Report 15-848
October 2015

Joe Grengs

Advancing Social Equity Analysis in Transportation with the Concept of Accessibility
Abstract

Despite notable recent advancements in federal regulations that have institutionalized equity analysis in the field of transportation, planners face a lack of guidance in their efforts to advance social justice. Practicing planners have regularly carried out equity analyses of their plans for more than a decade, yet their analyses rarely uncover the disparities that are commonly found by scholars, suggesting shortcomings in current practice. This paper explains why social equity in transportation ought to be evaluated on the basis of accessibility metrics rather than on the mobility metrics that dominate current practice, and it identifies normative standards for carrying out evaluations in practice.
Introduction

Public officials took notice of injustices in the transportation system long after the construction of the interstate highway system was underway, following decades of deterioration of public transit systems, and after central-city neighborhoods had been undermined through urban renewal programs. But it took violent and damaging urban uprisings in many of the nation’s largest cities including Los Angeles, Newark, and Detroit in the mid- to late-1960s for the links between transportation and social injustice to be widely revealed. After careful and detailed analysis, public leaders and scholars provided convincing evidence of a range of causes for the riots, including overt institutional racism, systematic police brutality, inadequate housing, and poor schools, with consequences of particular severity for blacks in central cities (Governor’s Commission on the Los Angeles Riots 1965; Kerner et al. 1968). Also among the causes was an indictment of transportation policy for failing to provide adequate access to jobs and other important destinations like healthcare facilities.

Transportation scholars responded with a flurry of studies seeking to better understand how transportation policy contributes to problems like poverty and social isolation (American Academy of Arts and Sciences 1968; Kain and Meyer 1970, 1968; Myers 1970; Notess 1972; Ornati 1969). The most important of these studies came from Wachs and Kumagai (1972) in a seminal article that advanced three innovative improvements for transportation policy: (1) it argued that accessibility and not mobility is the most appropriate concept for evaluating the success of transportation systems; (2) it demonstrated that accessibility as a metric reveals inequalities among social groups; and (3) it took a normative stance by asserting that transportation policy ought to be directed at improving access to opportunities and thus elevating the quality of life for disadvantaged people. The principles advanced in this forward-looking article from decades ago provide a blueprint for planners of today to reinvigorate their commitment to ensuring equity in transportation.

Wachs and Kumagai were building on Hansen’s (1959: 73) effort to introduce the concept of accessibility to planners, when he defined accessibility as the ‘the potential of opportunities for interaction.’ The importance of this concept stems from the fact that the very purpose of cities is the access they provide to help people prosper by offering a wide range of jobs, a variety of goods to meet needs, an assortment of amenities and services to satisfy diverse tastes, and to fulfill social desires for interacting with other people. Accessibility is a measure of how effectively people can reach the goods, services, and opportunities they need to achieve well-being and to participate fully in society. Where people live has a powerful effect on their
capacity to achieve a high quality of life (Dreier, Mollenkopf, and Swanstrom 2004), in part through the accessibility that a place provides.

The events of the 1960s brought urgency to the longstanding challenge for transportation planning to ensure that the costs and benefits of a transportation system are distributed among people in a way that achieves an acceptable level of fairness. This task is now mandated by a series of laws and regulations that requires ongoing and active monitoring by the public agencies charged with creating the plans and programs that guide transportation provision. Despite a noteworthy elevation of regulation aimed at mitigating injustices, the public officials in charge of providing transportation infrastructure and services struggle with the task of evaluating whether their decisions are in compliance with equity objectives (Deakin 2007; Karner and Niemeier 2013; Mills and Neuhauser 2000; Schweitzer and Valenzuela 2004).

Advancing the cause of social justice in transportation will surely require directing careful attention toward not only uncovering and addressing unjust outcomes, but also on strengthening processes that aim for a deeper engagement with the very people that environmental justice regulations are meant to protect, through such steps as minimizing language barriers and actively seeking the insights of traditionally marginalized people (Deakin 2007; Pirie 1983). The focus of this chapter is on advancing the analytical capabilities of public agencies that are mandated by law to monitor and detect outcomes that have disproportionately harmed vulnerable people such as racial minorities and those living in poverty, principally by displacing mobility-based evaluation frameworks with accessibility-based ones.

**Social Equity Mandates in Transportation**

Public agencies in the United States are required by law to prevent discrimination in their plans and programs, rooted in a series of laws such as Title VI of the Civil Rights Act of 1964, the National Environmental Policy Act of 1969 (NEPA), and in several Federal-Aid Highway Acts of the 1970s (Cairns, Greig, and Wachs 2003; Sanchez and Brenman 2007). The Clinton Administration in 1994 took a step that substantially elevated attention to social equity when it issued Executive Order 12898, in response to a growing environmental justice movement, by directing all federal agencies to develop a strategy that “identifies and addresses disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations” (Code of Federal Regulations 1994: 2).
The agencies within the U.S. Department of Transportation adopted their own regulations to call out more specific responsibilities in meeting these principles. For example, the Federal Transit Agency (FTA) issued specific guidance through a circular in 2007, later amended in 2012, that provides instructions necessary to carry out Title VI regulations and to ensure that the considerations expressed in the Department of Transportation’s principles of environmental justice are integrated into programs and activities (Federal Transit Administration 2007, 2012). These regulations prescribe a requirement to consider impacts on particular social groups, and specifically on low-income and racial-minority groups. And they direct agencies to evaluate not just the burdens of transportation decisions, which are typically the central concern in environmental regulation, but also the benefits. And the ultimate benefit of any transportation investment is improved access to opportunities, the purpose that underlies all transportation decisions.

**The State of Practice in Transportation Equity Analysis**

Despite the growing awareness of inequities in the transportation sector and the recent demands on governments to address them, public agencies often find environmental justice requirements challenging to implement. Transportation agencies are required to identify and address issues related to Title VI and environmental justice, and must ensure that their programs and policies distribute benefits widely without imposing disproportionately high burdens on any one social group. But the various laws, regulations, and internal policies that have mandated ongoing equity analysis and transparent public involvement have not prescribed specific methods for doing so. This lack of standardized techniques is, on the one hand, a means of providing the freedom and flexibility for planners to explore and invent the evaluation techniques that are most suitable to particular circumstances. Metropolitan regions throughout the nations differ substantially from one another – in their rate of growth or decline, in economic specialization, and in the problems they face such as congestion and air pollution – and it is sensible that methods of analysis ought to reflect these regional differences. On the other hand, because the guidelines are vague and the requirements rarely enforced, the extent and quality of analysis varies substantially among regions and commonly results in analyses that are highly incomplete (Karner and Niemeier 2013; Sanchez, Stolz, and Ma 2003). Indeed, planners and decision makers have expressed the need for more and better technical tools through which environmental and transportation justice performance can be gauged (Cambridge Systematics 2002: 1).
The most specific guidance on carrying out equity analysis has come from the Federal Transit Administration (FTA) through a series of internal memoranda and circulars that provide instructions for all recipients of financial assistance from the FTA, most notably state departments of transportation, metropolitan planning organizations (MPOs), and public transit agencies [cite memorandum 2007] (Federal Transit Administration 2007, 2012). The circulars stipulate that these public “should have an analytic basis in place for certifying their compliance with Title VI,” including methods for identifying “locations of socioeconomic groups, including low-income and minority populations,” having in place a planning process that “identifies the needs of low-income and minority populations,” and having an “analytical process that identifies the benefits and burdens of metropolitan transportation system investments for different socioeconomic groups, identifying imbalances and responding to the analyses produced” (Federal Transit Administration 2007: VI-1).

The most common type of equity analysis is conducted by MPOs to certify that their regional plans are in compliance with Title VI. Although accessibility-based evaluation has largely failed to make the leap from laboratory to practice in transportation planning generally, it is in the instance of carrying out equity analysis at the regional scale that the concept of accessibility has gained the strongest foothold, but with substantial room for improvement. The guidance provided by the FTA circulars has influenced what has become the most common approach for analyzing equity of regional transportation plans by MPOs, which can be summarized in three main steps (Cambridge 2002; Karner and Niemeier 2013). The first is to identify geographic concentrations of population groups, including at a minimum racial-minority and low-income residents of the region. For example, a geographic concentration of low-income households might consist of contiguous groups of census tracts that exceed 40 percent of persons below the federal poverty line. The second step is to define a set of metrics to be used for evaluating the benefits and burdens. The third step is to evaluate whether the distribution of the benefits and burdens are disproportionate, typically by comparing the metrics between what some refer to as a “protected population” or “EJ population” (e.g., minority or low income) to a “control population” (e.g., non-minority or non-low-income) (Steinberg 2000).

The concept of accessibility offers a way to address two main shortcomings with this approach. First, MPOs use widely divergent definitions for identifying geographic concentrations of populations, especially for “low-income” (Cambridge 2002). The outcome of an equity analysis is likely to be highly determined by this definition, and any equity analysis
should include a sensitivity analysis to reflect the complexity of social groups. More problematic than defining the groups, however, is the approach of comparing protected populations to control populations. Although it is common in the U.S. metropolis that racial minorities, people in poverty, and other vulnerable populations tend to be confined to pockets of high concentrations, not all are. Because accessibility is an attribute of people or households – unlike mobility metrics, which are attributes of infrastructure – an accessibility-based analysis allows for doing away with comparing geographic concentrations of populations. Instead, by attaching accessibility to people and then plotting out the full spectrum of all populations, a more accurate comparison can be made across full social groups regardless of whether they live at certain threshold concentrations (Grengs 2012, 2015).

The second and even more important way of addressing shortcomings in this common approach to equity analysis is to make accessibility the fundamental metric of comparison. At the second step of the general approach summarized above, MPOs and other agencies use a wide range of metrics for evaluating benefits and burdens. A few rely heavily on accessibility as an equity metric. Indeed, the Metropolitan Transportation Commission of the San Francisco Bay Area, the Mid-Ohio Regional Planning Commission of Columbus, and the Southern California Association of Governments are examples of early adopters and have included accessibility metrics among a mix of others in their equity analyses [cite MORPC, SCAG reports] (Purvis 2001). Where accessibility metrics do appear in equity analyses, they are but one among a set of mobility-based metrics. An excellent guidebook on approaches to environmental justice analysis provides an example of how accessibility is an important dimension of equity analysis, but it is presented as though it is on par with a wide range of mobility metrics (Forkenbrock and Weisbrod 2001). Common mobility-based metrics used in equity analysis include trips per day, miles per day, average travel time to work, mode share distributions, congested vehicle-miles of travel, the share of population within a half mile of home, and so forth. These mobility metrics are useful and surely contribute to our understanding of how some people are systematically disadvantaged by a transportation system. But considering accessibility as but one of a set of metrics that are mobility-based places on equal footing a means (mobility) toward the end (accessibility). When accessibility is defined properly, it subsumes mobility. Including mobility metrics in equity analysis, even when paired with accessibility metrics, reinforces the mistaken notion that mobility itself ought to be an independent goal, and undermines the transformative power of the accessibility concept. As I will argue below, accessibility ought to be the prime consideration of equity analysis.
Aside from equity analysis performed at the regional level, another common type of evaluation is required for changes in the service delivery of public transit. The FTA has done an admirable job of elevating awareness of the potential for injustice and ensuring that ongoing monitoring takes place, principally through the publication of recent circulars that are widely regarded as among the most authoritative guidelines for analyzing environmental justice outcomes (Federal Transit Administration 2007, 2012; Reddy, Chennadu, and Lu 2010). Transit agencies are required to maintain system-wide service standards and to perform an equity analysis of proposed changes in service or fares, including when routes or schedules are altered, or if bus lines or stops are eliminated. Any finding of disparities requires corrective action. Although the guidelines are extensive, a main purpose is “to collect and analyze racial and ethnic data showing the extent to which members of minority groups are beneficiaries of programs receiving Federal financial assistance” (Federal Transit Administration 2012: V-1).

In summary, a common approach is to create maps that show the proximity of minority and low-income population groups to facilities and services. Services must be evaluated on a range of metrics that include vehicle loads (e.g., passengers per vehicle), headways (the frequency of service as the time interval between vehicles arriving at a stop), on-time performance, availability of amenities (e.g., benches, shelters, trash receptacles), and service availability (e.g., whether large shares of a population live within walking distance of a transit stop). The main problem that prevents these guidelines from being effective in advancing social equity is that they fail to address disparities in accessibility to destinations. The ultimate purpose of a transit agency is to help riders reach destinations. The metrics in the guidelines are merely indirect means toward the end of accessibility.

Finally, the state of practice in equity analysis suffers from a substantial conceptual flaw that has the unfortunate effect of preserving the status quo. Equity analyses typically use as the basis of comparison a criterion of proportionality when assessing the fairness of a proposed project or a plan, and thereby fail to account for any pre-existing disadvantages (Cambridge 2002; Karner and Niemeier 2013; Martens, Golub, and Robinson 2012; Steinberg 2000). If, for example, an “EJ population” is found to experience benefits and burdens from a proposed project that are approximately the same as the “control population,” the project is deemed to have no disproportionate effect, and it can proceed without violating environmental justice provisions. This is a highly questionable approach given the long, painful history that has been
firmly established through scholarship on how racial segregation and concentrated poverty have been deeply etched into the landscape of the American metropolis (Frug 1999; Goldsmith and Blakely 2010; Marcuse 1997; Wacquant 1997). For African Americans in particular, the intense and debilitating social isolation that has persisted for decades was constructed through a series of well-defined institutional practices, private behaviors, and public policies by which whites sought to contain growing urban black populations” (Massey and Denton 1993: 10). A more assertive commitment to advancing social justice in transportation would acknowledge pre-existing disparities, and then by taking a more explicitly normative position would seek to redress them.

In recognition of the severe limitations of restricting equity analysis to the proportionality criterion, several scholars are pushing for transportation planners to take a more explicit and aggressive normative stance on distributive justice. They start from the observation that “horizontal equity,” where members of any one group such as low-income people are expected to experience identical benefits, is all but impossible because of the spatially lumpy nature of transportation and land-use investments. Attributes of places within metropolitan space such as residential density, demographics, and destinations vary so substantially that any location-based costs and benefits are unavoidably unequal. Following the concept of “vertical equity,” where benefits are distributed unequally among various groups, these scholars take the view that transportation benefits ought to be provided more favorably to some groups over others to address pre-existing disadvantages (Foth, Manaugh, and El-Geneidy 2013; Karner and Niemeier 2013; Martens 2012; Martens, Golub, and Robinson 2012; Murray and Davis 2001). Such a strategy would require identifying places of pre-existing disadvantage and then strategically targeting investments where they can address the greatest needs. For example, the defining feature of transportation disadvantage in the typical U.S. metropolitan region is the severe difference between reaching opportunities by car or by public transit (Blumenberg and Manville 2004; Grengs 2010). Any policy that aims to address social equity in transportation must confront the conditions of people who are unable or unwilling to drive in metropolitan regions that are designed to give advantage to cars throughout the nation. Accessibility-based evaluation tools can offer a more realistic reflection of the current distribution of transportation benefits and disadvantages, and can help focus attention and target resources toward underserved people and areas.
Rationale for Shifting from Mobility-based to Accessibility-based Equity Analysis

This chapter has argued that accessibility should be the primary criterion by which equity is evaluated. Placing the concept of accessibility foremost in evaluating social justice outcomes provides several advantages over traditional, mobility-based analysis. First, the purpose of transportation is not movement but access (Levine et al. 2012). Achieving higher accessibility is the “core objective” of transportation planning and is consistent with the consensus of the field that transportation is a “derived demand,” meaning that travelers do not consume transportation for the sake of movement but in order to reach destinations (Cheng, Bertolini, and le Clercq 2007; Meyer and Miller 2001; Wachs and Kumagai 1973). The concept of accessibility gauges directly the benefits of transportation policy.

Second, accessibility provides a clear basis for making decisions. The mobility-based metrics that are commonly used to test whether some social groups are disadvantaged fail to adequately capture the benefits of a transportation system. Commonly used mobility metrics in equity studies include miles traveled per day, trips per day, and minutes traveled per day (Dodson et al. 2010; Forkenbrock and Weisbrod 2001; Giuliano 2003; Johnston-Anumonwo 1995). Using such metrics leaves unclear whether a traveler is experiencing disadvantage or not. Most any traveler prefers shorter travel times to longer ones. But a preference for shorter travel time does not mean that those with longer travel times are somehow disadvantaged. Women and poor people are examples of social groups that have been shown to be disadvantaged in transportation (Blumenberg 2004; Hess 2005; Pratt and Hanson 1988), but they typically experience much shorter travel times on average than the general population (Pucher and Renne 2003). These shorter travel times cannot be appropriately considered an advantage, but rather result from their having fewer choices in how they travel (Taylor and Ong 1995). Many middle- and upper-income classes of the United States choose to trade-off longer commutes in exchange for experiencing the amenities that come with living in the suburbs, and the longer travel times or distances they experience cannot properly be considered a disadvantage. While mobility-based metrics in equity evaluation are uncertain with regard to disadvantage, accessibility metrics make disadvantage readily evident (Pfeffer et al. 2002: 40): “Accessibility as a planning goal provides clear direction for policy makers. Although greater mobility may be a good thing, greater accessibility is inherently a good thing.”
A third reason for placing accessibility at the pinnacle of equity evaluation is that traditional mobility-based metrics are biased in ways that are likely to continue harming people who have been systematically disadvantaged by transportation policy, including people of color and those living in poverty. Mobility-based measures such as levels of congestion are attributes of infrastructure, not of people. Measuring attributes of transportation infrastructure hides the effect on people, and offers little help in understanding equity among social groups. Congestion levels, for example, have little relevance for households without cars, yet carless people typically experience the greatest disadvantage from the automobile-dependent cities that we have been building for decades. In addition, mobility-based metrics are based on defining success in terms of faster movement (Ewing 1995). Achieving success in providing congestion relief through added roadway capacity – a prominent public policy priority – may induce destinations to move farther apart (Transportation Research Board 1995). Travel to increasingly dispersed destinations might be accomplished at higher speeds, but the geographic spread of these destinations forces travelers to cover more distance, imposing higher costs in money and time that disproportionately fall on those with low incomes. In this way, transportation policy may be contributing to the low-density, auto-oriented development that disproportionately harms racial minorities and low-income people who tend to live near the urban core and have fewer resources to adapt to spreading land-use patterns (Bullard, Torres, and Johnson 2000; Pendall 1999; Squires and Kubrin 2005).

Mobility-based metrics influence not just transportation projects, but also interfere with land-use development projects. The most commonly used metric of transportation performance at all levels of government is level-of-service (LOS), which assesses the amount of delay that motorists experience from the congestion induced by the presence of other vehicles. Some contend that the prevalent use of LOS evaluation further encourages low-density dispersal of residences and businesses (Henderson 2011). When planners forecast that a proposed new land-use development will degrade congestion below LOS guidelines, municipal authorities charge developers an impact fee to bring surrounding streets up to standard, or they simply reject the development outright. Because many urban streets in the core of a metropolis are already operating below LOS standards, and because mitigation is prohibitively expensive at higher-density locations, developers commonly simply shift their projects to suburban and exurban locations where traffic impacts are negligible (Dumbaugh, Tumlin, and Marshall 2014). The effects of adhering to LOS standards is to place a limit on densities, to impose a bias against infill development, to constrain the supply of affordable housing in the core of regions, and ultimately to degrade metropolitan accessibility by interfering with people’s ability to choose where to live.
The main problem with this over-reliance on LOS standards in evaluating the merits of a proposed land-use development is that it only counts the costs and fails to recognize the benefits of land-use developments. A better and more legitimate approach would be to use an accessibility-based evaluation to weigh the costs against the concomitant access benefits. In this way, if local planners were to forecast the effect of a proposed development on accessibility rather than on LOS alone, they could simultaneously assess the costs (in the form of worsened nearby traffic congestion) with the benefits (in the form people’s ability to live in close proximity to jobs and important destinations). When a proposed central-city grocery store is rejected because planners anticipate too much traffic on the surrounding streets, nearby residents lose a chance at better accessibility to jobs and food. When a developer is turned down for an affordable housing project in an inner-ring suburb for fear of congested traffic, planners will never know how many would-be residents may have gained access to the municipality’s amenities and opportunities. Accessibility-enhancing projects are too valuable to be rejected by local planning authorities for relying exclusively on the narrow standards of LOS evaluation, and accessibility is the tool for counteracting the harmful effects of LOS standards.

The fourth and final point in support of the claim that the concept of accessibility must be at the center of transportation equity analysis requires an extended argument: accessibility offers more conceptual consistency with the latest philosophical debates about social justice. Theoretical views of justice have been dominated for several hundred years by the idea of utilitarianism, which argues that people achieve well-being through the goods and services they consume, and that this consumption leads to utility or happiness. Critics contend that such an approach to theorizing justice places too much emphasis on consumption of commodities and that it fails to sufficiently address other important dimensions of well-being. Recent writers propose an alternative theory of justice that has come to be known as the “capabilities approach,” which argues that individual well-being can be evaluated not just by the extent of goods and services that a person has command over, but also by the person’s capacity to convert goods and services into “capabilities” that enable the achieving of a satisfying life (Nussbaum 2003; Nussbaum 2000; Sen 1985, 1992, 1999).

Amartya Sen’s (1981) analysis of famines in India in the 1940s, when several million people died from hunger, revealed a surprising source of the starvation, and illustrated how a utilitarian perspective falls short in assessing well-being. It was commonly believed that famines occur because of a decline in food production and supply. A utilitarian view would stress that a
lack of commodities led to starvation. Sen’s analysis challenged this conventional view by showing that famines typically occur not because of any lack of commodities – food supplies are typically plentiful during famines – but rather because some people lack the ability to purchase the food when prices shoot up. In short, this alternative perspective places emphasis on the source of starvation not on a lack of commodities, but on a lack of accessing the commodities. Some three million people died of starvation in the Bengal famine of 1943 while surrounded by plentiful supplies of food in close proximity that they could not access. Sen’s analysis shows that hunger depends not just on the availability of a good in the form of food, but also critically on the economic and political institutions that set prices and distribute the good. These economic and political institutions directly influence people’s abilities to access the good, and these abilities vary by people in systematic ways resulting in a range of health and nourishment outcomes.

The capabilities approach offers a different and more expansive understanding of social justice than the more traditional views that have dominated social science. Instead of the traditional concern with commodities and utility, the capabilities approach focuses on the two related but distinct concepts of functionings and capabilities. A functioning is an achievement, or what a person manages to do or to be. Having access to goods can enable a functioning, but a good and a functioning are not the same thing. A bike is a good that enables the functioning of mobility, in this case by moving freely to valued destinations more rapidly than by walking. But personal characteristics affect whether a person can convert this good into a functioning. For example, if one person is physically disabled and cannot ride a bike while a second person is not, then the first person is restricted from converting a bike into the functioning of movement in ways that the second is not. Aside from such personal attributes, social and environmental characteristics can influence a person’s ability to convert goods into a functioning as well (Robeyns 2005). The ability to use a bike can be hindered from a lack of sufficient income to keep it properly maintained, or if women are not allowed to ride bikes due to societal or cultural norms, or if a neighbourhood is so violent that riding a bike in certain hours is regarded by residents as unsafe, or if vehicular traffic on nearby roads is too dangerous for bikes. A utilitarian view would evaluate two people merely on the basis of their each having a bike, while the capabilities approach goes further to account for differences in the ability to convert the bike into a useful achievement.
But objectively adding up the functionings that a person accomplishes is not enough to adequately assess a person’s overall well-being, because a person’s quality of life is also determined in part by the opportunities that a person faces. A “capability” is a functioning that a person could have achieved. A functioning represents the condition of a person in terms of what one manages to do or to be. The capabilities reflect the combination of functionings that a person can possibly achieve through exercising choice. Capabilities are the wide range of opportunities that contribute to having a high quality of life, and they indicate the extent of freedom of choice that a person has to achieve a set of functionings. Sen (1985) illustrates the importance of capabilities by comparing two people with identical functionings. Both experience the same functioning of starvation and the misery that comes with the material lack of food. One person is hungry because poverty prevents the purchase of food. The other is fasting and is hungry as a matter of choice, perhaps due to religious beliefs. Fasting in this case is more than just starving – it is choosing to starve when other options are available (Sen 1992). Although these two people may be experiencing identical misery resulting from material lack of food, Sen argues that it would be a mistake to claim that these two experience similar levels of well-being because of the consequential difference in what they each bring by way of their freedom to choose in the matter of starvation. Quality of life involves more than material comfort. Being capable of freely choosing how to live one’s life is a fundamental dimension of well-being.

To summarize the capabilities approach, goods and material resources are inadequate indicators of how well a person is doing. To live a fulfilling and satisfying life also requires engaging in freely chosen activities when faced with a range of valuable and feasible opportunities. Instead of utility or resources, a person’s well-being should be evaluated by the functionings and capabilities that enable the exercise of choice to do or be what one values. The capabilities approach is consistent with equity planning’s call for expanding choice among people who have few options, because it contends that justice is advanced when steps are taken to reduce inequality in people’s respective capabilities and guaranteeing that people have adequate capabilities for functioning among plentiful and viable opportunities (Krumholz 1982; Krumholz and Forester 1990).

The capabilities approach has been widely influential in changing the way scholars and policy makers think about poverty and justice (Alkire 2005). Accessibility matches well with the capabilities approach in several important ways that might enhance the transformative
Advancing Social Equity Analysis in Transportation with the Concept of Accessibility

power of the accessibility concept to inject new ways of thinking into transportation equity analysis. The first similarity is that both the capabilities approach and accessibility are explicit about the distinction between means and ends. They insist on being clear about what the ultimate goal is, and that sometimes a tendency to fixate on the means rather than the ends can lead to unintended outcomes. For the capabilities approach, the ends are capabilities like being well-nourished or being healthy. Having access to a doctor is a means toward this end, but alone is not sufficient and can only serve as a proxy for the ultimate goal, principally because people differ in their ability to convert means into valuable outcomes. Similarly, for the accessibility concept, the ultimate goal is the amount of interaction a person can achieve with other people and places in a given amount of time. The speed at which people are able to travel is not meaningful in and of itself – the relevant question is how much interaction people can accomplish in a given time. Fast travel is one means toward the end, but it does not always lead to the ultimate goal. If a focus on the means of fast travel serves to spread out destinations or to reject otherwise accessibility-enhancing land-use projects, and people are left to spend yet more time reaching their destinations, then the means does not adequately reflect the ends.

Like the capabilities approach, the accessibility concept emphasizes the potential for achieving an outcome, not actual, realized behavior. Accessibility is a measure of the potential for people to reach destinations, but it does not address whether people actually seize the potential – actual trip-making behavior is not part of its definition. Placing the focus on potential rather than behavior allows for avoiding a serious problem of how to deal with people’s personal preferences. A central claim of the capabilities approach is that measuring well-being on resources alone – such as income or wealth – is insufficient because people have different “conversion rates” for turning a resource into a capability. For example, providing equal pedestrian resources to all residents in a neighborhood will not result in their having the same well-being, since people using wheelchairs will require more to perform the same activities. The key point is that making inferences about what people want or need from revealed behavior is often inaccurate and misleading because the behaviors often result from insufficient information or are adaptations to coercive or oppressive circumstances (Young 1990).

A longstanding practice in transportation planning has been to rely on empirical observations of travel as “revealed preference.” The travel demand models used in every regional planning agency in the country generate forecasts largely derived from current travel patterns. A major assumption in this revealed-preference approach is that the most frequently chosen
destination is that which is most preferred. However, the destination may represent the only choice available to a traveler, and thus the travel expresses no preference at all. Observed behavior may indeed represent a choice of one alternative over another, but it may also stem from involuntary actions. Transportation forecasting models easily lead to the inference that actions represent free choice, when in fact they result from severe constraints. Whenever choices are constrained, planners must acknowledge the possibility of misinterpreting observed behavior as a preference. The problem with relying heavily on observed behavior to formulate transportation policy is that travelers face highly unequal constraints. Most notably, the constraint that results in the most severe disadvantage in the American metropolis is the lack of a private vehicle. When planners and engineers rely heavily on models that implicitly assume away differences in constraints, they are susceptible to making decisions that undermine social justice. A common example of this problem would be a decision to build new freeway lanes in a suburban region because congestion there is high, without recognizing that such a decision is likely to exacerbate or reinforce the inequality that already exists between suburban and central-city workers (Sheppard 1995).

The accessibility concept, like the capabilities approach, provides an alternative to the dangers of revealed-preference modeling, because it recognizes the essential diversity of people. The capabilities approach allows for the fact that people do not have an equal capacity for converting resources into useful outcomes. The practical implication for planners is that to be useful for planning decisions, accessibility should be defined in terms of how public policy can provide more and better linkages among a wide range of opportunities and needs, not in terms of how individual people perceive the linkages provided. The planner cannot account for the full variety of preferences or constraints that travelers have. For example, living in a neighborhood with high accessibility to a medical clinic provides much value to a person who has healthcare coverage for that facility but little value to someone who does not. The land-use or transportation planner seeking to increase accessibility cannot know the medical coverage of all future residents of a neighborhood, but even in the absence of such information can do well by elevating accessibility of any place to a wider range of destinations for the people who will live there.

Both the capabilities approach and the concept of accessibility recognize the intrinsic value of having freedom and the capacity to choose among a variety of options. As the distinction between fasting and starving illustrates, having choice in one’s life is a highly valued
quality in and of itself (Sen 1985, 1988). Accessibility represents a measure of choice – as an indicator of a person’s potential for seizing available opportunities. Following the equity planning movement, advancing policies that broaden the scope of choice has become a central principle in the field of urban planning (Krumholz and Clavel 1994; Krumholz and Forester 1990). Many professional planners now espouse providing “a wider range of choices for ... residents who have few, if any, choices” (Krumholz 1982: 163), a tenet now codified in the ethical standards of the American Institute of Certified Planners (Solin 1997). The concept of accessibility provides the needed measurement tool as the critical link between social equity and the built environment in the pursuit of expanding choices for those who have few.

**Conclusion: Making Accessibility the Core of Equity Analysis**

Wachs and Kumagai (1973) argued decades ago that accessibility indicators should be used regularly by policy makers to evaluate transportation equity among social groups. Transportation planners can restore equity to their work by following the lessons from this prescient work. The most important step is to displace mobility-based evaluation with accessibility-based evaluation. Accessibility-based metrics address several serious shortcomings in commonly used mobility-based metrics. And because social equity analysis mandated by law is expected to address not only the costs but also the benefits of a transportation system, accessibility-based metrics gauge directly the benefit outcomes of transportation policy. Accounting for transportation benefits is especially important for counteracting the damaging effects of LOS standards that cause local planning authorities to reject accessibility-enhancing land-use developments that would otherwise provide valuable access for existing and future residents alike.

Accessibility is a useful tool for equity analysis because it properly places emphasis on people and their relationships to places, thus allowing for direct comparisons among social groups. It allows for evaluating outcomes over a full range of various populations, overcoming a limitation of current standard practice that compares aggregate outcomes only on geographically-defined populations. And while mobility-based metrics leave uncertainty about whether social groups experience disadvantage relative to others, accessibility metrics are clear: more is better than less. Accessibility is an indicator of a person’s capacity to interact with others, influencing how one engages with society: fulfilling needs for companionship with family and friends; participating in activities like work, learning, and worship; gaining access to
resources like food and clothing; and enjoying visits to places like symbolic sites, recreation locations, and open space.

By elevating accessibility as the central concept of equity analysis, planners will be better positioned to take a more explicitly normative stance in their practice. Although carrying out equity analysis has become standard practice in the field, thanks to recent and forward-thinking regulations, it remains cautiously incomplete by relying on making comparisons based on proportionate costs and benefits when assessing the fairness of a proposed project or a plan. Such an approach fails to account for any pre-existing disadvantages and preserves the status quo. Accessibility-based metrics would not only offer a more realistic reflection of current disadvantages that mobility-based metrics, but they would also provide a basis for identifying the people and places in greatest need so that new resources could be directed toward mitigating those needs. One group that deserves special attention in equity analysis is people without availability of a car, because travel mode is the single most decisive factor in determining the extent to which a person can reach destinations.
References


Advancing Social Equity Analysis in Transportation with the Concept of Accessibility


**Endnotes**

1 For example, the McCone Commission reported: “Our investigation has brought into clear focus the fact that the inadequate and costly public transportation currently existing throughout the Los Angeles area seriously restricts the residents of the disadvantaged areas such as south central Los Angeles” (Governor’s Commission on the Los Angeles Riots 1965: 65).

2 Transportation equity can be evaluated across a wide range of dimensions, including exposure to negative consequences like noise and air pollution, cost, tax and subsidy incidence, and so forth. Broader overviews of conceptual issues are available elsewhere (Deka 2004; Forkenbrock and Schweitzer 1999; Hay 1993; Hodge 1995; Schweitzer and Valenzuela 2004; Taylor and Tassiello Norton 2009).

3 To illustrate, based on reviewing the most recent equity analyses of 12 MPOs, 3 used the definition from the Department of Health and Human Services poverty guidelines, while 9 used a definition of their own making. For instance, the Metropolitan Council of Minneapolis/St. Paul uses: "Contiguous areas where at least 40% of residents live in households with incomes below 185% of the federal poverty line." The Southeast Michigan Council of Governments in the Detroit region uses: "All households that are in the lowest income quartile."

4 Technically, the requirement applies only to “major service changes” only, and a problem not addressed here is that the transit agency decides what constitutes a major change (Federal Transit Administration 2012).

5 The point was forcefully made following the urban uprisings of the 1960s through the Kerner Commission report: "What white Americans have never fully understood -- but what the Negro can never forget -- is that white society is deeply implicated in the ghetto. White institutions created it, white institutions maintain it, and white society condones it" (Kerner et al. 1968: 2).
The Population Studies Center (PSC) at the University of Michigan is one of the oldest population centers in the United States. Established in 1961 with a grant from the Ford Foundation, the Center has a rich history as the main workplace for an interdisciplinary community of scholars in the field of population studies.

Currently PSC is one of five centers within the University of Michigan’s Institute for Social Research. The Center receives core funding from both the Eunice Kennedy Shriver National Institute of Child Health and Human Development (R24) and the National Institute on Aging (P30).

PSC Research Reports are prepublication working papers that report on current demographic research conducted by PSC-affiliated researchers. These papers are written for timely dissemination and are often later submitted for publication in scholarly journals.

The PSC Research Report Series was initiated in 1981.

Copyrights for all Reports are held by the authors. Readers may quote from this work (except as limited by authors) if they properly acknowledge the authors and the PSC Series and do not alter the original work.