Literature Search 619: Improving transportation equity for all by centering the needs of marginalized and traumatized communities
Tuesday, June 9, 2020

Prepared for: Brent Rusco

Prepared by: Jim Byerly, Electronic Resources Librarian

Resources searched: Transport Database, Web, MnDOT Library Catalog

Summary: Results are compiled from the databases named above. Links are provided for full-text, if applicable, or to the full record citation. I completed my searches using the following terminology: equity, equality, justice, marginalized, and health. The results are divided into most relevant and less relevant.

Most Relevant Results

Homelessness, travel behaviour, and the politics of transportation mobilities in Long Beach, California
JOCOY, C L; DEL CASINO, V J

Abstract. The geography of homelessness is described. It is often characterized as containment in marginalized spaces of cities or as placelessness necessitating continuous relocation. These characterizations, which reflect discourses about ‘the homeless’ as an imagined deviant homogeneous group, have had substantial effects on policy formation in urban governance. Suggested policy responses frequently assume straightforward relationships between power/powerlessness and mobility/immobility binaries that do not appropriately portray actual mobility patterns of homeless individuals. Through focusgroups and structured interviews, this study examines the daily mobility of homeless adults in Long Beach, California, to identify the ways in which the everyday travel of homeless individuals compares with these imagined characterizations and with national US household travel patterns. Results show that homeless mobility is highly spatially constrained and structured by sociocultural relations of stigmatization, economic productivity, and personal responsibility that are reflected in the operational conventions and institutional practices of transportation and social welfare systems. Nonetheless, during the course of a day, homeless individuals move among spaces where they experience varying levels of inclusion and exclusion, complicating static, homogeneous characterizations. This analysis contributes to both the urban transport and social geography knowledge by demonstrating the value of combining sociocultural approaches to the study of mobility with more typical transportation geography analyses of individual travel behavior.

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Explorations into the Equity Dimensions of Bicycle Sharing Systems

Abstract. Research over the past several decades has made it increasingly clear that livable communities are inextricably linked with the provision of opportunities for active and/or non-motorized transportation; i.e., walking, cycling and their variants. An emerging phenomena that is working within the broader movement of active transportation is public bicycle sharing systems (BSS). Such systems have grown considerably in the US in recent years and, in some cases, are
dramatically changing the ecology of urban transport. Alongside celebrations of the early successes of US BSS, have been criticisms that these systems have not been adequately integrated into lower-income communities; a pattern that mirrors (motorized) transportation injustices—both past and present—that have burdened lower-income while simultaneously advantaging middle to higher-income communities. And while diverse communities are embracing non-motorized transportation, there is valid concern that traditionally underserved populations will again be marginalized or unable to share in the full benefits of existing and future bicycle- and pedestrian-oriented infrastructure including BSS. This research explores the spatial arrangements and allocations of US BSS and examines the extent to which lower-income communities experience differential access to bike-sharing infrastructure. Spatial regression models are employed to examine the degree to which race, ethnicity and/or economic hardship explain variations in the distribution of bike-sharing stations.


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The Cost of Equity: Assessing Transit Accessibility and Social Disparity Using Total Travel Cost
El-Geneidy, Ahmed; Levinson, David; Diab, Ehab; Boisjoly, Geneviève; Verbich, David; Loong, Charis

Abstract. Social equity is increasingly incorporated as a long-term objective into urban transportation plans. Researchers used accessibility measures to assess equity, such as determining the amount of jobs reachable by marginalized groups within a defined travel time threshold and compare these measures across socioeconomic groups. However, allocating public transit resources in an equitable manner is not only related to travel time, but also related to the out-of-pocket cost of transit fares, which can represent a major barrier for many disadvantaged groups. Therefore, this research proposes a set of new accessibility measures that incorporates both travel time and transit fares. It then applies those measures to determine whether the level of transit accessibility of residents of socially disadvantaged neighborhoods in Montreal, Canada. Results are presented in terms of regional accessibility and trends by social indicator decile. Travel time accessibility measures estimate a greater number of jobs that can be reached compared to combined travel time and cost measures. However, the degree and impact of these measures vary across social deciles. Compared to other groups in the region, residents of socially disadvantaged areas have more equitable accessibility to jobs using transit; this is reflected in smaller decreases in accessibility when fare costs are included. Generating new measures of accessibility combining travel time and transit fares provides more accurate measures that can be easily communicated by transportation planners and engineers to policy makers and the public since they present measures in monetary values.

Monograph Title: TRB 95th Annual Meeting Compendium of Papers
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Space–time mismatch between transit service and observed travel patterns in the Wasatch Front, Utah: A social equity perspective
Farber, Steven; Ritter, Benjamin; Fu, Liwei

Abstract. In the absence of other alternatives, people who rely on public transportation to conduct their daily activities have travel patterns that differ from discretionary transit users, especially those who choose to use transit for work trips. At the same time, in many regions around the world, public transportation is primarily designed to accommodate peak-hour travel demands in order to reduce congestion and its impacts. It is theorized that this results in a mismatch between the demand and supply of public transportation among populations at risk of social exclusion. In this research, the authors characterize and compare the spatiotemporal patterns of travel demand and transit supply. Their analysis consists of a comparison between observed travel patterns and a new temporal measure of transit supply based on travel times. They measure travel demand with the observed trip-making characteristics (i.e. origin, destination, time-of-day) of the respondents to two transportation surveys conducted in Utah. Transit supply is characterized using a transit travel time cube, a three-dimensional array of origin–destination transit travel times computed for all origins, destinations and times of day. Mismatch is examined by descriptive and multivariate comparisons of observed trips and computed levels of transit provision. The authors' results confirm theory: more marginalized groups demand travel between locations at times of the day that are poorly served by transit. However, when controlling for all variables simultaneously in a multivariate regression, few socioeconomic factors remain significant, indicating the overall importance of employment status, making work trips, and traveling during peak times, in explaining mismatch.

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research proposes a set of new accessibility measures that incorporates both travel time and transit fares. It then applies those measures to determine whether people residing in socially disadvantaged neighborhoods in Montreal, Canada experience the same levels of transit accessibility as those living in other neighborhoods. Results are presented in terms of regional accessibility and trends by social indicator decile. Travel time accessibility measures estimate a higher number of jobs that can be reached compared to combined travel time and cost measures. However, the degree and impact of these measures varies across the social deciles. Compared to other groups in the region, residents of socially disadvantaged areas have more equitable accessibility to jobs using transit; this is reflected in smaller decreases in accessibility when fare costs are included. Generating new measures of accessibility combining travel time and transit fares provides more accurate measures that can be easily communicated by transportation planners and engineers to policy makers and the public since it translates accessibility measures to a dollar value.

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Accessibility Scenario Analysis of a Hypothetical Future Transit Network: Social Equity Implications of a General Transit Feed Specification–Based Sketch Planning Tool
Guthrie, Andrew; Fan, Yingling; Das, Kirti Vardhan
Abstract. Accessibility analysis can have important implications for understanding social equity in transit planning. The emergence and the increasingly broad acceptance of the general transit feed specification (GTFS) format for transit route, stop, and schedule data have revolutionized transit accessibility research by providing researchers with a convenient, publicly available source of data interoperable with common geographic information system (GIS) software. Existing approaches to GTFS-based transit analysis, however, focus on currently operating transit systems. With major transit expansions across the nation and around the world increasing in number and ambition, understanding the accessibility impacts of proposed projects in their early planning stages is crucial to achieving the greatest possible social benefit from these massive public investments. This paper describes the development of a hypothetical transit network based on current GTFS data and proposed 2040 transit improvements for the Twin Cities region of Minneapolis–Saint Paul, Minnesota, as well as its use as a sketch planning tool in exploring the proposed system’s impacts on access to job vacancies from historically disadvantaged areas. This research demonstrates the importance of accessibility analysis in planning a transit system that increases opportunity for marginalized workers and concludes by calling for broader, easier access to accessibility analysis for practitioners and community groups to refine the early stages of the transit planning process and democratize an increasingly crucial transit planning tool.
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Public transit fare structure and social vulnerability in Montreal, Canada
Verbich, David; El-Geneidy, Ahmed
Abstract. Research on social equity pertaining to transportation typically addresses how residents in a region have access to desirable destinations. Nonetheless, little is known about how public transit fare structures relate to social equity concerns. Some transit agencies charge more for fewer rides—weekly fares often cost more per ride than unlimited monthly fares, though monthly fares cost more upfront. For some social groups, in particular low-income earners, purchasing monthly passes may place a burden on their budget, and influence them to buy weekly passes instead. In this study, the authors analyze transit fare purchases of total monthly, weekly, and three or more weekly
passes during the month of September 2014 in Montreal, Canada. The authors discovered that fare vendors in neighborhoods with low median household income and/or with a high proportion of unemployed residents are predicted to sell more weekly fares than vendors in neighborhoods with high household income and low rates of unemployment. Monthly fare purchases were not dependent on income or unemployed residents. Moreover, using smartcard data to track individual fare cards, the authors found that recurring purchases of three or more weekly passes depend on income and unemployment, so neighborhoods with socially vulnerable individuals are predicted to have more riders purchasing multiple weekly fares than socially secure neighborhoods. The authors’ findings indicate that individuals residing in marginalized neighborhoods are likely to spend more money on transit fares over the course of a month compared to those residing in wealthy neighborhoods. These findings raise concerns regarding the financial burden that the existing fare structure in the city of Montreal imposes, especially on low-income groups. The methodology and findings from this study provide insight for transport planners, particularly those concerned with providing an equitable public transit system.

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Opening the door to social equity: local and participatory approaches to transportation planning in Montreal
Boisjoly, Geneviève; Yengoh, Genesis T

Abstract. PURPOSE: Transportation systems play a key role in providing individuals with a diversity of means to access their desired destinations and have significant impacts on their quality of life. The social perspective of mobility is, however, marginalized in the current model of transportation planning and significant changes are called for. This study aims to identify the barriers and opportunities of local participatory approaches to trigger changes in transportation planning in Montreal, drawing on the concept of social learning. METHODS: A case study approach is selected and the participatory processes of two Local Transportation Plans (LTPs) are analysed. Data is collected through document analysis and semi-structured interviews with local transport planners and representatives of community groups. A qualitative content analysis is conducted to assess the outcomes of public participation, the quality of the processes and the perspectives of participants. RESULTS: The results highlight the narrow contribution of the participation of local communities and community groups in the development of LTPs. Furthermore, the participatory process assessed in this research allows for a limited integration of social aspects in the planning process. The main barriers lie in the broader planning context and the organizational structure at the borough level as well as the lack of expertise of the community groups. Nevertheless, LTPs provide a window of opportunity for addressing transport-related social aspects. CONCLUSION: In order to take advantage of this opportunity and foster social learning towards the desired changes, the process requires the inclusion of clear social equity goals at the metropolitan level. Furthermore, the presence of a skilled facilitator is key to support the integration of diverse perspectives on transportation planning. It is also essential to provide community groups with resources to meaningfully participate in the process, thereby promoting social equity. In sum, LTPs have the potential to further include the social dimension of transport, but further steps are required to foster an equitable and sustainable transportation system. This research is of relevance to researchers and planners wishing to better understand the challenges associated with participatory processes and social equity in transport planning.

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Exclusion and vulnerability on public transit: experiences of transit dependent riders in Portland, Oregon
Lubitow, Amy; Rainer, Jennifer; Bassett, Sasha

Abstract. In urban areas, the inequitable distribution of transit systems and services has been shown to reproduce safety and environmental risks – potentially exacerbating preexisting inequities. Thus, how vulnerable populations access and utilize public transportation is of critical concern to urban scholars. This paper utilizes focus group data to explore how transit-dependent (particularly low-income) riders engage with the public transit system in Portland, Oregon. The authors illustrate specific ways in which transit-dependent riders experience marginalization and exclusion. They find that certain groups, particularly mothers with young children and those with disabilities are not well served by a public infrastructure oriented toward an ‘ideal rider’ who is an economically stable, able-bodied, white, male commuter. The authors conclude that a public infrastructure meant to serve all riders equitably, yet which fails to consider the unique experiences of marginalized transit users risks further amplifying existing social vulnerabilities and reinforcing gender, racial, and class inequalities.

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Social justice implications of municipal transportation apportionments in Massachusetts: A case of disparate impact
Pasha, Obed

Abstract. The question of how social justice interacts with transportation has inspired a long-standing and partisan debate in the U.S., mostly focusing on social exclusion and inequitable distribution of resources. This study adds to this literature by empirically analyzing the extent to which municipal transportation apportionments in Massachusetts put marginalized groups at a disadvantage. An analysis of seven-year data of 351 municipalities in Massachusetts receiving reimbursable grants through the Massachusetts Department of Transportation's Chapter 90 program show that municipalities with a higher percentage of non-white individuals received less apportionment through the program. While these disparities exist for African-American, Asian, and Hispanic populations, they are found to be incidental, not deliberate. Lagged effects show that Massachusetts is investing in municipalities with higher percentage of marginalized individuals to reduce this historic resource gap. Theoretical and practical implications of the findings are discussed.

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Understanding the Accessibility, Economic and Social Equity Impacts of Urban Greenway Infrastructure
Liu, Jenny Hsing-I; Shi, Wei

Abstract. "City Greenways" is a concept proposed as a part of Portland's 2035 Comprehensive Plan, which calls for a citywide network of park-like pedestrian and bicycle friendly streets crisscrossing the city at roughly three-mile intervals. This research establishes several approaches to measure the transportation network impact of the "City Greenways" and relate bicycle network measures to economic and social equity outcomes. Expanding upon existing literature, the authors
derived three sets of bicycle accessibility measures (BAMs). They are distance-based BAM, destination-based BAM, and low-stress network-based BAM, which incorporate different components of a comprehensive bicycle network. The distance-based BAM measures accessibility of the active transportation infrastructure via a proximity measurement; the destination-based BAM measures the ease of access to the closest five important employment, retail, service and parks/recreation destinations; and the low-stress network-based BAM measures the comfort levels and willingness to use active transportation modes as a travel option, incorporating bicycle level of stress factors to determine the overall accessibility of the urban greenway network. The three sets of defined BAMs were applied to Portland’s current (2016) and proposed 2035 scenarios. The authors found that after the implementation of Portland’s “City Greenway” network, all three sets of BAMs showed improvements in accessibility compared to the existing network, although at varying degrees. The improved urban greenway network not only decreased the travel costs of active transportation due to well-connected network and higher comfort and safety levels of cycling, it would also provide increased accessibility to important destinations at lower stress levels within the same distances. Next, the authors explored the relationship between the bicycle accessibility levels of the urban greenway network and economic indicators. The authors found positive correlations between two BAMs (distance-based BAM and low-stress network-based BAM) with the number of jobs that are located in each census block. The low-stress network based proximity BAM appears to be the more preferred measure, due to the statistically significant correlations that the authors found. In addition, the hedonic price model indicated that higher BAM scores were associated with higher property values, particularly for multi-family homes. In general, better BAMs were associated with higher levels of economic activities. The spatial equity analysis examined the how bicycle accessibility is distributed across the metropolitan area and amongst identified historically marginalized communities (including communities with higher populations of people of color, low-income, limited English proficiency, older adults and younger persons), and how the proposed 2035 City Greenways plan might impact these communities differently. The authors found that the 2035 City Greenways plan, as measured through BAM slightly favor the disadvantaged population. While the distance-based BAM showed significant improvements in accessibility for many of the transportation-disadvantaged communities, the low-stress network-based BAMs showed tempered improvement in these communities. These results indicated that while residents might be better able to access the urban greenway network as more bicycle infrastructure was built, it did not necessarily translate into better access to important destinations without complementary economic development and land use policies expansion along the transportation infrastructure. It also underscores the importance of complementary economic development and land use policies that expand the spatial distribution of important destinations while investing in urban greenway infrastructure or other transportation network improvements.

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Analysis of the Georgia Add-on to the 2016-2017 National Household Travel Survey

Abstract. The objective of this research is to illuminate the impacts of new technologies and emerging trends on travel demand in Georgia, while paying particular attention to those potentially marginalized by such trends. To do this, the research team proposes to conduct a number of analyses of the 2016-2017 Georgia add-on of the National Household Travel Survey (NHTS), issuing a series of reports addressing the various topics to be investigated.

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Autonomous Vehicle Heaven or Hell? Creating a Transportation Revolution that Benefits All
Creger, Hana; Espino, Joel; Sanchez, Alvaro S

Abstract. This report looks at autonomous vehicles and equity issues. The authors interviewed stakeholders, conducted surveys, and used information from a literature review to examine the impacts of electric, shared, and autonomous vehicles. Policy recommendations are made which avoid personally-owned autonomous vehicles and instead focus on fleets of shared electric autonomous vehicles that provide mobility for all people, including marginalized people, while also decreasing congestion, improving accessibility, and reducing air pollution and greenhouse gas emissions.

http://greenlining.org/publications/2019/autonomous-vehicle-heaven-or-hell-creating-a-transportation-revolution-that-benefits-all/

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Making Bicycling Equitable: Lessons from Sociocultural Research
McCullough, Sarah Rebollosi; Lugo, Adonia; van Stokkum, Rebecca

Abstract. This white paper provides guidance for how planning, policy, and advocacy may better account for complex sociocultural forces, including gender, class, and race. The authors reviewed a large body of sociocultural research on bicycling with complex models capable of addressing an intersectional understanding of identity, the innerworkings of power in society, and the nature of inequity. These findings coalesced into four recommendations for those promoting bicycling as a mode of everyday transportation: (1) Extend what it means to embrace difference; (2) Recognize that the streets are not equally safe for all; (3) Engage in a meaningful way with marginalized communities and share decision-making power; and (4) Understand how local and national histories of injustice influence and relate to current bicycling planning processes. Integrating these recommendations into advocacy, policy, and planning can lead to greater equity in representation, distribution of resources, and decision-making in promoting bicycling. System-wide implementation of these recommendations will create the greatest impact on improving issues of equity, diversity, and inclusion in bicycling. This requires broad-scale interventions, including but not limited to, training, changes to funding and decision-making structures, valuing long-term community engagement and community knowledge, broadening measures to street safety, and considering historic inequality.

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Impact of Transformational Technologies on Underserved Populations

Abstract: Changes in technology provide opportunities and risk to mobility, particularly as it relates to traditionally and newly underserved populations. In recent years, economic, environmental, and social forces have quickly given rise to shared and on-demand mobility—a collective of entrepreneurs and consumers leveraging technology to maximize transportation and financial resources and generate capital. For instance, shared mobility services have become part of a sociodemographic trend that has pushed shared, on-demand mobility from the fringe into the mainstream. These services have included micromobility options, such as electric scooters and bikesharing in different forms (station-based systems, dockless systems, and bikes that are traditional or electric-assist); car-based services have included carsharing with either station-based or one-way (Car2Go) service models; ridehailing services such as Lyft and Uber; and peer-to-peer carsharing services such as Getaround and Turo. Many transportation agencies and transport companies are updating existing or developing new mobility tools to improve the transportation experience and to enhance access and mobility, including mobile fare payment apps; multimodal trip planning apps; real-time information apps; and shared mobility apps. Many of the new mobility tools, however, require smartphone ownership or mobile bank accounts, so not everyone is included in this technology revolution. There are concerns that new and emerging technologies and modal alternatives will exacerbate the disparity between the have and have nots, further isolating growing numbers of diverse populations. Rural areas and tribal reservations may lack even basic cell phone services and be excluded from accessing such services. According to the Pew Research Center's 2017 data, 23% of U.S. adults in urban areas do not have a smartphone or internet access, and 28% do not have smartphone ownership or can't afford service plans in rural areas. Moreover, many rural areas are deficient in access to broadband services. Lack of smartphone ownership is mainly concentrated on traditionally disadvantaged groups such as minority, seniors, and low income. Also according to Pew, nearly 40 million people in the United States have a disability and "[d]isabled adults are also about 20 percentage points less likely than those without disabilities to say they subscribe to home broadband, or own a traditional computer, smartphone or tablet." According to the Federal Deposit Insurance Corporation (FDIC), 7% of U.S. households are unbanked and an additional 20% are underbanked as of 2015, and thus are economically excluded from mobile financial services. From a transportation perspective, these populations are considered to be underserved. If underserved people's travel information and travel needs are missing from planning data, their travel patterns and needs will not be considered and modeled, which will result in biased projections. Without attention, these populations are likely to be routinely excluded from accessing enhanced mobility through new mobility services and associated technologies, perpetuating historical, institutional disenfranchisement. Research is needed to help public and private entities to assess, plan, and measure their progress toward achieving transportation equity and mobility inclusion in the era of transformational technology. Focusing narrowly on specific technologies and their benefits can enlarge our blind spots with respect to the underserved and with respect to consequences for travelers and others who are not direct users of these technologies. The research is anticipated to have three focus areas: (1) Inclusion of, or equivalent facilitation for, underserved communities to access and use mobility services. (2) Impacts of transformational technologies on mobility accessibility, travel behavior, and travel metrics. (3) Impacts of the lack of infrastructure on access and future financial implications to achieve inclusion (e.g., cell tower coverage in rural areas). The objective of this project is to develop a playbook with guidance on corrective actions with data, methods, and metrics to achieve inclusive mobility. To achieve the objective, it will be necessary to examine how new and existing technology-enabled mobility services impact a community’s capacity to meet the mobility needs of all residents, with a special focus on how a community can ensure traditionally and newly underserved residents will benefit from those technology-enabled mobility services. The playbook and associated products should inform transportation policymakers at planning organizations, and at public and private transportation entities with: Data analysis on the impacts of new technologies on travel behavior; Strategic guidance; Design requirements to inform policy and regulatory options to effect selected strategies; and Recommended metrics and decision-making processes that will evaluate inclusion of the entire population of the state, regional, local, tribal, or territorial service area in accessing technology-enabled mobility services. The guidance should be informed by an understanding of how technology has excluded or marginalized mobility options historically, and should emphasize current initiatives and strategic plans on how to include underserved populations in mobility enhancements including smartphone apps, vehicle automation, and shared on-demand mobility.

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Exploring the Equity Dimensions of US Bicycle Sharing Systems
Smith, C Scott; Oh, Jun-Seok; Lei, Cheyenne

Abstract. Research over the past several decades has made it increasingly clear that livable communities are inextricably linked with the provision of opportunities for active and/or non-motorized transportation; i.e., walking, cycling and their variants. An emerging phenomena that is working within the broader movement of active transportation is public bicycle sharing systems (BSS). Such systems have grown considerably in the US in recent years and, in some cases, are dramatically changing the ecology of urban transport. Alongside celebrations of the early successes of US BSS, have been criticisms that these systems have not been adequately integrated into lower-income communities; a pattern that mirrors (motorized) transportation injustices--both past and present--that have burdened lower-income while simultaneously advantaging middle to higher-income communities. And while diverse communities are embracing non-motorized transportation, there is valid concern that traditionally underserved populations will again be marginalized or unable to share in the full benefits of existing and future bicycle- and pedestrian-oriented infrastructure including BSS. This research explores the spatial arrangements and allocations of US BSS and examines the extent to which lower income communities experience differential access to bike-sharing infrastructure. Spatial regression models are employed to examine the degree to which race, ethnicity and/or economic hardship explain variations in the distribution of bike-sharing stations.

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Riding Tandem: Does Cycling Infrastructure Investment Mirror Gentrification and Privilege in Portland, Oregon, and Chicago, Illinois?
Flanagan, Elizabeth; Lachapelle, Ugo; El-Geneidy, Ahmed
Abstract. Bicycles have the potential to provide an environmentally friendly, healthy, low cost, and enjoyable transportation option to people of all socio-economic backgrounds and demographics. Increasingly, however, the ways in which cycling culture is manifested in North American cities is being questioned on the grounds of transportation equity through concerns over gentrification and the cooption of cycling culture to promote the agendas of the privileged class. This research assesses the geographic distribution of cycling infrastructure with regard to community demographic characteristics to better assess claims that cycling investment arrives in tandem with incoming populations of privilege or is targeted towards neighborhoods with existing wealth. Using census and municipal cycling infrastructure data in Chicago and Portland from 1990 to 2010, the authors create gentrification and cycling infrastructure investment indexes at the census tract level. Linear regression models are used to estimate the extent to which community demographics associated with gentrification and cycling infrastructure investment are related and if community change is a major driver in investment or if existing community characteristics are also involved. In both cities, the authors identify a bias towards increased cycling infrastructure investment in areas of privilege, whether due to an increase in characteristics associated with gentrification or pre-existing conditions. This paper provides evidence that marginalized communities are unlikely to attract as much cycling infrastructure investment without the presence of privileged populations, even when considering population density and distance to downtown, two motivators of urban cycling. To alleviate the continuation of inequitable distributions of cycling investments, it is proposed that planning processes both actively seek out diverse stakeholders and be sensitive to citywide community input and stated needs in future transportation projects, contributing to reinvestment achieved through bottom-up processes of revitalization rather than through the impositions of gentrification.

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