

Towards Mobility Justice: Linking Transportation and Education Equity in the Context of School Choice

Abstract

Problem, research strategy, and findings

Transportation equity research addresses questions of participation and planning process or the distribution of transportation's benefits and burdens. This work largely elides issues related to youth and student travel. Existing work on school trip mode choice does not engage deeply with the equity implications of its findings. Education equity researchers identify the abstract notion of choice as equity enhancing, but do not engage with the realities of disparate transportation resources and infrastructure. In this review essay, we articulate the contours of transportation equity, youth travel, and school choice research. We use emerging perspectives on "mobility justice" to frame the issues and provide vocabulary that can help bring education and transportation together in planners' everyday work.

Takeaway for Practice

A "mobility justice" framework encourages critical thought and action to address the root causes of inequities. Our conclusions make three contributions to research and practice: (1) challenging school district leaders to think about choice systems designed for access to schools, not just access to information about available options; (2) clarifying the broader implications of school choice by refusing to look away from the racial implications of forecasts; and (3) elucidating the need for a regional perspective.

Keywords

transportation equity, education equity, school choice, accessibility, mobility justice

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Acknowledgements

The authors thank the blind reviewers, Rand Quinn, Lauren J. Bierbaum, and participants of the 2019 *Exploring the Intersections of Transportation Justice and School Travel* Research Roundtable.

This is an Accepted Manuscript of an article published by Taylor & Francis in the *Journal of the American Planning Association* on September 16, 2020, available online:
<https://doi.org/10.1080/01944363.2020.1803104>

Towards Mobility Justice: Linking Transportation and Education Equity in the Context of School Choice

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Introduction

Across the United States, school districts are increasingly turning away from traditional neighborhood schools and implementing policies that provide families with choices outside their residential location. In many cases, these school choice policies aim to increase access to high-quality education and achieve *education equity*. This shift has profound but underappreciated implications for student travel behavior that vary by location and for different demographic groups. *Transportation equity* research examines these types of outcomes but has engaged little with student travel. In this review essay, we bring together these two disconnected areas of scholarship to highlight gaps in each field that must be addressed to achieve equity in both domains and to draw out implications for practitioners. We use emerging perspectives on “mobility justice” to frame the issues and provide vocabulary that brings education and transportation together in planners’ everyday work.

Three interrelated research and practice factors motivate our effort. First, transportation research has treated school and youth travel largely in the context of active travel propensity, mode choice, and related public health effects. Yet school travel is more than just a matter of mode choice and has impacts beyond public health. Access to quality schools is predicated on physical access to specific sites and the transportation infrastructure that enables it.

Second, the school travel literature is relatively silent on the equity implications of its findings. While broader transportation equity scholarship addresses issues of funding, public participation, and disparate accessibility for immigrants, women, low-income people, and other vulnerable populations, it misses a highly marginalized group in its neglect of youth—particularly youth of color or those from lower-income households. Considering persistent school segregation, racial disparities in school quality and outcomes, and operating structures of districts, the earlier school travel behavior research proves necessary, but insufficient, to address questions of equitable school access in the U.S.

Third, questions of access are complicated amid the persistent inequities that plague the U.S. educational landscape. School districts serving the most students of color receive \$1,800 less per student than districts with the fewest students of color and high-poverty districts receive \$1,000 less per student than low-poverty districts (Morgan & Amerikaner, 2018). Schools are deeply segregated: 40 percent of Black and Latinx students attend intensely segregated schools (Orfield et al., 2019). Only 50 percent of Black and Latinx students achieve basic reading skills, and only 14 percent of English language learners achieve math proficiency by fourth grade (*The Nation's Report Card: NDE Core Web*, 2017). Wealthy parents can select their residential location to take advantage of high-quality schools, while low-socioeconomic status parents cannot (Rothstein, 2017).

School choice policies have grown in popularity as a response to these inequities. Under systems of choice, the normative ideal of a neighborhood school to which students can walk or bike wanes, calling for additional approaches to transportation analyses. Both advocates and critics of school choice address questions of transportation access only in limited ways, even though *physical access to schools* is the fundamental premise through which choice ostensibly

facilitates education equity. If students do not have affordable, reliable, and convenient transportation options that connect them to quality schools, school choice policies will not benefit them.

The ground gained by earlier school travel studies has provided a strong foundation for a next generation of research that bridges transportation and educational equity in the context of school choice. In this review essay, we build use a “mobility justice” framework that encourages critical thought and action to address the root causes of inequities. Our conclusions contribute to research and practice in three ways: (1) challenging school district leaders to think about choice systems designed for access to schools, not just access to information about available options; (2) clarifying the broader implications of school choice by refusing to look away from the racial implications of forecasts; and (3) elucidating the need for a regional perspective.

Transportation and education equity literatures in the U.S. context

Transportation equity and justice have a well-defined foundation in the U.S., having emerged from the application of civil rights and environmental justice laws and guidance to transportation planning and decision making (Marcantonio et al., 2017). School choice has a complicated history with roots in both segregationist and desegregation movements, radical local control efforts particularly in Black communities, and more recently within a broader context of neoliberalism informed by the market ideals of freedom and competition (Chubb & Moe, 1990; J. T. Scott, 2012, 2013; Stulberg, 2016). While school choice policies and practices are certainly in use elsewhere around the world,ⁱ a narrower focus on the U.S. is important. The situation for people of color in the U.S. is unique; following 250 years of slavery and segregation, widely divergent health, wealth, incarceration, and quality of life outcomes persist despite robust civil

rights laws, regulations, and other guidance prohibiting discrimination in the allocation of federal funds.

We focus on research produced between the early 2000s and the present. The intellectual foundations for school choice trace back decades, but more recent and widespread attention to choice emerged in the late 1990s after the passage of the first charter school law in the U.S. Accordingly, academic research on school choice and its impacts began to appear in earnest in the early 2000s. Nationwide efforts to promote “Safe Routes to School” through federal transportation policy also began around this time, with philanthropic research funding following.ⁱⁱ

We used our knowledge in each domain to identify relevant monographs, edited volumes, and journals. We used standard academic search tools (e.g. Google Scholar, Web of Science, and the Transportation Research International Documentation database) to mitigate gaps. Our review also includes gray literature produced by think tanks and policy institutes because this work is often inspired directly by the needs of practitioners.

What is mobility justice?

The ability to move or to stay in place is unevenly distributed. Some can travel with relative ease and comfort across vast distances at great speed while others endure daily trips that cover very little space but take incredible amounts of time. Refugees, domestic violence survivors, and those fleeing natural disasters must all move when they would prefer not to. Rather than seeing this unevenness as an incidental effect of social organization, governance, and individual choice, mobility justice posits that it is a defining feature of exploitative systems that endow certain types of subjects with more value and power than others (Cresswell, 2010; Sheller, 2018a, 2018b; Sheller & Urry, 2006). Achieving justice requires addressing the root causes of this

unevenness across multiple scales (Sheller, 2018a). The mobility justice perspective provides the vocabulary and tools necessary for this task.

Mobility justice presents practical challenges to existing perspectives on transportation equity and justice. Questions of distributive outcomes—how benefits and burdens fall on different groups—dominate transportation planning processes and equity research. The mobility justice perspective pulls the lens back from this narrow distributive focus, imploring broad thinking about who engages in transportation decision making and which topics and questions are considered valid, critically interrogating the scales at which solutions are sought. Mobility justice resists a narrow focus on infrastructure and policy decisions and considers different types of impacts (Attoh, 2019; Enright, 2019; Sheller, 2018b).

For example, consider planning efforts to promote alternatives to automobile travel. A mobility justice perspective confronts not only the extremely low access to opportunities experienced by carless individuals in an auto-dominated society, but also contends with regional transportation performance metrics based on congestion mitigation, domestic environmental injustices associated with carbon-based fuels, and the global causes and consequences of crude oil extraction. While individual planners are necessarily limited in what they can accomplish within their organizations, recognizing the local-to-global nature of planning problems and supporting ongoing work across scales is ultimately needed to achieve just outcomes.

Sheller (2018b) discusses five types of justice as fundamental components of mobility justice: distributive, deliberative, procedural, restorative, and epistemic. Mobility justice critiques transportation equity for its narrow focus on distributive justice that emphasizes access to opportunities but elides the broader questions raised above. Deliberative and procedural justice draw from the literature and practice of public involvement familiar to planners. They consider

who is involved in decision making, the extent to which they can affect outcomes, and whose knowledge is considered valid. Restorative justice involves acknowledging and addressing the historical processes that have led to current disparities. Finally, epistemic justice requires creating new knowledge by addressing gaps in understanding and seeing across scales.

While access to education has not explicitly been part of mobility justice discourse to date, the framework can bring together transportation and education equity. Education inequity is a multi-scalar, historical, and embodied process inextricably tied to movement in a double sense: caregivers and children must physically travel to school sites and education is necessary to achieve social mobility. Efforts to integrate schools in the United States throughout the latter half of the 20th century led to inexorable “white flight” and accelerated automobile-dependent suburban sprawl. Since that time, schools in the U.S. have re-segregated and districts have cut transportation services while expanding systems of choice. With uneven quality and resources, some students face an impossible choice—long distances and travel times to choice schools or segregated neighborhood schools and attendant negative effects. The former option is likely to be unavailable for students without access to automobiles, and the latter reduces the likelihood that they will advance. Seen in this light, these policies often provide only the illusion of choice while keeping disadvantaged students further from high-quality education. The alternative strategy that would involve uniformly improving neighborhood schools has thus far been elusive.

Both transportation and education equity are rightly concerned with disparate outcomes. But a mobility justice perspective forces a more difficult conversation about the origins of disparities and the ongoing processes that continue to reproduce them. We illustrate the relationships between transportation equity, education equity, and mobility justice in Figure 1.

As demonstrated further below, mobility justice offers a powerful framework for identifying research and practice directions where the two fields meet.

[Figure 1]

Access and equity in school travel analyses

Transportation systems connect people to opportunities they need to lead a meaningful life, a benefit captured by the term *accessibility*. They also produce harmful negative effects, including air pollution, noise, and visual intrusions. Transportation equity research addresses how transportation planning decisions are made and how benefits and burdens are distributed across people and places (Karner et al., 2016, 2018).

Scholarly discussions of transportation equity often focus on distributive justice concerns with a particular emphasis on the potential for people to access employment, as shown in Figure 1 (e.g., Martens, 2017; Martens et al., 2012). This work emphasizes the potential to reach opportunities rather than the choices people make. A wide-ranging literature has established accessibility inequities across race, income, gender, and immigration status, among other characteristics (e.g., Blumenberg & Agrawal, 2014; Giuliano, 2003; Hanson & Pratt, 1995; Loukaitou-Sideris, 2014; Rosenbloom & Fielding, 1998; Tal & Handy, 2010). Other work addresses questions of procedural and deliberative justice in transportation planning, providing specific recommendations for process design (e.g., Aimen & Morris, 2012; Bickerstaff & Walker, 2001; Karner & Marcantonio, 2018). Restorative and epistemic justice concerns have been largely absent to date, with a few exceptions (e.g., Marcantonio et al., 2017; Martens & Golub, In press).

Also absent from many of these conversations about transportation equity and accessibility are questions of school access or youth engagement, despite the obvious importance

of education and the constrained nature of young people's travel choices. Existing literature on school travel engages weakly with equity issues. Much of that work focuses on the determinants of active travel to school, motivated by concerns about sedentary lifestyles that fuel obesity (see Appendix Table 1). In the 1960s, nearly half of all school trips were by foot or bike; by 2009, they were down to slightly more than one in 10, while rates of driving to school nearly tripled to 45% (McDonald et al., 2011).

Several structural changes are responsible for the decline in active travel and increase in driving to school. Distance to school has been the strongest factor predicting active travel in the U.S. (Rothman et al., 2018); studies using travel survey data consistently find that the closer students live to school, the more likely they are to walk or bike (McDonald et al., 2011; Schlossberg et al., 2006; Wilson et al., 2010; Zuniga, 2012). Suburban school districts often site new schools in greenfields, along major roads with ample car access, limiting the ability of students to walk or bike (Bejleri et al., 2009; Deka & Hagen, 2015; Steiner et al., 2008). With increasing suburbanization and school choice, travel distances also have increased (Rothman et al., 2018).

Household composition and social networks also influence how students get to school. Driving increases in households with single parents or two working parents where automobile travel allows for greater flexibility amid complicated household travel logistics (Dieleman et al., 2002; C. Makarewicz, 2013; McDonald & Aalborg, 2009; Schlossberg et al., 2006). Women are usually primary caregivers and are more likely to escort children to school regardless of mode, so less flexibility in work hours and negative perceptions of safety inhibit walking and cycling to school (He, 2013; McDonald, 2008c; Vovsha & Petersen, 2005; Yarlagadda & Srinivasan, 2008).

Nearly all studies we reviewed control for race and ethnicity in descriptive or multivariate analysis, indicating some recognition of distributive justice concerns. Most control for household income, and some control for household structure, free or reduced-price lunch status (a proxy for poverty), immigrant households, and neighborhood socioeconomic status. But fewer closely examine the relationships between disadvantage and school travel outcomes directly. They rarely articulate equity implications (Appendix Table 1).

Missed opportunities to call out distributive implications appear in some work that examines the influence of attitudes and built environment factors on student mode choice. A study based on 614 responses from an Alameda County, California travel survey found higher odds of walking among Black students when controlling for urban form and positive perceptions of neighborhood social cohesion, but *less* walking among Black students in neighborhoods with higher shares of Black residents (McDonald, 2007a). Similarly, analyses of the National Household Travel Survey show that low-income, Black, and Latinx students are more likely to walk to school but travel less overall (McDonald, 2007b, 2008a, 2008b).

Attitudes towards walking and cycling affect parents' willingness to allow their children to use active modes, and attitudes vary across cultural backgrounds (Carlson et al., 2014; McDonald et al., 2011; McDonald & Aalborg, 2009; McMillan, 2007; Schlossberg et al., 2005; Seraj et al., 2012; Wilson et al., 2010). When controlling for parental attitudes toward neighborhood factors like crime or safety, Black and Latinx students are less likely to walk or bike (McDonald et al., 2011). But attitudes and transportation availability may be mismatched in lower-income households. For example, a survey of 1,123 middle school students in Eugene, Oregon found that lower-income children who held negative perceptions of walking and cycling were more likely to walk or bike (Yang et al., 2012). In these cases, children living in urban

environments where walking is not attractive, such as high-traffic areas or gang territories, are well-aware of their social environments and take steps to mitigate their exposure to danger when they lack other options (Banerjee et al., 2014).

An intricate set of state and federal regulations complicates school transportation. Because of declining public revenues, many districts cut yellow bus service as a non-essential expense even as they turn towards school choice policies that inherently complicate student travel logistics (Burgoyne-Allen & Scheiss, 2017). Some districts look to public transit to bridge this gap, but most U.S. transit agencies emphasize peak-period commute services—not school trips. They are also prohibited from contracting with school districts if a viable private school bus provider is available (*Public Transportation and School Buses: Questions and Answers*, 2005; Final Policy Statement on FTA’s School Bus Operations Regulations, 2008).

In locations with limited or no yellow school bus service, districts and transit agencies have tried to mitigate inequities by providing families with low-cost or free transit passes. But such programs are challenging to implement because some transit agencies find school districts “difficult and time-consuming” to work with (Cain, 2006, p. 146) or because student pass costs may exceed reimbursements from districts, especially if pass-holders can use their passes for non-school related trips (Gase et al., 2014; McDonald et al., 2004). Several studies have documented mixed impacts of these passes for K–12 students. One study in the San Francisco Bay Area using survey, interview, and focus group data, did not find improvements or increases in school or after-school attendance among students with free transit passes (McDonald et al., 2004). In Minneapolis, students with a transit pass missed fewer days of class than those without a pass but their academic outcomes were the same (Fan & Das, 2016). In Boston, youth with a

transit pass took 13 percent more school- or work-related trips than they would have without a discounted pass (Thistle & Paget-Seekins, 2017).

School choice policies generally increase travel burdens for families. Distances to choice schools are longer than for neighborhood-based schools, substantially limiting the ability to walk or bike (Wilson et al., 2007; Yang et al., 2012; Zuniga, 2012). Distance and transportation options can be constraints in selecting a school. Parents of color are more likely to select schools that offer school bus service and are closer to home (Wilson et al., 2010). In Philadelphia, a district with a robust school choice program, travel to school by public transit takes nearly twice as long as by car, limiting capacity to select city-wide schools (M. R. Scott & Marshall, 2019). When school districts offer choice but do not provide bus service, emissions and vehicle miles traveled increase—by 4.5 times in one estimate—shifting costs onto families and the public, and may increase absenteeism among high school students (Krizek et al., 2014; Stein & Grigg, 2019; Wilson et al., 2007).

While distributive and process-oriented justice questions dominate the existing transportation equity literature, these same considerations are rarely articulated explicitly in work that addresses youth travel behavior or travel to schools. Even an accessibility perspective is limited because it focuses on the *potential* to reach opportunities, rather than the decisions that students and families make. Mobility justice highlights the multifaceted nature of justice, forcing decision makers to attend to the fundamental drivers of observed disparate outcomes. Education policy is a vital factor driving ongoing shifts in differences in student travel behavior, a landscape we address next.

Educational equity through increased access

To understand inequity in education, research, policy, and advocacy efforts examine four broad areas (Figure 1). First, research on school finance describes persistent declines and disparities in funding (Baker et al., 2018; Leachman et al., 2017; Morgan & Amerikaner, 2018). Further, it documents the positive, long-term impacts that adequate funding has on academic, employment, and other life outcomes (Hyman, 2017; Jackson et al., 2015; Johnson & Jackson, 2019). Second, studies have found that school segregation has increased since the 1990s and that racially segregated, high-poverty schools are generally under-resourced, have higher suspension rates, employ less experienced teachers, and have higher teacher turnover (Carter et al., 2013; Grubb, 2009; Orfield et al., 2012, 2019; Reardon & Owens, 2014). Third, research on teacher preparation, recruitment and retention, curricular innovations, and discipline all argue that what goes on inside schools is a driver of inequity (Bacher-Hicks et al., 2019; Bristol & Martin-Fernandez, 2019; Bristol & Mentor, 2018; Gershenson S. & Papageorge N., 2018; Ladson-Billings, 2009, 2014; Owens, 2017; Simon et al., 2015). Finally, studies on school choice examine the extent to which increasing options fosters improved academic outcomes and education equity (Betts & Tang, 2016; Goldhaber, 1999; Teske & Schneider, 2001).

School choice policies sever the link between home neighborhood and school location in the hopes of mitigating negative outcomes of racial and socioeconomic residential segregation. In the U.S., three broad choice approaches exist in a public system: open enrollment, magnet or other specialized schools, and charter schools (Cookson et al., 2018). Open enrollment allows students to choose schools outside of their assigned residential catchment area. Magnet and other specialized schools offer curricula focused on a specific theme or alternative educational models. Historically, many districts created magnet programs to encourage voluntary desegregation and

increase resources to underserved school communities. These schools may have selective or special admissions requirements. Charter schools are publicly funded, privately managed schools that emerged in the late 1990s. They are governed by a variety of state laws, but in general they are required to meet certain academic outcome standards, while enjoying substantial autonomy from the public-school district on staffing, curriculum, and administrative procedures.

School choice is likely a permanent fixture of U.S. public education, codified in law, enacted by districts, and sought after by parents as a normative outcome. Yet questions persist regarding how and under what conditions it creates higher quality public schools; facilitates equitable access to opportunities; and achieves greater social, racial, and economic integration (e.g., Cookson et al., 2018; Lubienski & Dougherty, 2009). Some argue that magnet schools and other desegregation strategies shift patterns of student demographics and achievement in undesirable ways; others express concern about how charter schools may siphon away funds from traditional public schools (e.g., Altonji et al., 2015; Henig & Stone, 2008; Kaplan & Owings, 2018). While choice that facilitates desegregation has positive outcomes for student achievement, charter schools have a more mixed record (Betts & Tang, 2016; Frankenberg et al., 2011; *Urban Charter School Study Report on 41 Regions*, 2015).

The functional aspects of choice confront the issues of family decision making. While options in schooling are sometimes framed as a way to empower parents, navigating choice systems can prove burdensome for families, especially women who bear the brunt of this “choice work” (André-Bechely, 2005b; Pattillo, 2015). This burden stems in part from the number of factors families consider when selecting schools. Peer-reviewed and gray literature studies that have examined how parents make school choices use both quantitative and qualitative methods. They confirm that issues of school access are, in part, issues of transportation access (see

Appendix Table 2). Household travel logistics and transportation availability feed into the decision-making calculus of families across race, ethnicity, and socioeconomic status, but interviews and surveys reveal that different demographic groups weight transportation differently when making choices (Altenhofen et al., 2016; Kleitz et al., 2000).

These studies present an increasingly nuanced understanding of *how* parents choose schools, while others ask specifically about the travel dimensions of these choices. Early work in this space follows two paths: (1) descriptive studies that report on travel time, distance, and mode choice, often disaggregated by demographics and (2) studies that assess the relative trade-offs that families gain from traveling further vis-à-vis school quality, student outcomes, and related factors.ⁱⁱⁱ Notably, they mostly rely on school district enrollment data and estimates of travel time, distance, and mode, rather than deploying travel surveys or qualitative methods to document the actual travel experiences.

Education research on school travel echoes but does not directly reference the school travel behavior literature discussed above. Based on student-level data, a study found that New York City elementary school students opting into schools of choice are more likely to use a school bus or public transportation than their counterparts who go to their neighborhood school (Cordes & Schwartz, 2018). In locations with less extensive public transit systems, the association between transit use and outcomes is less hopeful. For example, in New Orleans—a school district that is 100 percent choice—a study analyzing 17 schools’ bus routes found that travel times for students on public transit are nearly three times longer than those traveling by car (Lincove & Valant, 2018). A study using student enrollment data in Baltimore schools found that changes to the bus system negatively affected travel for many high school students (Stein et al., 2017).

Travel distance usually increases for all students attending schools of choice. However, studies using student-level demographics, home location, and school location data, found that Black and Latinx students travel further than their white and Asian counterparts when enrolled in choice schools (Corcoran, 2018; Cowen et al., 2018). In New York City, girls, higher-achieving students, and disadvantaged students travel farther than others (Corcoran, 2018). In Chicago, analysis of student-level enrollment data reveals that students of color face longer commute times and increased travel costs to get to school (Burdick-Will, 2017). In the Los Angeles area, Black students are more likely to enroll in choice schools and travel further, while low-income students are more likely to choose the school closest to their home (He & Giuliano, 2018).

Longer distances and travel times sometimes facilitate access to higher quality schools than those within a student's residential neighborhood. For example, in Denver, students who travel longer find schools with better academic performance, student behavior, and educational opportunities than schools closer to their homes (Denice & Gross, 2018). But there may be negative trade-offs. In Washington, D.C., students with longer commutes were more likely to change schools during the year or in subsequent years (Blagg, Rosenboom, et al., 2018). These students also had slightly higher rates of absenteeism than those with shorter commutes but no differences in sixth-grade test score outcomes (Blagg, Rosenboom, et al., 2018). In an analysis of the American Time Use Survey, Voulgaris et al. (2019) found that longer student commutes resulted in less time spent sleeping and exercising. The convergence of school and transportation choices may affect guardians' engagement in their child's schooling and influence other household travel and activity choices (C. Makarewicz, 2013).

Education policy is relatively more advanced compared to transportation policy when addressing questions of equity. Entirely new models of educational delivery have been

developed during the 20th century to address longstanding issues of racial disparities in educational outcomes. Advocates and policy makers frame these continual efforts as demonstrative of a commitment to deliberative and procedural justice by centering parental choice in school selection, and distributive justice in how these choices help reallocate public benefits to those most in need.

Despite these innovations, “choice policies proposed to be more equitable and democratic for parents, in many ways, still reproduce the schooling inequalities they were intended to reduce” because of multiple interacting factors (André-Bechely, 2005a, p. 269). While naming historic patterns of segregation and discrimination, choice policies generally lack a deep commitment to restorative justice, in their neglect of cumulative harms that these under-resourced and segregated schools have inflicted on communities of color and low-income communities. Further, studies have documented that transportation is an important factor for parents. Yet, questions of transportation access operate across scales and domains, requiring a view beyond individual school districts. Mobility justice can aid in bringing the threads of transportation and education together and pointing a way forward for research and practice.

Operationalizing mobility justice: Implications for research and practice

The principles of transportation equity and education equity are linked through their emphasis on access. Transportation equity research has examined how access to opportunities is distributed across demographic groups and places and affected by transportation infrastructure provision. But it does not consider *why* these distributions come to be or how they can be mitigated. Nor has it sufficiently grappled with the complexity of school choice and its implications for students and families. Education equity research does a better job at reflecting on historical drivers, but the proposed remedy of choice does not situate this approach in the multi-scalar reality of

families' lived experiences. Further, by de-emphasizing investments in neighborhood schools, choice policies complicate the ease with which students can reach high-quality schools, exacerbating disparities across demographic groups, limiting the potential benefits of active travel, and forcing trade-offs in other household decisions.

Taken together, these bodies of work reveal the “uneven mobilities” endemic to school travel in systems of school choice. A mobility justice framework bridges transportation and education equity and points to coordinated cross-disciplinary research. The framework challenges scholars and practitioners to simultaneously consider the five types of justice outlined above. Mainstream approaches emphasize the extent to which access to transportation or school infrastructure better distribute benefits and reduce harm to disadvantaged communities (distributive). Yet they spend less time addressing the structures of decision making around school siting or choice policies and transportation to school (deliberative and procedural) and even less time grappling with the cumulative harm that communities of color and low-income communities experience because of policies in both domains (restorative). The lack of coordinated practice across transportation and education sectors illustrates and reinforces the gaps of understanding across sectors and scales (epistemic).

The mobility justice framework suggests that taking up these five dimensions of justice will result in attention to not only the concerns about material movement—mode, cost, frequency, speed, and distance—which the literature addresses, but also to the “represented meanings” and “experienced practice” of school travel (Cresswell, 2010, p. 21). Certainly, the studies described above begin to reveal differences in the conditions that shape these experiences. But to truly understand the embodied practice of travel to school, planners must give young people and parents “priority as ‘data’” (*Untokening 1.0 — Principles of Mobility*

Justice, n.d.) and learn about their street-, neighborhood-, and transit-level experiences. Bell (2007, 2009a, 2009b) offers a helpful approach in her study of parents and school choice in Detroit. Her findings challenge a narrow definition of travel behavior, as she argues that parents' geography of schools is more than "distance and commute time. It is also neighborhood and community" (Bell, 2009b, p. 493). Her analyses reveal how persistent structural inequalities, memory, and the psychological impact of these inequalities shape what parents see as available choices in ways that traditional policy approaches do not necessarily consider.

Mobility justice also highlights additional research methods, such as time–space diaries, "mobile ethnography," documenting the "atmosphere of place" and the affective and performative dimensions of movement, and the use of objects to study the "development and active performances of memory" (Sheller & Urry, 2006, pp. 217–218). Mixed-methods and multidisciplinary approaches will help clarify the nexus of school and transportation decision making within families and how these decisions could inform district design and implementation of choice and transportation systems. Further, new questions emerge that center the student and family experience of school travel in systems of choice: namely, the physical health, mental health, social, and educational impacts of different kinds of trips and other policy domains—housing, environmental health, policing—that shape the conditions of school travel. Below, we reflect on three specific areas for planners in school districts and other public agencies to consider.

Mobility justice challenges school district leaders to think about systems designed for access to schools, not just access to information

School choice policies as a pathway to equity rely on parent decision making as the key lever of change. Of course, school districts understand that dispersing students districtwide through

choice means complicated travel logistics. Yet districts often focus their resources on maximizing access to information, designing transparent and centralized enrollment protocols, and disseminating information (Gross & Campbell, 2017; *MIT School Access and Quality Summit*, 2018; Schneider et al., 2000). These approaches do not sufficiently grapple with how and why families make choices, the extent to which they consider transportation logistics and travel experience, and the unevenness of these experiences.

The mobility justice framework challenges school district leaders to use other approaches. One example is school attendance zone design. Catchment areas affect students' travel, access to resources, and exposure to different people and experiences. Traditional district analyses use metrics like school capacity, utilization, and condition. These approaches center the building rather than the student. Recalling Cresswell (2010), asking young people questions about the burdens of travel to school (material movement), the perception of one school versus another or of particular modes of travel (representational meanings), and their fears and joys during school travel (experienced practice) disrupt typical analyses. A mobility justice framework also calls for a deep engagement with history to achieve restorative justice. When designing school attendance zones, a district reckoning with the history, benefits, and burdens of (de)segregation may balance school travel and student composition differently than if they were only looking at present conditions. A district committed to deliberative and procedural justice would center the voices of students most harmed by segregation in making these decisions. A district pursuing epistemic justice would structure a process wherein decisions are intertwined with policies of neighborhood and metropolitan segregation, even if those boundaries transcend school district jurisdiction.

Mobility justice clarifies the broader implications of school choice by refusing to look away from the racial implications of forecasts

Planners rely heavily on land use forecasts to evaluate future infrastructure adequacy. State demographers produce aggregate county-level forecasts often used by others (e.g., Smith et al., 2013). The most sophisticated regional agencies maintain land use simulation models that allocate future population and employment to small areas (e.g., parcels, tracts, or transportation analysis zones) and serve as inputs to travel demand models. School choice complicates the veracity of this forecasting chain in ways that have not previously been appreciated. Addressing the complications is not straightforward because of major data limitations.

Land use models often include measures of school quality that are coded at the neighborhood level. They have been shown to have an outsized influence on locational preferences (e.g., Kortum et al., 2012; Zhou & Kockelman, 2008). With a weak or nonexistent link between residential and school location in systems of choice, urban land values and thus location choices may shift in ways that extant models cannot anticipate. Further, neither race nor ethnicity is typically used as an explanatory variable in either land use or travel demand models (Karner & Niemeier, 2013) even though some districts have gone to great lengths to ensure racial homogeneity and despite decades of evidence showing racially disparate land-use decisions (Bischoff, 2008; Frankenberg, 2009; Frankenberg et al., 2017; Gobillon et al., 2007; Ihlanfeldt & Sjoquist, 1998). Instead, “colorblind” approaches prevail that either assume current year demographic distributions will remain unchanged or that decisions are made in the model without regard to race so as to not embed discrimination in future year forecasts.

Simply omitting race and ethnicity from modeling does not eliminate the likely effects on people of color. Including racial demographics and modifying existing models to reflect school

choice policies are feasible and would advance multiple justice dimensions but would entail both technical acumen and political will. If an agency decided to pursue this path, it would face challenges requiring original data collection. Much of the necessary data are simply not currently available. There are too few student travel questions in the National Household Travel Survey, too few rigorously collected sources of household decision-making processes regarding school transportation under conditions of choice, and too few administrative data sets capturing variables relevant to student transportation. In some cases, questions about school travel could be added to travel or activity surveys that would be conducted anyway by state or regional transportation agencies, but in others, entirely new survey designs will have to be devised. Location choice models could also be estimated that consider a much broader range of school quality variables than those in the residential neighborhood.

One further complication is that data that are collected are often inaccessible. Individual-level student data are justifiably protected by both Family Educational Rights and Privacy Act of 1974 (FERPA) and subsequent state regulations. These protections extend the timelines of any studies that hope to make use of such data because of the need to obtain appropriate approvals. This is hardly unique to education and transportation, but the issues are particularly stymying when coordination across multiple data sources is required to truly articulate structural challenges and develop viable policy and practice solutions.

Mobility justice elucidates the need for a regional perspective

Regional planning agencies have an important role to play in advancing the conversation on transportation equity and education equity in regions across the U.S. To receive federal funding in urbanized areas greater than 50,000 in population, a metropolitan planning organization

(MPO) must exist in order to coordinate transportation planning efforts (Sciara, 2017). This property makes them a favored level of government for discussing other regional issues.

From an education equity perspective, the power of the region is clear (Holme & Finnigan, 2018). A regional perspective can crystalize disparities in school quality and other areas across political jurisdictions. Even though MPOs have no ability to implement policy solutions that address root causes like regional education finance or measures that mitigate housing discrimination, they can collect data, conduct analyses, and build partnerships across different regional stakeholders. Many MPOs have embraced their role as conversation starters and conveners to address issues of regional importance, often driven by actors from outside the agency (Pastor et al., 2009; Weir et al., 2009). The Denver Regional Council of Governments (DRCOG) has been a leader in this regard, partnering with Denver Public Schools to assess the effects of demographic change on student enrollment and convening events to discuss these issues (Denver Public Schools, 2018). Likewise, the North Central Texas Council of Governments (NCTCOG) analyzes school siting, construction, and access and serves as a convener of local jurisdictions and school districts (*North Central Texas Council of Governments - School Site Planning & Access*, n.d.). While not explicitly informed by questions related to school choice, DRCOG and NCTCOG offer models of action for other MPOs.

Building on and cultivating new research–practice partnerships with school districts, MPOs, local jurisdictions, universities, and think tanks can provide the needed bridge between action-oriented analytics and the realities on the ground.^{iv} A research network supported by public, university, and philanthropic funding could provide much needed comparative work. These efforts could begin to address data concerns, explore the extent to which traditional

transportation data sources can be used to address questions of education equity, and consider how more expansive tools, including qualitative data collection could inform analysis and policy.

A key element of the mobility justice critique of existing perspectives on transportation equity is that they focus too narrowly on questions of distributive justice using readily available travel demand model outputs. Instead, the framework enumerates many different types of justice. These different elements variously embody the need to address gaps in existing knowledge, incorporate uncommon voices into the planning process, and repair prior harms. Given the interplay between residential segregation, school segregation, and upward social mobility, the regional discussion around school choice and quality must be elevated on the MPO agenda.

Education and transportation equity have an obvious affinity. In foregrounding questions of access and accessibility, both fields highlight the often-disparate landscape of opportunity faced by historically marginalized groups. They both complicate simplistic evaluations looking only at commute distances or dividing groups based on a single characteristic. To evolve, closer integration is required. In that integration, substantial complexity emerges that must be resolved to achieve progress towards the public education goals highlighted at the beginning of this article—that students have an opportunity to reach their full potential through high quality educational experiences that they can reach affordably, reliably, and safely.

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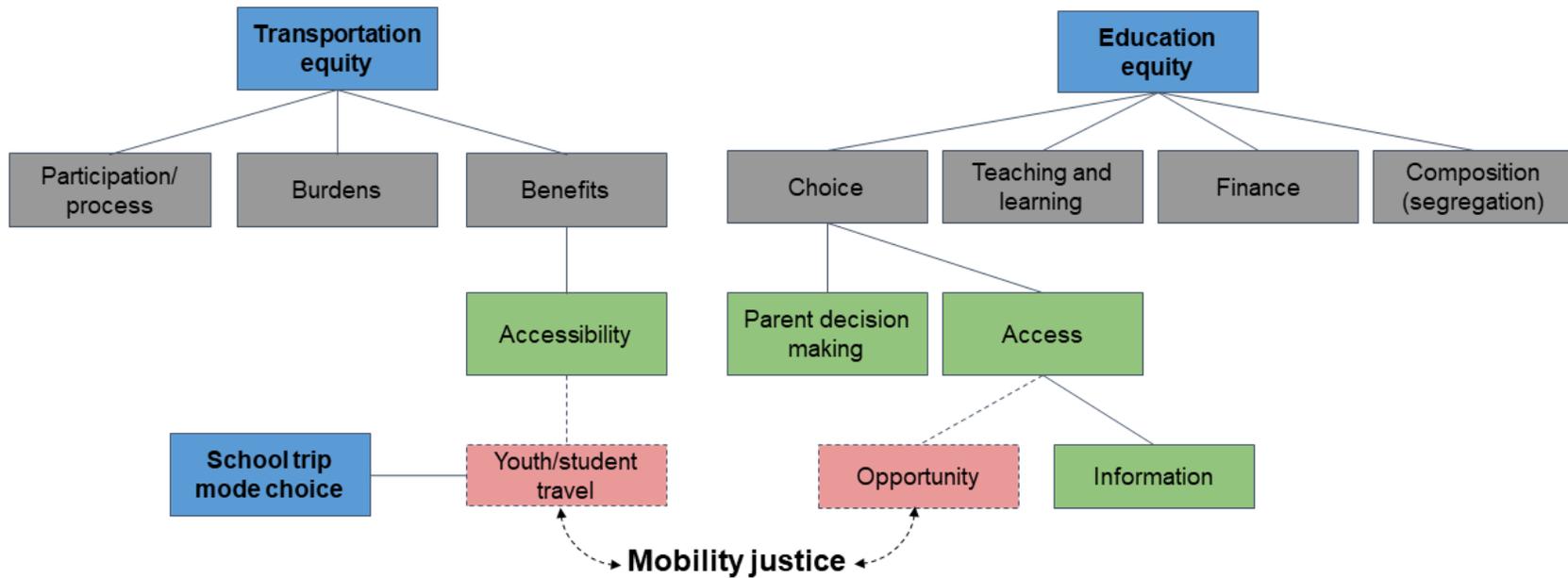
ⁱ For a recent review on school travel and choice including international contexts see (C. Makarewicz, 2020). See also (Kek et al., 2019; Malmberg et al., 2014; Mandic et al., 2017) for studies on school choice and transport in Sweden and New Zealand.

ⁱⁱ See e.g., The Robert Wood Johnson Foundation's Active Living Research (*Active Living Research: A National Program Report*, 2015) and the Safe Routes to Schools Program (Safe Routes Partnership, n.d.).

ⁱⁱⁱ Many of these appear in the gray literature, motivated by conundrums that practitioners and policy makers face. For example, in 2018, the Urban Institute launched the Student Transportation and Educational Access project, and produced working papers based on data from Denver, Detroit, New Orleans, New York City, and Washington, D.C. (Blagg, Chingos, et al., 2018; *Student Transportation and Educational Access*, 2018).

^{iv} Similar partnership efforts have been successful in other regional planning forums (e.g., Karner et al., 2014; Marcantonio & Karner, 2014).

Figure 1: Schematic map of the mobility justice framework with respect to transportation and education equity



Legend		
	Broad research area	 Components discussed in this review
	Specific components	 Gap areas
		 Existing connections
		 Weak/nonexistent connections

Table 1. Summary of school travel literature and equity analyses

Citation	Geog.	Sample size	Data	Age Group	Modes				Equity Indicators							Major findings	
					W	B	T	S	A	R	I	FR	St	FB	N		C
School choice focused																	
Krizek et al. (2014)	St. Paul, Minn.	NA	Emissions modeling	Grades K-6	x			x	x	x					x	Emissions and costs increase with school choice policies	
Scott and Marshall (2019)	Philadelphia	NA	Spatial modeling	Grades 9-12			x								x	x	Travel to school by transit takes 2x longer than by car limiting capacity for choice
Wilson et al. (2007)	St. Paul, Minn.	NA	Emissions modeling	Elementary	x	x		x	x						x	Students in city-wide school walk 6x less and have 4.5x more VMT, cost, and emissions compared to neighborhood school; school busing increases system costs more in choice systems	
Wilson et al. (2010)	St. Paul & Roseville, Minn.	1,216 parents	Original survey	Grades K-6	x			x	x	x	x		x		x	Mode and attitudes differ by school type, income, and race; low-income and students of color use bus more	
Yang et al. (2012)	Eugene, Ore.	1,123	Original survey	Grades K-5	x	x			x	x	x				x	School choice increases travel distance and driving to school; no association with race/ethnicity, middle incomes walk/bike more	
Zuniga (2012)	Denver	65 parents	Interviews	Elementary	x	x				x	x				x	School choice increases travel distance and driving to school; no association with race/ethnicity, middle incomes walk/bike more	
Walking/biking focused																	
Banerjee et al. (2014)	Los Angeles	104	Interviews	Grade 5	x	x				x					x	Inner-city Latino children have more concern for social environments than physical; and avoided walking routes with dangerous objects, gangs, and traffic	
Boarnet et al. (2005)	S. Calif.	1,124 parents	Original survey	Grades 3-5	x	x				x	x					SRTS projects along travel route increase walking/cycling; no diff by race ethnicity	
Clifton (2003)	US	4,344 trips	NPTS	Age 13-18	x	x	x	x	x							Teens with drivers licenses more likely to drive to and participate in after school activities; teens without car access may have limited destinations available	
Ewing et al. (2004)	Alachua County, Fla.	709	RTS/STS	Grades K-12	x	x		x	x		x				x	Income and car ownership associated with less walking; shorter walk and bike times lead to more walking and biking	

He (2011)	S. Calif.	3,646	RTS	Grades K-12	x	x	x	x	x	x	x	x	School quality has little impact on mode choice; Latino students less likely to drive, older students and higher income more likely to drive; distance highly predictive of mode choice
McDonald (2006)	US	34,593	NHTS	Age 0-18	x	x	x	x	x	x			Low-income children and children of color traveled less and less often for social or recreational trips
McDonald (2007a)	Alameda County, Calif.	614	RTS	Age 5-18	x				x	x		x	Social cohesion predicts walking; Black students less likely to walk in Black neighborhoods
McDonald (2007)	US	Varies by survey	NPTS/NHTS	Age 5-18	x	x			x	x			Walking/biking declined from 41% to 13% of trips between 1969 and 2001, half of which can be attributed to increasing distance; low-income students and student of color more likely to walk/bike
McDonald (2008a)	US	14,533	NHTS	Age 5-18	x	x			x	x		x	Low-income, Black, Latino students walk more, but racial differences vanish when controlling for income; Blacks and Latinos live closer to school
McDonald (2008b)	US	8,231	NHTS	Age 5-18	x	x			x	x		x	Young children less likely to walk or cycle when mother commutes in morning; Latino students odds walking/cycling still higher
McDonald et al. (2011)	US	Varies by analysis	NPTS/NHTS	Grades K-8 and K-12	x	x	x	x	x	x		x	For K-8 students, less walking with increasing distance; white, immigrant, low-income, and zero vehicle households walk/bike more; concern with weather and crime decreases walking/biking
McDonald et al. (2014)	DC, Fla., Tex., Ore.	801 schools	Original survey	Grades K-12	x	x			x		x	x	Students walk more after SRTS interventions; only higher prop of FRL associated with more walking
McMillan (2007)	S. Calif.	1,128 caregivers	Original survey	Grades 3-5	x	x			x	x		x	Convenience, social interaction, family approval associated with walking/cycling and matter more than built form; determinants vary by SES
Rodriguez and Vogt (2009)	Michigan	1,897	Original survey	Grades 3-5	x								Odds of walking decline with distance, increase with perceptions that walking is safe and saves time. No discussion of variation across socioeconomic status or neighborhood type

Schlossberg et al. (2005)	Bend, Ore.	104	Original survey	Middle school	x	x								Convenience, schools requirements, urban form, and personal safety are barriers to walking to a school located at the urban fringe
Schlossberg et al. (2006)	Oregon	287	Original survey	Grades 6-8	x	x			x	x				Distance strongly predictive of walking and cycling; convenience and attitudes are important predictors; no analysis by race or income
Seraj et al. (2012)	S. Calif.	1,000	NHTS add-on	School age	x	x			x	x				Attitudes toward children walking and cycling varies by race and income; familiarity with alternative modes yields fewer negative attitudes
Yang and Markowitz (2012)	Eugene, Ore.	1,197	Original survey	Grades K-5	x	x					x			Low-income children with low positive attitudes toward active travel were more likely to walk/bike; for high-income families, low car attitudes predicted walking/cycling
Yarlagadda and Srinivasan (2008)	SF Bay Area, Calif.	4,352	RTS	Age 0-18	x	x	x	x	x	x	x	x		Travel to and from school varies by race and flexibility of parents' work schedules; students are less sensitive to distance coming from school; joint decisionmaking includes household members besides parents
Other modes														
Carlson et al. (2014)	Baltimore, DC, Seattle	294	Original survey	Age 12-15										In a predominately high SES sample, parents who believe pedestrian environment is safe are more likely to walk/bike; psychosocial barriers hinder walking/biking; no examination across race or SES
Das and Fang (2015)	Minneapolis	2,453	Original survey	Grades 9-12			x		x	x	x		x	Free transit pass reduced number of days absent controlling for race/ethnicity but did not influence GPA
Gottfried (2017)	US	14,370	ECLS	Grade K			x		x	x		x	*	Students taking school bus less likely to be absent and have chronic absenteeism controlling for race, household structure, and student experiences
He (2013)	S. Calif.	1,320	RTS	Age 5-18					x	x		x		Parental employment (especially the mothers') is most significant influence on escorting to school; low-income children more likely to be escorted by others or travel independently; mode specific effects not analyzed

McDonald and Aalborg (2009)	East SF Bay Area, Calif.	432 parents	Original survey	Age 10-14		x	x		Parents cite convenience as most common reason for driving to school, "stranger danger" is number one single reason
McDonald et al. (2004)	SF Bay Area, Calif.	1,073/1,234	Original surveys	MS/JHS & HS		x		x	Free transit pass increased bus ridership and after-school participation but not attendance after one year; high variation in transit use to school across race because of parent perceptions of safety and supervision
Vovsha and Petersen (2005)	Atlanta	3,810 school tours	RTS	Age 0-18		x		x	Women are 2.5-3x as likely to escort children to school compared to men but most children are unescorted; fewer characteristics predict escorting back home, highlighting different needs to and from school

Abbreviations: W = Walk, B = Bike, T = Transit, S = School Bus, A = Auto; R = Race/ethnicity, I = Income, FR = Free and reduced lunch, St = Household structure, FB = foreign-born status, N = Neighborhood context; Ch = School choice; RTS = Regional travel survey, STS = Statewide travel survey, NPTS = Nationwide Personal Transportation Survey, NHTS = National Household Travel Survey, ECLS = Early Childhood Longitudinal Survey; MS = Middle school, JHS = Junior High School, HS = High school, K = Kindergarten

Note (*): Variable was English-language learner

Table 2. Summary of select studies on school choice decision factors

Citation	Geography	Sample Size	Data	Academics (class size, outcomes)	Student composition	Distance	Transportation access	Safety	Neighborhood condition or composition	Other
(Altenhofen et al., 2016)	Denver, CO	500	Survey interviews	✓		✓		✓		
(Bell, 2009b)	Detroit	36	Interviews	✓		✓	✓	✓	✓	✓
(Denice & Gross, 2016)	Denver	14,000	Student applications	✓	✓	✓				
(Glazerman & Dotter, 2017)	Washington, DC	22,000	Student applications	✓	✓	✓	✓			
(Harris & Larsen, 2015)*	New Orleans	31,000	Student applications	✓		✓	✓			✓
(Harris & Larsen, 2017)*	New Orleans	33,000	Student applications	✓		✓	✓			✓
(Hastings et al., 2005)	Mecklenburg County, North Carolina	37,000	Student applications	✓	✓	✓	✓			
(Kleitz et al., 2000)	Texas	1,100	Survey	✓		✓		✓		✓
(Jane A. Lincove et al., 2018)	New Orleans	892	Student applications	✓		✓				✓
(Pattillo, 2015)	Chicago	77	Interviews	✓			✓			✓
(Saporito, 2003)	Philadelphia	11,000	Student applications	✓	✓			✓		
(Schneider & Buckley, 2002)	Washington, DC	2,300	User searches	✓	✓	✓			✓	
(Shaw & Northern, 2013)*	National	2,000	Survey	✓	✓					✓
(Stein et al., 2011)*	Indianapolis	1,569 1,050	Survey Student academic records	✓				✓	✓	
(Teske et al., 2009)	Denver and Washington DC	600	Survey	✓		✓	✓			

Other includes extracurriculars, siblings, school facilities

** Indicates non-peer reviewed grey literature*