

Ride Service and Transit Partnerships

Susie Pike

University of California, Davis

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Equity review by tamika I. butler, University of California, Los Angeles

Program Description

This project reviews and summarizes empirical evidence for a selection of transportation and land use policies, infrastructure investments, demand management programs, and pricing policies for reducing vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions. The project explicitly considers social equity (fairness that accounts for differences in opportunity) and justice (equity of social systems) for the strategies and their outcomes. Each brief identifies the best available evidence in the peer-reviewed academic literature and has detailed discussions of study selection and methodological issues.

VMT and GHG emissions reduction is shown by effect size, defined as the amount of change in VMT (or other measures of travel behavior) per unit of the strategy, e.g., a unit increase in density. Effect sizes can be used to predict the outcome of a proposed policy or strategy. They can be in absolute terms (e.g., VMT reduced), but are more commonly in relative terms (e.g., percent VMT reduced). Relative effect sizes are often reported as the percent change in the outcome divided by the percent change in the strategy, also called an elasticity.

Summary

Ride service and transit partnerships take two main forms. Transportation network companies (TNCs) may provide on-demand taxi-like *ridehail* services (e.g., Uber and Lyft) or rideshare, where providers match travelers with similar routes and are not paid. TNC and rideshare partnerships with transit are formed to address a number of goals. This brief focuses on programs that subsidize or otherwise incentivize TNC and rideshare trips when they connect to and from transit, occur during transit non-service hours, or fill a gap that is not well served by fixed-route transit. By improving access, complementing service, and filling gaps, these programs may increase transit use and reduce reliance on personal vehicles.

Strategy Description

Ride service and transit partnerships take a variety of forms. Typically, the ride service trip

segment is subsidized in whole or in part by a public entity. Passengers may receive a maximum discount (such as \$5), pay a maximum amount (such as \$10 regardless of what the ride service fare otherwise would have been), or a percentage of the total ride service fare.

Ride service partnerships are expected to increase transit use and reduce car dependence through first/last mile connections to make it easier to use transit or by providing options at times or in locations when fixed-route transit does not operate, such as late at night.

Behavioral Effect Size

These partnerships have reduced the use of single-occupant vehicles for commutes by 49 percentage points (Shen et al. 2021) and resulted in 27% of participants switching from driving to bus (Cashmore et al. 2020). In one

study, impacts ranged from a 5-percentage point reduction to a 13-percentage point increase in transit use (Yan et al. 2019).

Strategy Extent

These partnership programs are typically offered at the city scale and/or within a transit agency's service area. They are bounded geographically and may require trips to start or end at transit stops. They are dependent on the availability of ride service vehicles/drivers.

Strategy Synergy

There is mixed evidence about whether unsubsidized TNC travel is used in connection with transit or is in direct competition with transit (see Clewlow and Mishra 2017, Manville et al. 2018, Erhardt et al. 2022). In areas where transit service is improved in coordination with a TNC program, transit use may increase to a greater extent.

Strategy Description

Ride service and transit partnerships implement programs that subsidize TNC or rideshare travel in coordination with transit. Subsidized trips may start or end at transit stops and stations or cover areas or times of day not well served by fixed-route transit services. Subsidized trips fill in service gaps and may improve transportation outcomes for those in the service areas.

These programs may improve ridership by increasing access to transit, improving first and last mile connections, and/or supporting transit or alternative mode use or by guaranteeing a ride home. By supporting increased transit use and/or multimodal travel, these partnerships may reduce car dependence and VMT.

Strategy Effects

These partnerships may improve transit use among program users and attract new transit riders. A small number of studies evaluate the impacts of these programs on expected and actual transit use. Others evaluate impacts on

Equity Effects

These programs can improve safety (safer connections, especially at night) and improve mobility and access to opportunities, particularly for transit-reliant groups, and those with some disabilities, though less so for wheelchair users. The California TNC Access for All program improves outcomes for wheelchair users by funding wheelchair accessible vehicles (WAVs) for TNCs (CPUC, 2025). When vehicles are not wheelchair accessible, this poses barriers for wheelchair users.

Like other technology-based transportation options, there may be limits on who has access to smartphones or data plans to support smartphone and thereby program use. Additionally, smartphone and digital payment literacy can be barriers.

other modes as well as use of the programs themselves.

Ride service and transit partnerships and programs may be evaluated in terms of use of the program, transit ridership, and changes in the use of other transport modes. It is not possible to assess the impacts of a program on the use of other modes based on this information, but it may still be useful as an indicator of potential impact. Effects are typically assessed following a program's implementation (i.e., presence/absence) and in some cases are tracked as programs evolve over time (as in Benaroya et al., 2023).

Behavioral Effect Size

In one carpool-based incentive program in the Seattle area (those using carpooling received \$2), over a 5-month period (December 2018 to April 2019) approximately 200,000 rides were made and an estimated one million VMT reduction occurred within the study region over the pilot period. This estimate accounts for the number of trips using different modes that

were replaced by carpool trips and assumes the study sample is representative of the population in the aggregate. This estimate accounts for decreases in travel by single occupant vehicles, transit, and other modes (Shen et al. 2021). In addition, mode switching was greatest from single occupancy vehicles, which went from 59% of commute mode to 9%. For transit the shares went from 25% to 7%. Once the \$2 incentive was in place, a large portion of participants reported increasing their use of Scoop (a rideshare company) to the following degrees: much more (31%), somewhat more (18%), slightly more (25%). The remainder reported the same use as before (26%).

Cashmore (2020) evaluated the impacts of a subsidized ridehail program in the Research Triangle area of North Carolina. RTP Connect, a partnership with Uber and Lyft, replaced an on-demand shuttle service. Rides between the regional transit center and any other location within a geofenced area were subsidized up to \$10 (only 6% of trips exceeded this amount). A total of 27% of survey participants reported switching from private vehicles to local or regional transit after the program launched. In addition, among those who had not previously used the bus, 69% reported doing so after, and most likely *because* the program was introduced.

In the Waterloo area of Toronto, the 903 Flex service, in partnership with RideCo, was launched in 2018, but discontinued in 2019. Travelers could make trips between virtual stops and/or transit stops. The cost was the same as the transit fare in the area operated by Grand River Transit. The study evaluates program use over several periods and draws on a trip characterization scheme based on the distance of the ridehail trip's origin or destination from the nearest transit stops and pilot program use frequency. Swarney et al. (2020) found that the program complemented transit among those who used it most. Trips

that could have been made by transit were taken by only 7% to 21% of those who used the program frequently while they accounted for 11% to 52% of the trips made by those using the program an average amount or infrequently. In addition, those who used the service most frequently were also most likely to make trips that were direct feeders to public transit; this accounted for 9% to 12% of the trips of frequent users but only 0% to 6% of the trips for average and infrequent users.

Some research on this topic evaluates expected changes resulting from TNC and transit partnerships. Pike (2023) explores interest in and expected use of a Lyft partnership planned in Davis, California. Results suggest a high level of potential program use, particularly for non-commute travel, an area that is not widely considered in the context of these programs. Yan et al. (2019) present findings that suggest transit use can increase with a program that replaces low performing fixed routes *and* provides first/last mile connections. Using both revealed preference and stated preference methodologies, they find transit mode share could increase by 13 percentage points or 28% above pre-program levels.

In some cases, TNC partnerships replace or are implemented instead of fixed-route service. One such program, in Innisfil, Canada, offered \$5 subsidy for ridehail trips with Uber. Two years after the program launched, a cap was introduced, limiting travelers to 30 subsidized rides per month. The cap slowed the growth of the subsidized program, but the use of unsubsidized TNC increased (Benaroya et al. 2023) with total TNC use leveling off over time; that is, the one made up for the use of the other. This study does not explore impacts on other modes but does offer insight into the extent a program operated in place of transit might be used.

Table 1. Ride service and Transit Programs

Study	Study Location/ Agencies	Sample Selection and Size	Study Years	Program Type: presence of TNCs, TNC partnership, other shared use partnership	Results
Benaroya et al. 2023	Innisfil, Ontario, Canada panel study of program phases	57 zones - ridership data	2016 to 2020	Phase 1: \$5 subsidy for Uber trips - replaced transit Phase 2: fixed fare of \$3 or \$5 for specific destinations Phase 3: no more than 30 subsidized rides per user per month	Phase 1: use grew over time and was higher than Uber use. Phase 3: capping the number of subsidized trips reduced subsidized program use: -0.46, did not impact unsubsidized Uber use: 0.04, and did not impact total (subsidized and unsubsidized) Uber use: 0.19
Shen et al. 2021	King County, Seattle	342 program users and trip data for more than 204,000 trips	December 2018 to April 2019	Transit and carpool app program - incentives of \$2 per trip per participant	Primary commute modes changes included: decreased driving alone (58% down to 9%) and decreased transit use (25% down to 7%) – overall expected decrease in VMT of 900,000 to 1 million
Cashmore et al. 2020	Research Triangle Park, North Carolina	30 intercept surveys	February to March 2020	Up to \$10 subsidized Uber or Lyft rides to or from transit center and a geofenced area in and around the park (\$10 covered 94% of program trips)	27% of respondents switched to bus from driving after program launch; and 69% reported using some bus after program launch
Pike 2023	Davis, CA - Capitol Corridor	random sample of addresses ~ 400 sample	2020	Stated preference for TNC partnership and rideshare based on free Lyft ride to the station	43% would increase train use for non-commute travel; 16% for commute
Yan et al. 2019	Michigan	166 faculty, 209 staff, 978 students	2017 or 2018 (assumed)	Stated preference and revealed preference models inform scenario testing for integration of “ridesourcing” and transit	Results range across scenarios from a 5 percentage point reduction in transit ridership to 13 percentage point increase in transit ridership

Extent

Scale of Application: Ride service and partnerships are likely to achieve their goals when they are right sized for the area they serve. For example, a first/last mile service may be more effective in suburban or other low density areas, while a late-night service may be more effective in a denser area where there might be late night demand but not enough to warrant night time fixed route service.

Efficiency or Cost: The implementation of these programs might improve cost effectiveness. Since costs only accrue for rides that are actually taken, the overhead costs are low. However, these programs are not typically built into local or regional budgets nor transit operating budgets so sustainable funding is a potential issue for their longevity.

Cashmore (2020) estimated program costs at \$55,172 for the subsidized TNC, \$161,656 for the on-demand shuttle, and \$139,650 for a fixed shuttle service. The costs per rider were \$7.96, \$31.44, and \$19.66 for the three programs, respectively.

Time / Speed of Change: The use of these programs, like many others, is tied to advertising and outreach. Once a program is in place, awareness and ease of use for travelers are likely the most important factors.

Location within the Region: For ridehailing use, whether in a transit replacement program or in general, population density was identified as the most important predictor in several models, with an elasticity of approximately 1.1 for all models (Benaroya et al. 2023).

Cashmore et al. (2020) suggest that the program is likely more effective in regional areas of service, rather than local services, as the benefits of a program would not be as useful for shorter trips that require a transfer.

Equity

Ride service and transit partnerships can improve transportation outcomes by improving

mobility and access. This can be particularly important for transit-reliant groups and disabled individuals who do not require a wheelchair. These programs fill in gaps spatially and temporally allowing travelers to participate in more activities.

Scholars have found that ridehailing on its own, i.e., without subsidized connections to transit, can improve mobility and access. Some have even pointed out that “The challenge for planners is to harness this opportunity to ensure that its promise is shared by all—not just some—travelers” (Brown 2019, p. 94). In related work, cost was identified as the most important barrier for lower-income individuals to use ridehailing, despite also finding that ridehailing is used in ways that fill in transportation gaps (Brown et al. 2022), such as through ridehail partnerships with transit. Zero-car households and areas with high percentages of minorities and low-income households were less able to reduce ridehail (or transit) use even during the height of the pandemic when concerns about shared use modes were greatest (Brown and Williams 2023). But these benefits are likely not available to all travelers, suggesting that these subsidies could enable lower income and transit reliant households even greater improvements in transportation outcomes. This can include reliable means to get to and from jobs, healthcare, schools, etc.

Nonetheless, there are equity challenges that must be addressed. First, smartphone literacy and access to data plans are necessary for successful use of the programs. Lower income and older adults may not be able to make use of the programs because of this. Several papers noted older individuals were less likely to use the programs (Pike 2023, Cashmore 2020, Shen et al. 2021, and Benaroya et al. 2023).

Similarly, payment tools that require the use of an app and a credit card may not be available to un- or underbanked travelers (Brown 2019, Pike et al. 2022). There may be overlaps among

those who are unbanked and those who do not have data plans or familiarity with digital payment tools.

In addition, TNCs are not typically accessible to wheelchair users. This issue led to the California state legislature to direct the Public Utilities Commission to develop the TNC Access for All program. This program assesses TNC fees that are used to support wheelchair accessible vehicles in TNC services (CPUC 2024). Though this has improved outcomes for wheelchair users, there is still not the same level of coverage or the same wait times as for non-wheelchair accessible vehicle (WAV) travelers.

Addressing these potential equity issues, however, could help foster these programs and the potential equity benefits they offer. Equity outcomes may also be improved through program design and features. For example, providing deeper subsidies or free rides for low-income travelers and program users, as in Innisfil, Ontario (Benaroya et al. 2023). In addition, allowing passengers to book their travel over the phone can improve access to the programs by lower income or older individuals.

Synergy

The positive impacts of these programs are likely to be better when other transit improvements occur, such as more frequent service. The same might be true for improvements to trip planning, payment integration or other features that make the entire system easier to use.

Travel behavior change is most likely to occur when contextual changes cause individuals to rethink their routines (Pike 2023).

Confidence

Evidence Quality

There are very few studies that evaluate the impacts of these partnerships, despite an interest in doing so (Schwieterman et al. 2018 and Curtis et al. 2019). Existing literature covers before and after implementation or expected program use, but cannot offer a comparison to what would have happened without the program. Similarly, the results of the available papers, many of which are case studies, may not be generalizable to other locations.

Technical & Background Information

Study Selection

Studies were selected for inclusion in this brief if they evaluated a ridehail partnership program with a transit agency. Search terms included ridehail, TNC, ridesourcing and rideshare and transit partnership or pilot program. We also reviewed a literature search conducted for a related project. While rideshare is no longer used to describe TNC services, when these services were first introduced it was. When the services were similar to TNC partnerships, this brief also included rideshare partnerships and programs. Rideshare is used to refer to carpool programs that match drivers and passengers already traveling along similar routes and/or to/from nearby origins and destinations. The programs were reviewed, and studies were included here if the partnerships' effects on transit use or ridership were evaluated in some way. In addition, a few studies use surveys to assess stated preferences or expected or anticipated outcomes reported by participants.

Methodological Considerations

The studies included here vary in methods and include stated preference, temporal analysis, ridership and mode share estimates as well as survey data. Each study has limitations typical of the methods employed. None of the studies present transit ridership elasticities in connection with the programs. Outcomes do reflect changes in transit ridership, program use, or transit (and alternative mode) use reported as resulting from the programs. It is not possible to determine, based on these studies, what

would have happened without the program (in terms of, for example, transit ridership) and how much impact could be expected if the program were expanded or implemented in another area. Nonetheless, the studies here do suggest that these programs can be popular and have the potential to reduce private vehicle use.

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