



## TRANSPORTATION EQUITY PROJECT PRIORITIZATION CRITERIA

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Master of Urban Planning 2020

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## Abstract

Transportation inequities, consequences of decades of auto-oriented planning alongside discriminatory land-use and transportation planning and policy decisions resulting from structural racism, severely impact people of color and other marginalized populations. To rectify this, future transportation investments must be strategically targeted to offer greater benefits to historically underserved communities and mitigate the effects of past discrimination. This requires a comprehensive understanding of what transportation equity is and how planners consider it in the allocation of transportation resources. The goal of this report is to inform practitioners of the two most common analytical approaches that consider equity in regional transportation planning, Environmental Justice (EJ) Analyses and equity-based criteria for project prioritization. Considering all the critiques and limitations of the former, this work advocates for the strengthening of the latter as a more effective technique to proactively improve transportation conditions for historically marginalized residents.

This research examines the use of equity-based criteria in the transportation investment prioritization processes of the metropolitan planning organizations (MPOs) that serve the 40 largest urbanized areas in the U.S. and finds that, despite the lack of federal requirements, almost half of them consider equity as a criterion for allocating transportation funds. We categorize each equity-based project evaluation criterion as one of five different types, with varying degrees of complexity and potential for impact, and we assess their strengths and

weaknesses. We evaluate their alignment with a working definition of transportation equity, and we find two important shortcomings at the general level: first, that equity measures currently in use do not consider all the relevant aspects of the transportation equity definition; second, that their weights applied to decision making are not high enough to significantly influence investment decisions. Based on this analysis, we develop a range of recommendations to further improve the consideration of equity in project selection methodologies, aimed to be implemented not only by MPOs but by any entity with the responsibility of programming transportation dollars.

## The Client

The Metropolitan Planning Council (MPC) is an independent planning and policy organization in Chicago, Illinois. This report is part of MPC's larger efforts to shape a more equitable, sustainable and prosperous greater Chicago region, and will be published on MPC's website, [www.metroplanning.org](http://www.metroplanning.org).

## Acknowledgments

Special thanks to my advisor, Prof. Jesus Barajas, for his insights and thoughtful comments, and MPC's Director of Transportation, Audrey Wennink, for her trust and guidance.

I am also deeply grateful to the University of Illinois and its Department of Urban and Regional Planning, the Fulbright Program and the Argentine Ministry of Education for providing me the opportunity to undertake my master's studies in the United States.

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## 1. Introduction

Given the increased recognition of historical inequities in transportation planning, there is a need to more explicitly consider historically marginalized groups and to provide them with the necessary resources to improve their quality of life. This requires a comprehensive understanding of how equity is considered in the allocation of transportation resources, as well as the strengths and weaknesses of these methods. **The goal of this report is to inform practitioners of the analytical approaches currently used for prioritizing transportation investments, their benefits and limitations, and possible ways to improve them.**

This report is structured as follows. First, we define the background and framework for our analysis. We introduce the definition of transportation equity, followed by a general overview of the complex history of inequities in transportation and their disproportionately negative impacts on low-income people and communities of color. We also provide a brief review of regional transportation planning in the country and the role played by Metropolitan Planning Organizations (MPOs).

Then, we study the two most common analytical approaches to consider transportation equity in planning decisions used by the MPOs that serve the 40 largest urbanized areas in the country. We first review how these agencies perform Environmental Justice Analyses, the predominant technique for analyzing the equity implications of transportation investments included in long- and short-term transportation plans. Since these analyses

rarely find evidence of disparities and are not structured to recommend changes to investment priorities, we believe that carefully considering equity in the process of prioritizing future investments is likely to have more impact on changing future transportation outcomes for historically marginalized populations. Consequently, we proceed to review the equity criteria that these MPOs include in their project selection methodologies. We discuss the benefits and limitations of these criteria, and we analyze their transportation equity implications.

Lastly, and based on the previous analyses, we provide a range of recommendations to enhance the consideration of equity in transportation project prioritization.

**This paper focuses on MPOs because, due to federal rules, there is a consistent planning process at this scale that allows regional comparisons.** However, it is important to highlight that the concepts of this document are relevant for transportation planning at all jurisdictional levels and for all transportation practitioners that have a role in prioritizing how transportation resources are spent. The reality is that only a small portion of all transportation dollars are distributed via MPOs, so to effect change a much wider range of stakeholders will need to institutionalize equity-focused processes.

## 2. Defining transportation equity

A range of academic and non-academic literature discusses the concept of transportation equity. The most common definitions state that **transportation equity is concerned with the fair distribution of benefits and burdens of transportation projects, plans and policies** (Litman, 2017; Karner, 2016; Karner, Rowangould, & London, 2016), **and with the meaningful and effective public participation in transportation decision making processes, especially of those most likely to be affected by these decisions** (Karner, Rowangould, & London, 2016).

Some authors classify transportation equity into different types based on how fairness is assessed. Bullard (2003) refers to three types of equity: procedural, geographical and social. Procedural equity focuses on the processes by which transportation decisions are made, advocating for uniform, fair and consistent procedures that involve diverse public stakeholders. Geographic equity focuses on the fair distribution of impacts across geography and space, and social equity on the fair distribution across population groups.

Litman (2017) divides social equity into three major subtypes: horizontal, vertical by income, and vertical by mobility need/ability. Horizontal equity is concerned with the distribution of impacts between individuals and groups considered equal in ability and need. According to this definition, equal individuals and groups should receive the same impacts and resources. Vertical equity focusing on income and social class is concerned with the distribution of impacts between individuals and groups that differ by income or social class. This definition supports policies and a distribution

of resources that favor economically and socially disadvantaged groups to compensate for overall inequities. Lastly, vertical equity focusing on mobility ability and need is concerned with the distribution of resources and related impacts between individuals and groups that differ in mobility ability and need, and therefore the degree to which the transportation system meets the needs of travelers with physical disabilities. This definition advocates for universal design, which is the composition of an environment such that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, or disability (Metropolitan Planning Council, 2019).

Transportation benefits include increases in access to social, educational and economic opportunities, improved access to high quality mobility options, opportunities for physical activity through active transportation modes, travel time savings, congestion mitigation, reduction of pollution, and local hiring and job training for jobs in construction, maintenance, and operation (Litman, 2017; Karner, Rowangould, & London, 2016; The Greenlining Institute, 2018). Transportation burdens, on the other hand, include reduced accessibility to opportunities, lack of access to adequate transportation, long travel times, financial burdens, traffic congestion, traffic-related risks, pollution, negative health outcomes, vulnerability to climate impacts, noise, barrier effects for nonmotorized travel and physical division of communities by transportation infrastructure (Karner, Rowangould, & London, 2016).

Accessibility is widely acknowledged as the most important benefit of transportation systems and is considered the most relevant concept for transportation equity (Litman, 2017; Karner, Rowangould, & London, 2016; Martens & Golub, 2018). Accessibility refers to the ease with which a person can reach potential destinations or opportunities; it depends on the number of opportunities available within a certain distance or travel time, and on mobility, which refers to the ability to move between different activity sites (Hanson, 2017). Basic or essential accessibility refers to the ability to reach activities that society considers basic or essential, such as food, education, employment, health care, emergency and public services, and social and recreational activities. Basic mobility refers to travel that provides this basic access (Litman, 2017). The spatial organization of contemporary society demands mobility, but mobility levels are not uniform across a given region (Hanson, 2017). Some population groups experience great constraints in terms of travel costs and modal options, and consequently, have access to reduced opportunities, with resulting deterioration to quality of life. Assessing the equity of a transportation system requires consideration of who gains accessibility and who loses it as a result of how that system is designed and modified (Hanson, 2017).

The concept of accessibility reflects the economic and social benefits provided by a transportation system and, therefore, it has been receiving more attention in the research and the planning fields in the last decades. For example, a number of research and advocacy organizations have developed tools to measure accessibility to a variety of activities that are useful resources for planners and policy makers to evaluate how well the transportation system connects people to opportunities.

The Travel Behavior & Urban Systems Research Group at the University of Illinois Chicago developed the *Metropolitan Chicago Accessibility Explorer*, a website that displays the number of jobs, parks, schools, groceries and other opportunities that can be reached from different neighborhoods in the Chicago metropolitan area within certain travel time thresholds by different modes. Similarly, Chicago's Center for Neighborhood Technology developed *AllTransit*, a tool that measures transit access and connectivity across the United States. From the private sector, *Walk Score* is also worth mentioning as it provides a public access walkability index that assigns a numerical walkability score to any address in the United States.

However, transportation planning has historically been dominated by a mobility-oriented paradigm that focuses on congestion reduction and time savings for motorists and usually overlooks the associated land uses (economic opportunities to which transportation connects) and household characteristics (need to access work, school, etc.) that drive transportation demand (Boisjoly & El-Geneidy, 2017). Conversely, an accessibility-oriented paradigm allows for the consideration of a wider range of modes, objectives, impacts, and options in the planning process (Litman, 2017), better aligning it with transportation equity goals. It is important to make clear, nevertheless, that although accessibility is necessary for the expansion of people's freedom of choice and promotion of equality of opportunities, considering that dimension alone is not sufficient (Pereira, Schwanen, & Banister, 2017). It is necessary to have a more nuanced and multidimensional understanding of accessibility that acknowledges the diversity of people's needs and constraints when they make transport

decisions (Pereira, Schwanen, & Banister, 2017), as well as to coordinate interventions with other facets of community planning like land use, housing and economic development, to enable us to prioritize the most beneficial transportation improvements.

The emphasis of transportation equity is on protecting and accommodating the needs of disadvantaged populations (Litman, 2017; Lucas, Martens, Di Ciommo, & Dupont-Kieffer, 2019). Academic literature acknowledges race and ethnicity, low income, isolation, disability and language barriers as factors that contribute to transportation disadvantage status (Litman, 2017; Sánchez, Stolz, & Ma, 2003). The greater the number of such factors that apply to an individual or group, the more disadvantaged it can be considered (Litman, 2017).

United States' historical and contemporary structural and institutional racism puts communities of color in the center of all discussion about transportation equity. *Structural racism* refers to a system in which history, ideology, public policies, institutional practices, cultural representations, and other norms interact to maintain a racial hierarchy that allows the privileges associated with whiteness and the disadvantages associated with color to endure and adapt over time (Aspen Institute Roundtable on Community Change, 2004). One facet of structural racism is *institutional racism*, which refers to discriminatory treatment, unfair policies and inequitable opportunities and impacts, based on race, produced and perpetuated by institutions (Lawrence & Keleher, 2004). Public and private discrimination practices, spatial segregation on the grounds of race, the systematic denial of benefits and the imposition of burdens to communities of color have molded the

built environment and created the current inequities people of color face today. Households in poverty, which are disproportionately comprised of African Americans and Hispanics, spend a higher proportion of their income on transportation expenses. Limited vehicle availability, fewer affordable transportation options and shorter radius of possible travel harm these groups, compared to higher income households (FHWA, 2014).

This present context requires that decision makers are clear about the distinction between *equality* and *equity* when making transportation decisions. An *equality* approach seeks an equal distribution of resources, benefits and burdens across the population in the present and in the future. This approach, however, does not address the cumulative burdens and harms of historical and contemporary racism and related practices that created the pressing transportation needs that disadvantaged communities have today. Overcoming current inequities requires an *equity* approach that allocates resources based on communities' need, with the aim of correcting existing differences and removing the effects of past discrimination (Martens & Golub, 2018). An equity approach also requires the provision of meaningful opportunities to disadvantaged communities to participate in transportation decisions and to guarantee that any planned improvements respond to residents' specific needs (Karner, Rowangould, & London, 2016; Lucas, Martens, Di Ciommo, & Dupont-Kieffer, 2019; The Greenlining Institute, 2018).



For the purpose of this document, we define transportation equity as a planning approach:

- concerned with the distribution of benefits and burdens of transportation projects, plans and policies between individuals and groups that differ by race, income and ability;
- that aims to protect and increase the benefits—with an emphasis on accessibility—for historically marginalized populations, especially low-income communities of color;
- that allocates resources based on communities' needs, with the aim of correcting existing differences and removing the effects of past discrimination; and
- that provides effective opportunities for disadvantaged populations to participate in the transportation decisions that will affect them.

### 3. Inequities in transportation: causes and consequences

#### 3.1. Causes of transportation inequities: structural racism, discriminatory policies, auto-oriented planning and unequal representation

Transportation inequities in the United States are a consequence of historical and contemporary racism, discriminatory public policies and private practices, inequitable funding distribution and unequal representation in decision-making processes that have socially and spatially shaped metropolitan areas during the 20<sup>th</sup> century. The history of inequities in transportation is complex, and this narrative only seeks to provide a general overview.

Inequitable transportation policies can be traced back to the 1896 U.S. Supreme Court decision *Plessy vs. Ferguson*. This decision established the "separate but equal" doctrine that allowed racial segregation in public facilities if equal opportunities were provided to African Americans. This

legitimized the practices of separate rail cars for African Americans, the "white section" and "colored section" Jim Crow seating law and the insistence that African Americans were to sit at the rear of any public transit bus. Decades later, these transportation injustices became integral to the civil rights movement of the 1950s and 1960s. Rosa Parks and bus boycotts in Alabama and Louisiana exposed the discrimination against African-Americans on public transit, and the Freedom Riders exposed the threats faced by African-Americans traveling on interstate transportation systems (The Chicago Urban League, 2016; Bullard, 2003; Sánchez, Stolz, & Ma, 2003).

After World War II, the planning and development of transportation systems contributed to maintaining the residential segregation established through discriminatory land use and housing policies and practices, and increased the concentration of poverty in urban areas (Cytron, 2010; The Leadership Conference Education Fund, 2011; The Chicago



Urban League, 2016; Sánchez, Stolz, & Ma, 2003). The disproportionate investment in highways compared to other modes, in combination with housing and lending policies, led to a massive migration of residential and non-residential activities from central cities to the suburbs between 1945 and 1970. However, exclusionary zoning ordinances and discrimination in housing and mortgage markets prevented people of color from moving to suburban neighborhoods. As business and economic opportunities also relocated to the suburbs, access to opportunity increased among car-owning families but decreased for low-income city-dwellers without cars, since suburban areas were not well served by public transportation (Cytron, 2010; The Chicago Urban League, 2016; The Leadership Conference Education Fund, 2011; Sánchez, Stolz, & Ma, 2003).

Also important is that, during this period, highways were commonly constructed through low-income communities and communities of color which suffered from multiple negative impacts like evictions, physical division of neighborhoods, erosion of local economies, and disproportionate exposure to noise, air pollutants, unhealthy and unsafe conditions (Cytron, 2010). The growing recognition that the poor and people of color are the ones more disparately exposed to this and other severely polluted environments gave rise to the Environmental Justice Movement, started primarily by people of color who sought to address the inequity of environmental protection in their communities (U.S. EPA, 2019). Its origins can be linked to the American civil rights movement of the 1960s; however, protesting communities were not associated with others in similar situations until the early 1980s. This changed when residents of Warren County, North Carolina, protested against the state in 1982 for deciding to locate a hazardous waste

landfill in a small, predominately African American community there. Despite being unsuccessful, this protest provided a national start to the environmental justice movement (U.S. Department of Energy, 2019), which received serious government attention during the 1990s.

In 1994, President Clinton issued Executive Order 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requiring federal agencies to achieve environmental justice as part of their missions, by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. This order partially overlaps with the Title VI of the Civil Rights act of 1964, which prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance (U.S. Department of Justice, 2019) but does not include low-income populations. In subsequent years, federal transportation agencies issued guidance for incorporating environmental justice and Title VI principles into existing programs, policies, and activities, and brought attention to the issue of transportation equity (Sánchez, Stolz, & Ma, 2003).

Currently, transportation funding continues to prioritize regional transportation over urban transit needs. Academic literature highlights three main reasons for this. First, federal transportation authorizations allocate most of the funding (80% or more) to roadway development and only a small proportion (20% or below) to public transit (Bullard, 2003; Sánchez, Stolz, & Ma, 2003; Bureau of Transportation Statistics, 2020).

Second, there are widespread inequities between investments in city bus service, which tends to serve more low-income riders, and in rail service, which tends to serve higher-income riders. In an effort to attract more discretionary commuters out of their automobiles, investments favor new commuter rail lines that disproportionately serve a wealthier, less transit-dependent population than do central city transit services (Bullard, 2003; Sánchez, Stolz, & Ma, 2003; Garrett & Taylor, 1999). The preference of elected officials and transit agencies for large new capital investments over operational improvements is in part related to the fact that transit dependent riders do not represent a strong constituency for improved bus service since fewer poor and minority persons are registered to vote, and they are less likely to vote, compared to suburban residents (Garrett & Taylor, 1999). Furthermore, federal transit funding is mostly devoted to capital expenditures, with just a small proportion committed to operations.

Lastly, procedural inequities in decision-making processes are a systemic problem. MPOs, which are in charge of regional transportation planning and resource allocation, underrepresent urbanized areas and disproportionately represent suburban interests due to the “one area, one vote” system, by which less dense counties have the same number of votes as highly populous urban jurisdictions. Furthermore, these voting members usually are not representative of their metropolitan area’s demographics. This has led to an underrepresentation of racial minorities and an overrepresentation of white constituents (Sanchez, 2008; Yan, 2013; Marcantonio, Golub, Karner, & Nelson, 2017). At the same time, there are structural barriers to accessing decision-making

processes. The public’s ability to engage in opportunities like public meetings can be constrained, for example, by the times of the meetings or by their language skills. Low-wage workers, who are disproportionately people of color, are less likely to attend meetings scheduled during the workday due to little flexibility in their schedules. People with limited English proficiency can feel discouraged to attend to public meetings, unless translation is available for them to understand and participate in discussions (Yan, 2013). Even more, academic literature underlines that traditional approaches to public involvement in decision-making processes are rarely meaningful and do not really provide affected residents the power to influence agencies’ decisions (Innes & Booher, 2004; Karner & Marcantonio, 2018). Most of the time, formal public involvement efforts are implemented after decisions are made or detailed plans have been prepared, asking affected residents for their reactions only (Innes & Booher, 2004).

### 3.2. Economic, social and health dimensions of transportation inequities

The previously explained combination of land use and transportation practices has deeply affected people of color and low-income populations. John Kain (1968) formulated the “spatial mismatch hypothesis” to explain concentrated poverty among African Americans in central cities as a result of the disconnection between the location of housing and jobs suitable for them product of the suburbanization of jobs and housing and labor market discrimination previously discussed. More recent research reconceptualized this hypothesis as an automobile-ownership or modal mismatch, arguing that the barrier that prevents low-income residents from accessing

distant suburban jobs is not so much geographic distance but a lack of reliable personal transportation. Low-income and non-white workers without a car depend on public transit, which limits the employment available to them and puts them at disadvantage (Taylor & Ong, 1995; Grengs, 2010).

National transportation statistics and research provide ample evidence of differences in travel behavior and patterns according to race and income. The Federal Highway Administration's brief *Mobility Challenges for Households in Poverty* (2014) highlights that households in poverty:

- Are disproportionately represented by African Americans and Hispanics and are more likely to be headed by a female;
- Spend a higher proportion of their income on transportation expenses;
- Have lower vehicle ownership rates: about 24% of households in poverty do not own a vehicle, whereas this rate drops to approximately 6% for households with incomes between the poverty level and \$100,000, and to less than 2% for households earning more than \$100,000;
- Have the highest vehicle occupancy rates: individuals in poverty are about twice as likely to travel in a multi-occupant vehicle than a single-occupant vehicle as those in the higher income groups;
- Have the highest usage of alternative and less costly modes of transportation: individuals in poverty take about three times as many transit trips as those in the

higher income groups, have the greatest rate of bike trips and take walk trips about 50% more than their higher-income counterparts.

Furthermore, the unbalanced emphasis on auto-oriented planning and design has resulted in a lack of safe and appealing places to walk, bike, or take public transportation. This has disproportionately impacted the safety and the health of low-income and minority populations, older adults, and children. According to a literature review by Smart Growth America (2019):

- The pedestrian fatality rates for Latinos and African Americans are over 60% and 75% higher than the rate for whites, respectively;
- Adults over 65 made up 22% of all pedestrian fatalities from 2000 to 2009, despite comprising only 13% percent of the population. Older Latino adults have a pedestrian fatality rate that is 173% higher than that of older white adults;
- Children of color are more impacted by air pollution from traffic: they are at least 20% more likely than their white peers to live in neighborhoods that exceed air quality standards for ozone and are more likely than white children to suffer from asthma;
- Low-income, African Americans and Latinos are less likely to get enough physical activity and are more likely to be obese than higher-income and white communities. Streets without safe infrastructure to walk or bicycle for exercise are among the several factors that contribute to this.

This review briefly illustrates the systemic neglect experienced by oppressed communities and the structural inequalities they continue facing today. As academic literature underlines, United States' history of overt racism left an enduring imprint on the built environment and it is important to understand that racially neutral decisions, when layered onto a segregated metropolitan geography, reinforce existing inequalities by failing to address racial barriers to opportunity and failing to

reconfigure the built environment (Golub, Marcantonio, & Sanchez, 2013). Therefore, it is essential that every professional playing a role in shaping the country's transportation system carefully understand these inequities and their roots, and allocate resources to mitigate the effects of past discrimination, offer greater benefits to marginalized groups and improve their quality of life.

#### 4. Regional Transportation Planning Overview

**Metropolitan Planning Organizations (MPOs) are the bodies in charge of regional transportation planning in urbanized areas in the United States.** The Federal-Aid Highway Act of 1962 requires their existence by mandating the establishment of MPOs in all urbanized areas with population greater than 50,000. They are responsible for establishing the guiding vision for regional transportation systems and for creating fiscally constrained short- and long-range transportation plans.

Each MPO is designated individually by agreement between its state governor and local governments representing 75% or more of a region's population (U.S. Department of Transportation, 2019). MPOs exist in several forms: as part of county governments, generally when county boundaries encompass the entire planning area; as part of regional councils of government (COGs), larger organizations that handle regional issues beyond transportation, such as land use and economic development; as subdivisions of state departments of transportation (DOTs); or as independent entities devoted solely to transportation planning (Sciara, 2017; Sanchez, 2006).

Long Range Transportation Plans (LRTPs) are one of the main planning products produced by MPOs; they establish the regional vision for transportation systems for a planning horizon of 20 years or more. LRTPs are meant to guide regional transportation investments and policies, and they are updated at least every 5 years. LRTPs are implemented through Transportation Improvement Programs (TIPs), which include the projects to be implemented in the short-term—usually a period of 3 to 5 years. As recipients of federal funding, MPOs must demonstrate compliance with the Title VI of the 1964 Civil Rights Act and with the U.S. Department of Transportation's Order 5610.2(a) *Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, which incorporates and updates Executive Order 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. To do this, MPOs typically prepare an “equity,” “Environmental Justice,” or “Title VI” analysis of the transportation investments and strategies included in the LRTPs

and TIPs, with the aim of identifying and addressing disproportionate adverse impacts on protected populations.

Implementing agencies—states, cities, counties, and transit agencies—responsible for building the projects and operating the transportation system typically propose the projects included in the LRTP and TIP. Since MPOs usually are not implementing agencies, they cannot include a project in the TIP and LRTP unless an implementing agency sponsors it. The 1991 *Intermodal Surface Transportation Efficiency Act (ISTEA)* strengthened the planning process by including fiscal constraint provisions, requiring that both LRTPs and TIPs realistically reflect anticipated funding levels – that is, investments should be limited to the amount of funding likely to be available over the LRTP and TIP periods (Sciara & Handy, 2017).

In recent years, starting with the 2012 *Moving Ahead for Progress in the 21st Century Act (MAP-21)* and continuing under the current *Fixing America's Surface Transportation (FAST) Act*, federal transportation funding authorizations have begun to require a transition to performance-based planning, which is a strategic approach to using data on system performance to inform investment decisions. Performance-based planning is based on the idea that making data-driven decisions and using performance measures to track outcomes can better ensure that projects and investments are delivering the desired results and can increase accountability and transparency. Under MAP-21 and the FAST Act, the metropolitan transportation planning process must focus on achieving the following national goals:

- Safety: to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

- Infrastructure Condition: to maintain the highway infrastructure asset system in a state of good repair.
- Congestion Reduction: to achieve a significant reduction in congestion on the National Highway System.
- System Reliability: to improve the efficiency of the surface transportation system.
- Freight Movement and Economic Vitality: to improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- Environmental Sustainability: to enhance the performance of the transportation system while protecting and enhancing the natural environment.
- Reduced Project Delivery Delays: to reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

In 2016, the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) published the final rules on state and metropolitan transportation planning, which established new requirements for state DOTs and MPOs to transition to performance-based programs. Under these rules, **state DOTs and MPOs are now federally required to track a set of transportation performance measures and to set targets to guide progress.** These performance measures include:

- Infrastructure:
  - Percent of pavement of interstate system NHS<sup>1</sup> in good/poor condition
  - Percent of pavement on non-interstate system NHS in good/poor condition
  - Percent of NHS bridges in good/poor condition.
- System performance:
  - Percent of reliable person-miles traveled on interstate/non-interstate NHS
  - Total emissions reduction of on-road mobile source emissions for CMAQ<sup>2</sup> program
  - Total emissions reduction of on-road mobile source emissions for CMAQ program
  - Truck travel time reliability index
  - Annual hours of peak hour excessive delay/capita on NHS (congestion)
  - Percent of all non-SOV<sup>3</sup> work travel on NHS
- Safety (all public roads):
  - Number and rate of fatalities
  - Number and rate of serious injuries
  - Number of combined non-motorized fatalities and serious injuries

- Transit asset management: State of good repair for:
  - Rolling stock
  - Non-revenue service vehicles and equipment
  - Transit rail infrastructure
  - Transit facilities

As a result of the Federal emphasis on performance-based planning, data-driven methods are now integrated into MPO processes, and agencies are more commonly using performance measures to prioritize transportation projects. The measures, as shown, are mostly auto focused and not connected to broader goals of the transportation system, such as efficiently connecting people to essential opportunities. If equity were considered in a meaningful way as part of this process, transportation investments could be targeted to improve the quality of life for historically marginalized populations. Fortunately, despite the lack of federal requirements, many MPOs are defining equity in their own terms and incorporating it as a criterion into their project prioritization methods.

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<sup>1</sup> NHS = National Highway System

<sup>2</sup> CMAQ = Congestion Mitigation and Air Quality

<sup>3</sup> SOV = Single occupant vehicle



## 5. Research methods

This research describes how Metropolitan Planning Organizations are currently considering transportation equity in their transportation planning and investment decisions. MPOs are the focus of this study because, due to federal rules, there are consistent processes and plans at this scale that allow regional comparison. Consequently, these agencies' websites better document their work and products, compared to those of State and City Departments of Transportation (DOTs). Additionally, municipal DOTs are uncommon outside of large cities, and the jurisdiction of state DOTs inherently results in their focus on state-owned roadways.

This work analyzes the information publicly available for the 40 largest Metropolitan Planning Organizations -in terms of service areas or boundaries- in the United States, all serving urbanized areas with populations greater than 1,000,000 and listed in Table 1. We focus on the agencies that serve largest populations because we expect them to address transportation equity with more detailed and complex approaches due to their greater capacities in terms of resources and staff in comparison with smaller MPOs. We reviewed documents including the last adopted Long Range Transportation Plans, Transportation Improvement Programs, Environmental Justice/Title VI/Equity Analyses and documentation of project prioritization criteria for available funds.<sup>4</sup>

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<sup>4</sup> Details about project evaluation were usually found in the body or in the appendixes of the LRTPs, in the material related with Transportation Improvement Programs, or on specific webpages about Funding Sources. In the cases it was not found in any of them, the website of the MPOs were

As previously mentioned, MPOs commonly use two analytical approaches to address equity concerns in their planning and programming processes:

- Preparation of an Environmental Justice (EJ), Title VI, or equity assessment to analyze the impacts of the strategies and projects included in their transportation plans and improvement programs on different segments of the community;
- Inclusion of an equity criterion in their project selection methodologies to prioritize future investments based on their impacts on historically marginalized population groups.

Since Environmental Justice or Title VI Analyses are the predominant technique for analyzing the equity implications of transportation investments included in Long Range Transportation Plans (LRTPs) and Transportation Improvement Programs (TIPs), we start by reviewing how the selected MPOs perform these analyses. At the time of this research (June-December 2019), 32 (80%) of the 40 agencies had Environmental Justice/Title VI Analyses for their last adopted Long Range Transportation Plans and/or Transportation Improvement Programs publicly available online. Due to the extensive literature on this method, we only provide a general overview of the common elements found in this sample and the

searched for the words "Project Selection," "Project Prioritization," "Project Evaluation," "Surface Transportation Program," and "Call for Projects." This last one usually referred to current or previous round of projects submissions and their application guidelines.



performance measures they used to assess impacts, and we discuss the limitations of this technique.

The main critique to these analyses is that they rarely find evidence of disparities and they are not structured to recommend changes to investment priorities. Therefore, we believe that carefully considering equity in the process of prioritizing future investments is likely to have more impact on changing future transportation outcomes for historically marginalized and underserved populations. Consequently, we examined the project selection methodologies of MPOs to determine if they included equity as a criterion for allocating transportation resources. **Of the 40 agencies, 23 (58%) had project prioritization methodologies available online at the time of this research, of which 18 (45%) included an equity-related criterion** (Table 1 and Figure 1). We considered as equity criterion any evaluation measure that awarded or subtracted points to proposed projects based on the effects they would have on populations defined by the MPOs as disadvantaged. For the MPOs that did implement equity criteria, we evaluate the strengths and weaknesses of their approaches, and their

alignment with our working definition of transportation equity. This requires determining if the methods currently in use:

- Clearly identify disadvantaged population groups, with an emphasis on low-income populations and people of color;
- Clearly identify transportation benefits to disadvantaged populations, and emphasize accessibility;
- Clearly identify transportation burdens to disadvantaged populations, and emphasize their protection;
- Adopt an equity approach that allocates resources based on need; and
- Respond to communities' specific needs.

Based on this framework, we analyze the transportation equity implications of current methods and develop recommendations for improvement.

Table 1: Metropolitan Planning Organizations analyzed (ranked by population size<sup>5</sup>)

MPO	Urban centers	2010 Population [millions]	Project Prioritization Criteria	
			Online availability	Equity criteria
Southern California Association of Governments (SCAG)	Los Angeles, CA	18.1	-	
New York Metropolitan Transportation Council (NYMTC)	New York, NY	12.4	-	
Chicago Metropolitan Agency for Planning (CMAP)	Chicago, IL	8.5	x	x
Metropolitan Transportation Commission (MTC)	San Francisco, CA	7.2	-	
North Jersey Transportation Planning Authority (NJTPA)	Newark, NJ	6.6	x	x
North Central Texas Council of Governments (NCTCOG)	Dallas/Fort Worth, TX	6.4	x	x
Houston-Galveston Area Council (H-GAC)	Houston, TX	5.9	x	x
Delaware Valley Regional Planning Commission (DVRPC)	Philadelphia, PA	5.6	x	x
National Capital Region Transportation Planning Board (TPB)	Washington D.C.	5.1	-	
Atlanta Regional Commission (ARC)	Atlanta, GA	4.8	x	x
Southeast Michigan Council of Governments (SEMCOG)	Detroit, MI	4.7	-	
Maricopa Association of Governments (MAG)	Phoenix, AZ	4.1	-	
Puget Sound Regional Council (PSRC)	Seattle, WA	3.7	x	x
Boston Region Metropolitan Planning Organization	Boston, MA	3.2	x	x
San Diego Association of Governments (SANDAG)	San Diego, CA	3.1	x	x
Metropolitan Council	Saint Paul, MN	2.9	-	
Denver Regional Council of Governments (DRCOG)	Denver, CO	2.8	x	x
Baltimore Regional Transportation Board (BRTB)	Baltimore, MD	2.7	x	x
Southwestern Pennsylvania Commission (SPC)	Pittsburgh, PA	2.6	-	

Note: A cross (x) designates the online availability of a project selection methodology, where a dash (-) designates unavailability. If the project selection methodology was available, the cross (x) designates that it included an equity related criterion and a dash (-) designates that it didn't. the project selection methodology was unavailable, a grey space indicates that it was not possible to determine the use or not of an equity criterion. This table does not contemplate the availability or not of Environmental Justice Analyses.

<sup>5</sup> The population included within the jurisdiction of a Metropolitan Planning Organization can differ from the population size of a Metropolitan Statistical Area (MSA) since their boundaries vary and do not always align. Some MSAs are divided among multiple MPOs (e.g., Miami-Ft Lauderdale-Palm Beach).

Table 1 (continued): Metropolitan Planning Organizations analyzed (ranked by population size)

MPO	Urban centers	2010 Population [millions]	Project Prioritization Criteria	
			Online availability	Equity criteria
East-West Gateway Council of Governments (EWGCOG)	Saint Louis, MO	2.6	x	x
Miami Dade Transportation Planning Organization	Miami, FL	2.6	-	
Sacramento Area Council of Governments (SACOG)	Sacramento, CA	2.3	x	-
Northeast Ohio Areawide Coordinating Agency (NOACA)	Cleveland, Ohio	2.1	-	
Alamo Area Metropolitan Planning Organization (AAMPO)	San Antonio, TX	2.0	-	
Ohio-Kentucky-Indiana Regional Council of Govts. (OKI)	Cincinnati, OH	2.0	x	x
Regional Transp. Commission of Southern Nevada (RTC)	Las Vegas, NV	2.0	x	-
Southeastern Wisconsin Regional Planning Comm. (SEWRPC)	Milwaukee, WI	1.9	-	
Mid-America Regional Council (MARC)	Kansas City, MO	1.9	x	-
MetroPlan Orlando	Orlando, FL	1.8	-	
Capital Area Metropolitan Planning Organization (CAMPO)	Austin, TX	1.8	x	x
Broward Metropolitan Planning Organization (BMPO)	Fort Lauderdale, FL	1.7	-	
Hampton Roads Transp. Planning Organization (HRTPO)	Chesapeake, VA	1.6	x	-
Wasatch Front Regional Council (WFRC)	Salt Lake, UT	1.6	-	
Indianapolis Metropolitan Planning Organization	Indianapolis, IN	1.6	x	-
Portland Area Comprehensive Transportation System (METRO)	Portland, OR	1.5	x	x
Greater Nashville Regional Council (GNRC)	Nashville, TN	1.5	x	x
Mid-Ohio Regional Planning Commission (MORPC)	Columbus, OH	1.4	x	x
Palm Beach Transportation Planning Agency	West Palm Beach, FL	1.3	-	
North Florida Transportation Planning Organization	Jacksonville, FL	1.3	-	
Charlotte Regional Transp. Planning Organization (CRTPO)	Charlotte, NC	1.3	x	x

Note: A cross (x) designates the online availability of a project selection methodology, where a dash (-) designates unavailability. If the project selection methodology was available, the cross (x) designates that it included an equity related criterion and a dash (-) designates that it didn't. If the project selection methodology was unavailable, a grey space indicates that it was not possible to determine the use or not of an equity criterion. This table does not contemplate the availability or not of Environmental Justice Analyses.

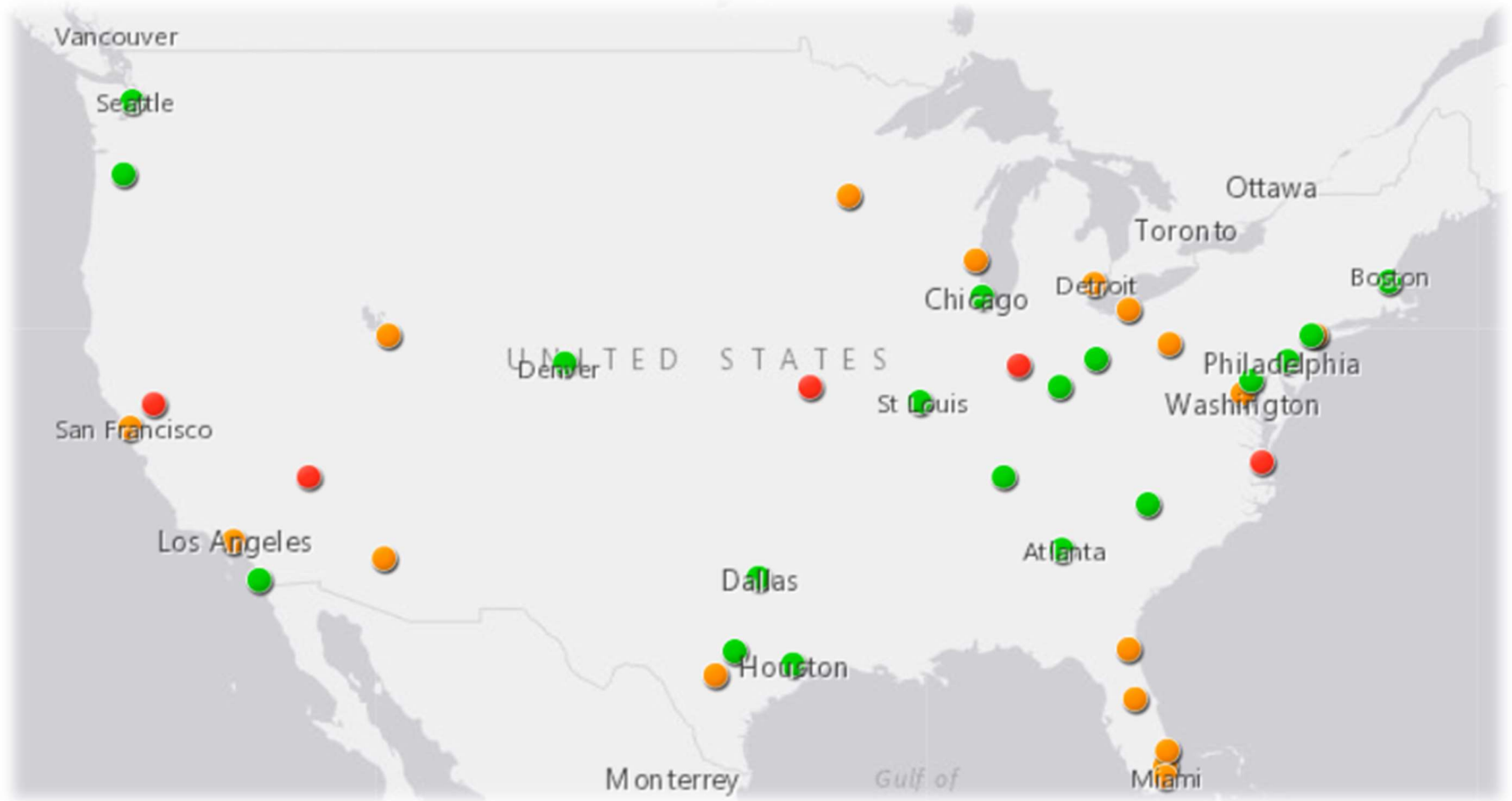


Figure 1: Metropolitan Planning Organizations analyzed.

- Note:
- MPOs whose project selection methodologies were not available on their websites;
  - MPOs whose project selection methodologies were available on their websites and included equity criteria;
  - MPOs whose project selection methodologies were available on their websites and did not include equity criteria.

## 6. Environmental Justice Analyses

Environmental Justice Analyses identify and analyze the impacts of transportation plans to assess whether they are shared equitably across all population groups. The traditional approach consists of identifying geographic units with high concentrations of marginalized populations and comparing them with the rest of the region in terms of distribution of investments and assessment of impacts (burdens and benefits) through different performance measures.

Metropolitan Planning Organizations refer to marginalized populations in several ways. Common designations include "disadvantaged", "vulnerable", "Environmental Justice", "historically marginalized" and "traditionally underserved" populations or communities. These designations seek to include groups who have been or are denied access and/or suffer institutional or structural discrimination. As previously discussed, two federal mandates dictate the inclusion of people of color and low-income populations in the agencies' definition of marginalized populations:

- **Title VI of the Civil Rights Act of 1964**, aimed at protecting against discrimination in federally funded programs on the grounds of a person's race, color, or national origin; and
- **Environmental Justice Executive Order 12898 of 1994**, aimed at avoiding disproportionately high and adverse effects on minority and low-income populations.

Following these regulations, the U.S. Department of Transportation (US DOT), the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) issued

directives to perform Environmental Justice and Title VI analysis and ensure compliance with these mandates in subsequent years (US DOT, 1997; FHWA & FTA, 1999; FTA, 2007; FTA, 2012; FTA, 2012; FHWA, 2012).

"Minority" refers to persons belonging to any of the following groups, as well as "other" categories that are based on the self-identification of individuals in the U.S. Census: African American, Hispanic, Asian/Pacific Islander, and Native American and Alaskan Native. Low-income refers to persons whose household income is a certain percentage above, at or below the federal poverty guidelines of the U.S. Department of Health and Human Services (DHHS). Each MPO adopts thresholds (above, at or below) based on their regional costs of living and average household sizes, composition and income.

Some agencies include other traditionally underserved groups besides people of color and low-income groups required in the EJ order and Title VI. In our study, we found that many MPOs also consider people with disabilities and people with limited English proficiency in their definitions. The consideration of these populations is based on two other federal mandates:

- **Americans with Disabilities Act of 1990**, aimed at protecting against discrimination in federally-funded programs on the grounds of physical or mental disabilities; and
- **Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency**, aimed at guaranteeing meaningful access to federally funded programs for people who speak limited English

People with disabilities includes any non-institutionalized person with at least one disability that may limit the individual's ability to care for himself or herself. Limited English proficiency refers to any person aged 5 years or older who does not speak English as his/her primary language and who reported being able to read, speak, write, or understand English less than "very well" as classified by the U.S. Census Bureau.

We also found that many agencies consider seniors/elderly population, zero-vehicle or carless households, female headed households with child or single-parent families and limited or low educational attainment as factors of disadvantage. A few MPOs also included foreign born populations, veterans, people who use public transportation to get to work, areas with high levels of unemployment or chronic underemployment, cost-burdened renters or households with risk of displacement, and households receiving food stamps or cash public assistance.

Table 2 describes the common elements found in the 32 analyzed EJ and Title VI Analyses. Table 3 enumerates the performance measures most commonly used to assess impacts. These metrics are generally calculated separately for the aggregated disadvantaged populations defined by the MPOs and for the remainder of the population to assess whether historically marginalized populations experience disproportionate impacts. **The focus is typically on identification and mitigation of anticipated negative impacts on EJ populations, not consideration of whether the investments are the right ones to achieve desired regional outcomes in terms of benefits to these populations.**

The format, content and extent of EJ Analyses vary widely by MPO. Some agencies prepared very complete documents that

include most of the elements described in Table 2, whereas others limited their analyses to the identification and mapping of disadvantaged groups in their regions without analyzing any impact. This finding is aligned with one important critique raised by academic literature: despite the extensive law and regulatory guidance, there is a lack of specific recommendations and analysis requirements for MPOs, as well as a lack of enforcement. This results in a situation where the completion of any analysis is considered sufficient for compliance with federal mandates (Karner & Niemeier, 2013; Rowangould, Karner, & London, 2016; Marcantonio, Golub, Karner, & Nelson, 2017; Martens & Golub, 2018).

Although this study provides only a general description of this technique, it is still possible to make some observations regarding alignment of EJ analyses with the evaluation framework presented in the Research Methods section. First, all the analyses clearly identify marginalized population groups, emphasizing people of color and low-income populations. However, the traditional approach for doing this is highly criticized by academic literature. MPOs usually define thresholds (based on race, income, and other factors) to identify geographic units such as Census tracts with high concentrations of disadvantaged groups in the region. These geographies with high EJ population are used as proxies for disadvantaged populations and compared with the rest of the region in the analysis of the distribution of investments and assessment of impacts. The main critique to this approach is that it excludes disadvantaged people that reside outside the target geographies and it includes non-disadvantaged populations living within them in the calculation of the performance metrics (Marcantonio, Golub, Karner, & Nelson, 2017; Rowangould, Karner, & London, 2016).

Second, most MPOs included an assessment of impacts and/or distribution of investments. However, as highlighted by academic literature, **Environmental Justice Analyses rarely find evidence of disparities in performance measures outcomes or fund allocations** (Rowangould, Karner, & London, 2016; Martens & Golub, 2018; Karner & Niemeier, 2013). Several reasons are attributed to this: the previously mentioned lack of standards governing equity analyses (Karner & Niemeier, 2013) and inadequate definition of disadvantaged communities (Rowangould, Karner, & London, 2016); MPOs' differing analytical capacity and sophistication of resources available according to their size (Karner, 2016; Marcantonio, Golub, Karner, & Nelson, 2017); and analytical techniques that do not reflect the travel behavior of people of color (Karner & Niemeier, 2013). Of the 32 Environmental Justice Analyses reviewed in our research, 25 evaluated impacts and/or distribution of investments, and of those, only 3 found disparities in some of the performance measures outcomes.

Third, it is important to note that **the analysis of the distribution of transportation investments is usually meant to demonstrate that marginalized communities will benefit from similar levels of investments as non-marginalized ones**. This approach is not compatible with the definition of transportation equity adopted in this work. Similar levels of investments do not constitute equitable investments. Transportation equity pursues equal outcomes, which requires allocating resources based on a marginalized population's needs, and usually means increased investments in marginalized communities.

Lastly, only some of the MPOs mention outreach efforts and instances of public input specifically targeting marginalized populations in their Environmental Justice Analyses. However, it is important to acknowledge that some agencies prepare Public Participation plans separately from these analyses, which Table 2 does not contemplate.

Table 2: Common elements of Environmental Justice Analyses

Element	Content	# of MPOs	%
Identification of disadvantaged groups	Identification of demographic groups of interest. Definition of thresholds (based on race, income, etc.) and application to geographic units (census tracts, traffic analysis zones, etc.) for analysis. Mapping of geographic units with high concentrations of disadvantaged groups in the region.	32	100%
Outreach efforts & public Input	Description of the outreach and public input strategy adopted by the MPO during and for the development of the LRTP. For instance, public events, workshops, focus groups and interviews held with stakeholders and with particular target groups. The outcomes of these events are usually linked with the influence they had on the plan development process.	14	44%



Table 2 (continued): Common elements of Environmental Justice Analyses

Element	Content	# of MPOs	%
Examination of trends	<p>Examination of historic and current trends throughout the region, focused on the disadvantaged population groups previously defined. MPOs usually analyze some of the following aspects:</p> <ul style="list-style-type: none"> <li>○ Demographic changes</li> <li>○ Income</li> <li>○ Number of trips</li> <li>○ Transportation mode usage</li> <li>○ Vehicle ownership</li> <li>○ Travel times and travel distance</li> <li>○ Bike, pedestrian and vehicle crashes</li> <li>○ Transportation infrastructure condition in disadvantaged communities</li> <li>○ Jobs and housing mismatch</li> <li>○ Proximity to parks, schools, hospitals and retail centers</li> <li>○ Gentrification and displacement</li> </ul>	14	44%
Distribution of transportation investments	<p>Illustration of the distribution of transportation investments relative to different population subgroups in the region, to determine whether disadvantaged communities receive a similar level of investments as non-disadvantaged populations. Two commonly used techniques:</p> <p>Population-based distribution: comparison of per capita transportation funding or of the share of investments that benefit disadvantaged and non-disadvantaged populations.</p> <p>Project mapping: spatial distribution of projects relative to geographic units with high concentration of disadvantaged populations, to visually determine any indication of systematic exclusion or imbalance.</p>	19	59%

Table 2 (continued): Common elements of Environmental Justice Analyses

Element	Content	# of MPOs	%
Assessment of impacts	<p>Definition of Performance Measures*, calculation (modeling) and comparison of outcomes for disadvantaged populations versus the remainder of the region, for the base year and for at least two alternative scenarios in the horizon year of the plan:</p> <ul style="list-style-type: none"> <li>Scenario #1: no implementation of the plan or “business as usual”.</li> <li>Scenario #2: implementation of the strategies contained in the plan.</li> </ul> <p>*Refer to Table 4 for commonly used Performance Measures in EJ analysis.</p>	16	50%
Potential strategies	Description of possible measures to address potential impacts to disadvantaged communities and to promote the implementation of environmental justice mandates and regulations in the activities of the MPO	3	9%
Next steps	Description of actions and work to undertake by the MPO based on the results of the analysis, related with the plan implementation, future topics to explore and refinement of future analysis.	9	28%

Table 3: Performance Measures used by MPOs to assess impacts in EJ Analyses

Theme	Measures
Affordability	<p>Housing plus transportation costs</p> <p>Out-of-pocket costs</p> <p>Travel time savings</p> <p>Travel distance reductions</p>
Accessibility to essential destinations and jobs	<p>Time-based (available destinations within a certain travel time for certain modes)</p> <p>Distance-based (available destinations within a certain travel distance)</p> <p>Proximity-based (proportion of population within a certain distance or within a certain travel time from a destination)</p>

Table 3 (continued): Performance Measures used by MPOs to assess impacts in EJ Analyses

Theme	Measures
Access to travel options	<ul style="list-style-type: none"> <li>Share of population within a certain distance of frequent transit service</li> <li>Bus stops concentration</li> <li>Sidewalk and bike facility coverage</li> <li>Vehicle ownership</li> <li>Transportation mode accessible to disabled people</li> <li>Transportation mode accessible to people with various cultures/languages</li> <li>Transportation mode accessible to people without the need for banking or a smartphone</li> </ul>
Mobility	<ul style="list-style-type: none"> <li>Vehicle Miles Traveled (VMT)</li> <li>Trips generated (by mode and by purpose)</li> <li>Congestions levels</li> <li>Mode shares</li> <li>Travel time (by mode) to certain destinations</li> <li>Travel distance (by mode)</li> <li>Time spent in traffic</li> <li>Frequency of transit</li> </ul>
Safety	<ul style="list-style-type: none"> <li>Vehicle crashes</li> <li>Bicycle and Pedestrian Crashes</li> <li>Crashes at Railroad Crossings</li> </ul>
Environmental and health impacts	<ul style="list-style-type: none"> <li>Proximity to roadways</li> <li>Roadway noise impacts</li> <li>Greenhouse gas emissions</li> <li>Small particulate matter (PM2.5) emissions</li> <li>Carbon monoxide emissions</li> <li>Acres of natural/agricultural land consumed by new development</li> <li>Time spent walking and bicycling for transportation purposes</li> </ul>
Gentrification	<ul style="list-style-type: none"> <li>Households at risk of displacement</li> <li>Share of affordable housing</li> </ul>

## 7. Equity-oriented project prioritization criteria

The project selection methodologies studied address transportation equity concerns in different ways. Of the 18 MPOs that included an equity performance measures in their prioritization methodologies, 16 incorporate specific equity criteria—designated as “Environmental Justice,” “Social Equity,” and “Transportation Equity” among others—whereas the other two consider equity within broader categories that combine different goals like environment, health, land use and mobility.

We categorize the equity criteria that MPOs use for project evaluation into the following five types:

- **Location burdens-based:** considers the location of a project within predefined areas with high concentrations of marginalized populations as detrimental for them; awards points if the project is not located within these areas.
- **Location benefits-based:** considers the location of a project within predefined areas with high concentrations of marginalized populations as beneficial for them; awards points if the project is located within these areas.
- **Impact benefits-based:** evaluates the potential benefits a project will have on predefined areas with high concentrations of marginalized populations and awards more points to projects that will have positive effects.
- **Access to destinations-based:** considers accessibility improvements that projects provide to predefined areas with high concentrations of marginalized populations

and awards more points to projects that will provide greater increases in access to key destinations.

- **User-based:** considers the number of users of a project that will belong to the population defined as marginalized and awards more points to projects with greater number of marginalized users.

These criteria have varying degrees of complexity and potential for impact (Figure 2). The first four involve a spatial component as a proxy for marginalized users of a potential facility. This means that they assessed the benefits or burdens provided by a facility based on an assessment of proximity to potential users versus an actual measure of use by the populations for which benefits are desired or burdens are prevented. The fifth type is based on projected users of the transportation improvement. Table 4 provides an assessment of the benefits and limitations of each type and shows which MPOs employ them in their selection methodologies. Some MPOs used more than one type of criteria, generally for different project types. The following sections discuss each type in detail.

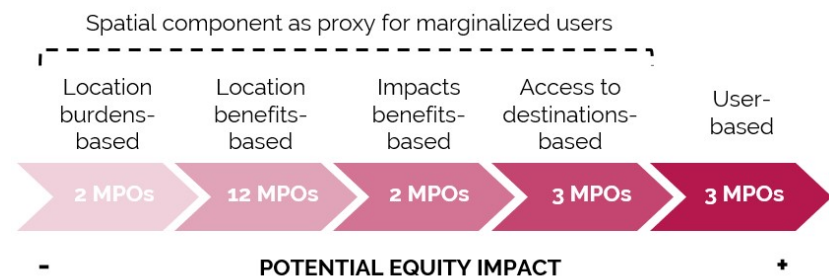


Figure 2: Five categories of MPOs' equity criteria

Table 4: Type of equity criteria employed by MPOs in project prioritization

Type	Definition	Contributions	Limitations	MPOs
Location burdens-based	Considers the location of the proposed project in relation to predefined areas with high concentrations of marginalized populations and awards points if the <u>project is not located within them.</u>	Acknowledges <u>potential negative impacts of transportation projects,</u> especially in areas with a high marginalized population.  Easy to calculate. Only requires demographic data and mapping.	Assumes burdens for marginalized populations based on project location, does not specifically identify them.  Does not measure benefits.	HGAC, CRTPO
Location benefits-based	Considers the location of the proposed project in relation to predefined areas with high concentrations of marginalized populations and awards points if the <u>project is located within them.</u>	Acknowledges <u>potential benefits of transportation projects physically accessible</u> to marginalized populations.  Easy to calculate. Only requires demographic data and mapping.	Assumes that a project located within a marginalized population area will benefit and serve the surrounding population, when the opposite might be true.  Limited and unclear definition of benefits.  Sometimes mistakenly used as a proxy for accessibility.  Does not measure burdens.	NJTPA, NCTCOG, DVRPC, ARC, Boston, SANDAG, BRTB, EWGCOG, CAMPO, METRO, GNRC, CRTPO
Impact benefits-based	Considers the potential <u>positive impacts</u> the proposed project will have on predefined areas with high concentrations of marginalized populations, which may include — but goes beyond — an assessment of only spatial proximity.	<u>Assesses the positive effects</u> of a project instead of assuming them.  Methods may be subjective or quantitative and more than one method may be used.	If benefits are not clearly defined in the evaluation methodology, the result of the evaluation can be unclear, very subjective and susceptible to distortion  Usually does not consider burdens.	NJTPA, OKI

Table 4 (continued): Type of equity criteria employed by MPOs in project prioritization

Type	Definition	Contributions	Limitations	MPOs
Access to destinations-based	Considers <u>accessibility improvements</u> that projects will provide to areas with high concentrations of marginalized populations. This is called out separately due to the higher specificity of this analysis and transportation's essential function of providing access to basic needs and economic opportunity.	Acknowledges <u>access to key destinations as the most important benefit</u> of transportation systems.	Does not consider other benefits. Does not consider burdens.	ARC, BRTB, SANDAG
User-based	Considers the <u>number of users of the proposed project</u> that will belong to the population defined as marginalized and awards more points to projects with more marginalized users.	Considers the <u>marginalized population directly served</u> by the facility.	Requires sophisticated tools such as a travel demand model to calculate. Assumptions of the travel demand model determine outcomes. Does not identify other benefits. Does not consider burdens.	CMAP, MORPC, SANDAG

## 7.1. Location burdens-based criteria and location benefits-based criteria

**Location burdens-based criteria** consider the location of a project within areas with high concentrations of marginalized populations as detrimental for them. These aim to capture potential negative effects, like those created by highways routed through low-income neighborhoods, and award points if a project is not located within the area or if measures to mitigate harm are integrated. Table 5 shows the criteria of this type defined by HGAC and CRTPO, the two MPOs that adopted this approach. Neither of them penalize projects by subtracting points for imposing burdens on disadvantaged populations.

This kind of criterion has two main limitations: it assumes burdens are intrinsic features of a project without specifically identifying them, and it fails to acknowledge potential positive impacts.

**Location benefits-based criteria**, conversely, consider the location of a project within areas with high concentrations of marginalized populations as beneficial for them, and award points if a project is located within them.

The underpinning concept of location benefits-based measures is that projects serve and provide benefits to traditionally underserved populations if they are located within these communities. This approach acknowledges the potential positive impacts of transportation projects that are physically accessible to marginalized populations and, therefore, likely to be used by these populations. Almost all the measures included in this group ask the question: "Does the project serve Environmental Justice communities?". However, it is important to note that the word "serve" refers to serve by being

geographically proximate, not by considering if members of marginalized populations are in fact users.

Of the 18 MPOs that incorporated equity criteria within their selection methodologies, 12 used this type. Table 6 shows the criteria of this type defined by DVRPC and EWGCOG, and more examples can be found in the Appendix. Table 7 shows the criterion of this type defined by NJTPA, which adopted a different approach than all the other agencies: instead of focusing on specific population groups within neighborhoods or census tracts, it prioritizes investments in municipalities in weak economic, fiscal, housing and poverty conditions.

Many MPOs categorize new transportation infrastructure near marginalized populations as providing access benefits, based on the population having access to more or improved transportation choices. However, we have categorized any measure that involves new features near EJ populations as location benefits-based given that the measure is based on geographic proximity. More transportation infrastructure or choices does not necessarily reflect the ability to use them, to get to more destinations or to access more opportunity.

The inverse of location burdens-based criteria, location benefits-based measures have two limitations: the lack of a clear identification of benefits and the failure to acknowledge potential burdens on surrounding populations.

Location-based criteria are the types most widely used by MPOs, possibly because they are easier to calculate in comparison with the other kinds. These measures only require demographic data and mapping, whereas the impact-, access- and user-based types need more sophisticated tools such as travel demand models.



Table 5: Location burdens-based criteria defined by H-GAC and CRTPO

MPO	Houston-Galveston Area Council (H-GAC)	Charlotte Regional Transportation Planning Org. (CRTPO)
Project types	Manage, Maintain and Expand	Roadways
Equity Criterion	Environmental Justice	Environmental Justice Impacts
Max. Weight	5%	3%
Definition and Scoring	<p>Is the proposed project located in or is adjoining an environmental justice sensitive area (census block groups) identified by HGAC?</p> <p>EJ sensitive zones are census block-groups where the average number of persons within the protected class exceed the average for the MPO region. Besides minority and low-income status, HGAC recognizes five “secondary” indicators of disadvantage: limited English proficiency, senior status (65 years and over), limited educational attainment, carless households, and female head of households.</p> <p>5% of total score if the project is not located in or adjoining an Environmental Justice sensitive area, OR 5% of total score if the project incorporates measures to reduce, minimize or avoid adverse effects on an Environmental Justice sensitive area</p>	<p>Measure the level of impact that candidate projects have on identified Environmental Justice communities.</p> <p>Seven groups have been identified: Black/African American, Hispanic, Asian-American, American Indian/Alaska Native, Households in Poverty, Carless Households, Limited English Proficiency households.</p> <p>The percent of each project, based on project length, located within or adjacent to the above concentration groups is calculated. If a project linearly straddles two concentration groups, 100% of the project is considered to be located within the higher concentration group. Points are allocated as follows:</p> <p><u>1-2 groups</u> exceeding regional averages for a given census tract:</p> <p>0 - 25% of the project = 3% of total score; 26 - 50% of the project = 2% of total score; 51 - 75% of the project = 1% of total score ; 76% or more of the project = 0% of total score</p> <p><u>3-4 groups</u> exceeding regional averages for a given census tract:</p> <p>0 - 25% of the project = 2% of total score; 26 - 50% of the project = 1% of total score; 51% or more of the project = 0% of total score</p> <p><u>5-7 groups</u> exceeding regional averages for a given census tract:</p> <p>0 - 25% of the project = 1% of total score; 26% or more of the project = 0% of total score</p>
Source	H-GAC 2018 Call for Projects Rules	2045 Metropolitan Transportation Plan, Appendix H: Project Ranking Methodologies, Roadway Ranking Methodology

Table 6: Location benefits-based criteria defined by H-GAC and CRTPO

MPO	Delaware Valley Regional Planning Commission (DVRPC)	East-West Gateway Council of Government (EWGCOG)
Project types	Roadway Preservation, Roadway Operational Improvements, Bike/Ped, Transit Preservation, Transit Operational Improvements	Road , Bridge , Traffic Flow , Safety , Active transportation , Freight/Economic Development, Transit Asset Management, Transit Expansion
Equity Criterion	Environmental Justice	Social Equity
Max. Weight	5%	8% for Transit Projects, 4% for all the rest
Definition and Scoring	<p>Does the project serve EJ communities and the additional population groups, as defined by the DVRPC IPD methodology, with additional transportation needs?</p> <p>This analysis uses the eight IPDs (Indicators of Potential Disadvantage) identified by DVRPC. IPDs are based on census tracts that meet or exceed the regional average in Poverty, Carless Households, Non-Hispanic Minority, Physically Disabled, Hispanic, Limited English Proficiency, Elderly and Female Head of Household with Child.</p> <p>Projects are compared to the IPDs map in GIS and scored based on the following equation:</p> $(100\% \times \text{project length in 7-8 IPD communities} + 70\% \times \text{project length in 5-6 IPD communities} + 30\% \times \text{project length in 3-4 IPD communities}) \div \text{total project length.}$	<p>Project serves or is located in an Environmental Justice area.</p> <p>In addition to minority and low-income populations, EWG further expands on EJ to include areas with a high concentration of one or more of zero-vehicle households, elderly, and persons with a disability.</p> <p>For all project types except transit projects:</p> <p>Project falls in, or partially in, an EJ area with high concentration of:</p> <ul style="list-style-type: none"> <li>*Low-income persons or minorities = 4% of total score</li> <li>*Zero-vehicle households = 3% of total score</li> <li>*Seniors or persons with a disability = 1% of total score</li> <li>*Project is not located in an EJ area or project imposes a burden on an EJ area = 0% of total score</li> </ul> <p>Transit projects are scored as follows:</p> <ul style="list-style-type: none"> <li>*Project serves an EJ population or is located within an EJ area = 8% of total score</li> <li>*Project does not serve an EJ population or is not located within an EJ area = 0% of total score</li> </ul>
Source	Connections 2045 Plan for Greater Philadelphia, December 2017 - Appendix D: Project Evaluation - TIP Project Benefit Criteria	Surface Transportation Block Grant Program, 2019 Call for Projects For the St. Louis Region, Guidance Document for STP-S Project Evaluation

Table 7: Location benefits-based criterion defined by NJTPA

MPO	North Jersey Transportation Planning Authority (NJTPA)
Project types	Local Highways, Local Bridges, State Highways, State Bridges
Equity Criterion	Within "Land Use and Transportation"
Max. Weight	6.8% local projects; 1.8% state projects
Definition and Scoring	Will it serve distressed municipalities? Project is located within, or directly serves, a distressed municipality, as defined by the NJ Department of Community Affairs (DCA) = 1.8% of total score for state projects; 6.8% for local projects
Source	Transportation Improvement Program (TIP), NJTPA Project Prioritization Criteria

## 7.2. Impact benefits-based criteria

**Impact benefits-based criteria** consider the potential benefits a proposed project will have on marginalized populations and award more points to projects that will have positive effects. This criterion type includes a range of qualitative or quantitative methods for defining benefits. It may include a spatial component but goes beyond that to assess how the project will provide meaningful benefits.

The important difference between this and the location benefits-based type is that it does not assume a project will have positive impacts on marginalized populations just because it is in proximity to them. Instead, it requires a thoughtful evaluation of impacts to determine how beneficial they will be.

Of the eighteen MPOs, five used this type. Table 8 presents the impact benefits-based criteria defined by NJTPA and OKI.

NJTPA clearly defines what positive effects qualify for points and how they prioritize them. Their criterion is explicit about accessibility as one of the most important benefits and also gives projects credits for a range of other benefits such as safety, increased multimodal connections and infrastructure maintenance. One limitation of this approach is that, if the clear delineation of benefits is not flexible, it might not capture context-specific positive impacts. OKI adopts a contrasting approach by only mentioning a few positive effects and leaving the definition of benefits open-ended for further evaluation. This potentially allows for a nuanced and context-specific evaluation of benefits, but could also result in evaluations that are unclear, very subjective, and susceptible to distortion.

None of the MPOs that use this criteria type penalize projects by subtracting points if a project causes negative impacts on marginalized population.

Table 8: Impact benefits-based criteria

MPO	North Jersey Transportation Planning Authority (NJTPA)	Ohio-Kentucky-Indiana Reg. Council of Governments (OKI)
Project types	Local Highways, Local Bridges, State Highways, State Bridges	Roadway, Public Transportation, Bicycle, Pedestrian, Freight, Intelligent Transportation Systems
Equity Criterion	Within "Environment"	Environmental Justice
Max. Weight	2%	5%
Definition and Scoring	<p>Does it provide benefits or reduce burdens to Environmental Justice (EJ) communities?</p> <p>High: Address safety problems, results in reduced noise or pollutant impacts, mitigates community cohesion or other social impacts; mitigates cumulative impacts, or improves accessibility to employment, education, healthcare, and other essential services for EJ communities = 1.6% of total score</p> <p>Med: Add/improve vehicle, bicycle, transit, or pedestrian connectivity within EJ communities = 1.1% of total score</p> <p>Low: Repair roadways or bridges, or streetscapes unless project would result in permanent negative impacts to traffic conditions in the neighborhood (e.g., by bringing in more vehicle traffic) or would involve significant right-of-way acquisition in EJ communities = 0.6% of total score</p>	<p>Awards points to projects that will have an overall net benefit to minority and low-income population groups per Executive Order 12898 issued by President Clinton in February 1994. OKI also examines a project's impact on zero-car households, elderly persons and persons with disabilities. The overall net benefit in the scoring indicates a subjective consideration of both positive and negative impacts. Potential elements that could be impacted by transportation projects include, but are not limited to travel times, division of neighborhoods and changes in noise and/or air pollution levels.</p> <p>Positive impact = 5% of the total score</p> <p>No impact = 3% of the total score</p> <p>Negative impact = 0% of the total score</p>
Source	Transportation Improvement Program (TIP), NJTPA Project Prioritization Criteria	2040 OKI Regional Transportation Plan, Project Prioritization Process, January 2016

### 7.3. Access to destinations-based

**Access to destinations-based criteria** are a kind of impact benefits-based criterion that consider how projects improve access to key destinations (i.e., food, recreation, medical, employment) for marginalized populations. This type includes the criteria that focus on how projects provide new, better or faster access.

This category is called out separately due to the improved specificity of this analysis and the importance of transportation's essential function of providing access to basic needs and economic opportunity. Table 9 presents the access to destinations-based criteria defined by ARC, BRTB and SANDAG, the three MPOs that use this type.

ARC defined an equity criterion for transit projects in terms of improved job access, reflecting one of the most important objectives of transportation systems: connect people with economic opportunity. It is also positive that it requires project sponsors to reflect on the implication of the project. However, this assessment can account for up to 40% of the total score in the category, so it is important it be supported by good evidence and verified by the evaluators.

SANDAG defined an equity criterion for highway projects in terms of congestion relief, measuring the change in daily person hours saved for the population living in a disadvantaged community. This measure reflects travel time improvements and the possibility of accessing destinations faster. However, this is a system level measure and does not give good information about how actual trips are changing and does not link travel time reductions to specific destinations. If many

people save an estimated 1 minute of travel time the score could look good, but the reality is that the benefit to an actual driver who has a 60-minute commute reduced to an estimated 59 minutes is not meaningful. So ultimately, very little real benefit may be achieved.

The main limitation of this approach is that users of the facility may differ from those who are able to access the transportation project based on the spatial analysis. Also, like the previous types, by focusing on specific aspects it disregards other potential benefits and burdens..

Table g: Access to destinations-based criteria

MPO	Atlanta Regional Commission (ARC)	Baltimore Regional Transportation Board (BRTB)	San Diego Association of Governments (SANDAG)
Project types	Transit Expansion	Transit	Highway Corridors
Equity Criterion	Social Equity	Transit stations/stops	Within "Congestion relief"
Max. Weight	10%	11%	5%
Definition and Scoring	<p>1) Does project serve a minority or low-income community? Written; sponsor provides an assessment of how developing the project will support these populations. This information is used to screen projects to receive a score.</p> <p>2) Change in the number of jobs that low-income and minority community workers can access during peak period</p> <p>40% of the score in this category is based on qualitative information provided by the sponsor in (1); AND</p> <p>60% of the score in this category is based on the quantitative assessment of change in job access in (2). The number of new low-income and minority community workers with access to Regional Employment Centers will be scored on a distribution to assign a range of scores from 0-100 based on area with low-income and minority concentrations ranked as medium-high or high. The project with the highest number of new workers gaining access will receive the highest score, the project with the least will receive the lowest.</p>	<p>Degree to which transit project supports access to specific destinations for EJ populations - 1/4-mile buffer analysis</p> <p>Points are awarded as follows:</p> <p>Improve existing station/stops = 11% of total score</p> <p>New station/stops = 7% of total score</p> <p>Operations improvement plan = 2% of total score</p>	<p>Change in daily person-hours saved for disadvantaged communities population</p>
Source	The ARC TIP Project Evaluation Framework - Fall 2018, Transportation Project Scoring	Maximize2045: A Performance-Based Transportation Plan, Appendix B: Project Evaluation and Scoring	San Diego Forward The 2019 Federal Regional Transportation Plan, Appendix M: Transportation Project Evaluation Criteria and Rankings

#### 7.4. User-based criteria

Finally, **user-based criteria** consider the users of the proposed project that will belong to the population defined as marginalized and award more points to projects with more marginalized users. Table 10 presents the user-based criteria defined by CMAP, MORPC and SANDAG, the three MPOs that used this type.

CMAP and MORPC measure the percentage of users of the facility that will belong to the population defined as disadvantaged. This approach might disadvantage projects sponsored by larger municipalities in the metropolitan area (with high number of marginalized users that account for a small percentage) over those of smaller communities (with a smaller number of disadvantaged users, but that account for a bigger fraction of the users of the facility). If users were measured in absolute terms, instead, projects sponsored by larger communities might be favored over those of smaller municipalities.

SANDAG adopts a different approach, using the increase in transit trips made by disadvantaged communities as a proxy for users. This may not reflect meaningful improvement to individual trips because the number is an aggregate for many people in the system.

A disadvantage of user-based criteria is that they require sophisticated tools like travel demand models. Even when agencies can rely on this resource, models can be imprecise and limited by the assumptions built into the designs.



Table 10: User-based criteria

MPO	Chicago Metropolitan Agency for Planning (CMAP)	Mid-Ohio Regional Planning Commission (MORPC)	San Diego Association of Governments (SANDAG)
Project types	Road reconstructions, Transit station rehabilitation/reconstructions, Bridge rehabilitation/reconstructions, Highway/rail grade crossing improvements, Road expansions, Bus speed improvements, Corridor-level or small area safety improvements, Truck route improvements	Major Widening, New Roadway, Minor Widening, Intersection, Signals, Bike and Pedestrian, Transit, System Preservation	Transit Services
Equity Criterion	Inclusive Growth	Environmental Justice	Increase in transit trips by disadvantaged communities
Max. Weight	8%	Not clear, varies by project type	3%
Definition and Scoring	<p>Percent of travelers using a facility that are people of color below the poverty line, as modeled by CMAP's travel demand model</p> <p>0% - 5% of travelers = 0% of total score</p> <p>5% - 10% of travelers = 1.6% of total score</p> <p>10% - 15% of travelers = 3.2% of total score</p> <p>15% - 20% of travelers = 4.8% of total score</p> <p>20% - 25% of travelers = 6.4% of total score</p> <p>25% or more = 8% of total score</p>	Of the estimated opening day users of the project, what is the minority percentage, what is the poverty percentage, what is the elder percentage, and what is the transportation handicapped percentage? The ratio of each of these relative to the regional average of each will be calculated. For the Bike and Pedestrian category, the population within 1 mile of the project will be estimated instead of the users.	Change in total transit trips by disadvantaged communities population
Source	STP Shared Fund (FFY2020-2024) Program Application Booklet	Policies for Managing MORPC-Attributable Funds, April 2018	San Diego Forward The 2019 Federal Regional Transportation Plan - Appendix M: Transportation Project Evaluation Criteria and Rankings

## 7.5. Criteria application and weighting

The way MPOs implement equity criteria is varied. Some agencies apply the same equity criterion with the same weight across all project types. This is the case for the methodologies of CMAP, NJTPA, HGAC, Boston, OKI and MARC.

Others employ the same criterion for all projects, but the weight depends on the project type. This is the case for the methodologies of NJTPA, BRTB, CAMPO and MORPC. CAMPO's methodology, for instance, gives a higher weight to the equity criterion for active transportation projects, and the same weight for transit and roadway projects.

A third group implements different criteria and different weights for different project types. This is the case for the methodologies of ARC, SANDAG, BRTB, EWGCOG and CRTPO. SANDAG, for example, implements the "change in daily person-hours saved for disadvantaged communities population" with a 5% maximum weight for roadway projects; the "increase in total transit trips by disadvantaged communities population" with a 3% maximum weight for transit projects; and the "share of disadvantaged communities population in proximity of the project" for active transportation and rail grade separation projects, with 3% and 2% maximum weights respectively.

Maximum weights for the equity criterion vary from a minimum of 2% to a maximum of 15%. Boston and CMAP are the agencies that assign more weight to their uniform equity criteria: 9% and 8% of the total score, respectively. ARC and BRTB, on the other hand, are the MPOs that assign the highest weights for their equity criteria for transit projects specifically: 15% and 11% of their total scores.

## 7.6. Transportation equity implications

The ultimate goal of evaluating projects for equity is to influence future investment decisions and increase transportation benefits to historically marginalized populations. The presented criteria reveal the wide variety of approaches MPOs use to include equity in project prioritization, and it is necessary to discuss how they relate with the five aspects of the transportation equity definition and its shortcomings.

Whether in their criteria definition or other related documents (like Environmental Justice Analysis), MPOs clearly identify disadvantaged population groups. Following federal mandates, all of them emphasize low-income people and people of color, and some MPOs include additional groups in their definitions. However, most MPOs aggregate all these groups into one for their analyses, identifying spatial units with high concentrations of target populations or indicators of disadvantage. Their aggregation is not the best approach for two reasons. On the one hand, the lived experiences and travel behavior of racial and ethnic groups, people with disabilities, older people, and others are different, so projects will impact them differently as well. On the other hand, the use of geographic units and static demographic thresholds as proxy for underserved users does not work well for groups that do not congregate spatially and tend to be dispersed, such as seniors and single parents (Karner & Niemeier, 2013; Rowangould, Karner, & London, 2016).

The measures implemented by most MPOs do not clearly identify the concrete benefits that projects will confer to marginalized populations. Their criteria either assume projects will provide benefits simply by being in proximity to marginalized populations (location benefits-based criteria) or

delegate the decision to the evaluator without delineating potential benefits to be examined. Few MPOs clearly state their definitions of benefits and their prioritization, and even fewer are explicit about improved accessibility for historically underserved populations as the main benefit and goal to accomplish.

Most MPOs equate proximity to access from the standpoint that if a transportation improvement is a near a large marginalized population, they could use that new facility. However, this approach does not account for whether people can use that facility to get to destinations that are useful to them. A more meaningful definition of access is whether disadvantaged populations can get to needed work, cultural, social, health, or education destinations within a reasonable time as a result of new infrastructure. To demonstrate that, additional analysis will need to be completed.

Most MPOs do not acknowledge burdens to marginalized populations in their project prioritization criteria. In the few times where this is the case, they do not provide a clear definition of negative effects. More importantly, most MPOs do not emphasize the protection of historically harmed population groups: burdens are ignored by not awarding any points to projects with negative impacts, instead of penalizing them with point subtraction.

Despite the inclusion of criteria to consider equity concerns in project prioritization, we argue that MPOs are not currently adopting an equity approach to allocate resources based on communities' specific needs. First, some MPOs only apply equity criteria for some types of projects and not for others. Second, the current weightings that MPOs assign to their equity

criteria are not high enough to influence project evaluation significantly. A project that does not advance equity—and that even harms historically marginalized populations—is still able to rank first by obtaining good results on other criteria, such as the condition of existing infrastructure as a determinant of need, the enhancement of freight movement, or congestion reduction (common criteria employed by most MPOs).

Third, the scoring processes reviewed had no indication of community participation or involvement in the development of proposed projects or in decision-making. It was not clear if projects addressed needs identified by the communities they were intended to serve, if communities had a role in generating the project concepts, or if they supported or opposed the projects under consideration.

Lastly, most MPOs include individual equity-related criteria that focus only on specific aspects of the transportation equity definition (either benefits or burdens) and disregard others (benefits, burdens, participation). In the case of MPOs that only focus on burdens, their criteria are only meant to comply with federal mandates that a project not increase burdens to disadvantaged groups, without aiming to improve outcomes for historically underserved populations.

The previous points illustrate how important it is for planners and decision makers to fully understand the meaning of transportation equity and its implications when prioritizing investments. Transportation equity is a multifaceted concept and as such, its incorporation in planning and programming processes requires rigorous attention and placement in a central role to deliberately influence the allocation of transportation dollars.

## 8. Recommendations for enhancing equity considerations in project prioritization

The implementation of project prioritization processes that consider equity as a factor of paramount importance is essential to improve transportation equity in future investments. In most project selection methodologies reviewed the weighting of the equity criteria was less than 10% of the overall score and sometimes much less. Therefore, **it is crucial to recognize that if the weighting of equity remains so low, we are likely to see minimal effect on the overall regional allocation of resources and sustained transportation inequities.** Thus, it is critical that MPOs implement prioritization processes with equity criteria weights high enough to meaningfully target investments towards communities with higher needs.

Additionally, agencies should carefully analyze potential benefits of proposed projects for historically marginalized populations, specify which ones are priorities, define how they will be calculated, and provide clear guidance to sponsors and project evaluators on those methods. They should also adopt a similar approach to evaluate burdens, so that projects with potential negative effects are flagged and penalized in scoring. Lastly, agencies' evaluation criteria framework should consider the extent of community support or opposition to proposed projects, whether projects address needs defined by members of the communities they intend to serve, and whether communities had a role in generating project concepts. Marginalized populations too often are disconnected from the planning process. If community members are included, most of the time, this occurs after a project has been defined and they are asked only for input on design. To improve equity, community input on preferred solutions should be gathered

very early in the process. Mobility justice leaders and academic literature advocate for meaningful public involvement of affected residents through the provision of space and resources for impacted communities to identify their unmet needs, envision solutions and implement their own planning models (Untokening Collective, 2017; Karner & Marcantonio, 2018).

It is necessary to clarify, however, that regional transportation planning is not independent of other levels of government. Although MPOs appear to be leaders in transportation decisions, state and local agencies have the ultimate control in making final decisions for their jurisdictions (Lowe, 2014; Sciara & Handy, 2017), often with little regard to transportation impacts at the regional level. Additionally, MPOs do not directly control the majority of regional transportation funds, and federal funds typically do not flow directly to them. Most federal highway funds flow to state departments of transportation, and most federal transit funds flow directly to transit agencies. MPOs are given authority to prioritize proposed projects only within a limited range of federal funding programs, like the Surface Transportation Block Grant Program (STBG) and The Congestion Mitigation and Air Quality (CMAQ) Program. Consequently, **it is important that not only MPOs but all entities with responsibility to program federal, state or locally generated funds adopt a proactive equity approach for prioritizing investments.**

A range of recommendations to further improve equity considerations in project selection methodologies is presented below, aligned with the important factors in our transportation equity definition.

Transportation equity is concerned with the distribution of benefits and burdens of transportation projects, plans and policies between individuals and groups that differ by race, income and ability.

Project selection methodologies should:

- Clearly identify and prioritize both benefits and burdens separately, for disaggregated marginalized populations.
- Require project sponsors to submit their own assessment of how their projects would impact marginalized communities. This could allow the assessment of additional equity implications that might not be captured by any scoring category, and that could also be considered for awarding or subtracting points.
- Consider impacts on a range of marginalized population groups in addition to low-income and communities of color, such as people with disabilities and older adults.
- Avoid aggregating all marginalized populations into one group. Communities of color should not be aggregated either, since experiences differ by ethnic and racial identity.

Transportation equity aims to protect and increase the benefits —with an emphasis on accessibility—for historically marginalized populations, especially low-income communities of color.

Project selection methodologies should:

- Penalize projects (subtract points) that create burdens for marginalized populations and reduce the amount of points subtracted due to burdens if projects incorporate measures to reduce, minimize, or avoid adverse effects on marginalized populations.
- Not award points based on equity to neutral projects that neither provide benefits nor generate burdens to marginalized populations.
- Award points directly based on the overall economic condition of the sponsor community, to prioritize projects in communities with higher needs and fewer resources.
- Appropriately assess projects' contribution to increase accessibility to jobs and opportunities by socioeconomic status and prioritize (award more points) those projects that improve accessibility for marginalized populations.
- Prioritize projects that make a last-mile transit connection in areas with a high concentration of marginalized populations.

Transportation equity allocates resources based on communities' needs, with the aim of correcting existing differences and removing the effects of past discrimination.

Project selection methodologies should:

- Place more emphasis on increasing investments and resources in communities with higher needs in order to improve transportation and life outcomes, remove existing inequities, and undo the effects of both historical and contemporary racism. Instead of pursuing equal investments, selection methodologies should pursue equal outcomes.
- Assign higher weights to equity criteria than current approaches to exert a significant influence in project prioritization.
- Apply equity-related criteria to all project types. In other words, all projects should be required to contribute to advancing equity.
- Use multiple equity-oriented criteria. For a holistic and multidimensional assessment of projects, a single equity criterion cannot address all the aspects relevant to transportation equity. There should be separate criteria to address benefits, burdens, and specific needs for disaggregated marginalized populations.

Transportation equity provides effective opportunities for marginalized populations to participate in the transportation decisions that will affect them.

- Investment prioritization processes should identify and prioritize projects that are community-driven, based on stated community needs, and that have community support.
- Besides reframing project prioritization processes, planners should engage and empower local members of marginalized communities to help illuminate the barriers to mobility access that they face and incorporate them as priorities for transportation planning and policy.
- Agencies should aid communities with limited resources by developing project proposals for communities that are not able to do it themselves. A good example is Chicago Metropolitan Agency for Planning's (CMAP) Local Technical Assistance Program, which prioritizes increasing support to communities with lower resources.

#### Other recommendations.

- Federal regulations should more explicitly define equity standards for the assessment of transportation projects and plans, something that academic literature has been calling for (see, for example, Martens & Golub, 2018; Marcantonio, Golub, Karner, & Nelson, 2017; Lowe, 2014)
- Beyond the adoption of specific equity criteria, the equity implications of all other evaluation criteria (e.g., safety, complete streets, environment, air quality) should be assessed — for example, by defining and analyzing the benefits and burdens for general versus marginalized populations within other criteria. Doing this contributes to a more equitable evaluation overall.
- Transportation planning should fully transition from the traditional mobility-based paradigm to an accessibility-based paradigm, which presents a more holistic, multimodal, and equitable framework that focuses more explicitly on how transportation helps people meet their needs.
- Transportation agencies (MPOs, DOTs) should conduct periodic regional or community-level analyses to monitor trends in how the system is performing overall in terms of equity. Such an analysis could track key performance measures such as commute times, access to key destinations, etc. and other socio-economic indicators -like poverty, unemployment, rates of violence, and more. This should be performed for the overall population and disaggregated marginalized populations with respect to race, income, ability and geography, to evaluate whether outcomes for marginalized populations are improving and moving toward the levels of the general population. This would reveal whether the equity criteria used in investment methodologies are effective at improving transportation outcomes for historically underserved populations. If not, or if change is progressing too slowly, the agency should revise its measures and weights to increase the focus on equity.



## Equity Assessment Checklist

Planners should become advocates for improving how their regions or communities consider equity in making future transportation investments. Planners in all types of agencies are encouraged to examine how their DOTs, MPOs, and local communities prioritize transportation projects and to understand how equity is considered. The questions below can serve as a guide when determining how well their prioritization processes assess equity:

- ☐ Does your community or region prioritize transportation projects using data-driven methods that are transparent?
- ☐ Does your community or region clearly define marginalized populations? Determine if you think the current definition is appropriate or merits further review and adjustment, and advocate for any needed changes.
- ☐ Does the project prioritization method clearly identify both benefits and burdens of proposed investments, separately?
- ☐ Does the process consider benefits and impacts on different marginalized populations (e.g., black, Latinx, Asian, seniors, disabled) separately?
- ☐ Does the process subtract points for any investment forecasted to increase burdens on marginalized populations?
- ☐ Does the process give extra points to projects in economically disadvantaged communities?
- ☐ Does the process consider equity as a criterion for all project types?
- ☐ Does the process consider whether proposed projects are addressing community-defined needs and supported by community members?
- ☐ Does the process place significant weight on criteria that measure the extent to which transportation investments provide improved access to key destinations (e.g., workplaces, schools, healthcare services)?
- ☐ Does the process include multiple equity-oriented criteria and weight them highly enough that they have a meaningful influence on how transportation resources are allocated?
- ☐ Do evaluators consider the equity implications of the other criteria used for project prioritization? For instance, if an increase in freight movement is deemed positive in one category, how does the location of increased truck or train traffic affect marginalized populations? What are the consequences in terms of safety, noise, and air quality? Doing this for every factor contributes to a more equitable evaluation overall.
- ☐ Does the region or community provide technical assistance to aid communities or populations with limited or no resources to develop projects themselves?
- ☐ Does the region assess transportation outcomes disaggregated by marginalized groups periodically to see if investment practices are resulting in a more equitable region or community?

## 9. Conclusion

Transportation inequities are the result of decades of discriminatory land-use and auto-oriented transportation planning that have severely impacted people of color and other marginalized populations. To rectify this, planners must work to improve communities that have historically experienced disinvestment and that have been unfairly burdened.

Environmental Justice Analyses, the predominant analytical approach for addressing equity concerns in planning decisions, are mostly reactive; they are frequently prepared once planning and programming decisions have been made. In the manner they are currently undertaken, these analyses focus on mitigating harm and do not address the need to proactively improve transportation conditions for historically marginalized populations. Therefore, strengthening current methods that consider equity in the process of prioritizing future investments is more likely to strategically target investments to offer greater benefits to marginalized groups.

This research presents the different types of equity measures that MPOs implement in their project selection methodologies and discusses their strengths and weaknesses. It also identifies two important shortcomings at the general level that are worth re-stating. On the one hand, measures currently in use do not consider all the aspects relevant to transportation equity. On the other hand, the weight of equity measures is not high enough to significantly influence investment decisions. To see meaningful

improvements for marginalized groups, equity measures in project prioritization must be multidimensional and must be given more weight.

Besides the implementation of methodologies that include strong equity performance measures, prioritization processes need to be complemented in three ways. First, with the improved participation of marginalized populations in decision making processes. Second, with the tracking of transportation trends over time to ensure that investments result in measurable improvements and make ongoing adjustments if that is not the case. Lastly, in coordination with improvements to other aspects of planning, such as land use, housing and economic development, which are highly related to successfully delivering transportation that gets people where they need to go.

Only by equitably distributing resources to increase transportation investments in communities with higher needs and providing them with more options will it be possible to remove existing inequities and undo the harmful effects of both historical and contemporary racism. We hope that the findings of our research and our recommendations are a useful starting point for planners to modify performance-based planning investment practices and better provide a wider range of choices for those who often have few.

## 10. References

- Aspen Institute Roundtable on Community Change. (2004). *Structural Racism and Community Building*. Washington, D.C.: The Aspen Institute.
- Boisjoly, G., & El-Geneidy, A. (2017). *Measuring Performance: Accessibility Metrics in Metropolitan Regions around the World*. Brookings.
- Bullard, R. D. (2003). Addressing Urban Transportation Equity in the United States. *Fordham Urban Law Journal*, 31(5).
- CMAP. (2019). *Economically Disconnected and Disinvested Areas*. Retrieved from Chicago Metropolitan Agency for Planning: <https://www.cmap.illinois.gov/2050/maps/eda>
- CMAP. (2019). *Local Technical Assistance*. Retrieved from Chicago Metropolitan Agency for Planning: <https://www.cmap.illinois.gov/programs/lta>
- CMAP. (2019). *Surface Transportation Program*. Retrieved October 9, 2019, from Chicago Metropolitan Agency for Planning: <https://www.cmap.illinois.gov/committees/advisory/council-of-mayors/stp>
- Cytron, N. (2010). The role of transportation planning and policy in shaping communities. *Community Investments*, 22(2).
- FHWA & FTA. (1999). *Memorandum—Action: Implementing Title VI Requirements in Metropolitan and Statewide Planning*. Retrieved from [https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/Implementing\\_TitleVI\\_Requirements.pdf](https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/Implementing_TitleVI_Requirements.pdf)
- FHWA. (2012). FHWA Actions to Address Environmental Justice in Minority Populations and Low-income Populations (Order 6640.23A).
- FHWA. (2014). *Federal Highway Administration National Household Travel Survey Brief: Mobility Challenges for Households in Poverty*.
- FHWA. (2019). *Special Federal-Aid Funding: Surface Transportation Block Grant Program (STBG)*. Retrieved October 9, 2019, from U.S. Department of Transportation - Federal Highway Administration: <https://www.fhwa.dot.gov/specialfunding/stp/>
- FTA. (2007). Title VI and Title VI-dependent Guidelines for Federal Transit Administration Recipients (FTA C 4702.1A).
- FTA. (2012). Circular FTA C 4702.1B: Title VI Requirements and Guidelines for Federal Transit Administration Recipients.
- FTA. (2012). Circular FTA C 4703.1: Environmental Justice Policy Guidance for Federal Transit Administration Recipients.
- Garrett, M., & Taylor, B. D. (1999). Reconsidering Social Equity in Public Transit. *Berkeley Planning Journal*, 13(1).
- Golub, A., Marcantonio, R. A., & Sanchez, T. W. (2013). Race, Space, and Struggles for Mobility: Transportation Impacts on African Americans in Oakland and the East Bay. *Urban Geography*, 699-728.

Grengs, J. (2010). Job accessibility and the modal mismatch in Detroit. *Journal of Transport Geography*, 42–54.

Hanson, S. (2017). Introducing Urban Transportation. In G. Giuliano, & S. Hanson, *The Geography of Urban Transportation*. New York: The Guilford Press.

Innes, J., & Booher, D. E. (2004). Reframing Public Participation: Strategies for the 21st Century. *Planning Theory & Practice*, 419–436.

International Transport Forum. (2017). *Income Inequality, Social Inclusion and Mobility*.

Karner, A. (2016). Planning for transportation equity in small regions: Towards meaningful performance assessment. *Transport Policy*.

Karner, A., & Marcantonio, R. A. (2018). Achieving Transportation Equity: Meaningful Public Involvement to Meet the Needs of Underserved Communities. *Public Works Management & Policy*, 105-126.

Karner, A., & Niemeier, D. (2013). Civil rights guidance and equity analysis methods for regional transportation plans: A critical review of literature and practice. *Journal of Transport Geography*(33), 126-134.

Karner, A., Rowangould, D., & London, J. K. (2016). *We Can Get There From Here: New Perspectives on Transportation Equity*. Davis, CA: National Center for Sustainable Transportation.

Lawrence, K., & Keleher, T. (2004). *Structural Racism*. Retrieved from Racial Equity Tools:

<https://www.racialequitytools.org/resourcefiles/Definitions-of%20Racism.pdf>

Litman, T. (2017). *Evaluating transportation equity: Guidance For Incorporating Distributional Impacts in Transportation Planning*.

Litman, T. (2017). *Towards More Comprehensive and Multi Modal Transport Evaluation*. Victoria Transport Policy Institute.

Lowe, K. (2014). Bypassing Equity? Transit Investment and Regional Transportation Planning. *Journal of Planning Education and Research*, 30-44.

Lucas, K., Martens, K., Di Ciommo, F., & Dupont-Kieffer, A. (2019). *Measuring Transport Equity*. Elsevier.

Lucas, K., Mattioli, G., Verlinghieri, E., & Guzman, A. (2016). Transport poverty and its adverse social consequences. *Transport*.

Marcantonio, R. A., Golub, A., Karner, A., & Nelson, L. (2017). Confronting Inequality in Metropolitan Regions: Realizing the Promise of Civil Rights and Environmental Justice in Metropolitan Transportation Planning . *Fordham Urban Law Journal*.

Martens, K., & Golub, A. (2018). A Fair Distribution of Accessibility: Interpreting Civil Rights Regulations for Regional Transportation Plans. *Journal of Planning Education and Research*.

Metropolitan Planning Council. (2019). *TOWARD UNIVERSAL MOBILITY: Charting a Path to Improve Transportation Accessibility*. Chicago: Metropolitan Planning Council. Retrieved from

<https://www.metroplanning.org/multimedia/publication/947>

Pereira, R. H., Schwanen, T., & Banister, D. (2017). Distributive justice and equity in transportation. *Transport Reviews*, 170-191.

Rowangould, D., Karner, A., & London, J. (2016). Identifying environmental justice communities for transportation analysis. *Transportation Research Part A: Policy and Practice*(88), 151-162.

Sanchez, T. (2006). An Inherent Bias? Geographic and Racial-Ethnic Patterns of Metropolitan Planning Organization Boards. *The Brookings Institution Series on Transportation Reform*.

Sanchez, T. (2008). An Equity Analysis of Transportation Funding. *Race, Poverty & the Environment*, pp. 72-74.

Sánchez, T. W., Stolz, R., & Ma, J. S. (2003). *Moving to Equity: Addressing Inequitable Effects of Transportation Policies on Minorities*. Cambridge, MA: The Civil Rights Project at Harvard University.

Sciara, G. C. (2017). Metropolitan Transportation Planning: Lessons From the Past, Institutions for the Future. *Journal of the American Planning Association*, 262-276.

Sciara, G. C., & Handy, S. (2017). Regional Transportation Planning. In G. Giuliano, & S. Hanson, *The Geography of Urban Transportation*. New York: Guilford Publications.

Smart Growth America. (2019). *Complete Streets Mean Equitable Streets*. Retrieved from Smart Growth America Web site:

<http://old.smartgrowthamerica.org/documents/cs/factsheets/cs-equity.pdf>

Taylor, B. D., & Ong, P. M. (1995). Spatial Mismatch or Automobile Mismatch? An Examination of Race, Residence and Commuting in US Metropolitan Areas. *Urban Studies*, 1453-1473.

The Chicago Urban League. (2016). *100 Years and Counting: The Enduring Legacy of Racial Residential Segregation in Chicago in the Post-Civil Rights Era. Part One: The Impact of Chicago's Racial Residential Segregation on Residence, Housing and Transportation*.

The Greenlining Institute. (2018). *Mobility Equity Framework: How to Make Transportation Work for People*.

The Leadership Conference Education Fund. (2011). *Where We Need to Go: A Civil Rights Roadmap for Transportation Equity*.

U.S. Department of Energy . (2019). *Environmental Justice*. Retrieved from Environmental Justice History: <https://www.energy.gov/lm/services/environmental-justice/environmental-justice-history>

U.S. Department of Justice. (2019). *Title VI of the Civil Rights Act of 1964*. Retrieved from U.S. Department of Justice Web site: <https://www.justice.gov/crt/fcs/TitleVI>

U.S. Department of Transportation. (2019, September 30). *Metropolitan Planning Organization (MPO) Overview*. Retrieved from Federal Transit Administration : <https://www.transit.dot.gov/regulations-and->

guidance/transportation-planning/metropolitan-planning-organization-mpo

U.S. EPA. (2019). *Environmental Justice*. Retrieved from United States Environmental Protection Agency: <https://www.epa.gov/environmentaljustice>

Untokening Collective. (2017, November 11). *Principles of Mobility Justice*. Retrieved from Untokening Web site: <http://www.untokening.org/updates/2017/11/11/untokening-10-principles-of-mobility-justice>

US DOT. (1997). Department of Transportation (DOT) order to address environmental justice in minority populations and low income populations. *Federal Register*, 62(72), 18377–18381. Retrieved from [https://www.transit.dot.gov/sites/fta.dot.gov/files/DO T%20Order%20re%20Environmental%20Justice.pdf](https://www.transit.dot.gov/sites/fta.dot.gov/files/DO%20T%20Order%20re%20Environmental%20Justice.pdf)

Yan, J. (2013). Rousing the Sleeping Giant: Administrative Enforcement of Title VI and New Routes to Equity in Transit Planning. *California Law Review*, 1131-1183.