BACKGROUND AND OBJECTIVES
Pooled transportation network company (TNC) services (e.g., Uber Pool, Lyft Shared) have the opportunity to provide an affordable, flexible, on-demand mobility option that can increase the occupancy of vehicles. These changes can potentially lead to reductions in traffic congestion, private vehicle ownership, and transportation-sector greenhouse gas emissions. However, even prior to the COVID-19 pandemic, only about 20% of TNC riders selected the pooled option and approximately half of the riders who selected that option were matched with other riders. Users also infrequently used TNC trips as a first- or last-mile public transit connection. These travel patterns led to questions about how to improve current TNC use to maximize the potential benefits. A review of prior research identified curb management, built environment, pricing, and incentive strategies, to increase pooling use and connectivity with public transportation. However, much of this research relied on surveys and aggregated preference data with little direct input from the users themselves. The goal of this study was to address this research gap by gaining insights directly from pooled TNC users on their experiences using TNCs, pooling, and making public transit connections. These insights helped evaluate strategies to increase pooling use.

METHODOLOGY
This study employed an implementation of the photovoice methodology to gain TNC users’ insights. Photovoice is a participatory research method initially developed for the field of public health, which involves participants in the data collection and analysis process and allows them to share their thoughts and perspectives on their own communities. In preparation for the study, the researchers conducted four interviews with photovoice experts to gain an improved understanding of the photovoice method and receive feedback on proposed modifications that would allow the typical photovoice method to be administered remotely during the COVID-19 pandemic. The researchers also interviewed ten pooling experts from the public, private, and non-profit sectors to learn more about current pooling practices and identify what stakeholders were interested in learning about TNC user perspectives on pooling.

For the photovoice implementation, 15 TNC users from the San Francisco Bay Area with varied past experiences using pooled mobility services were asked to take photographs of the built environment at three pooled TNC pick-up/drop-off locations of their choosing. During five different small group discussions (with typically two to four participants each), the TNC users shared their photographs, stories about past experiences using pooled TNCs and making public transit connections, and thoughts on pricing strategies and incentives to encourage pooling. The study culminated in a workshop with TNC users (n=12) and transportation stakeholders (n=5) returning to discuss the photovoice results and provide feedback on proposed strategies to increase pooling.

RESEARCH FINDINGS
This study led to several findings related to TNC user interests in pooling, differences in the preferences of heavy TNC users (i.e., those who take TNC more than three times per week) and non-heavy TNC users (i.e., those who take TNCs three or fewer times per week); insights into the current user experience of walking to and waiting at pick-up locations; and preferences for built environment improvements and incentives/pricing promotions.

Pooling Interest
TNC users take private trips when trip time, purpose, and discretion are important. Inversely, users take pooled trips when trip cost is important and/or public transit is not available.

Users prefer door-to-door pooled trips in inclement weather, at night, and in unfamiliar areas, but they are interested in the corner-to-corner option (e.g., Uber Express Pool, Lyft Shared Saver) when they receive a discount on the trip cost and the walking distance is not too far (less than 10 minutes). Users connect TNCs to public transit when transit is inaccessible by walking, they have luggage, or the wait time for public transit increases due to unforeseen circumstances.
Heavy and Non-Heavy TNC User Preferences

Heavy TNC users prefer multimodal trips while non-heavy users want to use one mode for the entirety of their trip duration. Additionally, heavy TNC users are interested in frequency-based incentives. Alternatively, non-heavy TNC users prefer discount-based pooling incentives. While heavy TNC users have fewer built environment preferences for waiting locations, they prefer visible signage. However, non-heavy users want locations that facilitate easy connections to drivers (e.g., wider sidewalks) but more subtle signage.

Walking to and Waiting at Existing TNC Pick-Up Locations

TNC users are concerned about walking to pick-up locations at night and through unsafe areas that put them at risk for being robbed, attacked, or approached by homeless individuals. TNC users prefer waiting in safe, well-lit, and open locations near shopping areas and away from homeless encampments. Female TNC users prefer waiting in retail areas where there are other people around and often take additional safety precautions when waiting for and taking rides (e.g., not putting in their exact address, relaying trip information to a third party). Male TNC users’ main safety concern is having their phone stolen while waiting in a crowded area. TNC users consider the ease of connecting with their driver when selecting pick-up locations and prefer locations with loading zones, parking lots, and clear landmarks to help avoid double parking or conflicts with other modes.

Built Environment Preferences

Users expressed interest in a network of TNC stops providing designated areas for drivers to pull over and a safe place for TNC users to wait, although users are skeptical of how the safety and cleanliness of these stops would be maintained. Users are interested in seating, shelter, and lighting at stops, as well as wayfinding and safety features like signage and emergency call buttons. Some users are also interested in waiting amenities like screens with real-time trip information and Wi-Fi. They prefer TNC stops located in safe, centralized areas near shopping and dining establishments. Some users are willing to pay higher trip costs or walk to more inconvenient locations to use designated TNC stops.

Incentives

Most TNC users would switch from private to pooled trips for a price discount, and about half of users would switch from door-to-door pooled trips to corner-to-corner pooled trips for an additional discount, depending on time of day and walking area. There is less interest in incentives to connect TNCs to public transit, as most users who already do this either do it infrequently or are required to do it (e.g., for their commute) and would continue doing so with or without a discount. Disincentivizing the use of personal cars to connect to public transit (e.g., by raising station parking prices) could shift more users to using pooled TNCs for this purpose.

POLICY AND PRACTICE RECOMMENDATIONS

This research led to the development of five policy recommendations that could incentivize pooling. These recommendations are presented in the ranked order of their support from the study participants:

1) Safety and Trip Information: Users find uncertainty in many aspects related to pooling, which can decrease their interest in sharing a ride, particularly users who are new to the service. Increasing the amount of upfront trip information provided to users (e.g., arrival time, number of pick-ups and drop-offs, where a corner-to-corner trip would pick them up); giving users the opportunity to share their trip information with others (e.g., emergency contacts); and allowing users to select a preferred driver gender could help provide users with increased feelings of safety.

2) Network of TNC Stops: Developing a network of designated TNC stops with strong lighting and clear designations for where TNC vehicles could pull over located near retailers with existing infrastructure could provide TNC users with safe waiting locations, drivers with a clear and recognizable landmark to drive toward, and retailers with potential customers.

3) Partnership Programs: Innovative partnerships with event venues (e.g., stadiums, tourist attractions), schools, employers, retailers, and airports could help streamline rides for users who take non-urgent trips, traveling to or from high-demand destinations, or making regular trips where very few of them are pooling. Users expressed interest in pooling for these trips, especially for incentives like retail discounts, food or drink vouchers, and bulk purchase discounts.

4) Operational Improvements: Two existing logistical barriers limit the operational efficiency of using TNCs to connect to public transit: 1) timing TNC routes for trip planning and 2) integrating different fare types into a compatible fare payment system. To make TNCs a viable first- and last-mile option for users, stakeholders must work to efficiently integrate these different modes.

5) Data Sharing: Improved data sharing of common pick-up and drop-off locations or where curb uses do not match their designation (e.g., towaway zones that are used as loading zones) can help improve curbspace use and transportation safety and efficiency for all stakeholders.

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