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Sources of and Gaps in Public Transit Ridership Data

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Issue

Public transit in the United States is ailing. Before the COVID-19 pandemic, transit ridership fell by more than 800 million annual transit trips, or about 7.5%, between 2014 and 2019. The onset of the COVID-19 pandemic in the spring of 2020 only compounded these losses. Both before and during the pandemic, the changes in transit ridership were uneven, varying across metropolitan areas, built environments, times of day, days of the week, trip purposes, operators, modes, and directions.

With high-quality, accessible, up-to-date data, practitioners and researchers can diagnose the causes of America's transit ridership woes, as well as evaluate and recommend possible cures. The availability of detailed transit data, disaggregated across a number of axes, is more important than ever to the recovery of the transit industry and the mobility of those who rely on it. Moreover, data about transit use can answer pressing questions beyond patronage declines, including analyses of transportation equity, evaluations of proposed capital and operating improvements, inquiries into the effects of private shared mobility services, and projections of emissions and pollution, among others. All of these topics rely on a growing — though still incomplete and often incompatible — set of transit data sources collected in different ways, from different sources, on different timeframes.

Key Research Findings

- Data on public transit supply and aggregate ridership collected from operators are comparatively comprehensive, though in some cases incompatible across agencies or datasets. Datasets on transit riders and individual transit use have larger holes, most noticeably in information on non-commute transit trips and users. Likewise, transit operators collect passenger survey data and performance metrics related to service quality in a piecemeal fashion. **Table 1** lists the major datasets and data sources about transit ridership, and **Table 2** describes significant gaps in those data.

Table 1. Major Datasets on Transit Ridership and on the Factors behind It

Dataset	Data Source	Data Included	Web Address
National Transit Database	Transit operator reports to FTA, with ridership figures estimated using a variety of approved methods	Ridership, service, finances, safety, labor, assets	transit.dot.gov/ntd
Public Transportation Fact Book	NTD data supplemented by APTA reporting	Ridership expanded from the NTD, historical ridership	apta.com/research-technical-resources/transit-statistics

Dataset	Data Source	Data Included	Web Address
National Household Travel Survey	Semi-regular FHWA survey of U.S. households	Household travel diary, socio-economic characteristics of travelers	nhts.ornl.gov
California Household Travel Survey	Caltrans survey of California households	Household travel diary, socio-economic characteristics of travelers	nrel.gov/transportation/secure-transportation-data/tsdc-california-travel-survey.html
American Community Survey data tables	The ACS, a rolling U.S. Census Bureau survey of U.S. residents	Commute characteristics, socio-economic characteristics of commuters	data.census.gov
Public Use Microdata Sample	ACS data	Commute characteristics, socio-economic characteristics of commuters	usa.ipums.org
Census Transportation Planning Products	ACS data	Commute flows, socio-economic characteristics of commuters	ctpp.transportation.org
LEHD Origin-Destination Employment Statistics	State employment records	Job and residence locations, employment characteristics	onthemap.ces.census.gov lehd.ces.census.gov/data
General Transit Feed Specification data	Transit operator GTFS feeds	Geographic route, stop, and schedule information	Repositories: transit.land transitfeeds.com transitwiki.org/TransitWiki/index.php/Publicly-accessible_public_transportation_data bts.gov/national-transit-map/national-transit-map-data-maps-and-apps
Nonemployer Statistics	Federal business tax records	Counts of ride-hail "establishments" (i.e., drivers)	census.gov/programs-surveys/nonemployer-statistics.html

Table 2. Significant Gaps in Transit Ridership Data

Category	Gap	Recommendation
Ridership	Linked trips (transfers within or between operators)	Explore the feasibility of including linked trip counts or estimates in the NTD (potentially drawing on regional transit smartcard data); provide operators methodology and resources from FTA to do so
Ridership	Trip counts by time of day and day of the week	Collect temporally disaggregated trip counts in the NTD; provide operators methodology and resources from FTA to do so
Riders and Travel patterns	Riders and travel patterns in between NHTS collection years and in more granular geographic areas	Regularize the NHTS schedule every five years and encourage more states and regional planning bodies sponsor oversamples, to allow for more geographically disaggregated analyses
Riders and Travel patterns	Transit flows (origin-destination pairs)	Expand and improve CTPP data
Riders and Travel patterns	Non-commute transit trips	Adopt the NHTS recommendations above to enable better analysis of non-commute trips through the NHTS; encourage transit operators and other mobility providers to regularly survey riders on their trip purposes in ways that allow for comparisons across operators
Riders and Travel patterns	Transit use and travel patterns of those experiencing homelessness	Adopt better survey methods and more survey inclusion of those experiencing homelessness

Category	Gap	Recommendation
Transit Service Quality	Performance metrics, passenger satisfaction, demographics of ridership on particular operators, etc.	Collect rider surveys and service metrics in a centralized database like CATPAD; establish peer group determinations; develop a small set of standard performance metrics collected and reported by FTA
	Why people do not ride transit or have given up riding	Conduct more surveys by transit operators of people beyond their own customers
	Safety, policing, fare enforcement, citations, etc. on transit and their effect on ridership	Collect incident/citation counts and reports, disaggregated by characteristics like race/ethnicity and gender, in a centralized database; improve incident reporting and data collection; survey both current and potential riders on the effects of perceptions of safety and policing on ridership
Private Shared Mobility	Ride-hail trip characteristics, especially as they complement and/or substitute for transit	Collect disaggregated, timestamped TNC trip data with origin and destination geolocations, as well as reported connections to transit; make such data available publicly in a form that adopts prudent privacy protections
	Corporate shuttle and micromobility trip characteristics, especially as they complement and/or substitute for transit	Systematically collect and make public shuttle and micromobility trip data, through the same regulations as for ride-hail

- While we note a number of gaps in data on public transit and the external factors that influence its use, the most salient gap is data on private shared mobility across most regions.

- Gaps in data both align with existing inequities and enable them to continue, unmeasured. For example, data on rider satisfaction should be cross-tabulated with race/ethnicity and household income data, and surveys should include questions about perceptions of policing and safety in addition to other aspects of the rider experience.

- The COVID-19 pandemic has made closing transit data gaps all the more important. For instance, real-time estimates of ridership and crowding on vehicles might better enable social distancing and improve travelers' piece of mind.

More Information

This policy brief is drawn from the report "Sources of and Gaps in Data for Understanding Public Transit Ridership," prepared by Jacob Wasserman and Brian D. Taylor of UCLA. The report and this policy brief can be found at: www.ucits.org/research-project/2020-33. For more information about findings contained in this brief, please contact Jacob Wasserman at jacobwasserman@ucla.edu.

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