

Route Elimination without Representation?

Assessing the effects of transit board composition on decision making in times of crisis

Project Overview

Transit executives and board members made major transit service changes in response to the global pandemic.ⁱ Some, such as those in Seattle and Miami, implemented consistent, system-wide service cuts. Others, such as those in San Francisco and Portland, increased service to areas with vulnerable riders. Particular transit riders may be vulnerable due to the intersectionality of social characteristics, including race, ethnicity, gender, (dis)ability, and access to a private vehicle. We refer to the presence and influence of members on a transit board who identify with vulnerable riders across these dimensions as “representation.” While transit board representation has been understudied, available data suggest that levels of representation on transit boards varies, and is generally low.ⁱⁱ This project will evaluate the extent to which transit board representation is associated with outcomes that serve the needs of vulnerable riders and essential workers.

During the COVID-19 pandemic, transit executives and board members have struggled to balance the mobility needs of essential workers with concerns about public health, reductions in fare revenues, and high rates of absenteeism among workers as well as increased expenses of protective gear and deep cleaning fleets.ⁱⁱⁱ At the same time, the pandemic highlighted the importance of transit services to essential workers, who are often low-income and transit dependent.^{iv}

Transit executives and boards have exhibited considerable discretion in their reorganization of services in response to the pandemic^v. The majority of research on the topic of public transit and global pandemics uses service and ridership data to identify trends in use and provision of public transit during global health crises.^{vi,vii} Preliminary assessments conducted during the height of COVID shutdowns suggest that many U.S. providers took specific steps to protect or even enhance transit services to low-income and minority neighborhoods, who tend to be the primary users of public transit services in American cities.^{viii}

What remains less clear is how transit board representation and board deliberation processes influenced decisions to reduce, cut or enhance public transit services across localities. Transit governance structure, including the mechanisms by which board members are appointed or elected, likely explains much of the variation in board lack of representation on many transit boards. However, transit governance has received less attention in the field of urban transit, relative to service and ridership outcomes, despite the primacy of governance in shaping transit services, investments and amenities.^{ix} The lack of attention to context and power is indicative of a field that prioritizes technical questions and minimizes concerns with public decision-making.^x Board governance and representation shape policy and operational decisions related to transit and urban transportation^{xi}, but remain undertheorized as causal mechanisms.^{xii}

This project uses a mixed methods research design to understand how board representation shapes deliberation and service allocation decisions for vulnerable communities. We use the period during and immediately following the peak of the COVID pandemic to compare boards’ responses to the same crisis. The approach outlined below centers local institutions and governance rather than treating them as background contexts for the investigation of policy-making^{xiii}. The research is guided by three primary questions: (1) How does representation of vulnerable and transit dependent populations on transit governing boards influence policy decisions? (2) How do transit governing boards integrate or eschew concerns about vulnerable populations during times of crisis? (3) How are concerns about essential workers and vulnerable populations shaping transit provision in the post-COVID period? This research tests several hypotheses:

- H1: Boards with greater representation are more likely to emphasize the needs of vulnerable and transit dependent communities in their policy documents and board discussions.
- H2: Boards with greater representation are more likely to increase service to low-income and vulnerable neighborhoods in response to the pandemic.
- H3: Agencies that emphasize the needs of essential workers are more likely to maintain or increase transit services to low income and minority communities.
- H4: Greater transit board representation was associated with smaller reductions in transit accessibility for essential workers was reduced during the COVID pandemic.

Research Design

To answer these questions, the project utilizes a mixed methods research design that leverages a novel database on transit governance, policy documents of transit agencies, archived transit route and schedule data, and information from the U.S. Census Bureau.

Data

1. *Transit governance database.* We have assembled a novel database about the organizational decision-making structures of transit agencies headquartered within the 40 most populous cities in the continental United States^{xiv}. The unit of analysis is the individual transit agency, as defined by the National Transit Database (NTD). For this analysis, we will focus on the agencies that are the primary provider of transit service within their region, as defined by the number of transit trips provided. These 39 agencies vary considerably in size and in governance structures.^{xv} Oklahoma City's EMBARK, the smallest agency, served 3 million passenger trips in 2019, while New York City's Metropolitan Transportation Authority served 4 billion. In terms of governance, eight of the 39, or 20% operate as city departments with no board of directors. Twelve are controlled by the city, and of those 12 boards, 8 have all members appointed by the central city, with no representation from other entities. Nine are partnerships of local governments, where the central city has no more than a 50% share of votes on a board. In all but one of these regions, elected officials sit on the board ex officio. Four of the 39 are creatures of county governments, with the central city having no more than a 25% share of the board vote. Five of the 39 have the majority of appointments controlled by state governments, and one region directly elects its board members. Through a partnership with the philanthropic foundation TransitCenter, we are conducting a survey to enhance the database with information on the race, gender, zip code, disability status, and travel behavior of board members. We expect to have this data by July 2022 for inclusion in this analysis.
2. *Coded policy documents.* To document agency decision-making during the COVID pandemic, we are assembling publicly available policy documents produced by each agency in the database during the 18 months of the COVID pandemic (Table 1). These policy documents include board agenda and meeting minutes, video recordings of board meetings, presentations, reports and public comments documents. Once assembled, we will code the documents using an iterative protocol that identifies justifications for specific policy actions related to transit service provision, major points of contention and agreement among transit board members regarding COVID policy, the inclusion of community and government stakeholders in decision-making processes, policy trade-offs regarding short vs. long term impacts, and concern with essential workers, transit dependent populations and low-income residents.

Table 1. Document availability, representation, and governance for selected transit boards.

Agency	City	Number of documents discussing COVID service changes (Jan. 20 - Sept. 21) ¹	Percent of board members who are not white	Percent of board members who are female	Presence of a board member with a disability	Entity that appoints majority of board members
MTA	New York	35	14%	19%	Yes	State
LACMTA	Los Angeles	14	36%	43%	Unknown ²	Municipalities
CTA	Chicago	16	83%	17%	Yes	City of Chicago
DART	Dallas	9	40%	27%	Unknown ²	Municipalities
Metro	Houston	23	44%	22%	Yes	City of Houston

1. Documents include press releases, public meeting agendas, and public meeting minutes.

2. Public-facing documents do not indicate that any board members have a disability. We are currently conducting a survey to confirm the disability status of board members.

3. *Archived route and schedule data.* This data will be used to construct our primary dependent variables related to transit service and essential worker accessibility. Almost every transit agency in the United States (and many transit agencies throughout the world) publish detailed route and schedule data in a

common data format called General Transit Feed Specification (GTFS) that can be accessed through OpenMobility’s publicly-accessible archive. An initial analysis of data from Los Angeles, Dallas, and Chicago shows substantial variation in route-level service changes during the first phase of the COVID shutdown (i.e. February and May 2020) both within each agency and among agencies (Table 2). In Los Angeles, specific routes experienced frequency increases as great as 45 percent and decreases as great as 64 percent. In Dallas, reductions were similarly as low as 65 percent, and no route had frequencies increased by more than nine percent. Chicago was noteworthy for maintaining a consistent service level throughout its system. 94 percent of routes had no change in frequency, and no route changed its frequency by more than two percent.

Table 2. Route-level service changes in selected cities

City	Number of routes	Percent of routes with...			Maximum frequency reduction	Maximum frequency increase	Average frequency change
		Increased frequency	Reduced frequency	Unchanged frequency			
Los Angeles	133	5%	81%	14%	64%	45%	-25%
Dallas	151	4%	80%	16%	65%	9%	-22%
Chicago	124	2%	4%	94%	2%	2%	0%

4. *U.S. Census Bureau Data.* We will use several population datasets in our analysis. The distribution of essential jobs in each of the cities will be identified using payroll data compiled by the United States Census Bureau^{xvi} and labor classifications provided by the Center for Disease Control^{xvii}. We will also assemble American Community Survey data on population demographics for individual census tracts and areas served by each transit route.

Analytic Strategy

Our analysis will focus on the following three points in time, which we will identify for each transit provider in our sample based on transit service and ridership data: **Pre-pandemic conditions (PPC):** A point in time immediately preceding the changes in ridership and transit services associated with the beginning of public health advisories to limit non-essential trips and practice social distancing. For most regions, we anticipate that this will have been at some point in February 2020. **Minimum transit (MT):** A point in time when the reduction in overall ridership and transit service reached their minimum levels prior to rebounding ridership and the availability of funding through Coronavirus Aid, Relief, and Economic Security (CARES) Act, American Rescue Plan Act of 2021 (ARPA) and other recovery programs. For most regions, we anticipate that this will have been at some point in the late spring or early summer of 2020. **Initial recovery (IR):** A point in time when transit ridership had begun to rebound and service levels had moved substantially toward the levels provided at the PPC point. For most regions, we anticipate that this will have been at some point in the summer of 2021.

We will evaluate two outcomes at each of the above three time points. First, we will evaluate transit service frequency at the route level, defined as the number of scheduled trips (i.e. the number of scheduled arrivals per transit stop) per weekday, based on archived GTFS feeds. Second, we will evaluate accessibility to essential jobs. We will define the accessibility of each census tract as the weighted number of jobs within the region, with weights assigned based on a decay function of transit travel time from each job to the tract’s centroid^{xviii}.

We will estimate four multilevel models with varying slopes and intercepts. Two models will predict route-level changes in transit frequency (from the PPC to the MT point in time, and from the MT to the IR point in time), and two models will predict tract-level changes in essential job accessibility (for the same two time periods). Multilevel models are appropriate when observations (transit routes or census tracts, in this case) are nested in groups (regions, in this case), with explanatory variables at the individual level and at the group level. This model form will allow us to evaluate differences among regions as well as differences among individual neighborhoods and transit routes within regions.

All four models will include agency-level predictors describing transit board governance structure, transit board representation (in terms of race, gender, disability status, and experience as a transit rider), and

board values (as identified through our analysis of policy documents and meeting minutes). The service frequency models will include route-level predictors describing the sociodemographic and employment characteristics of individuals living and working each route's service area (the area within a quarter mile of each stop on the route), route-level ridership, and average fares. The accessibility models will include sociodemographic and employment characteristics of individuals living and working in each census tract.

Limitations

The results of our analysis will demonstrate any relationships between board representation and the values that are emphasized in public-facing statements regarding service changes, as well as the relationships that representation and values may have with route-level service frequencies and neighborhood-level differences in accessibility. These relationships may be consistent with causal hypotheses, but their presence would not necessarily demonstrate causality. Indeed, it is possible that the same forces that prevent women, people of color, and people with disabilities from serving on transit boards also influence transit planning decisions that de-emphasize the needs of vulnerable riders. This would also be an interesting dynamic to uncover, but our methods do not allow us to differentiate among those alternative causal narratives.

Addressing the Foundation's Goals

This project uses the case of public transit to understand how representation on public boards influences the services provided to vulnerable populations. It supports the foundation's efforts to understand the effects of COVID on the economy, workers and inequalities and its effects on politics and political behavior. It also supports the foundation's interest in the factors that contribute to social, political and economic inequality in the United States.

Qualifications and responsibilities of investigators

Carole Turley Voulgaris (Co-PI) is an assistant professor in the Department of Urban Planning and Design at the Harvard Graduate School of Design. Her research focuses on uncertainty and error in transportation forecasts, and the ways in which transportation agencies apply data to decision making. She currently serves as secretary of the Transit Data Committee and as a member of the Transit Fare Policy and Marketing Committee of the National Academies Transportation Research Board. She has authored sixteen peer-reviewed journal articles and has been quoted in the *Seattle Times* and the *Wall Street Journal*. Dr. Voulgaris will lead the analysis of route and schedule data, including the calculation of transit accessibility measures and the estimation of the models predicting changes in service frequencies and accessibility.

Lauren Ames Fischer (Co-PI) is an assistant professor at the University of North Texas. Her research examines the relationship between local governance processes and equitable policy outcomes related to land use and transportation. Her research has been supported by the National Science Foundation and private foundations. Dr. Fischer has authored thirteen peer reviewed journal articles and is an active member of the American Planning Association, and the Urban Affairs Association. Dr. Fischer will lead the analysis of policy documents to identify key themes that indicate the values that are expressed in relation to changes in transit service.

Rosalie Singerman Ray (Co-PI) is an assistant professor in the Department of Geography at Texas State University. Her research examines the role of local governments in transitions to more sustainable modes of travel, both internationally and domestically. Her research has been supported by the Volvo Research and Education Foundations and Alliance Francaise and has been published in academic journals and popular media outlets. Dr. Ray will lead the in the development of agency-level variables to describe transit representation and governance.

Budget

We request \$175,000 to conduct this research. We will use the funds to hire graduate research assistants to code the documents and assemble and analyze the secondary data. We also request summer salary for the three PIs to conduct the analysis and write the report. We will publish the assembled data on the Harvard Dataverse to support open access.

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- ^{xv} Valley RPTA provides service to both Phoenix and Mesa, AZ, so only 39 agencies serve the 40 largest cities.
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- ^{xvii} U.S. Centers for Disease Control. Interim List of Categories of Essential Workers Mapped to Standardized Industry Codes and Titles. <https://www.cdc.gov/vaccines/covid-19/categories-essential-workers.html> Date: March 29, 2021 (archived document)
- ^{xviii} The decay function is based on the cumulative distribution function of a logistic distribution, which relates well to discrete choice theory. We will use logistic distribution with a median (inflection point) of 45 minutes (to approximately correspond to the average commute time of bus commuters in the United States) and a standard deviation of 10 minutes. This decay function approximates the probability that a worker would consider a job to be accessible by transit.