis for regional transportation plans and programs developed by metropolitan planning organizations (MPOs) (Twaddell and Zgoda 2020a). This TCRP study's five-step framework includes public engagement through all five steps:

1. Identify Populations for Analysis.
2. Identify Needs and Concerns.
3. Measure Impacts of Proposed Agency Activity.
4. Determine Disparity/DHAE.
5. Develop Strategies to Avoid or Mitigate Inequities.

A separate published volume (Volume 2) describes in detail the results from the research effort and the findings obtained (Twaddell and Zgoda 2020b).

The five-step process introduced in the Guide begins with Step 1 defining the population groups that will be included in the analysis and the high-priority areas that will be addressed. This step also includes identifying regional distribution patterns so that changes in demographics can be understood.

Step 2 involves identifying the needs and concerns at both the regional and neighborhood levels. This is followed by an analysis in Step 3 to use selected performance indicators to measure outputs and outcomes for the different options being considered. In Step 4 the findings are reviewed and validated using qualitative measures and stakeholder engagement activities. If issues arise, the various causes and mitigation options can be explored. The process concludes with Step 5, which entails investing in the projects that advance equity and taking steps to evaluate and measure progress.

The entire process involves an inclusive public engagement plan that attracts communities and members of underserved populations and establishes goals and metrics to evaluate progress.

Following the development of the initial framework, pilot studies were conducted to finalize the process based on actual experiences. Four agencies participated in the pilot studies, including those agencies listed below. Since each pilot focused on a different aspect of the process, the target area for each pilot is also described (Twaddell and Zgoda 2020a):

- Metro in Portland, OR. This pilot study focused primarily on the messaging and communication approaches that could be used to share the results of an equity analysis with stakeholders and decision makers.
- Denver Regional Council of Governments. One method of identifying populations involves a “population-weighted approach” that was tested during this pilot.
- Mid-America Regional Council in Kansas City, MO/KS. This pilot again tested the “population-weighted approach” but also developed a strategic plan for engaging a new regional equity network in its Long-Range Transportation Plan update.
- Mid-Ohio Regional Planning Commission in Columbus, OH. This pilot study involved an analysis of positive and negative impacts associated with new “smart city” transit investments using a Geographic Information System (GIS) analysis.

## **Chicago, IL**

In the Chicago Metropolitan Agency for Planning (CMAP), a central focus of the agency’s *On To 2050 Regional Plan* was the comprehensive use of data to evaluate the disproportionate cost of travel for low-income drivers and transit users (CMAP 2018). This has led to initiatives that improve the connectivity of transit options and efforts to help households with lower income reduce their travel costs while also improving access to transit fare and transfer savings. Other issues, including reductions in traffic and transit fees and fines, were also addressed in the plan.

The plan recommends the following types of changes to existing practices (CMAP 2018):

- Increasing access to reliable transportation options such as bicycling, walking, and vanpooling.
- Investing in transit improvements to enhance system reliability and availability.

- Expanding reduce fare eligibility to include low-income people who earn up to 200 percent of the Federal poverty level.
- Increasing payment options and locations for paying parking fines or purchasing transit passes to make it easier for people without access to credit cards or online purchasing.
- Implementing income-based fine levels and offering alternatives to monetary fines.

The agency recognizes that the successful implementation of these recommendations requires significant investment along with changes to existing agency policies and the cooperation of numerous entities. Success also relies on the availability of new revenue sources since several of the changes will reduce revenues for both transportation agencies and the court system (e.g., addressing transit fines outside of the court system).

### **Massachusetts DOT**

The Massachusetts DOT (Mass DOT) initiated an effort to better address equity considerations in its planning activities through the Office of Transportation Planning. Their efforts were presented by Liz Williams, the Director of Data and Policy for Mass DOT's Office of Transportation Planning, at a meeting of the Transportation Research Board's Executive Committee in Woods Hole on July 16, 2021. In the absence of well-established practices in this area, Mass DOT elected to use a destination measure as its equity performance measure. Using a target of 30 minutes, the capital improvement process now includes an analysis of census blocks to determine the number of jobs that are accessible within the desired timeframe. Mass DOT can also model non-work trips to see how changes to the transportation network impact users. One example illustrates the impact that equity considerations can have on communities. In this example, a recommendation was made to add a dedicated bus lane to one of the most congested bridges in the city used by both commuters and transit buses. This single change made more than 100,000 additional jobs accessible to underrepresented communities within the desired 30-minute window (Williams 2021).

### **Boston Region Metropolitan Planning Organization (MPO)**

A second presentation at the Transportation Research Board's Executive Committee in Woods Hole on July 16, 2021, the Boston Region MPO's efforts to consider environmental justice in selecting projects for its Transportation Improvement Plan (TIP) and Long-Range Transportation Plan (LRTP). According to the speaker, Ms. Betsy Harvey, the Transportation Equity Manager at the MPO, the assessment initially considered project proximity to seniors and underrepresented communities when evaluating TIP projects. However, an updated project evaluation process is looking at both proximity and impacts to the community in terms of factors such as air quality. In the future, the MPO also envisions analyzing access as part of the TIP process. A new Disparate Impact and Disproportionate Burden (DI/DB) Policy<sup>11</sup> has been endorsed that involves an environmental justice analysis as part of its LRTP process. This analysis considers disparate impacts on communities and is expected to be used as part of the 2023 LRTP update (Harvey 2021).

---

11 Boston Region MPO. 2020. Disparate Impact and Disproportionate Burden Policy for the Boston Region Metropolitan Planning Organization's Long-Range Transportation Plan. <https://www.bostonmpo.org/data/pdf/programs/equity/2020-Disparate-Impact-Disproportionate-Burden-Policy.pdf>



## CHAPTER 4: MOVING FORWARD

### Introduction

The consideration of equity in transportation is evolving as agencies recognize the inequities that have resulted from prior practices that disrupted underrepresented communities and disenfranchised populations. Redlining, which classified low-income communities as “high-risk” for mortgage loans, established barriers unrelated to transportation. The impacts of these prior practices continue to affect communities to this day.

As evidenced by the examples presented in this paper, transportation agencies are increasingly recognizing the impacts of prior decisions on disadvantaged and under-represented populations, taking steps to mitigate the negative effects of past investments, and recognizing elements of inherent bias in existing asset management processes. This has led to questions concerning the types of data needed, the performance measures used to evaluate investment options, and agencies’ ability to address the complexities of considering investment impacts between options and transportation modes.

As Chapter 3 demonstrates, several agencies have taken steps to enhance the consideration of equity in transportation programs. Early leaders in this area include regional planning organizations and larger cities where both roadway and transit issues are addressed. State DOTs are also beginning to address these issues through changes in policies, stakeholder engagement, and system design. However, the TAM ETG found few examples documenting how equity is being considered in the asset management process that State and local agencies use to allocate resources to system preservation.

The TAM ETG prepared this document as a first step in advancing the consideration of equity in asset management activities that result in setting investment priorities and project programming. The Livable Streets Executive Director, Stacy Thompson, noted the importance of promoting the consideration of equity and recognizing that change takes time (Larson 2021). As the quote in the callout box indicates, Thompson suggests that success will occur when policy makers are basing decisions on the input of all relevant stakeholders.

**“Any step toward equity is important. Where you see real action is when communities are listened to and lead, advocacy groups are at the table, and policy makers are making decisions based on all that.”**

Stacy Thompson, Executive Director, Livable Streets (Larson 2021)

To help advance the state-of-practice, this chapter introduces some framing questions that agencies can use to begin defining their objectives and ideas for future research in this area. It also includes suggestions for next steps to advance future consideration of equity in asset planning and investment decisions.

### Framing Questions

The USDOT’s Request for Information on Transportation Equity Data (*Federal Register* Notice 86 FR 28189 [May 25, 2021]),<sup>12</sup> provides a framework for agencies to begin discussions that

<sup>12</sup> USDOT. 2021. *Request for Information on Transportation Equity Data*. Federal Register. <https://www.federalregister.gov/documents/2021/05/25/2021-10436/request-for-information-on-transportation-equity-data>.

help measure and interpret topics related to transportation equity. The RFI itself provides detailed questions that an agency may consider, which address the following topic areas:

- **What methods and assessment tools are available to measure equity?** Are there feasible methods to determine the extent to which Departmental programs and policies perpetuate systemic barriers to transportation opportunities and benefits for underserved communities? What data are needed to assess equity in current funding distributions? What assessment tools can be used to analyze equity as a factor in transportation investments, policies, and programs? What key performance metrics would be useful to support this type of assessment? How can the benefits and downsides to transportation investments be evaluated? How can access to reliable transportation be measured? What equitable planning methodologies can be used to address the needs of underserved communities? What lessons can be learned from the experiences of other agencies in the United States and internationally?
- **What are the equity data considerations?** What level of spatial granularity (e.g., nation, state, region, community) is needed to meet the agency's equity analysis needs? How can equity data be used most effectively? How can an agency determine whether its data collection methodologies are equitable? How will the agency address non-responsiveness in its data collection efforts? What data gaps exist in terms of determining the environmental impacts (e.g., pollution and vehicle emissions) on disadvantaged populations? How can equity data be modeled while protecting individual privacy? How can technology be used to support the collection and analysis of the data?
- **How can the transportation workforce become more diverse and inclusive?** What efforts have been made to increase diversity and retain individuals from underserved populations within the workforce? How are the impacts of these efforts evaluated in terms of placement into jobs, retention, opportunities for advancement, and whether salaries are equitable? What additional steps could be taken to increase minority and disadvantaged business participation in the transportation industry?

### **Setting the Direction for Research and Practice**

The MnDOT study on advancing transportation equity recommended the following areas as topics that would benefit from additional research (MnDOT 2019b):

- The evaluation of outcomes from existing efforts.
- The development of quantitative and qualitative performance measures to evaluate outcomes from different investment strategies.
- A summary of disparities currently faced by underserved and underrepresented communities.
- Community engagement methods that have been successful in developing effective long-term relationships.
- Strategies for making new mobility options (such as automated vehicles) more equitable.
- A summary of how equity factors are currently considered in freight planning.
- Impacts resulting from racial bias that may exist traffic enforcement and transit policies.
- Specific opportunities for Minnesota to advance equity in transportation across the State.

Additional research ideas have been prepared and evaluated by the AASHTO Special Committee on Research and Innovation that were ranked by the AASHTO Agency Administration Managing Committee (AAMC) using feedback from the Committee on Human Resources and the Committee on Civil Rights. While most of the research suggestions address issues related to new and expanded infrastructure, the following five research topics relate to the types of asset preservation and investment decisions intended to preserve the condition of existing highway and transit infrastructure:

- Understanding accessibility and the role of public transit as a support system for access to people without cars.
- Identifying practices and policies to advance equity into transportation decision-making.
- Exploring new means of cross-sector collaborative decision-making to solve issues around inequity in individual communities.
- Identifying and addressing the potential impacts from infrastructure location decisions with respect to low-income and minority communities.
- Defining the relationship between public transit access, affordable housing, housing insecurity, and homelessness with respect to low-income, minority, and other vulnerable populations.

The Transportation Research Board (TRB) published *Opportunities for Research on Transportation and Equity* under NCHRP Project 2020-01 (Grant and Bowen 2020). The brainstorming session captured in the report was conducted in response to a challenge by the TRB Executive Committee to prioritize equity issues within TRB programs and committee efforts. The initiative resulted in research concepts that can be considered by TRB committees and other organizations for prioritization and action in the future (Grant and Bowen 2020).

The research ideas were organized into the four categories listed below:

- A. Access to employment, health care, education, and other opportunities.** This category includes six problem statements related to transportation access challenges.
- B. Displacement, gentrification, affordable housing, and land use.** Included in this category are three problem statements related to the impacts of gentrification and changes in land value in response to transportation investments.
- C. Environmental justice and inequitable impacts.** The six problem statements in this category relate to how well transportation practitioners understand the connections between environmental justice and equity considerations.
- D. Institutional issues and decision-making.** The final category includes six problem statements that address institutional racism, support systems, and the basis for decision-making and collaboration across sectors.

Out of the 21 problem statements generated through the brainstorming session, the topics summarized below were most relevant to the broad application of transportation asset management principles and practices used by State, local, and regional agencies (Grant and Bowen 2020). Some are more directly related to transit issues and the role transit plays in accessibility. Others address the need to better understand the role that past transportation decisions have had on social injustice and the development of strategies to modify policies and

practices to avoid similar practices in the future. Where appropriate, the problem statement topics have been expanded by the TAM ETG to better illustrate the complexities that asset managers face in making investment decisions related to existing infrastructure assets:

- A-1: Understand how accessibility to employment, health care, education, and other vital needs varies for different populations groups in different settings, and methods for effectively assessing mobility and accessibility needs. From an asset management perspective, the study should include an understanding of how mobility and accessibility needs are impacted by assets in poor condition (e.g., wheelchair users in roadway traffic because sidewalks are too cracked to navigate).
- A-4: Consider how technology advances such as autonomous vehicles can support mobility and safety for low-income, minority, and other vulnerable populations, and how to ensure equitable access to these services. Asset managers will have to ensure existing infrastructure assets support the use of this new technology.
- B-1: Understand the role of transportation infrastructure investment in gentrification and displacement and identify effective policies and strategies to address these efforts. For asset management, this will require new data sources to consider the impacts of investment policies and strategies.
- C-1: Clarify how equity differs from environmental justice, and how to broaden consideration of equity issues in transportation analysis. For the asset management community, this will involve the identification of new performance measures and analysis variables free of inherent bias.
- C-2: Identify the causes of racial disparities in traffic safety. The results of this analysis may influence the types of infrastructure investments needed to support safety, including investments in working signals, safer intersections, and so on.
- C-5: Identify and address the potential for inequitable impacts from infrastructure location decisions with respect to low-income and minority communities. This will include the resulting impacts associated with assets in poor condition.
- D-1: Examine the history of institutional racism in transportation decision-making to identify how to eliminate it and address it. For asset management, this will require an objective evaluation of existing variables considered in planning and programming decisions.
- D-2: Identify practices and policies to advance equity into transportation decision-making. In addition to evaluating the variables currently used in an analysis, this will involve new data sources to identify demographics and consideration of options across transportation modes.
- D-3: Identify tools and methods for assessing transportation solutions with an equity lens, including how to relate equity to other methods, such as benefit-cost analysis. Transportation asset management often uses a benefit-cost analysis as the basis for prioritizing investment needs under constrained budgets. These tools and methods will have to be examined from an equity lens to determine how best to address equity needs.
- D-5: Define the personal, social, and economic consequences to Native American communities of restricted mobility and underdeveloped infrastructure, including the impacts associated with assets in poor condition or historical under-investment in existing assets.

- D-6: Explore new means of cross-sector collaborative decision-making to solve issues around inequity in individual communities. For asset management, this will involve infrastructure preservation decisions that consider safety, mobility, and equity impacts and evaluate options that include both highway and transit solutions.

## Next Steps

The FHWA's TAM ETG identified several suggestions that can be undertaken by the asset management community to help in furthering an understanding of the issues related to equity considerations in asset management decisions, especially those related to establishing investment priorities and implementing planned life-cycle strategies to preserve asset conditions. These suggestions include the following:

1. Identifying and advancing research topics that address issues related to the consideration of equity in asset planning and investment decisions. The following research topics are provided as examples of the types of research that would be beneficial:
  - a. Developing a framework for considering equity in performance-based planning activities, including the development of a methodology for identifying alternate investment options with an equity lens and innovative community engagement activities that increase the involvement of underserved communities.
  - b. Establishing quantitative and qualitative performance measures that transportation agencies might find useful to advance their consideration of equity in asset management decisions.
  - c. Summarizing examples of inherent inequities in asset management planning and investment decisions as a way to help transportation agencies better understand inherent biases and their resulting impacts on underserved communities.
  - d. Developing suggestions for transportation agencies to address equity-conscious outcomes in investment planning and programming.
2. Seek opportunities to conduct asset management peer exchanges and/or webinars featuring agencies that have begun addressing equity issues. These forums provide opportunities to bring attention to the relevant issues while conveying lessons learned by agencies that have taken steps in this direction. The presentations could describe how each agency started, what steps they have taken, and what challenges they continue to face.

As this topic advances and more work is accomplished, the TAM ETG will continue to consider ways to bring attention to this topic and identify practices that advance equity in asset planning and investment decisions.



## REFERENCES

American Association of State Highway and Transportation Officials (AASHTO). 2021a. "[Biden Harris Administration Reveals Infrastructure Priorities](#)." *AASHTO Journal*. AASHTO, Washington, DC.

American Association of State Highway and Transportation Officials (AASHTO). 2021b. [State DOT CEOs Talk Transportation Equity at EPW Hearing](#). AASHTO, Washington, DC.

Archer, D. 2021. *Transportation Policy and the Underdevelopment of Black Communities*. Public Law Research Paper No. 21-12. New York University School of Law, New York, NY.

California Department of Transportation (Caltrans). 2021. [Caltrans 2020-2024 Strategic Plan](#). Caltrans, Sacramento, CA.

Chicago Metropolitan Agency for Planning (CMAP). 2018. *On to 2050 Regional Plan*. CMAP, Chicago, IL.

City of Oakland. 2019. [Downtown Oakland Specific Plan \(DOSP\)](#). City of Oakland, CA. Website last accessed March 1, 2023.

Connect Oakland. 2015. [Connect Oakland](#). Website last accessed March 1, 2023.

Federal Highway Administration (FHWA). 2012. [FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations](#). Federal Highway Administration, Washington, DC.

Grant, M. and B. Bowen. 2020. [Opportunities for Research on Transportation and Equity](#). TR Circular E-C270. NCHRP Project 2020-01. Transportation Research Board, Washington, DC.

Harvey, B. 2021. "Leveraging Data to Improve Decision-making and Transportation Equity Outcomes." *Transportation Research Board Executive Committee meeting*. Presentation. Transportation Research Board, Washington, DC.

Larson, S. 2021. [How Chicago Could Build Equity into Transportation](#). Chicago Metropolitan Agency for Planning, Chicago, IL.

Litman, T. 2021. *Evaluating Transportation Equity: Guidance for Incorporating Distributional Impacts in Transportation Planning*. Victoria Transport Policy Institute, Victoria, British Columbia, Canada.

Minnesota DOT (MnDOT). 2016. [Rethinking I-94 — Minneapolis to St. Paul](#). Website last accessed March 1, 2023.

Minnesota DOT (MnDOT). 2017. [Rethinking I-94: MnDOT's Public Engagement Toolkit for I-94 Between St. Paul and Minneapolis](#). MnDOT, St. Paul, MN.

Minnesota DOT (MnDOT). 2019a. [SOP Goals and Strategies: Business Planning Context](#). MnDOT, St. Paul, MN.

Minnesota DOT (MnDOT). 2019b. *Advancing Transportation Equity: Strategies for Reducing Transportation Disparities*. CTS Research Brief 2019-01. MnDOT, St. Paul, MN.

- North Front Range Metropolitan Planning Organization (NFRMPO). 2021. *Environmental Justice (EJ) Plan*. NFRMPO, Fort Collins, CO.
- Oregon DOT (ODOT). 2023. [Strategic Action Plan](#). Oregon DOT, Salem, OR. Website last accessed March 1, 2023.
- Seattle DOT. 2022. [Transportation Equity Program](#). Seattle DOT, Seattle, WA. Website last accessed March 1, 2023.
- Singer, J. 2018. “Inside the Nation’s First Transportation Equity Program.” *Vision Zero Cities Journal*. Transportation Alternatives.
- The White House. 2021. [Fact Sheet: The Bipartisan Infrastructure Deal](#). Briefing Room, Statements and Releases. Website last accessed February 28, 2023.
- Transportation Research Board (TRB). 2021. [TRB Webinar: Addressing Justice in Transportation](#). National Academies of Sciences, Engineering, and Medicine, Washington, DC.
- Twaddell, H. and B. Zgoda. 2020a. *Equity Analysis in Regional Transportation Planning Processes – Volume 1: Guide*. Transit Cooperative Research Program (TCRP) Research Report 214. National Academies of Sciences. Transportation Research Board, Washington, DC.
- Twaddell, H. and B. Zgoda. 2020b. *Equity Analysis in Regional Transportation Planning Processes – Volume 2: Research Overview*. Transit Cooperative Research Program (TCRP) Research Report 214. National Academies of Sciences. Transportation Research Board, Washington, DC.
- U.S. Department of Transportation (USDOT). 2021. [U.S. Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations](#). 5610.2C. U.S. Department of Transportation, Washington, DC.
- U.S. Department of Transportation (USDOT). 2022. [U.S. DOT Strategic Plan. FY 2022-2026](#). U.S. Department of Transportation, Washington, DC.
- Van Dort, L. A. Guthrie, Y. Fan, G. Baas. 2019. [Advancing Transportation Equity: Research and Practice](#). Final Report 19-08. Center for Transportation Studies, University of Minnesota, Minneapolis, MN.
- Van Orden, D. and C. Grauberger. 2002. [Environmental Justice Research Study](#). Final Report. CDOT-DTD-R-2002-7. Colorado Department of Transportation, Research Branch, Denver, CO.
- Washington State DOT (WSDOT). n.d. [Strategic Plan](#). Washington State DOT, Olympia, WA. Website last accessed March 1, 2023.
- Williams, L. 2021. “[MassDOT Resources to Address Equity](#).” *Transportation Research Board Executive Committee meeting*. Presentation. Transportation Research Board, Washington, DC.
- Wisconsin DOT (WisDOT). 2021. [WisDOT CAV Strategic Work Plan 2021-2023](#). Wisconsin DOT, Madison, WI.