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**Opportunities for  
Research on  
Transportation  
and Equity**

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TRANSPORTATION RESEARCH CIRCULAR E-C270

# Opportunities for Research on Transportation and Equity

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*Submitted*

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Transportation Research Board

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## Background

This summary report is the outcome of a Transportation Research Board (TRB) brainstorming session. The professionals who participated in the session are recognized for their strong contribution to the discussion and other efforts to lead the transportation sector on this topic. The Acknowledgments section of this report provides the list of individuals who participated in the brainstorming session.

With this summary activity, TRB is responding to the Executive Committee challenge to prioritize equity issues as well as the current widespread and heightened interest in taking a hard look at where inequity exists and identify how to address it. Research resulting from this summary could be conducted under the National Cooperative Highway Research Program (NCHRP) or other relevant cooperative research programs TRB manages; however, the information on research needs will be available for full consideration at the national, state, and local levels, depending on specific needs of transportation agencies, organizations, and their partners.

On September 25, 2020, TRB hosted a brainstorming session, “Critical Issues for Transportation and Equity.” Invited participants were provided four general categories for discussion that included initial ideas and topics provided by TRB staff and others. Both the initial information and the brainstorming session discussion notes are the primary basis for the research concepts included in this summary report. The issues and challenges from the discussion are translated here into [Problem Statements](#) as the basis for prioritization and additional action.

Any discussion of equity—even when confined to the interface with transportation—is sufficiently broad to run into some definitional issues. During the brainstorming discussion, participants noted several overarching questions that may be best considered as a foundation for research rather than unique research problems. The following questions present food for thought as more-detailed discussion is reviewed.

- **To what specific groups of people does the term “equity” apply?** The term “equity” is a broad concept addressing a wide array of populations. While environmental justice (EJ) communities are defined as low-income and minority populations and the term “low-income and minorities” was often used in the brainstorming session, equity also is often considered in relation to other groups considered “vulnerable populations” or facing unique mobility challenges, such as zero-vehicle households (transit-dependent populations); persons with disabilities; low-English literacy populations; elderly people; and children. Equity issues were identified in relation to racial and ethnic minorities and addressed issues specific to racism and racial justice. While most of the brainstorming discussions focused on low-income and minority populations, the many different segments of population that may be affected by inequities needs to be considered in relation to the research issues and needs identified.

- **What can we learn from past injustices?** Because inequity has existed for so long and has lasting impacts, it is important to understand the historical context. The role of race and racism in transportation policy and practice is something that must be understood by everyone entering transportation practice. As one participant noted, “If we are going to make change, we need to understand the rationales for why we did what we did.”

- **What is the role/responsibility of the decision-making process?** Are transportation decision-makers sufficiently “enlightened” or have the life experience to understand the unique

needs and issues facing vulnerable populations, and to value and advance transportation policies, plans, and projects that reflect equity?

- **How can equity be addressed in a systematic approach?** Participants were highly aware of the diverse and interconnected nature of the discussion and expressed concern that research would proceed in a single line of interest rather than in parallel consideration that reflects this web of influence. Approaches mentioned were a research “taxonomy,” a “transport justice framework,” and “a mobility bill of rights” as potential organizing principles.

As the experience of living through the COVID-19 pandemic has shown, transportation is an essential service for all individuals and is interconnected with many areas of public support for communities at all levels of government. The issues of social justice and equity are currently in sharp focus across this spectrum, which provides an unparalleled opportunity to make necessary changes. As the participants in this session noted, broad, systems-based change requires will power along with partnerships in other government agencies and the corporate sector.

The information that follows briefly identifies the approach used to summarize the brainstorming information into individual problem statements with supporting information and an initial evaluation of the urgency of the research.

## Synthesis Approach

In preparation for the brainstorming session, TRB staff and volunteers developed a preliminary list of research topics. These topics have been used as research categories for the summary as listed below.

- A. Access to Employment, Health Care, Education, and Other Opportunities
- B. Displacement, Gentrification, Affordable Housing, and Land Use
- C. Environmental Justice and Inequitable Impacts
- D. Institutional Issues and Decision-Making

Each topic covered in the brainstorming session produced a variety of research ideas that were framed into problem statements and research questions. It is important to note that the identified research questions and issues discussed within each topic often overlapped, and the participant discussions brought up some research issues within individual categories that addressed or reiterated issues identified in other categories. For the purposes of identifying research problem statements, similar issues were grouped into a single problem statement where feasible to avoid duplication of problem statements. Additional understanding was provided in the problem statement background either from the discussion or subject knowledge. To the greatest extent possible, the descriptions provided by participants were used in the problem statements to remain true to the meaning without extensive interpretation.



## Organization and Relationships

This report contains 21 Problem Statements to be considered as candidates for future research that may be undertaken by transportation stakeholders across all modes and sectors. Each problem statement is assigned to one primary category, although as noted above there are cross-cutting relationships and interdependencies that connect the categories.

Individual problem statements have the following structure.

- Category. Four overarching themes defined by TRB staff.
- Problem Statement. Brief description of the problem or issue to be addressed.
- Background. Detailed description of the context and/or need for this research.
- Research Questions. Based on the background, initial questions that should be considered.
  - Literature Search Summary. Readily available past or existing related research this could build upon. The relevant literature was identified based on an assessment of connections between the different problem statements, research knowledge, and limited use of the Transportation Research Information Database. However, this is not a comprehensive list of other ongoing or planned research. Some literature search entries are used in multiple problem statements.
  - Research Objective. Clear statement of the intended outcome and potential types of resulting products (e.g., research synthesis, case studies, guidebook, tool, or model) and benefits.
  - Urgency and Potential Benefits. Research that is definitional or involves assessment of data related to the COVID-19 pandemic is identified as immediate. Research that supports application in transportation practice is generally short term. Institutionalization and decision-making changes are long-term research problem statements that build upon the immediate and short-term information.

As a quick reference, each problem statement category is described along with titles of the individual problem statements. The full problem statements are in the sections that follow the tables on the next page.

<b>Category A: Access to Employment, Health Care, Education, and Other Opportunities</b>	
<b>What is included:</b> Transportation access challenges faced by low-income and minority populations, as well as other vulnerable population groups; the personal, social, and economic impacts of these access challenges; and strategies to support more equitable access.	
<b>Problem Statements</b>	
A.1	Understand how access to employment, health care, education, and other vital needs varies for different population groups in different settings, and methods for effectively assessing mobility and accessibility needs.
A.2	Identify effective strategies to support access to health care and other essential services through coordinated social service transit services and other solutions.
A.3	Identify equity issues related to auto ownership and strategies to support mobility in contexts that are not currently well served by non-auto modes.
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.
A.5	Assess policy mechanisms such as means-based fare systems to address the challenges of transportation affordability and access for low-income and other vulnerable persons across all modes.
A.6	Examine lessons learned from the COVID-19 pandemic to address vital mobility needs for transit-dependent populations.

<b>Category B: Displacement, Gentrification, Affordable Housing, and Land Use</b>	
<b>What is included:</b> The impacts of gentrification and changes in land values in response to transportation investments; housing/jobs/transportation connections; past discriminatory practices related to housing and transportation, the sustained impacts of these decisions, and ways to address these effects.	
<b>Problem Statements</b>	
B.1	Understand the role of transportation infrastructure investment in gentrification and displacement and identify effective policies and strategies to address these effects.
B.2	Define the relationship between public transit access, affordable housing, housing insecurity, and homelessness with respect to low-income, minority, and other vulnerable populations.
B.3	Develop strategies to address and mitigate injustice and harms caused by past transportation decisions, particularly in relation to community disruption and barriers to access.

### Category C: Environmental Justice and Inequitable Impacts

**What is included:** Understanding by transportation practitioners of the connections between EJ and equity considerations; analysis of specific issues with respect to traffic safety, traffic and transit enforcement, and other issues beyond those addressed in Categories A and B.

#### Problem Statements

C.1	Clarify how equity and social justice differ from EJ, and how to broaden consideration of equity issues in transportation analysis.
C.2	Identify the causes of racial disparities in traffic safety.
C.3	Understand bias in traffic and transit enforcement and implications for minority communities.
C.4	Identify emerging approaches for public engagement meaningfully to involve minorities, low-income, and other vulnerable populations.
C.5	Identify and address the potential for inequitable impacts from infrastructure location decisions with respect to low-income and minority communities.
C.6	Define how equity analysis can include broad societal and nontransportation costs and impacts such as affordable housing and access to health services.

### Category D: Institutional Issues and Decision-Making

**What is included:** Institutional racism, support systems, basis of decision-making and collaboration across sectors; specific populations such as Native Americans and transit-dependent populations.

#### Problem Statements

D.1	Examine the history of institutional racism in transportation decision-making to identify how to eliminate and address it.
D.2	Identify practices and policies to advance social justice and equity into transportation decision-making.
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.
D.4	Explore the value of public transit as a support system for low-income, minority, and homeless populations, and for those who do not own cars.
D.5	Define the personal, social, and economic consequences to Native American communities of restricted mobility and underdeveloped infrastructure.
D.6	Explore new means of cross-sector collaborative decision-making to solve issues around inequity in individual communities.

## PROBLEM STATEMENTS CATEGORY A

# Access to Employment, Health Care, Education, and Other Opportunities

**A.1: Understand how access to employment, health care, education, and other vital needs varies for different population groups in different settings, and methods for effectively assessing mobility and accessibility needs.**

### Background

Transportation needs of low-income and minority groups are not homogenous, and differences can be seen in geographic context across metro areas with different spatial concentration of jobs, segregation, and poverty, and different levels of transit, shared modes, and auto ownership, as well as across urban, suburban, and rural contexts. For example, the importance of transit service for accessibility in some situations contrasts with the need for private auto travel in others. To provide equitable transportation options these differences must be understood better, and improved methods are needed to conduct these types of analyses. It is important to gain a better understanding of what matters most to low-income and minority populations, to what extent the needs vary by area and context, and methods to assess these needs.

Moreover, while there is considerable research on access to employment, common methodologies do not fully represent the unique challenges faced by many low-income, minority, and other vulnerable population workers whose commute patterns do not fit traditional commute work hours or travel patterns. For instance, many low-income and minority communities show high levels of access to jobs by transit and auto when considering all jobs and looking at transit services during typical commute hours. However, there are often major gaps in access to jobs that people need to get to, such as warehouses or distribution centers that have limited transit services or no service at times needed; are reverse commutes; or require multiple transfers. More also needs to be done to understand and address accessibility needs in relation to health care, education, healthy food, and recreation, which often require disproportionately long travel times for low-income and minority populations.

### Research Questions

- How do the transportation needs of low-income and minority travelers differ across metro areas, and by mode, travel behavior, and other key attributes of travelers? What are the factors or characteristics that influence these access needs and challenges? What transportation accessibility issues are unique to rural areas? To urban areas? To suburban areas?
- What is the relative importance of transit, autos, bicycle–pedestrian infrastructure in searching for and obtaining employment, subsequent earnings, and job tenure in urban, suburban, and rural areas? What do low-income and minority populations see as the relative importance of modes? What is the comparative importance of improving transit, shared modes, and auto ownership? And what factors influence the importance?
  - What data and analysis methods can help identify unique accessibility needs of low-income and minority workers that are not captured well in common job accessibility metrics?
  - What data and analysis methods are effective for analyzing access to health care, healthy food, education, and other noncommute needs? And for identifying transportation solutions?

- How can access issues for low-income and service workers who commute during off-peak times such as evenings or at night be most effectively addressed? What examples of employer-based and -funded transit services for low-income employees are available? Initiatives that have been tried in some areas may provide lessons that can be applied elsewhere.
- What are the most cost-effective strategies for enhancing auto, shared mode, and transit access to key destinations for low-income persons and minorities in urban, suburban, and rural contexts?

### Literature Search Summary

- Stacy, C. P. et al. *Access to Opportunity through Equitable Transportation: Lessons from Four Metropolitan Regions*. Urban Institute, 2020. <https://www.urban.org/research/publication/access-opportunity-through-equitable-transportation>. This report focuses on four case studies highlighting the barriers four U.S. cities have in providing equitable transportation and identifies ways metro regions could improve transportation equity.
- NCHRP Project 08-121, *Accessibility Measures in Practice: Guidance for Transportation Agencies*. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4558>. This research will result in guidance for transportation agencies on how to select and implement accessibility measures.
- The National Accessibility Evaluation Pooled-Fund Study. Minnesota Department of Transportation through the Accessibility Observatory at the University of Minnesota. <http://access.umn.edu/research/pooledfund/index.html>. Accessed December 15, 2020. The study focuses on measuring access to jobs in the United States.

### Research Objective

The objective of this research is to better understand, and develop methodologies to better understand, accessibility to employment, health care, education, and other opportunities for low-income, minority, and other vulnerable populations, and differences and factors that influence the needs in different geographic contexts and for different groups.

### Urgency and Potential Benefits

Immediate. This information will provide the foundation for other research that further explores strategies and solutions, including integration in transportation decision-making.

## A.2: Identify effective strategies to support access to health care and other essential services through coordinated social service transit services and other solutions.

### Background

Access to essential services, including health care and education, as well as employment, are social determinants of health. Coordinated human service transit access is an established part of transportation services in both rural and urban areas to help meet these needs. Still, many transportation studies focus on access to jobs, and there is a critical need to understand travel needs related to health and education, and how to best provide transportation services that meet these needs. Good examples of coordinated social service transit services and lessons learned can be used to strengthen understanding of the consequences of restricted access and strategies to address inequitable impacts.

### Research Questions

- What is the effect of consolidation of social services, such as public health facilities, into fewer locations on accessibility to these services for minorities and low-income residents?
- What are good examples of coordinated social service transit services to support access to health care and other essential services? What are lessons learned that can be used by other regions?

### Literature Search Summary

- Rodman, W., et al. *NCHRP Research Report 832: State DOTs Connecting Specialized Transportation Users and Rides, Volume 1: Research Report*. Transportation Research Board, Washington, D.C., 2016. <http://www.trb.org/Main/Blurbs/174327.aspx>. This report is a resource for agencies focused on connecting specialized transportation users with daily services.
- Rodman, W., et al. *NCHRP Research Report 832: State DOTs Connecting Specialized Transportation Users and Rides, Volume 2: Toolkit for State DOTs and Others*. Transportation Research Board, Washington, D.C., 2016. <http://www.trb.org/Main/Blurbs/174328.aspx>. This report provides a toolkit to help agencies develop linkages that connect specialized transportation users with rides.
- KFH Group, Inc., and NORC at the University of Chicago. *TCRP Research Report 223: Guidebook and Research Plan to Help Communities Improve Transportation to Health Care Services*. Transportation Research Board, Washington, D.C., 2020. <http://www.trb.org/Main/Blurbs/181416.aspx>. This report provides guidance on how to create dialogue between transportation and health-care providers, including strategies for pursuing partnerships and implementing solutions.

### Research Objective

This research will use data on transportation provided by paratransit and other systems to meet the social and medical needs of the population. Additional information collected during the research will inform future adjustments to these systems, decisions on where consolidation may be beneficial, and which additional services may improve well-being.

### Urgency and Potential Benefits

Short term. This research will provide information that can be used in transportation practice. This research supports and can build on research related to [Problem Statement A.1](#).

### A.3: Identify equity issues related to auto ownership and strategies to support mobility in contexts that are not currently well served by non-auto modes.

#### Background

Vehicle ownership is a significant expense, but the lack of a personal car can greatly limit access to employment and other essential services. Most travel by low-income and minority travelers is by auto, especially in suburban and rural areas. Yet these individuals often face unique challenges related to vehicle ownership, including higher financing costs for purchasing a vehicle, issues related to how to hold onto a vehicle during periods of unemployment, and often higher insurance rates. Research is needed to assess how these issues affect mobility for low-income and minority populations and ways to address them. Moreover, there is a need to understand effective strategies for addressing mobility needs, such as travel to manufacturing or warehousing jobs in suburban locations, late night shifts, and other needs that are not well served by existing transit services in most locations. This research would address effective strategies for enhancing auto, shared mode, and transit access while ameliorating the economic burden of auto ownership and operation.

#### Research Questions

- What are the specific challenges faced by zero-vehicle households and low-income populations in terms of mobility to access jobs, groceries, health care and other vital needs? In what circumstances are people dependent on auto use? What options are available to overcome these challenges?
  - What policies can help low-income persons avoid excessive costs associated with vehicle ownership and operation, such as higher financing rates for the cars they buy and higher insurance rates?
  - What transportation policies would be more equitable for low-income drivers, such as those related to registration fees, smog check, and licensing fees, which are typically regressive taxes? In relation to tolls, parking fees, and other charges? As urban areas implement policies to discourage auto use and auto ownership (such as increased parking fees, reduced parking requirements), what are the impacts on low-income residents?
    - How can individuals with low incomes retain cars through periods of unemployment?
    - What are the impacts of driver's licenses being taken away for nontransportation reasons, such as failure to pay child support or other debts?
    - How can access issues for low-income and service workers who commute during off-peak times such as evenings or at night be most effectively addressed? How can access issues for workers who commute to suburban warehousing facilities and other job locations outside of those served by core transit services, often with 24-h operations, be addressed? What are cost-effective ways to enhance modal options, including transit and shared-use transportation (e.g., subsidies for using shared-ride services) to provide access while limiting the need to own a vehicle? What are lessons learned from pilots to support service workers who commute during off-peak times?

#### Literature Search Summary

- Morris, E.A. et al. "Does lacking a car put the brakes on activity participation? Private vehicle access and access to opportunities among low-income adults." *Transportation Research Part A: Policy and Practice*, Vol. 136, 2020, pp. 375–397. <https://trid.trb.org/View/1705795>. This paper examines the association between private vehicle access and activity participation for low-income individuals. It uses pooled data from the Netherlands, Canada, Spain, and the United Kingdom.

- Rowangould, D. *Evaluation of Travel Constraints and Travel Burdens in the U.S. and in Rural Zero-Car Households*. UVM-DOT-712 [Active]. <https://trid.trb.org/View/1725530>. This research will evaluate the relationship between travel constraints and burdens with a focus on zero-car rural populations.
- Fransen, K. “The impact of driver’s license ownership on unemployed job seekers’ access to job openings: Assessing the driver’s license at School project in Flanders.” *Case Studies on Transport Policy*, Vol. 6, 2018, pp. 695–705. <https://trid.trb.org/View/1540068>. This study examines the relationship between having a driver’s license and access to job opportunities.
- Johnson, S. TCRP Project J-07/Topic SA-52, Assessing Equity and Identifying Impacts Associated with Bus Network Redesigns. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5008>. This synthesis will review the current practice of transit providers to see how they address the equity impacts of bus network redesign.

### Research Objective

The objective of this research is to identify the challenges faced by low-income persons those who need a vehicle for access to vital needs and how to overcome those challenges.

### Urgency and Potential Benefits

Short term. This research would help particularly to support low-income persons in rural and suburban communities as well as those in urban areas with reverse commutes. This research is closely linked with [Problem Statement A.1](#).

**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.**

### Background

The use of technology is rapidly changing transportation service availability. Autonomous transit shuttles, automated on-demand taxi services, and connected-vehicle technology are likely to improve safety and mobility for the public. However, many pilot deployments are geared toward activity centers and other locations that do not serve populations with the greatest access needs and are incorporated into vehicles that are not financially viable to all populations. The ability of low-income and minority populations, as well as other vulnerable populations, to use these service options is unknown depending on where and how they are deployed and priced. Along with what appear to be benefits, there may be unknown challenges or barriers to widespread use. Moreover, COVID-19 has shown how access to broadband service results in inequitable education opportunities for low-income, minority, and rural communities. This research will build on existing research on how technology can help to support the needs of underserved populations and will help practitioners and decision-makers better understand how to apply these services appropriately.



### Research Questions

- How can new technology services, such as autonomous transit shuttles or autonomous taxi services, be deployed to benefit low-income and minority areas and serve the needs of vulnerable populations?
  - Does the inability to own a credit or debit card or a smartphone limit access similarly to auto ownership?
    - How can access to ride-hailing and other transportation services that require bank cards and smartphones be provided to those who do not have credit or debit cards or smartphones? What can be learned from pilot projects that have tried to address this issue?
    - How can jurisdictions ensure equitable access to these services? What policies can jurisdictions adopt to ensure that these new services enhance equity, rather than exacerbate equity issues?
    - How will technology affect the transportation system in the coming decades? For example, will it create a situation where some people have vehicles that incorporate the best safety, traveler information, mobility, and electric vehicle technology, while others are left behind? What are the equity implications for safety, public health, and access? What are possible solutions to enhance equity?
  - Beyond transportation services, to what extent does lack of access to high-speed Internet affect the ability of low-income and other vulnerable populations to take advantage of online ordering, tele-medicine, and other services without traveling?

### Literature Search Summary

- Ricci, A. *Conference Proceedings 56: Socioeconomic Impacts of Automated and Connected Vehicle: Summary of the Sixth EU–U.S. Transportation Research Symposium*, Transportation Research Board, Washington, D.C., 2019. <http://www.trb.org/Main/Blurbs/178576.aspx>. This symposium in 2018 focused on promoting common understanding and collaboration in relation to socioeconomic impacts of automated and connected vehicles.
  - Zmud, J. P. TCRP Project B-47, Impact of Transformational Technologies on Underserved Populations. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4686>. This research will result in guidance on ways to achieve inclusive mobility. The research will focus on inclusion of underserved communities and the impacts of transformational technologies and lack of infrastructure.

### Research Objective

The objective of this research is to identify how technology affects low-income, minority, and other vulnerable populations to inform ongoing decisions about application of technology with a focus on addressing equity.

### Urgency and Potential Benefits

Short term. Technology is a quickly growing area of transportation decision-making and this research is needed to inform how technology is implemented in individual communities.

## A.5: Assess policy mechanisms such as means-based fare systems to address the challenges of transportation affordability and access for low-income and other vulnerable persons across all modes.

### Background

The cost of transportation—transit, auto ownership, and ride-hailing services—is a challenge for low-income populations. While discounted transit fares for older adults and youth are common across the United States, discounted fare for low-income residents is less common. Different regional transit agencies have implemented various programs with different structures, such as providing monthly passes to emergency assistances offices to share with low-income individuals trying to find jobs or for individuals leaving incarceration. Some agencies have also implemented fare-free services in certain locations or other forms of discounts. When these fare structures are used, there is need to consider issues such as how subsidies are provided (e.g., at the regional or local level); how need is defined (e.g., based on income, participation in social services); and impacts to changes in service demands (e.g., at different times of day, locations). Places that have applied these types of strategies may offer lessons to others on what works and what challenges have been faced.

### Research Questions

- How many transit systems in the country offer a fare system specifically for low-income riders? What are the details of how this option is provided?
- How does a means-based fare or other fare options open up access and opportunity? What are the challenges? What are successful practices?
- What is the best way to implement means-based fares for transit?
- How might the concept be applied to other modes of travel, such as subsidies for shared-ride services and shared mobility options, such as bicycle sharing?

### Literature Search Summary

- Pettine, A. TCRP Project J-07/Topic SH-21, Transit Fare Capping: Balancing Revenue and Equity Impacts. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5013>. This synthesis examines transit fare capping, highlighting that research on different types of equitable-fare systems is being conducted.
- Shaheen, S. et al. *Travel Behavior: Shared Mobility and Transportation Equity*. Federal Highway Administration, U.S. Department of Transportation, 2017. [https://www.fhwa.dot.gov/policy/otps/shared\\_use\\_mobility\\_equity\\_final.pdf](https://www.fhwa.dot.gov/policy/otps/shared_use_mobility_equity_final.pdf). This research proposes a “STEPS to Transportation Equity” framework (Spatial, Temporal, Economic, Physiological, and Social) exploring policy recommendations for shared mobility.

### Research Objective

This research will help shed light on effective ways to implement means-based fare systems and related strategies to support affordable mobility low-income and vulnerable populations. Building on the experience of similar strategies can provide sufficient detail for broad application.

### Urgency and Potential Benefits

Long term. This research may benefit from data collected in other research to understand the needs of low-income and other vulnerable populations to make the best decisions on how to create a more equitable cost structure for transportation access.

## Problem Statement A.6: Examine lessons learned from the COVID-19 pandemic to address vital mobility needs for transit-dependent populations.

### Background

The COVID-19 pandemic has illustrated inequities concerning access for low-income populations and others that are transit-dependent. While many office workers could shift to telework, workers in many service and manufacturing industries—disproportionately low-income and minority—including health care, grocery stores, food processing, and related industries, such as construction and other services, could not. These workers are more likely to be transit-dependent, with transit services providing essential mobility not only for access to work but also for health care and other needs. Many transit systems struggle to provide adequate service in the best of times, and operation depends on revenue from ridership. As transit agencies have been forced to reduce service, safeguarding this mode is important, especially for those who depend on transit for access and mobility. These challenges are expected to continue as service adjustments are made in response to reduced ridership due to increased teleworking on an ongoing basis.

### Research Questions

- What lessons can be learned from the pandemic about ensuring adequate access for essential employees during a major disruption, including subsidizing use of alternative modes, such as transportation network companies, taxis, or other shared-use modes?
- What workers are disproportionately impacted by reduction in transit service? How is this evaluated?
  - As adjustments to transit services are made in response to reduced ridership due to increased teleworking, what methods and policies need to be adopted to ensure that low-income residents are not inequitably impacted? What needs to be done to ensure that lower-income and minority workers continue to have adequate access to jobs and are not affected inequitably?
  - Can a transportation safety net be created to ensure people can maintain access to jobs, healthcare, and other essential services?

### Literature Search Summary

- Jeihani, M., and C. Chavis. *The Effect of COVID-19 on Mobility and Equity: A Case Study on Transit Users in Baltimore, Maryland*. Morgan State University, Baltimore, Md. <https://trid.trb.org/View/1709920>. This research will assist in understanding the pandemic's effect on vulnerable populations' mobility in Baltimore, MD.
- Schwager, D. S. TCRP Project H-60 [Anticipated], Addressing Disproportionate Share of Health, Economic, and Transportation Impacts for Lower-Income Households and Communities of Color. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5072>. This research will look at the disproportionate share of impacts COVID-19 has on low-income and minority populations. It will discuss how to address the impacts and needs in relation to transportation during a pandemic and in the future.
- Johnson, S. Assessing Equity and Identifying Impacts Associated with Bus Network Redesigns. TCRP Synthesis J-07/Topic SA-52 [Active]. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5008>. This synthesis will review the current practice of transit providers to see how they address the equity impacts of bus network redesign.
- Kramer, A., and A. Goldstein. "Meeting the Public's Need for Transit Options: Characteristics of Socially Equitable Transit Networks." *ITE Journal*, Vol. 85, 2015, pp. 23–30.

<https://trid.trb.org/view/1371713>. This report provides guidance for evaluating public transit social equity impacts, specific strategies for achieving social equity goals, and several examples.

### **Research Objective**

The outcome of this research will be a better understanding of how transit provides vital services to low-income and minority individuals. This information can be used to inform future transportation decisions with respect to service provision, particularly when transit services are being reduced or adjusted.

### **Urgency and Potential Benefits**

Immediate. This issue builds on lessons learned from the COVID-19 pandemic and is needed to inform future research.

## PROBLEM STATEMENTS CATEGORY B

# Displacement, Gentrification, Affordable Housing, and Land Use

### B.1: Understand the role of transportation infrastructure investment in gentrification and displacement and identify effective policies and strategies to address these effects.

#### Background

Gentrification is widespread and can be caused by a variety of factors, among them transportation infrastructure investment. In particular, investments in transit rail, and associated transit-oriented development (TOD) and bicycle infrastructure improvements are being promoted to support access by transit and creating land use patterns that are more walkable and bike friendly. However, this development can lead to increases in land values causing displacement of low-income and minority populations who can no longer afford to live in their community. The overall outcome of gentrification on low-income and minority communities can be housing instability and displacement, often to areas with poorer transit access, resulting in longer commutes, as well as disruption to social connections associated with access to religious institutions and other community connections. This is a complex issue that requires understanding the negative outcomes of gentrification and identifying effective approaches to ensure that transportation policy and investment, and associated housing and land use policies, avoid displacement, and support low-income and minority communities in reaping the benefits of improved transit services.

#### Research Questions

- How does transportation investment contribute to gentrification? What effects do rail transit infrastructure and housing or commercial development at rail nodes have on land values and housing affordability?
  - What are the adverse impacts to low-income and minority communities associated with gentrification? Can gentrification present any opportunities for low-income and minority communities?
  - What policies and strategies related to transportation, affordable housing, land use, or other fields are effective in ensuring the low-income and minority communities are not displaced and benefit from improvements in transit, bicycle, and pedestrian access? How can engagement of existing residents help support positive outcomes?
  - What are lessons from existing experience with gentrification and policies to support low-income and minority populations in these communities? How well are policies to ensure affordable housing in TODs working, and what can we learn from them?

#### Literature Search Summary

- Nilsson, I., and E. C. Delmelle. "Impact of new rail transit stations on neighborhood destination choices and income segregation." *Cities*, Vol. 102, 2020. <https://trid.trb.org/View/1705206>. This article examines the difference in neighborhoods that low-income individuals versus higher-income individuals move to in response to rail transit investments in their current neighborhood.
- Appleyard, B. S., et al. "Are all transit stations equal and equitable? Calculating sustainability, livability, health, and equity performance of smart growth & transit-oriented-development." *Journal of Transport & Health*, Vol. 14, 2019. <https://trid.trb.org/View/1638708>. This

study examines areas that incorporate smart growth and TOD practices into their light rail stations with respect to equity.

- Ewing, R., A. Adkins, and N. Iroz-Elardo. Is Transit-Oriented Development Affordable for Low and Moderate Income Households (in terms of H+T)? [Active]. <https://trid.trb.org/View/1637646>. This project examines the affordability of TOD for people in different income groups. Notable examples of TOD developers are also included.

### Research Objective

The objective of this research is to identify effective policies and strategies to avoid displacement or other adverse impacts of gentrification on low-income and minority communities.

### Urgency and Potential Benefits

Short term. This information will inform transportation policies and decision-making.

## B.2: Define the relationship between public transit access, affordable housing, housing insecurity, and homelessness with respect to low-income, minority, and other vulnerable populations.

### Background

The relationship between transportation and job access is well understood; however, affordable housing is an essential link in the ability to survive in a turbulent economy or to make it through challenging times. In many regions, there is a spatial mismatch between jobs and housing, with many low-income and minority communities facing long commutes. As urban areas grow, housing becomes more expensive, often forcing low-income families to move farther out, where transit service is limited or absent or creates an extended commute time. Homelessness is a growing issue in many parts of the country. Due to COVID-19, there is a heightened concern about vulnerable populations not being able to afford to stay in their homes due to job losses or reduction in income. Moreover, reductions in transit services due to reduced transit ridership is making commutes and other daily trips more challenging. Affordable housing in locations near jobs and transit services, and programs to address homelessness are keys to solving access and mobility issues for many vulnerable populations. However, historically, affordable housing is often viewed as undesirable.

### Research Questions

- What strategies can be used to address the specific disconnect between jobs, housing, and transportation services? How can regions address the jobs–housing balance across their geographies beyond providing affordable housing in job-rich neighborhoods?
  - In times of economic hardship, what effect do transit service reductions or other changes in transportation access have on the likelihood of households losing their homes?
  - How can planning for affordable housing, land use, transportation, and programs to reduce homelessness work together to support equitable access to job opportunities and other needs? What are examples of successful practices or lessons learned from experience?

### Literature Search Summary

- Lamers, J. et al. Accessibility to Community Services in the City of Toronto: A Perspective on Social Disadvantage and Homelessness. Presented at 95th Annual Meeting of the Transportation Research Board, Washington, D.C., 2016. <https://trid.trb.org/View/1393077>. This paper examines the accessibility to government and nonprofit services throughout Toronto for homeless and other socially disadvantaged populations.
- Zimmerman, M. TCRP Synthesis J-07/Topic SB-34 [Active], Coordination of Public Transit Services and Investments with Affordable Housing Policies. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5011>. The purpose of this synthesis is to identify ways to coordinate public transit with affordable housing initiatives.

### Research Objective

The objective of this research is to identify strategies related to aligning affordable housing, land use, and transportation to support access to jobs and other services, employment, and reduction in homelessness.

### Urgency and Potential Benefits

Immediate. Housing instability and homelessness due to COVID-19 are issues that should be addressed as soon as possible.

## B.3: Develop strategies to address and mitigate injustice and harms caused by past transportation decisions, particularly in relation to community disruption and barriers to access.

### Background

Transportation decisions made in the past, such as in the period of the development of the interstate highway system, still contribute to inequities and adverse impacts to low-income and minority communities. Freeways constructed through the heart of a community of color destroyed, divided, or created barriers to access for low-income and minority communities with profound and lasting impacts. In addition, land use and housing policies, including redlining and exclusionary zoning, played an important role in limiting access to opportunities for minority communities. In addition to not repeating these mistakes, it is necessary to mitigate the negative outcomes, particularly as transportation decisions are made in relation to rehabilitation of aging transportation infrastructure.

### Research Questions

- What is the effectiveness, including cost-effectiveness, of strategies to reduce the division and social isolation of low-income and minority neighborhoods caused by transportation infrastructure?
- What strategies can be used to mitigate the adverse impacts of the Interstate system's impacts on communities of color?

- What are effective approaches to enhance access, and quality of life in areas adversely impacted by past infrastructure projects? How can these strategies be integrated into and prioritized in infrastructure rehabilitation?

### Literature Search Summary

- Rooney, K. *Community Connections Innovations Handbook*. Prepared for Federal Highway Administration, 2018. [https://www.fhwa.dot.gov/planning/community\\_connections/handbook/fhwahep19002.pdf](https://www.fhwa.dot.gov/planning/community_connections/handbook/fhwahep19002.pdf). This handbook includes a toolbox for transportation practitioners with strategies, techniques and case studies.
- Brinkman, J., and J. Lin. *Freeway Revolts! Urban Freeway Impacts: Central Neighborhoods Versus Suburban Commuters*. Federal Reserve Bank of Philadelphia, 2019. <https://www.philadelphiafed.org/-/media/frbp/assets/working-papers/2019/wp19-29.pdf>. This research indicates that freeway impacts are different for people in centralized areas compared to outlying areas where residents are more often poor and minority.
- Grant, M. NCHRP Project 25-25 Task 36, *Recurring Community Impacts*, 2008. [http://onlinepubs.trb.org/onlinepubs/archive/NotesDocs/25-25\(36\)\\_FR.pdf](http://onlinepubs.trb.org/onlinepubs/archive/NotesDocs/25-25(36)_FR.pdf). This document focuses on recurring community impacts connected to transportation infrastructure and opportunities for meaningful change.

### Research Objective

The research outcome is to document the inequities of past transportation decisions with an understanding of how these decisions were supported and how to avoid these practices in the future.

### Urgency and Potential Benefits

Short-term. Strategies that avoid these negative consequences, identified and described in detail to allow better options for decision-making.



## PROBLEM STATEMENTS CATEGORY C

### Environmental Justice and Inequitable Impacts

#### C.1: Clarify how equity and social justice differ from environmental justice, and how to broaden consideration of equity issues in transportation analysis.

##### Background

The consideration of EJ in current transportation practice has come to be associated strongly with engaging minority and low-income populations and considering disproportionate adverse impacts of projects, but often does not take a holistic view of equity or the social needs of populations. Although considerable guidance and best practice documentation exists, the consideration of EJ does not completely address the inequitable effects and processes that are used in transportation decision-making. EJ as defined under EO 13274 also focused on minority and low-income populations and does not specifically address other vulnerable populations. If practitioners believe that EJ covers their responsibility, inequitable impacts may go unaddressed. This problem statement identifies the need to broadly consider the causes, examples, and impacts of inequity in our society and how transportation policies can lead to changes in common practice. This work includes the need to better communicate and describe the issues associated with equity and how they expand beyond EJ and disproportionate adverse effects.

##### Research Questions

- How do practitioners view EJ and equity? How are these issues addressed?
- What are the inequitable impacts that need to be addressed in transportation decision-making?
  - What is the best way to communicate these impacts and the importance of each to transportation practitioners?
    - How to best help transportation practitioners and decision-makers understand the scope of equity in relation to benefits and burdens of transportation?
    - How do broad regional or federal policies (e.g., complete streets, limiting parking) create issues related to inequitable impacts and benefits in different types of neighborhoods?

##### Literature Search Summary

- Golub, A., et al. *Addressing Changing Demographics in Environmental Justice Analysis*, 2019. <https://trid.trb.org/view/1601556>. This report highlights national demographic trends showing significant change in the size and location of low-income and minority households.
- Karner, A., et al. From Transportation Equity to Transportation Justice: Within, Through, and Beyond the State. *Journal of Planning Literature*, Vol. 35, 2020, pp.440–459. [https://rid.trb.org / View/1729754](https://rid.trb.org/View/1729754). This paper considers shifting the focus from transportation equity to transportation justice in the transportation planning practice.

### Research Objective

Influencing transportation practice first requires an understanding of terminology and application. The research objective of this problem statement is to provide some baseline understanding of both concepts in order to improve the means of addressing inequities.

### Urgency and Potential Benefits

Immediate. The understanding provided by this research is the foundation for other problem statements.

## C.2: Identify the causes of racial disparities in traffic safety.

### Background

Providing a safe transportation system is the greatest responsibility of transportation agencies. Safety has many aspects, including fatalities and injuries, and involves strategies such as engineering, education, enforcement, and emergency response. Research has shown that higher pedestrian fatality rates occur in low-income and minority communities. Native American communities are disproportionately affected by traffic crashes, with risk factors identified by the Center for Disease Control including low seat belt use, low child safety seat use, and alcohol impaired driving. This research will uncover the differential traffic safety impacts for minorities, and lead to solutions to address these disparities. It can also address unique traffic safety issues related to other vulnerable populations.

### Research Questions

- What are the causes of racial disparities in traffic safety, in terms of who is injured and killed?
- To what extent are disparities in pedestrian fatalities caused by differences in personal decisions in regard to mode choices and route choices, differences in available options and supportive infrastructure for bicycling and walking, or other factors?
  - To what extent to safety belt use and other behaviors play a role?
  - What role does gender play in relation to safety?
  - What can be done to address the causes of traffic safety disparities and target solutions to the needs of different communities?

### Literature Search Summary

- Chisholm-Smith, G. TCRP J-05/Topic 20-03 [RFP], Policing and Public Transportation. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5016>. This legal research will result in a digest that provides advice on policing public transportation systems, including discrimination and profiling.
- Sandt, L., et al. *Pursuing Equity in Pedestrian and Bicycle Planning*, 2016. [http://www.pedbikeinfo.org/cms/downloads/PBIC\\_WhitePaper\\_Equity.pdf](http://www.pedbikeinfo.org/cms/downloads/PBIC_WhitePaper_Equity.pdf). This white paper defines equity-related terms for bicycle and pedestrian facilities and programs, includes recent findings

related to the needs of traditionally underserved populations, and identifies strategies, practices, and resources to address inequities.

- Smart Growth America. *Dangerous by Design 2019*. <https://smartgrowthamerica.org/resources/dangerous-by-design-2019/>. A “Pedestrian Danger Index” is used to measure danger to pedestrians based on injuries and fatalities in comparison to total population and the share who walk to work.

### Research Objective

The purpose of this research is to identify how transportation safety should be viewed in its widest context for low-income, indigenous, and other minority communities to begin to address transportation safety inequities.

### Urgency and Potential Benefits

Immediate. Traffic safety is of primary interest to all transportation agencies and the questions surrounding enforcement are relevant today.

## C.3: Understand bias in traffic and transit enforcement and implications for minority communities.

### Background

Minorities are disproportionately likely to be the subject of traffic enforcement, and there is evidence for this for people driving, walking, and bicycling. Enforcement of rules on public transit is also an area of concern. As there has been increased attention focused on racism in policing, there is a need to consider the ramifications in relation to transportation and mobility. Research is needed to better document the extent of the problem and to develop non-racist enforcement practices.

### Research Questions

- What are the causes of racial disparities in traffic enforcement?
- How do we reduce and eliminate such bias? To what extent does automated enforcement address the issue?
- How does racism in traffic safety enforcement affect personal travel choice decisions (e.g., mode choice, route, time of travel)? What are the implications in terms of community trust of police and implications on traffic safety?

### Literature Search Summary

- Chisholm-Smith, G. TCRP J-05/Topic 20-03 [RFP], Policing and Public Transportation. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5016>. This legal research will result in a digest that provides advice on policing public transportation systems for lawmakers, police, public transit agencies, and their attorneys. One of the topics to be covered in this digest is discrimination and profiling.
- Atiba Goff, P., et al. *The Science of Justice: Race, Arrests, and Police Use of Force*. Center for Policing Equity, 2016. [https://policingequity.org/images/pdfs-doc/CPE\\_SoJ\\_Race-Arrests-](https://policingequity.org/images/pdfs-doc/CPE_SoJ_Race-Arrests-)

[UoF\\_2016-07-08-1130.pdf](#). An analytic framework is used to distinguish among three broad types of explanations for racial disparities that arise from community characteristics, police characteristics, and relationships between communities and police.

### Research Objective

The purpose of this research is to identify how racial bias manifests itself in traffic enforcement, how this impacts communities, and identify ways to reduce and eliminate such bias.

### Urgency and Potential Benefits

Immediate. This research would potentially support or fit into other research addressing policing and relates to [Problem Statement C.2](#).

## C.4: Identify emerging approaches for public engagement to meaningfully involve minorities, low-income, and other vulnerable populations.

### Background

While several studies and guidebooks have focused on effective public involvement practices, including methods to engage low-income, minority, low-English literacy, and other vulnerable populations, there is a need to refresh and identify the most effective methods for engagement. These methods should go beyond simply engaging populations to meaningful involvement of the public in transportation decision-making. This is particularly important for low-income and minority communities that stand to lose the most if their needs are not considered and often are not engaged in the political process. For example, some researchers are critical of public involvement processes used for low-income and minority groups and propose an alternative model based on case studies of successful practice.

### Research Questions

- What has been identified as successful practice in public involvement for these groups?
- What examples can be used to define success?
- What is known about processes that do not work well?
- How should public involvement be reframed or reimagined to solicit the best information from minority and low-income groups?
  - What recent alternative public involvement approaches for low-income and minority groups have been identified? What success has been documented?
  - What voices or champions in these communities might reflect their values and interests?
  - What is the comparative effectiveness of processes for involving low-income and minority populations in plans and strategies to address EJ and to affect the outcomes of decisions?

### Literature Search Summary

- Hartell, A. NCHRP 08-142 [RFP], Virtual Public Involvement: A Manual for Effective, Equitable, and Efficient Practices for Transportation Agencies. <https://apps.trb.org/cmsfeed/TRBNet>

[ProjectDisplay.asp?ProjectID=4953](#). This research will evaluate virtual public involvement practices to develop a manual with guidance on virtual tools and techniques for transportation agencies.

- Karner, A., and R. A. Marcantonio. Achieving Transportation Equity: Meaningful Public Involvement to Meet the Needs of Underserved Communities. *Public Works Management & Policy*, Vol. 23, 2018, pp. 105–126. <https://journals.sagepub.com/doi/abs/10.1177/1087724X17738792>. This article covers importance of meaningful public involvement in achieving equity and proposes a new model for public involvement in transportation planning.

- Zeilinger, C. Developing and Advancing Effective Public Involvement and Environmental Justice Strategies for Rural and Small Communities. FHWA-HEP-17-023. 2016. [https://www.fhwa.dot.gov/environment/environmental\\_justice/publications/effective\\_strategies/index.cfm](https://www.fhwa.dot.gov/environment/environmental_justice/publications/effective_strategies/index.cfm). This research includes public involvement strategies to mitigate or avoid prospective EJ issues in rural areas and other smaller communities.

### Research Objective

Improved public involvement for low-income and minority groups is the objective of this research.

### Urgency and Potential Benefits

Short term. Public involvement has been studied in an ongoing way, and this research will add to the body of knowledge.

## C.5: Identify and address the potential for inequitable impacts from infrastructure decisions with respect to low-income and minority communities.

### Background

The decision of where to build infrastructure, particularly freeways, has huge consequences. The location of freeways can have positive or negative long-term outcomes for the affected neighborhoods. Common practice for transportation planning and project development decisions is to rely primarily on population data and the resulting travel demand. Although essential, this information does not identify the potential for inequitable impacts or the transportation needs of individual communities. This research will look at information commonly used for decision-making about infrastructure location and how to better evaluate the consequences on individual communities, particularly low-income communities that have historically suffered in these decisions.

### Research Questions

- What data is commonly used for decision-making in each phase of transportation practice (e.g. planning, programming, project development, design)?
- What does the data indicate about opportunities that transportation provides (access, mobility, economic benefit)?
- What are the questions about equitable impacts that this information fails to address?
- How should transportation analyses assess benefits, as well as impacts, and how should these benefits affect funding decisions?

- How can economic and housing impacts be measured? What tools are available to capture and evaluate this information?
- How can benefit/cost analysis include societal costs in a quantifiable way? How does this compare over area type and by mode?
- What additional information is available to measure equitable impacts or opportunities?
- How can this data be collected and evaluated?
- What are the appropriate places in transportation decision-making to consider this data?
- What policies and investment decisions should be used to avoid disproportionate impacts?

### Literature Search Summary

- Crutchfield, J., et al. *Promoting Environmental Justice Populations' Access to Opportunities with Suburban Boomtowns: An Interdisciplinary Mixed-Methods Approach to Addressing Infrastructure Needs*, 2020. <https://trid.trb.org/View/1683374>. This research examines the relationship between economic growth and transportation infrastructure in suburban boomtowns with a focus on the impacts for EJ populations.

### Research Objective

The objective of this research is to inform transportation practitioners about the collection and use of data and other information to help make decisions that take into account the equity and opportunities.

### Urgency and Potential Benefits

Long term. This research has major implications and will take significant time to develop. It may benefit from earlier research in this topic.

## C.6: Define how equity analysis can include broad societal and nontransportation costs and impacts such as affordable housing and access to health services.

### Background

Considering nontransportation factors such as housing affordability, public health, and other societal aspects can arguably be considered outside the domain of transportation decision-making. But cross-sector collaboration in individual communities illustrates the efficiencies and improved decision-making that are possible when sectors are not barriers. Equity analysis offers a way to incorporate the costs and impacts of non-transportation factors into transportation decision-making that has better consequences for low-income and minority communities.

### Research Questions

- How should external factors be incorporated into EJ and equity analysis and transportation decision-making?
- What policies ensure that EJ is a decision factor rather than just a process requirement?
- How do low-income and minority populations gain power in transportation decision-making? What are some examples?

### **Literature Search Summary**

- Zimmerman, M. TCRP Synthesis J-07/Topic SB-34 [Active], Coordination of Public Transit Services and Investments with Affordable Housing Policies. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5011>. The purpose of this synthesis is to identify ways to coordinate public transit with affordable housing initiatives.

### **Research Objective**

The objective of this research is to account for non-transportation costs and impacts on low-income and minority communities in transportation decision-making.

### **Urgency and Potential Benefits**

Long term. Cross-sector interface will take time to develop and understand best practices.

## PROBLEM STATEMENTS CATEGORY D

### Institutional Issues and Decision-Making

**D.1: Examine the history of institutional racism in transportation decision-making to identify how to eliminate and address it.**

#### Background

Institutional racism infiltrates aspects of social decision-making. Transportation is an essential service for all people. By examining historical racism in transportation decision-making, strategies to eliminate this practice, as well as to address past injustice, can be identified.

#### Research Questions

- How can we describe institutional racism in transportation sufficiently to define this research?
- What are the lessons learned from the past and how do they apply today?
- How were the decision-making institutions set up to allow institutional racism?
- What rationale allowed decisions that created these inequities? What directly contributed to decisions that were inequitable?
- What transportation and land use plans are available to provide examples of past decisions? What record is available about the data, analysis, and policy direction that were associated with these plans?
- What actions are needed to dismantle institutional racism in the transportation sector?
- What practices should be eliminated or added?
- How is racism different for Native Americans? How are equity issues different from those affecting other minority and underrepresented racial groups?

#### Literature Search Summary

- Stephan, P. TCRP H-59 [Anticipated], Racial Equity, Black America and Public Transportation. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5071>. This anticipated research will examine the socioeconomic and health gaps between black Americans and white Americans. It will focus on social equity policies, funding guidelines to reverse damage from redlining, and ways to make transit planning more inclusive.
- Weingroff, R. F. *The Road to Civil Rights*. <https://www.fhwa.dot.gov/highwayhistory/road/road.pdf?CFID=148459767&CFTOKEN=aeb6cbc44dd33182-0B91AC27-BB93-76B5-46370F2D716D2A05>. This book covers the history of racial discrimination in the United States, with a focus on transportation.

#### Research Objective

Develop a historical summary of racism related to transportation decision-making and identify strategies to overcome this history.



### Urgency and Potential Benefits

Immediate. Although this is a complex problem that will need extensive effort, it is important to start immediately as the understanding is foundational to other research. This research relates to [Problem Statement B.3](#).

## D.2: Identify practices and policies to advance social justice and equity into transportation decision-making.

### Background

Because transportation decision-making is an ongoing practice of planning, evaluating, implementing, and measuring, new policies and practices can become best practice over time. This research is intended to identify the most-effective ways to incorporate equity into ongoing transportation practice at all levels. Beyond statewide and regional planning, sometimes local decisions on where to add bus shelters, crosswalk improvements, and other infrastructure, as well as traffic calming, are structured in response to public concerns raised about needs, but this approach often disadvantages vulnerable communities who are not well engaged in the political process. This research will identify how and why current decision-making practice fails to consider equity appropriately, across all aspects of transportation decision-making—planning, project selection, project design and development, operations and maintenance—and how this outcome can be changed.

### Research Questions

- How can lessons learned from equity research be more effectively translated into practice?
- How can desired social outcomes be identified and promoted?
- How is equity considered in transportation decision-making, including all aspects of planning, project selection, project design, and operations and maintenance? For instance, in regard to operations, how to best balance traffic, transit, and bicycling/walking modes? In regard to snow removal, how to ensure equitable access, including to bus stops and sidewalks?
  - What policies ensure that EJ is a decision factor rather than just a process requirement? What are the decision-making criteria for consideration of equity? What good examples can be cited for how equity is considered?
    - How can a better connection be made between equitable transportation policy priorities, decision-making, and investments?
    - What are the effects on equity in transportation of decision-making dispersed across many jurisdictions and agencies, with different jurisdictions having different abilities to make investments? How can this be addressed from a policy perspective?
      - What are the mechanisms that allow decision-makers to make decisions that do not provide an equitable solution? How can decision-makers be held accountable?
      - What needs to be done to ensure equitable provision of infrastructure such as transit stations, sidewalks, bicycle facilities, and bike docking stations? How can equity and needs for vulnerable populations be better integrated into decisions?

### Literature Search Summary

- Twaddell, H., and B. Zgoda. *TCRP Research Report 214: Equity Analysis in Regional Transportation Planning Processes, Volume 1: Guide*. Transportation Research Board, Washington, D.C., 2020. <http://www.trb.org/Main/Blurbs/180936.aspx>. This guide helps metropolitan planning organizations (MPOs) analyze and address equity in their planning processes.
- Twaddell, H., and B. Zgoda. *TCRP Research Report 214: Equity Analysis in Regional Transportation Planning Processes, Volume 2: Research Overview*. Transportation Research Board, Washington, D.C., 2020. <http://www.trb.org/main/blurbs/181021.aspx>. This report describes research results and identifies ways that MPOs, in partnership with transit agencies, can analyze equity. The report is organized in a five-step framework for analyzing equity.
- Wennink, A., and A. Krapp. *PAS Memo: Equity-Oriented Performance Measures in Transportation Planning*. American Planning Association, 2020. <https://www.planning.org/publications/document/9196998/>. This resource considers the use of equity-based performance measurement criteria in the project prioritization process of MPOs and provides guidance for evaluating and improving equity considerations in practice.
- Pesesky, L., et al. *NCHRP Research Report 860: Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox*. Transportation Research Board, Washington, D.C., 2018. <http://www.trb.org/Main/Blurbs/177062.aspx>. This guidebook and toolbox enable practitioners to analyze the impacts of toll implementation and rate changes on low-income and minority populations.

### Research Objective

The objective of this research is to identify the best approaches to adoption and implementation of new practices related to equity.

### Urgency and Potential Benefits

Long term. This is one of the most extensive outcomes of the equity research and will benefit from the earlier inputs.

## 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.

### Background

At the highest level, decision-makers in transportation are elected or appointed officials who represent the broader interests of their community. Projects to improve the transportation system are expected to compete on the basis of cost–benefit criteria. Measuring the benefits and the cost savings of improved conditions for low-income and minority communities is not well represented in this approach.

Moreover, transit analysis often takes into account ridership and other metrics but does not always differentiate between services that are a lifeline for residents to access vital services and those that are serving choice riders. This research will support other research by specifically exploring performance measures and analysis tools to support decision-making.

## Research Questions

- What methods are available to compare and assess the equity effects of different strategies?
- What tools and approaches help to support analysis of equity needs and equity outcomes in terms of benefits and costs to communities?

## Literature Search Summary

- Williams, K., et al. *Transportation Equity Scorecard: A Tool for Project Screening and Prioritization*, 2020. <https://trid.trb.org/View/1635483>. This project will provide a project screening tool for MPOs, as well as guidance to help advance equitable access to transportation and health-care opportunities.
- Williams, K., et al. *Transportation Equity Needs Assessment Toolkit*. University of Texas at Arlington, [Active]. <https://trid.trb.org/View/1676639>. The Transportation Equity Toolkit is meant to complement the Transportation Equity Scorecard, also being developed. This project focuses on developing a needs assessment audit tool, as well as guidance on applying equity criteria in the scorecard to assess transportation needs.
- Karner, A., and A. Golub. Assessing the Equity Impacts of a Transportation Improvement Program. Presented at 97th Annual Meeting of the Transportation Research Board Meeting, Washington, D.C., 2018. <https://trid.trb.org/View/1496579>. This paper examines the current approaches to EJ analysis in Transportation Improvement Programs and discusses ways agencies can enhance their equity analyses.
- Litman, T. *Evaluating Transportation Equity: Guidance for Incorporating Distributional Impacts in Transportation Planning*. Victoria Transport Policy Institute, 2020. <https://www.vtpi.org/equity.pdf>. This report provides practical guidance for evaluating transportation equity and fairness with respect to benefits and costs by defining various types of equity impacts and practical ways to evaluate in transportation planning.
- El-Geneidy, A., et al. The Cost of Equity: Assessing Transit Accessibility and Social Disparity Using Total Travel Cost. *Transportation Research Part A: Policy and Practice*, Vol. 91, 2016, pp. 302–316. <https://www.sciencedirect.com/science/article/abs/pii/S0965856416305924?via%3Dihub>. Researchers developed new transit accessibility measures based on generalized costs (travel time and fares) to compare transit accessibility between socially disadvantaged and other neighborhoods in Montreal, Canada.

## Research Objective

The objective of this research is to improve tools and methods used in transportation decision-making practice by including equity considerations.

## Urgency and Potential Benefits

Long term. This outcome requires consideration of a wide array of existing tools and those under development.

## D.4: Explore the value of public transit as a support system for low-income, minority, and homeless populations, and for those who do not own cars.

### Background

COVID-19 has shone a spotlight on the demands, challenges, and essential nature of public transportation in this country. Disadvantaged populations typically rely on transit service in urban areas where it is available. Rural communities often identify transit as a desired addition to the transportation system. However, the barriers to implementing and sustaining a transit service are considerable. Providing this modal option to those who need it most requires understanding and addressing the obstacles to implementation.

### Research Questions

- How does public transit provide an essential service for specific populations?
- What are the barriers to implementing transit solutions to meet the needs of specific populations?
  - In addition to transit fare, how are individual transit systems and individual routes supported?
  - Are there other ways, besides ridership, that can be used to measure success, such as environmental sustainability or equity measures?
  - Is transit undervalued and underfunded? If so, why, and how can this problem be overcome?
  - What do policies on inequity, racism, and homelessness do to support transit?
  - How should we evaluate the trade-offs between providing new transit services to attract discretionary travelers and providing adequate or improved services for areas with transit-dependent riders?

### Literature Search Summary

- Schwager, D.S. TCRP H-60 [Anticipated], Addressing Disproportionate Share of Health, Economic, and Transportation Impacts for Lower-Income Households and Communities of Color. <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5072>. This research will look at the disproportionate impacts COVID-19 has had on low-income and minority populations. It will discuss how to address these populations' needs, specifically in relation to transportation, during a pandemic and in the future.

### Research Objective

The objective of this research is to acknowledge and understand the use of public transit as a means for improving equity and social justice.

### Urgency and Potential Benefits

Short term. Although this only applies to transit, research like this may impact funding decisions at all levels.

## D.5: Define the personal, social, and economic consequences to Native American communities of restricted mobility and underdeveloped infrastructure.

### Background

Because tribal governments are independent nations, equity issues are especially complex. Indigenous people suffer racism and inequities in society and with respect to the transportation system. Connecting to tribal transportation systems is similar to the country's cross-border relationships with Canada and Mexico. However, the tribal transportation system functions more like systems that cross urban–rural boundaries. This research will identify how Native American communities have restricted mobility and declining or undeveloped infrastructure as a result of this interface.

### Research Questions

- What are the policy and research issues that create structural impediments to development of transportation infrastructure in Native American nations?
- What are the policy impediments to effective tribal governance and operation of transportation infrastructure?
- What is and what should be the role of transportation in support of the treaty obligations of the United States for the health, education, social welfare, and economic development of tribal lands and communities?
- What is needed to ensure equitable provision of transportation facilities in tribal lands and communities, such as bike paths, sidewalks, and open-space trails?

### Literature Search Summary

- Luhman, H. E., and T. Klein. *NCHRP Web-Only Document 281: Integrating Tribal Expertise into Processes to Identify, Evaluate, and Record Cultural Resources*. Transportation Research Board, Washington, D.C., 2020. <http://www.trb.org/Main/Blurbs/180505.aspx>. This report identifies ways to involve Native American tribes and their perspectives into the transportation project process.

### Research Objective

The objective of this research is to incorporate Native American communities into transportation decision-making in a way that addresses equitable access and infrastructure.

### Urgency and Potential Benefits

Short term. Native Americans are a unique subset of minority communities. This research provides a specific understanding of how inequities apply to that group and unique transportation needs.

## D.6: Explore new means of cross-sector collaborative decision-making to solve issues around inequity in individual communities.

### Background

Transportation decision-making continues to broaden in scope as the many ways in which transportation systems benefit communities are understood. Transportation agencies may experience the strain of new demands on their federally mandated processes when resources are stretched thin. Instead of delineating what is or is not the responsibility of a transportation system, a collaborative approach to working with other public-sector agencies is desirable. There is a recognized need to better integrate transportation and a whole range of other policies, related to housing, land use, education, and health.

### Research Questions

- What is the relationship between transportation and health care, food opportunities, and everything else? Can we link them?
  - Are there efficiencies to considering them together?
  - Instead of considering how to integrate health, affordability, and other topics into transportation, is it possible to integrate transportation into the other sector processes?
- What can the transportation sector learn from the public health and housing sectors that can be applied to transportation practice?
  - How do transportation practitioners use data and tools developed in other sectors and adopt them to the transportation practice?
  - How should societal and nontransportation costs and impacts (such as affordable housing and public health considerations) be included in EJ?
- What is the benefit of moving decision-making away from “protecting my mode” to moving people and goods?
  - What are the financial burdens related to equity, aside from road price schemes and transit fares (for example, racial disparities in auto loan interest rates)?

### Literature Search Summary

- Fields, N. L. et al. Interprofessional collaboration to promote transportation equity for environmental justice populations: A mixed-methods study of civil engineers, transportation planners, and social workers’ perspectives. *Transportation Research Interdisciplinary Perspectives*, Vol. 5, 2020. <https://trid.trb.org/View/1705752>. This study examines the interactions between engineers, planners, and social workers, to identify opportunities for collaboration in equity and decision-making.

### Research Objective

The research objective is to identify the types of equity and social justice issues that are related to the transportation system and other sectors. Guidance on how collaborative decision-making can enable pooled resources and shared responsibility is the product outcome.

### Urgency and Potential Benefits

Long term. This requires cross-sector engagement and may benefit from earlier research.

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