



Transit's downward spiral: Assessing the social-justice implications of ride-hailing platforms and COVID-19 for public transportation in the US

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ABSTRACT

This paper explores the interconnections between ride-hailing platforms and public transit systems in large US cities. Drawing upon qualitative interviews with expert key informants representing city government agencies, industry, community groups, and others, we find that ride-hailing platforms have catalyzed a *downward spiral* in many public transportation systems: as more people use ride-hailing instead of transit, transit systems receive less revenue and must reduce services to compensate, which makes transit seem even less desirable to would-be riders, leading more people to explore other transit options. Prior to the COVID-19 pandemic, preexisting transit deficiencies, shifting customer expectations, and stigmatization of transit systems and riders each contributed to ride-hailing platforms' successful encroachment upon public transit. The pandemic has fundamentally destabilized both transit systems and ride-hailing alternatives, but it portends an even greater decline in transit as people gravitate to privately owned vehicles and eschew sharing rides with others. Ride-hailing and transit partnerships, such as a Boston-based pilot project to provide paratransit services for people with disabilities, point to possibilities for complementary arrangements moving forward, but they remain constrained by their industry-focused market models. The current downward spiral is particularly concerning because it negatively impacts the most vulnerable and disempowered in society.

1. Introduction

In the US, the COVID-19 pandemic has severely strained many urban public services, including public transportation. As cities anticipate the looming need to provide transit services at full capacity in order to ensure adequate social distancing, they are simultaneously confronted with unprecedented budget shortfalls—in the range of billions of dollars for large metropolitan areas—due to declines in ridership (Gelinas, 2020). Although many researchers and transit advocates regularly acknowledge the social problems caused by inadequate transportation options for people from lower socioeconomic backgrounds (Grengs, 2005; Moulding, 2005; Ranchordas, 2020), the present situation brings social justice concerns to the fore. This is especially the case when reducing transit capacity during a pandemic could lead to heightened risks of virus exposure for marginalized groups who already have fewer transportation options (Allen, 2017; Brown & Taylor, 2018; Lubitow et al., 2017), are more likely to have service-sector employment that requires them to travel in person, as opposed to telecommute (Rho et al., 2020), and who are significantly more likely to face medical

complications or die from coronavirus exposure (Godoy & Wood, 2020). While this situation highlights the need to reinvest in transit on a massive scale in order to address these social justice issues, it also presents an opportunity to take stock of—and reconsider—some of the arrangements that led to a decline in public transit over the past decade (Siddiqui, 2018).

The particular focus of this paper is on the relationship of ride-hailing platforms, such as Uber and Lyft, to public transit systems in US cities. (The term *transit*, as deployed here, refers to public transportation systems more broadly, including buses, subways, light rail, commuter trains, and so on.) It is well documented that ride-hailing platforms—referred to hereafter using the specialized term “transportation network companies” (TNCs)—present a host of problems for cities and their residents, ranging from increased congestion (Clewlow & Mishra, 2017), to dangers to cyclists and pedestrians (Speck, 2018), to discrimination against customers (Ge et al., 2016), to exploitative labor relations (Rosenblat, 2018), but the impact of TNCs on transit systems has received less attention and is more ambiguous. Indeed, some studies have indicated a competitive relationship between TNCs and transit

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(Rayle et al., 2016), whereas others have outlined complementarities, especially if TNCs are able to extend services beyond existing transit routes or times (Feigon & Murphy, 2016; Jin et al., 2018). Nonetheless, we argue that when viewed holistically, TNCs have catalyzed a *downward spiral* in many public transportation systems: as more people use TNCs instead of transit, already-strained transit systems receive less revenue and must reduce services to compensate, which makes transit seem even less desirable to would-be riders, leading more people to explore other transit options. Additionally, regardless of whether TNCs are able to fill an existing gap in service, they nonetheless change the character of cities and encourage a neoliberal orientation that would frame transportation modes in terms of customer “choices” rather than denizens’ rights. In a time of intensified social inequality and vulnerability, it is vital that we short-circuit such downward spirals and implement changes to meet collective needs.

Building upon a larger study documenting city responses to digital platforms (Monahan, 2021), this paper explores the interconnections between TNCs and public transit systems in large US cities. We draw primarily upon qualitative interviews with expert key informants representing city government agencies, industry, community groups, and others to reflect on the long-term implications of TNC and transit relationships. While we find variation among positions, many informants did express a desire for partnerships that would benefit currently disadvantaged riders and correct some of the many existing discontinuities in service.

The COVID-19 pandemic, however, has significantly destabilized both transit systems and TNCs. Health and safety concerns act as a deterrent to *any* shared mobility options. The rise in remote working arrangements for many professional workers has also contributed to a precipitous decline in transit usage, which is a pattern that is being locked in with many former urban residents relocating to suburban settings and purchasing private vehicles (Penney, 2021). A key result of these changes may be a catastrophic reduction in fare-based revenue for transit systems and an inability to invest in the kinds of innovations or service improvements that would allow transit systems to broaden their ridership. The ramifications could include significantly reduced service for marginalized, poor, and differently abled populations at a time when their livelihoods and lives depend upon transit the most.

To begin to grapple with the implications of these changes that are still underway, this paper first provides a literature review of pre-pandemic scholarship on the relationship between TNCs and transit. Second, we describe the methods for our pre-pandemic research study. Third, we give a detailed overview of our findings about TNC and transit relationships, noting an overall downward spiral for transit but also possibilities for enabling partnerships. Fourth, we offer a discussion that takes stock of the COVID-19 pandemic and its implications for transit systems and social justice in the US. Finally, we conclude by outlining some of our study’s limitations and making a case for decentering dominant transportation models to foreground the needs of the most vulnerable in society.

2. Literature review

Given the extreme geographical, infrastructural, and cultural variation between US cities, existing studies of TNC and transit relationships

have generated partial and sometimes contradictory findings (see Table 1). In smaller cities or in regions where transit systems are underdeveloped or geographically dispersed, such as some of the sprawl-like cities in the Southwest, TNCs may compensate for transit-system deficiencies (Hall et al., 2018). Even in larger, high-density cities, if they had low numbers of transit riders *prior* to the entry of TNCs, ride-hailing platforms appear to spark modest additional bus utilization (2.96%) but a slight decline in train ridership (-0.76%) (Hall et al., 2018). In large cities with anemic transit systems or layouts that resist efficient transit, commuters tend to opt for automobile-based options if they are able to, even in the absence of TNCs. This can be witnessed, for instance, with the natural experiment of the temporary exodus of ride-hailing companies in Austin, Texas, after losing a public referendum in 2016 that would have required fingerprint-based criminal background checks on drivers (Collier et al., 2018; Mekeburg, 2016). In the case of Austin, 45% of former TNC customers switched to personal vehicles during this one-year period, 41% switched to another ride-sharing company (such as the community-based non-profit “Ride Austin”), while only 3% switched to public transit (Hampshire et al., 2017).

In dense urban environments with well-developed transit systems, however, a systematic review of the literature suggests a competitive relationship, leading to a notable decline in public transit use overall (Jin et al., 2018). These findings are supported by surveys of TNC users who say that they would have selected transit options had TNCs not been available in their cities (Henao & Marshall, 2018; Rayle et al., 2016); for instance, up to 33% of those surveyed in San Francisco claimed they would have chosen transit instead (Rayle et al., 2016). When TNC options are available, however, at least a portion of the riding public will choose them over transit even if there are convenient transit stations or stops nearby (Deka & Fei, 2019). A rigorous national survey conducted by the Institute of Transportation Studies at University of California, Davis (Clewlow & Mishra, 2017), found that TNCs reduced transit use overall by 6% in major US cities, with a 6% net reduction in bus ridership and a 3% net reduction in light rail ridership. (Only commuter rail benefited from a complementary effect, with a 3% net increase.) Interestingly, when asked which transportation mode commuters would have chosen if TNCs were not available, 15% selected transit, but 46% said they would have walked, biked, or not made the trip at all (Clewlow & Mishra, 2017; see also Lavieri & Bhat, 2019). This indicates that in addition to pulling people from transit options, TNCs are also contributing considerably both to vehicle miles traveled (VMT) in cities and to the congestion, pollution, and road wear associated with those VMT (Tirachini, 2019; Wenzel et al., 2019).

In order to home in on the social justice dimensions of these trends, it is necessary to analyze ridership demographics in relation to transportation modes. As might be expected, TNC utilization correlates strongly with affluence, education, and youth. According to one survey, TNC users “tend to be young, well-educated, higher-income, employed, and residing in higher density neighborhoods” (Dias et al., 2017). Individuals with college degrees are twice as likely to be TNC customers as those without degrees (26% to 13%, respectively), and those making more than \$150,000 are twice as likely to be TNC customers as those making less than \$35,000 (33% to 15%, respectively) (Clewlow & Mishra, 2017). Additionally, the majority of TNC customers (54%) engage the service for social activities or recreational purposes, compared to a smaller number (21%) who use TNCs to commute to work (Feigon & Murphy, 2016). Especially among Millennials, those who are frequent TNC users are more likely (than infrequent users) to reside in non-vehicle-owning households, perhaps because of “differences in lifestyles, attitudes, and familiarity with modern technologies... as well as the recessionary economic conditions which tended to hit early-career millennials harder than older cohorts” (Alemi et al., 2018: 90). Finally, data suggest that the majority of TNC users are white, with Black or African American riders representing less than 5% of the total (Dias et al., 2019). Compare this with transit riders in the US, where 21% have household incomes below \$15,000, 49% do not hold a college degree,

Table 1
Relationship between TNCs and transit by city characteristics.

Possible complementary relationship	Likely competitive relationship
Smaller cities	Larger cities
Regions with anemic transit systems	Cities with robust transit systems
Regions with extended sprawl	Cities with high-density development patterns
Cities with few transit riders prior to TNCs	Cities with many transit riders prior to TNCs

and 60% are people of color (Clark, 2017; see also Brown & Taylor, 2018; Polzin & Sperling, 2018).

For our purposes, there are a few conclusions to be drawn from these depictions of TNC and transit relationships. First, TNCs may modestly complement transit in geographically dispersed metropolitan areas or in cities with deficient or underdeveloped public transit systems, but in such situations, as seen with the example of Austin, this arrangement may solidify an urban infrastructure and culture dedicated to automobility, not transit. Second, TNCs perform well in high-density urban areas with relatively well-developed transit systems, and TNCs compete with these systems, possibly undermining transit services for those living or working in those cities. Finally, to the extent that TNC adoption can be seen as empowering for users, the benefits of this adoption are unequally distributed to the relatively affluent, college educated, young, and white. Hence, previous studies underscore how these dynamics could destabilize transit overall and aggravate existing transportation inequities in cities.

3. Methods

The data presented here come from a two-year study investigating the ways that large US cities are contending with the challenges introduced by digital platforms (e.g., Uber, Lyft). The primary research questions asked were: (1) what are the perceived effects of digital platforms upon cities; (2) how do specific city infrastructures or cultures shape the adoption of platform technologies; and (3) how are organizations responding to digital platforms. The project's methods included content analysis of industry, media, and government documents; semi-structured interviews with expert key informants in relevant organizations; and spatial mapping of platform densities across selected urban regions.

3.1. City selection rationale

We concentrated on three case-study cities—Boston, Austin, and San Francisco—which were selected based on their active policy debates around digital platforms and to achieve regional diversity to maximize the comparative potential of the study. For example, Boston had a fairly well-developed and well-utilized transit system, along with a robust taxi industry opposed to TNCs; Austin had a less-developed transit system, a controversial dispute with TNCs that led to TNCs temporarily suspending service in the region, and unique tensions between city and state governments over the authority to regulate such platforms; San Francisco also had a well-utilized transit system, a vocally resistant taxi industry, and some of the country's most progressive and widely reported efforts to regulate TNCs.

3.2. Stakeholder selection process

For the interview component of our study, stakeholders were selected from organizations that had established positions on the subject and different investments in the outcomes of TNC and transit conflicts (see Table 2). To allow for variation among findings, we included representatives from city governments (e.g., transportation planning offices), industry (e.g., Uber), community groups, labor unions (e.g., taxi unions), non-governmental organizations (e.g., think tanks, transportation justice groups), and academia (e.g., university research centers). Because the emphasis of this portion of the data collection was on the insights of “expert key informants,” within each stakeholder group, we located individuals who had advanced knowledge of the debates and many years of experience working on the topic under investigation. Through a rigorous review of insider publications, research reports, and media stories, we identified and recruited interviewees who were either prominent in their fields or known for their specialized expertise. We also recruited interviewees who were referred to us by other informants, provided that their specialization aligned with the organizational focus

Table 2
Classification of stakeholders.

Boston	Austin	San Francisco
City and Regional Planning City Transportation Research Office	Business Alliances City and Regional Planning	Business Alliances City and Regional Planning
Community Groups and Coalitions	City Council	City Regulation Office
Labor Unions	Community Groups and Coalitions	Community Groups and Coalitions
Platform Companies Transportation Justice Groups	Labor Unions Platform Companies	Labor Unions Platform Companies
	Tourism Groups University Research Centers Worker Advocacy Groups	Urban Planning NGOs University Research Centers

of our research project and we were able to ensure confidentiality. By triangulating the material provided by multiple stakeholders from different sectors, we were able to identify and analyze different areas of concern across groups, leading to a nuanced, multidimensional representation of the organizational challenges introduced by ride-hailing/TNCs in cities.

3.3. Semi-structured interviews

In total, we conducted 34 semi-structured phone interviews from March to September 2019 (see Appendix 1 for interview guide). The interview length ranged from 29 to 166 min, with the average being 70 min long. We continued to recruit and interview informants until we achieved adequate organizational representation for each of our case-study cities and reached saturation with the types of responses conveyed by interviewees (Charmaz, 2014). The distribution of interviews by group was *city governments* (n = 6), *industry* (n = 7), *community groups* (n = 5), *labor unions* (n = 7), *non-governmental organizations* (n = 5), and *academia* (n = 4). Interviews were audio-recorded, professionally transcribed, and verified for accuracy and coded by the research team. Confidentiality was maintained throughout all research stages. In our reporting, we do reference specific case-study cities and organizational types in order to contextualize informant articulations, but in adherence with our ethics protocol for the protection of human subjects, we do not disclose informants' names, proper titles, or exact organizational affiliations.

3.4. Method of analysis

Building upon the tenets of abductive analysis (Tavory & Timmermans, 2014), we concentrated our analysis on the interplay of previously identified analytic categories and unanticipated themes that emerged organically throughout the coding and analysis process. Abductive analysis operates as a form of “thematic analysis” (Braun & Clarke, 2006) that does not privilege induction—as with grounded theory (Charmaz, 2006)—or deduction—as with theory testing (Breakwell et al., 2006)—but instead emphasizes the recursive and iterative dimensions of rigorous qualitative research.¹ Such analysis allows for the mobilization of sensitizing concepts and categories to guide initial inquiry (Blumer, 1954; Charmaz, 2006), but it then directs attention to surprises and anomalies that emerge and require additional inquiry or theory development for explanation (Timmermans & Tavory, 2012).

¹ Thematic analysis has proven especially generative in urban research given the complexity of spatial practices and diversity of qualitative experiences within urban settings (e.g., Costa et al., 2020; Nikitas et al., 2018; Wang & Wong, 2020).

Through the application of an abductive analysis process, we systematically coded the project's transcripts for core themes, identified anomalies and revisited the literature and other transcripts to seek explanation, and in some instances, we followed up with our expert key informants—or sought out new interviewees—to obtain their insights about puzzles in the data (see Fig. 1). The dominant themes explored in this paper (e.g., transit's downward spiral, shifting cultural perceptions, public-private partnerships) grew out of this iterative analysis process.

4. Implications of TNCs for public transit

City transportation networks can be thought of as complex ecosystems that are continually struggling to maintain functionality.² The nature of the component elements varies widely from region to region and is shaped significantly by a city's particular development history, legacy systems and infrastructures, policies, and cultures. While such variation makes generalization difficult or impossible, even within countries or regions, there is value in documenting patterns of change among system elements and theorizing their impacts. In this paper, we focus on a small slice of these interconnections—namely, between TNCs and public transit in three large US cities, seen primarily from the perspective of city transportation planners and transportation justice advocates. As a brief overview, we find concerns over the steady erosion of transit offerings, shifting cultural expectations on the part of riders toward platform-mediated services (e.g., Uber), possibilities for TNC and transit partnerships, and dire threats to transit introduced by the COVID-19 pandemic, which has compelled many former commuters to move out of cities, adapt to remote work conditions, and favor trips in privately owned vehicles. We present key findings, commentary, and analysis for each of these themes in the sections that follow.

4.1. Downward spiral of transit

A recurring, unprompted motif in our study was that of a “downward spiral” in transit caused by riders gravitating to Uber and other TNCs. A Boston city planner reflected on these changes:

If people are taking ride-hail trips and replacing transit trips with those trips, it becomes harder to sustain a public transit system and it becomes harder to run a roadway network efficiently... So, that's a scary spiral to go down. Fewer people riding transit means less farebox revenue, which means maybe less investment in transit, fewer people advocating for transit. And then the people that are sort of transit captive don't have a good option in a system that's sort of failing them.

(City planner)

A transportation planner in San Francisco explained that they have been tracking these changes empirically and are especially concerned about the implications for transit improvements that must be customer funded:

Ridership has been dropping pretty significantly. And because SFO [San Francisco International Airport] has an app and a deal with Uber and Lyft, they can actually track how many people are coming to the airport in every single mode. So, they have a geofence, so they know literally how many people are coming in and out of their private section of the city... We can see that more and more people are getting to the airport via Uber and Lyft. Fewer and fewer people are taking trains. And if BART [Bay Area Rapid Transit], which relies on

its farebox recovery to pay for its capital improvements, which it does, it is a problem, then, that they have bonded [transit extensions projects] against future revenues that they are no longer getting.

(Transportation planner)

A transportation advocate in Boston put it more bluntly, focusing on the implications for social inequalities in cities:

[TNCs] are siphoning riders. I know that Uber and Lyft like to position themselves as first mile/last mile partners.³ I don't agree that they are... they're just making things worse... Then the perception of public transportation will go down in the eyes of the public and it will become, again, something that is just for the poor. And we, in our society, hate the poor—let's be real about it. So, you will see this service [transit] eventually go bankrupt, and it will go away.

(Transportation justice organizer)

An undercurrent here is not only that public transit offerings will decline or fail to meet emerging needs, but that these reductions will be felt more acutely by poor populations that are already inadequately supported by existing options. Thus, there are social justice implications to these reductions, even if TNCs would prefer to characterize their services in terms of customer choice.⁴

While one might expect that US cities with mature, interlinked bus and train systems would be more immune to TNC encroachment, the density of these types of cities—along with the tech-savvy and consumer-oriented dispositions of their populations—makes them all the more attractive to TNCs. As one San Francisco planner related:

This is the irony that a lot of city planners and folks in my position in other cities have struggled with, is that the greatest market for ride hailing are the biggest cities that have transit service. [laughs] And so it's kind of ironic, in fact, that we kind of feel under attack, which I don't think is the right paradigm to look at this sector, but it's the way it's phrased for now. But it is interesting to me that Uber and Lyft depended most strongly on, I believe, their Seattle, [San Francisco] Bay Area, Los Angeles, San Diego, Chicago, Miami, and New York, Boston markets, even though most of the cities that I just listed have really good transit service.

(Transportation planner)

With urban density, it becomes easier for TNC drivers to locate customers, engage in less “deadheading” (driving without customers), and target leisure destinations, such as bars, clubs, and theaters. Indeed, some of our informants in Austin stressed the notable public safety benefits of TNCs taking clients to and from bars in the city, undoubtedly reducing the number of inebriated drivers on the road.

Thus, TNCs can—and do—compensate for transit shortcomings (e.g., by providing services afterhours or to destinations not on transit lines), and they can provide services that increase public safety in certain circumstances, but it nonetheless remains in their financial interest to compete with transit in highly populated urban settings. The effects of this competition could vary radically depending on city type, as one

³ In this context, “first mile/last mile” is shorthand for how people get to transit stops from their starting point (e.g., home) and from transit to their destination point (e.g., work). It represents the portion of the trip that is not provided by existing transit services.

⁴ Although it is not the focus of this paper, there is a prevalent industry discourse of TNCs filling a “latent demand” and providing superior “choices” for customers in a transportation marketplace (McKee, 2017). A quote from one of our industry informants captures this sentiment: “There were a lot of people who could just never get a cab where they lived. Service was unreliable and had long wait times, and so when Uber and Lyft entered the market, that was their jet fuel, because there were tons of people who wanted this kind of a service” (TNC representative).

² This metaphor is not meant to naturalize human-built systems but instead call attention to complex urban interdependencies, including with natural and computational systems, that frequently exceed holistic understanding or control (Bratton, 2016; Zitouni, 2013).

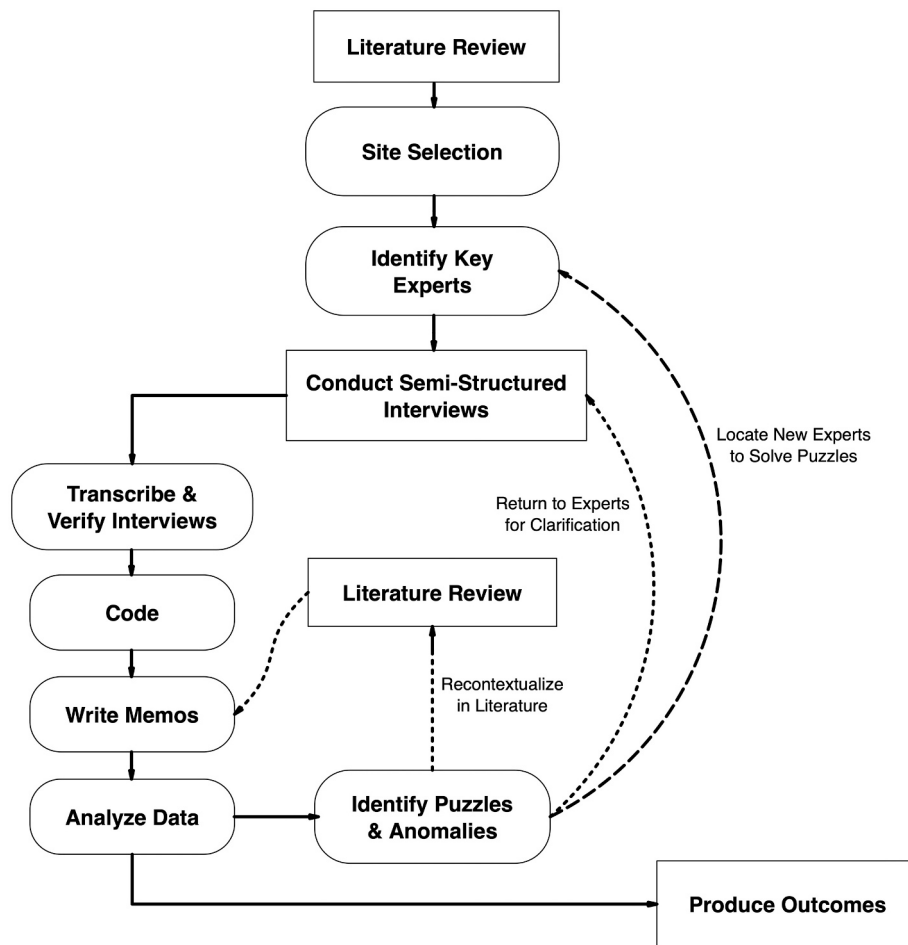


Fig. 1. Data flow diagram.

planner conveyed:

Imagine cities that don't have a rail network, which is most of the cities in the country, that are just dependent on bus networks. You probably end up in a place where there's not as many riders and there's not as many people advocating for it [transit], and then elected officials say, "Why do we need to be spending all this money on this service?" and look for ways to sort of trim that budget as a result. So, I think it becomes increasingly inequitable in cities that don't have a good transportation system now.

(City planner)

So, while the downward spiral trend is certainly of paramount concern to the planners and engineers in our study, they also signaled that it might exacerbate inequalities even more in cities without robust legacy transit systems.

In sum, these articulations stress that TNCs are encroaching upon and eroding public transit systems, but the reasons for those trends extend beyond mere opportunism on the part of TNCs; the reasons also include preexisting transit deficiencies, shifting customer expectations, and stigmatization of transit systems and riders. Nonetheless, the dynamic relationship between TNCs and transit means that changes in one affect the other. While there might be opportunities for complementarities and synergies that benefit cities and their diverse populations, the increasing popularity and utilization of TNCs still contributes to financial and material reductions in public transit systems.

4.2. Shifting cultural perceptions

Just as the relationship between TNCs and transit is dynamic, so too are cultural dispositions surrounding transportation. As individuals become acclimated to what TNCs advertise as "on demand," digitally mediated transportation services with additional amenities, they may come to expect similar offerings from transit. One transportation planner used the provocative analogy of romantic relationships to underscore this point about shifting expectations:

One of the arguments that I get into with [planners] at [a city transportation agency] is they say, "Uber and Lyft are stealing our riders." And I'm like, "Did they steal them or are you just losing them?" Because I think of it kind of like dating, where it's like if you stop taking care of yourself, you start treating your mate really poorly, and then someone better comes along and says, "Hey, I'll treat you well," you can't really be surprised, then, that they left you [laughs]. To be honest.

(Transportation planner)

Rather than see this as an unfair infringement on transit systems, this informant chose instead to view it as a productive challenge that could prompt transit systems to offer better services:

Public transit agencies need to figure out, then, why is it that what otherwise was a captive audience is suddenly interested in a new lover, if you will. And that, is there a way for us to serve our community better, whether that's cleaner buses, better seats, more reliable service, et cetera. Because a lot of times people will say, "Hey, I

really like that I can open the [TNC] app and know exactly where the car is, even if it's going to take 10 minutes to get here.” All right, well, buses can do the same thing. We can track our buses and tell you where they are. And the fact that we are not very good at doing that is a problem... We need to start thinking about how we can up our own game and provide better service in light of the fact that there's a new kid on the block.

(Transportation planner)

Granted, when this position is juxtaposed with previous articulations of a downward spiral in transit, it becomes clear that budget shortfalls may make the implementation of such improvements all the more difficult.⁵ When increased customer expectations collide with reduced funding for *existing* transit services, these cultural shifts may portend an even greater exodus of transit riders and the further erosion—not improvement—of transit offerings.

Perception also plays an important part in ongoing cultural shifts around transportation. Whereas scholars or policymakers might prefer to compare transit offerings in an objective way—for instance, by determining whether transit options have comparable real-time location systems and interfaces, as referenced above—individuals also make transportation decisions based on subjective assessments. For example, a taxi union representative in our study observed:

People will tolerate quite a lot of bad behavior from Uber and Lyft... This has kind of always been a puzzle to me. But, you know, people will tolerate having their driver cancel. Having their second driver cancel, and then finally getting their third driver... They tolerate having the car stopped across the street, half a block down, you know, and having to run over to the car across traffic... I don't quite understand why. It could just be sort of part of the culture that has developed around this Uber and Lyft.

(Taxi union representative)

From this informant's perspective, the specific culture that has emerged around TNCs encourages users to shrug off poor service that would not be tolerated of alternative modes of transportation, such as taxis or transit. While a lot has been written about the growth of the gig economy and its shaping of customer and worker behaviors (e.g., Mumby, 2019; Ravenelle, 2019; Wood et al., 2019), a related component of the cultural shift described by our informant is the monopolistic and totalizing nature of TNC platforms, which can entrain users to see TNC services as their first—if not only—option (Monahan, *in press*).

If TNCs' technological platforms can entice users through real-time location updates or easy payment mechanisms, for instance, then technological protocols could also disincentivize TNC use and/or incentivize transit adoption. This is revealed in the following quote by a transportation justice advocate in Boston, who goes to great lengths to rationalize her occasional TNC use even though she is critical of TNCs more generally:

Saturday night, I will use myself as an example. I was at a speaking engagement and then I had a friend in town, so we went out and got drinks. Because I had been at work, I was wearing horrible, horrible heels. And we were at a place at midnight that was close to public transit, and my home was close to public transit, and we took a Lyft because I was like, “I do not wanna walk for five minutes in these heels.” At this time of night, it will cost five dollars, and between the two of us, a single ride on the T [transit system] would've been more than five dollars. So, we made a choice... But if there had been a

significant fee based on them [the Lyft driver] dropping me off within a half mile of a public transit hub, I maybe would've taken a different option or made a different choice. That was on one of the most reliable T lines in the city, so it's not like a bus that won't come for an hour. It was like, I could've gotten on the orange line, and I just didn't wanna walk.

(Transportation justice advocate)

In this instance, TNC use did not align with our informant's general stance on TNCs, yet the incentive/disincentive structure—combined with her uncomfortable footwear—inflected her choice and pushed her to use Lyft. With some minor technical and policy modifications, such as an imposed fee for taking TNCs close to viable transit lines, she may have made a different decision. Therefore, for users who want to be supportive of transit and select it for their commutes, pricing and other disparities that favor TNCs present obstacles to those outcomes.

These few examples illustrate the evolving relationship between cultural perceptions of and decision making about transportation use. A downward spiral of transit does not occur in a vacuum; instead, it unfolds relationally in specific cultural and geographical contexts, and it is shaped by larger technological cultures, as well as by platform protocols. What is consistent across these varied examples, though, is the framing of the transportation “choices” made by autonomous individuals who have a range of options. While most of our informants are committed to social justice issues, this individualistic framing nonetheless downplays conditions of structural inequality that constrain the mobility options of many urban residents. In short, it supports the sort of neoliberal orientation embraced by TNCs: one that posits an open marketplace of transportation options without attending to the collectivities that support those exchanges (e.g., city infrastructures, communities) or are threatened by them. The dominance of this cultural-economic framework presents additional challenges to transit sustainability at the very moment when transit systems are the most vulnerable.

4.3. Evaluating paratransit as a model for partnerships

Although the threat posed to transit by TNCs is extreme, especially in a period of reduced funding for transit systems, there are some models for partnerships that may increase or improve mobility services for people who have historically been neglected. Such models might include cities providing TNC subsidies for individuals who commute to or from work late at night when transit offerings are limited, contracting to TNCs for individuals' transportation to and from healthcare providers or COVID-19 vaccination sites, or providing subsidized TNC service for the elderly or people with disabilities.⁶ These are promising areas for partnerships in large part because these populations are so poorly served by existing transit systems and infrastructures, especially given the automobile-centric orientation of most transportation systems in the US.

Throughout our study, the public-private partnership arrangement referenced most frequently by our informants was a “paratransit” pilot program in Boston to provide transportation services to people with disabilities. As stipulated by the Americans with Disabilities Act of 1990 (ADA), public transit services must provide services for individuals with disabilities, including by offering complementary paratransit shuttles for passengers who would be unable to navigate fixed-route transit systems due to physical or mental limitations (ADA, *Americans with Disabilities Act, 1990*). Because these services are notoriously costly for cities and inconvenient for passengers (e.g., requiring scheduling 24 hours in advance, not making multiple stops for individual passengers, being subject to delays) (Deka, 2014, 2015), the prospect of partnering

⁵ Moreover, it should be noted that this framing puts transit officials in a reactive position, implying that they *should* undertake the additional labor of monitoring industry trends and implementing competitive offerings in order to keep pace with unprofitable but increasingly popular TNC services.

⁶ While not the focus here, another often-mentioned partnership scheme was replacing underutilized and expensive fixed-route bus lines with TNC subsidies, thereby potentially decreasing costs for cities while increasing convenience for passengers.

with TNCs for paratransit was one that many of our informants found compelling. Given the social justice overtones of such a partnership, the platforms involved (Uber, Lyft, and the taxi-app Curb), have also generated a good deal of positive PR from the pilot arrangement (e.g., [Dungca, 2016](#); [Gerst, 2019](#)).

The details of this partnership are relatively straightforward. The Massachusetts Bay Transportation Authority [MBTA] offers monthly TNC subsidies of up to \$40 to members of its shared-ride paratransit program called “The Ride.” Ostensibly, customers can use the Uber, Lyft, or Curb apps to hail a vehicle, and the MBTA subsidies will be automatically processed through the app ([Surampudi, 2018](#)). For most rides, users must pay the first \$2 and anything over \$42 for the entire trip cost (MBTA, [Massachusetts Bay Transportation Authority, 2020](#)). Launched in 2016, the program generated more than 10,000 rides just in its first five months ([Bankson, 2017](#)), and it is currently set to expire in April 2021 (MBTA, [Massachusetts Bay Transportation Authority, 2021](#)). Industry representatives at TNCs characterized this partnership as a low-hanging fruit for their expansion, in large part because they already prioritize customized trips:

And so, [paratransit] is obviously a type of service model that more closely resembles Uber and Lyft service than most types of public transit, because it's already on demand. It's already going directly to someone's house and taking them directly to their destination instead of having a fixed route. Uber and Lyft already have a fleet of vehicles that's out there providing this kind of service at a much lower cost to them than what agencies are usually paying for paratransit.

(TNC representative)

Similarly, even community advocacy groups in our study, who were otherwise critical of TNCs, found merit in this partnership: “[The pilot program has] been very successful because they've been able to leapfrog the current technology, and it's a lot easier for someone who needs to use The Ride to get a ride-hailing app, and that service is subsidized by the public, but in a positive way” (Transportation justice advocate).

Beyond the fanfare around the program, however, there is increasing evidence that it may not be as successful for some of the neediest passengers. For example, according to one report, there is such a dearth of wheelchair-accessible vehicles being offered by TNCs that individuals may have trouble locating *any* on the respective apps, meaning that they either find themselves waiting for hours for a ride to become available or they give up entirely ([Daniel & Alulema, 2019](#); see also [Westervelt, 2019](#)). This is a trend seen in other states as well, as a transportation planner in California related to us that whereas TNCs are “a boon” to the blind, for instance, “folks in wheelchairs, once again they've sort of been left behind” (Transportation planner). Some other concerns raised by our informants pertained to the safety of passengers with unvetted or un (*der*)trained drivers; one community advocate fretted: “Where [the paratransit partnership] gets a little iffy is for people who are maybe more physically impaired or are legally blind because, of course, the interaction with the driver is—it could go either way. So, we do worry about the safety sometimes of people getting in the car” (Transportation justice organizer). Finally, the sustainability of such partnerships may also be uncertain, particularly given that TNCs have historically been unprofitable ventures, so individual companies might disappear without much warning, leaving city agencies left to scramble if they have become dependent on those services.

There may be some innovative opportunities for TNCs to complement rather than compete with public transit services, but Boston's paratransit program illustrates the double-edged nature of even the most encouraging partnerships. The core tension is between treating riders as profit-generating customers or as individuals whose legal rights to mobility must be safeguarded. If seen through the lens of commercial exchange, then it may be expedient and fiscally sound for cities to outsource difficult transportation services to TNCs. If seen through the lens of legal rights, then according to the ADA, transit agencies must provide

disabled passengers with a “comparable” level of service as that made available to able-bodied passengers ([ADA, Americans with Disabilities Act, 1990](#)). While it is the case that most paratransit services in the US are contracted out to private companies, they are typically contractually obligated to operate a sufficient number of wheelchair-accessible vehicles ([ADA National Network, 2018](#); [State of California, 2020](#)), which is not true of current TNC partnerships. In fact, such contractual obligations would be in tension with the platform capitalism model of TNCs that positions them as mere intermediaries connecting customers with independent contractors ([Cunningham-Parmeter, 2016](#); [Rosenblat & Stark, 2016](#); [Srniczek, 2017](#)). Thus, threats of a downward spiral of transit should be approached not only as a possible demise of service for city residents and workers but also as a potential erosion in *the nature of the service provided*.⁷ To protect the most vulnerable or disempowered in society, it is crucial that their needs remain central in any decisions made about transportation systems or programs.

5. Discussion: the effects of the pandemic

Although the theme of transit's downward spiral was based on data collected prior to the COVID-19 pandemic, the present crisis and projected future recovery both signal an acceleration of the trends described. In this section we explore current knowledge about the effects of the pandemic on transit, TNCs, and their uneasy relationship. By using our pre-pandemic findings as a reference point, we forecast some of the challenges to transit and social justice in the years to come.

5.1. Sketching the COVID-19 transportation context

As might be expected given the gravity and magnitude of this deadly pandemic, there has been a precipitous decline in transit use worldwide. According to one report, “A year into the coronavirus pandemic, public transit is hanging by a thread in many cities around the world. Riders remain at home or they remain fearful of boarding buses and trains. And without their fares, public transit revenues have fallen off a cliff” ([Sengupta et al., 2021](#)). In places like New York City, subway ridership as of March 2021 was only at 30% of its pre-pandemic level, whereas bus ridership was only at 40% ([Goldbaum & Verma, 2021](#)). Similarly, TNCs saw their ridership plummet 80% at the start of the pandemic but have since recouped better than transit to achieve 50-60% of their previous ridership by the end of 2020 ([Conger, 2021](#); [Rana, 2020](#)).⁸ The reasons for these declines in transit and TNC use can be traced to individuals' fear of contracting COVID-19, dramatic increases in unemployment, a wholesale shift to remote working for many professionals, travel restrictions, and severe reductions in tourism-related travel ([Bereitschaft & Scheller, 2020: 9](#); [Bandarin et al., 2020](#); [Penney, 2021](#)). Additionally, some urban centers have seen an exodus of wealthy residents moving to suburbs and buying private vehicles ([Penney, 2021](#)). Even for the less affluent, concerns about mitigating coronavirus exposure have led to a 22% increase in the purchase of used cars and trucks ([Boudette, 2020](#)).

Just as with the effects of transit decline described with our data, the negative impacts of transportation changes in the COVID-19 context are

⁷ That said, because according to the ADA, cities are obligated to provide only a *comparable* level of paratransit service to those needing it—and only within $\frac{3}{4}$ of a mile alongside existing fixed routes—reductions in basic transit routes will undoubtedly lead to reductions in paratransit services too. These are some of the possible ripple effects of transit's downward spiral: service reductions for disabled populations that already face acute mobility impediments.

⁸ Some of the major TNC losses were recouped through gains in food delivery, for instance Uber Eats grew by 125% in 2020 ([Conger, 2021](#)). On the labor side of this equation, though, gig work of this sort can further endanger some of the most precarious members of the population who are “worried about their health and safety because these platform companies offer no proper protections or insurances to their independent contractors” ([Bosma et al., 2020](#)).

felt unevenly. Poor and minority communities have little choice but to use public transit (Penney, 2021), even if it puts them at much greater risk of contracting the virus because of the inability to effectively social distance (Hays & Ritzel, 2020). Front-line and “essential” workers rarely have the luxury of remote work arrangements, and many rely on public transit to commute to and from work (George, 2020). While difficult to quantify, this situation undoubtedly contributes to shocking disparities in mortality rates, where in the US, for instance, Black people “have been dying at twice the rate of whites” from COVID-19 (Jacobs, 2021). Minority communities have also not had equal access to vaccines, which is a situation exacerbated by reduced transit options, inadequate public health systems, and limited availability of broadband networks and computers for scheduling appointments (Jacobs, 2021).⁹ In these—and many other—ways, as Laster Pirtle (2020: 504) writes, a pervasive system of racial capitalism constructs “harmful social conditions that fundamentally shape COVID-19 disease inequities,” leading to disproportionate illness and death for people of color and the economically disadvantaged. Transit’s downward spiral is woven into these patterns, particularly as maintaining public transportation systems during a pandemic has been “crucial for transporting medical and essential workers” but has also led to the “worst budget crisis in history” for some transit systems (Penney, 2021).¹⁰

5.2. Transportation in a post-COVID world

Undeniably, the COVID-19 crisis will have long-term ramifications for transportation systems worldwide (Bandarin et al., 2020; Honey-Roses et al., 2020; Ratho & John, 2020). In the US, the budget situation remains the overriding factor as urban transit systems face massive deficits despite the assistance of government stimulus packages (Bliss, 2020). For instance, although President Biden’s COVID-19 Stimulus Bill (“American Rescue Plan”) helps avert immediate catastrophe by earmarking \$30 billion for transit systems throughout the country, transit systems remain in much worse financial shape than they were before the pandemic (Goldbaum & Verma, 2021). For example, even after this funding infusion, New York City’s Metropolitan Transportation Authority “still faces a \$1.5 billion operating shortfall through 2024 [and the probability that] the stable revenue sources the agencies tend to rely on — state and local subsidies along with fares — will likely remain suppressed for years to come” (Goldbaum & Verma, 2021). Loss of revenue can only fuel transit’s downward spiral by necessitating fare hikes or reduced service, as well as by hindering the kinds of innovations and improvements that our informants said were needed to compete with TNCs (Sengupta et al., 2021).

The health concerns of individuals will also play a part in guiding the behavior of transit and TNC passengers. In a global survey, “46% said they’d be less likely to use public transportation in the future” due to concerns about health and safety (Phelan, 2020). For US-based respondents that percentage rose to 53%. TNCs were also viewed with apprehension, with 43% globally, and 49% in the US, indicating they would be “less likely to use them this year and in the future” (Phelan, 2020). One academic overview of the impact of COVID-19 on public space summarizes: “It would be naïve to predict that people will happily return to public mass transit without major adjustments to vehicle design and operations, as well as infrastructure in public spaces to help prevent the next spread” (Honey-Roses et al., 2020: 9).

⁹ While the media and many public health experts are keen to blame the supposed “vaccine hesitancy” of racialized minorities who are suspicious of medical authorities, this discourse fails to confront conditions of pervasive structural racism that undergird health disparities (Corbie-Smith, 2021).

¹⁰ Costs for additional cleaning and disinfecting alone were \$371 million for New York City’s Metropolitan Transportation Authority in 2020, and those annual costs are projected to remain the same for the coming years (Penney, 2021).

For those who can afford it, research suggests that an ongoing response to concerns over virus exposure with transit and TNCs will be investment in privately owned vehicles. According to one survey, 35% of respondents worldwide and 34% in the US claimed they were considering buying a vehicle to mitigate coronavirus exposure (Phelan, 2020). Interestingly, this sentiment was especially true for younger populations: “Younger consumers (<35 years of age) are the largest segment [44%] considering buying a new vehicle in 2020 – a reversal of their historical preference to avoid vehicle ownership” (Capgemini Research Institute, 2020). TNCs are not facing a demise, given that their ridership is rebounding (Conger, 2021), but these sentiments could translate to some impact upon TNC usage, as younger populations who frequently used TNCs before the pandemic also eschewed vehicle ownership (Alemi et al., 2018). As with individuals who fled cities and relocated to suburban (or rural) settings during the height of the pandemic, vehicle ownership could lock in private commuting patterns—at least for the short- to mid-term—that forestall a return of transit ridership and revenue. An especially deleterious side effect could be an increase in pollution and a backslide on climate change goals worldwide (Bandarin et al., 2020; Penney, 2021; Sengupta et al., 2021).

Projecting out, there are signs that TNCs are on a slow path to pre-pandemic bookings, but that they will probably continue to compensate for losses through other offerings like food delivery (Bursztynsky, 2021; Troise, 2021). As with transit, an obstacle to full recovery is individuals’ expression of a newfound aversion to sharing rides with others, which could either suggest fewer carpool-type bookings (e.g., UberPool) or a move to private vehicle usage instead (Ratho & John, 2020). This would be a development that similarly hurt the taxi industry, of course (Ratho & John, 2020). Additionally, as with transit, expectations for heightened cleaning protocols are likely to persist, adding additional expense for drivers (Honey-Roses et al., 2020). Relatedly, while some micromobility and individual transport options (e.g., walking, biking, scooter use) have increased during the pandemic, primarily for younger, more affluent groups commuting in urban centers (Bandarin et al., 2020), once the pandemic subsides and traffic returns, dedicated infrastructure and protected lanes would probably be required for people to continue this practice (Penney, 2021).¹¹

5.3. Social justice implications moving forward

Whereas the data from our study highlighted TNC-based erosions to transit in the US, the COVID-19 pandemic introduced an even greater threat to the sustainability of public transit systems. It is true that TNCs have suffered as well during this time, but clearly it is not a zero-sum relationship between the two modes and there are many other components of—and forces at work within—mobility systems. Nevertheless, the repercussions for social justice provide a through-line across these sections, as systemic inequalities impinge most severely upon marginalized, poor, and differently abled populations. During the pandemic, these inequalities contributed to increased risk of virus exposure and death, as interlocking forms of structural racism, including those manifesting in mobility infrastructures and policies, conspired against the health of racialized, poor, and marginalized bodies. Moving forward, the safety net of public transit will need ongoing financial support and repair to mitigate the worst of these inequalities. Should current patterns in remote or hybrid work arrangements persist for the relatively privileged, and should concern about health and safety push such groups to other transport options, increased government and commercial investments will be necessary to shore up public transportation systems and provide for those who depend upon transit for their livelihoods, wellbeing, and survival (Bandarin et al., 2020: 17).

¹¹ That said, micromobility options did not thrive universally during the pandemic. For instance, scooter use dropped in places like Austin because of concerns over sanitation (Bereitschaft & Scheller, 2020).

6. Conclusion

At a moment when many people have become attuned to the unequal vulnerabilities of minority and low-income populations in the US, whether in the face of the COVID-19 pandemic or police violence, cities have an opportunity to rethink their commitments to correcting social inequalities and ensuring basic services, including the provision of functional public transportation. Budget shortfalls present monumental challenges to these goals, but transit systems were already struggling before the pandemic, due in part to the popularity and pervasiveness of TNC platforms, such as Uber. In this paper, we have argued that TNCs have been catalyzing a downward spiral in transit, leading to fewer transit customers and reduced revenue for transit systems, which make upgrading such systems even more difficult at a time when riders are coming to expect or desire transit services that cater to their individual needs. While this theme is alarming, particularly in a COVID-19 context where transportation inequalities could lead to increased risk of virus exposure and death, a limitation and constraint of our study is that we were not able to directly measure this trend or track its differential manifestation across cities. Because our data collection occurred prior to the pandemic, we were also unable to draw upon our primary data to assess how various stakeholders are contending with and thinking about TNC-transit relationships in the current, uncertain and unstable moment. Future research will be required to take full stock of the degree to which cities are grappling with threats to transit and the many factors contributing to it, including the threats posed by TNCs.

While many states and municipalities have been moving toward various forms of regulation of the TNC sector, for instance by adding congestion charges or attempting to recategorize drivers as employees rather than independent contractors (Griswold, 2019), the popularity of TNCs has contributed to a cultural shift that presents further challenges for transit providers. An open marketplace model of transportation, which positions people as atomized users consuming transportation options, deflects attention away from collective needs as well as from the publicly funded infrastructures (e.g., roads, bridges, curb space) that make TNCs viable in the first place. The association of TNCs with technological sophistication, individual autonomy, and convenience further entrenches a transportation paradigm that transit systems will be unable to match without either substantially more funding or effective (dis)incentive structures, perhaps such as levying additional charges for individuals riding TNCs alone or credits for riders disembarking from a TNC at a transit hub. Ultimately, the dominance of market-based customer models of transportation presents a substantial cultural challenge to transit reinvention and may aggravate transit's downward spiral.

Rather than positioning TNCs and transit as locked in destructive competition, however, there may be possibilities for partnerships that increase service offerings while reducing costs. The case study of Boston's pilot program to provide paratransit services through TNC platforms and vehicles suggests that such arrangements could work under certain circumstances. While the pilot program has been well-utilized on the whole, indicating its attractiveness over other paratransit offerings, it has also failed to meet the needs of riders requiring wheelchair accessibility. Additionally, as our informants indicate, the partnership could raise other concerns, such as the safety of riders, the sustainability of TNC platforms over time, or even the labor exploitation of TNC drivers. All of this points to the need for city agencies to have much more stringent contracts with TNCs when negotiating partnerships, especially to ensure that ADA requirements are being met, and to insist on access to TNC data as a way to audit the service being provided, which, to date, has been something that TNCs have strenuously resisted (Monahan, 2020).¹² The current downward spiral of transit can be arrested and

¹² TNCs have also been instrumental in guiding state preemption of local restrictions on ride-hailing operations (Collier et al., 2018; Griswold, 2019), which could be a trend that further challenges these types of partnerships.

corrected. To do so, we will need to start from a position of ethical commitment to the most marginalized or vulnerable in society and insist, collectively, that we can do better.

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Appendix A. Supplementary data

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