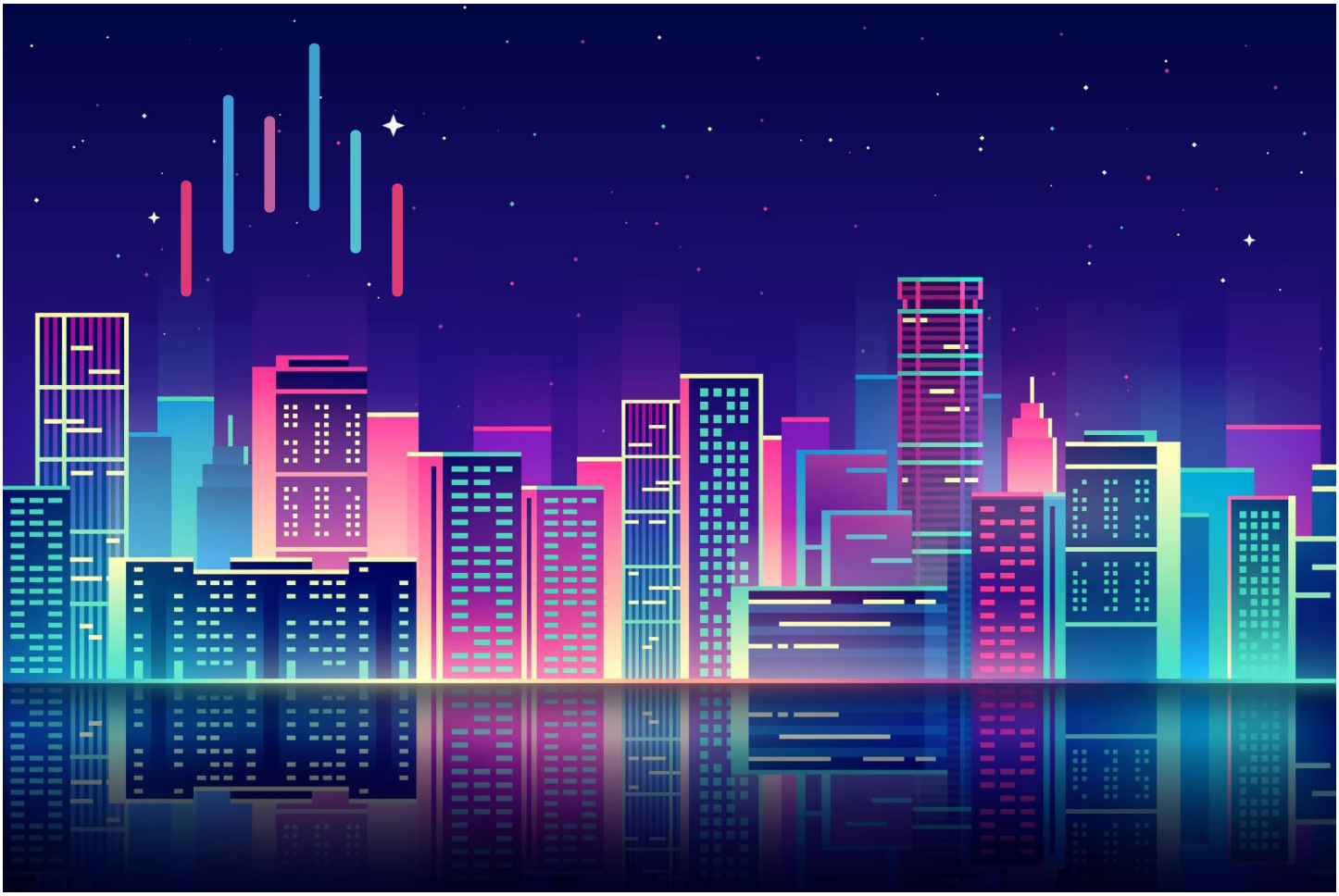
November 2019

Evaluating the Potential of Cooperative Ridesourcing: A Case Study of Arcade City in Austin, Texas



Adam Stocker
Transportation Researcher

Sara Stephens
Cooperatives Attorney

Sustainable Economies Law Center

Table of Contents

About the Study

This report explores the benefits, challenges, and implications of decentralized platform cooperatives as more equitable and sustainable alternatives to established commercial 'sharing economy' platforms. The authors examine the case of Arcade City in Austin, Texas, a decentralized peer-to-peer (P2P) ridesourcing platform (similar to Uber or Lyft) that consists of a 36,000-member Facebook group that links riders with drivers. The study uses empirical findings from Arcade City Austin's operations to inform best practices for P2P platforms. Based on these findings, the researchers make recommendations for cooperative sharing platforms and policymakers.

About the Authors

Adam Stocker is a transportation engineer and researcher. In addition to serving as a research consultant to the Sustainable Economies Law Center, he holds a research and project management position with the Innovative Mobility group of UC Berkeley's Transportation Sustainability Research Center, where he designs and executes studies that assess the travel behavior, societal, and environmental effects of shared mobility services. His research interests also include platform cooperatives, with an emphasis on applications related to transportation.

Sara Stephens is a cooperatives attorney with the Sustainable Economies Law Center, where she coordinates policy advocacy, education, and client support for more equitable housing and workplaces. She also provides legal support to the East Bay Permanent Real Estate Cooperative. In the Cooperatives Program, Sara coordinates co-oplaw.org, a legal resource library for cooperatives, as well as the development of a legal practice guide for cooperative attorneys. Sara authored the model city ordinance that the Law Center has been working with local cities to adopt in order to incentivize worker cooperatives as an economic development strategy. Sara also offers legal advice to cooperatives, focusing on immigrant-owned businesses and conventional businesses converting to worker ownership.

Executive Summary

Commercial 'sharing economy' platforms have exploded in popularity over the past decade as technology has increased connectivity and reduced transaction costs, making sharing assets and services cheaper and easier than before. However, most sharing platforms that currently command large market shares are controlled by a small number of platform owners who consolidate power and extract value to benefit themselves and their investors. These platforms often unfairly and unpredictably dictate wages and commission rates, leading some platform workers to make less than a minimum wage salary after expenses. These exploitative practices have led to unrest among many platform workers and subsequent action by advocacy groups and regulators around the world, as awareness of the precarity of platform work grows. While current discussions mostly focus on regulating the 'sharing economy' giants like Uber, Airbnb, and others, less emphasis has been placed on scrutinizing these companies' fundamental business models and exploring whether more sustainable and equitable alternatives are possible.

A small but growing movement of alternatively-organized platforms are beginning to challenge these business practices by distributing power and ownership among platform workers. Platform cooperatives and truly peer-to-peer (P2P) platforms are starting to emerge in fields as diverse as transportation, photography, healthcare, and many others. Platform cooperatives represent a paradigm shift in sharing platform organizational structures and incorporate cooperative ownership and democratic governance to facilitate the sale of goods or exchange of services.

While ridesourcing (services like Uber, Lyft, and their global counterparts) is often cited as a possible application for a P2P or cooperative platform, there currently exist very few functioning examples. This study examines the operations of one such P2P ridesourcing platform called Arcade City in Austin, Texas. Arcade City (AC) Austin is a 36,000-member Facebook group that links drivers to those requesting on-demand rides, deliveries, and other driving services. The group originally formed in response to the abrupt exit of Uber and Lyft from Austin in May 2016 due to stricter background checks for drivers. Transactions on AC Austin are not subject to commission, are not mediated by a central platform owner, and rely on a distributed volunteer network of drivers and moderators to keep operations running smoothly. While AC Austin does not currently operate according to cooperative principles, they are one of the only P2P ridesourcing platforms in the world that has served thousands of on-demand rides and requests on a citywide scale continuously for multiple years.

Since AC Austin offers a unique opportunity to evaluate a real-world P2P ridesourcing platform, this study is one of the first of its kind to provide empirical insights into the benefits, challenges, and implications of decentralized platforms. Through a case study of AC Austin, this study addresses the following four key research questions:

- What factors are most important for sustaining the operations of decentralized ridesourcing platforms like AC Austin?

- What are the benefits and challenges of AC Austin's governance model and how can platform cooperatives ensure equitable and sustainable governance practices?
- What are the environmental implications of decentralized ridesourcing platforms compared to their more centralized counterparts?
- What policy and legal barriers exist for ridesourcing platform cooperatives and what can platforms and policymakers do to address these issues?

To inform findings, the research team reviewed relevant literature and collected data over the course of April 2018 through October 2019 from three original sources, including: 1) trip-level data spanning a month of AC Austin operations, 2) nine in-person stakeholder interviews, and 3) completed surveys from 39 riders and 20 drivers with AC Austin.

Factors for Successful Decentralized Ridesourcing Operations

One of the first questions we examined was how well AC Austin functions from an operational standpoint, especially considering that transportation is a logistics-intensive industry and participants coordinate rides and requests through a simple message board via Facebook with no centralized matching algorithms. Despite AC Austin's fairly rudimentary platform technology, we found the group to be surprisingly effective, successfully completing 81% of the 4,405 cumulative requests over the month with a network of 99 active drivers and an average wait time of 15 minutes elapsed between the initiation of a request and a driver arriving. While AC Austin is likely less consistent at matching and has longer average wait times than app-based competitors like Uber and Lyft, these data nonetheless show that it is feasible for a decentralized network of drivers to coordinate successful ridesourcing operations, even with a relatively low-tech platform solution.

Ultimately, the success of on-demand transportation networks is determined largely by how efficiently demand is served in a timely and reliable manner. Therefore, we were also interested in determining what factors are most important in achieving lower wait times and better matching success through a decentralized ridesourcing network. Examining key metrics spatially and temporally, we found that there are certain situations where requests are more likely to be successfully matched with a driver. We identify three important operational factors for ensuring consistent and high-quality performance of decentralized ridesourcing platforms:

- Low wait times – Unsurprisingly, the single most significant factor leading to matching success is the time elapsed between a request and when a driver is able to arrive. The chances of a successful match occurring are notable lower for wait times of 24 minutes or longer. This wait time threshold is an important travel behavior factor to consider for those planning or operating on-demand ridesourcing services.
- Core geographical area – Low wait times depend on how close by available drivers are from a requester's location. We found that while AC Austin serves a majority of the city, they operate at the highest volumes and most efficiently in downtown and adjacent neighborhoods, with large portions of ridership in neighborhoods on the

south side of Austin, specifically. For decentralized ridesourcing networks, especially small ones starting up, having core defined operating areas within a city ensures that service quality is high and that requests are being met within a reasonable amount of time. After succeeding within defined areas, platforms should then consider strategic expansion.

- Targeted use cases and customer segments – Relatively small, decentralized ridesourcing networks should identify and target key use cases and customer segments in order to strategically allocate resources and remain competitive with larger and better funded commercial platforms. One niche use case that AC Austin has seemingly identified is late-night and early AM trips. Where other ridesourcing services usually experience drops in trip volumes after midnight, AC Austin request volumes and matching success rates are relatively high through the evening until around 4am. Additionally, an important rider segment of AC Austin is service industry workers (servers, bartenders, etc.) who use the service to commute to and from work, and who prefer cash-based payment. From our rider survey, we found that many of these late-night workers would not have made it to work at all, if it were not for AC Austin and other ridesourcing services. P2P ridesourcing platforms could be well-suited to serve certain traveler segments whose needs may not be adequately met by existing transportation options.

While a decentralized ridesourcing platform could certainly implement an app and improve performance by automating parts or all of the requester-driver matching process, the factors above are important for any ridesourcing platform to consider before launching. There are also more qualitative factors that are important for P2P platforms to consider. Both rider and driver survey respondents indicated that greater senses of community and ownership are some of the most important reasons why they use AC Austin over other ridesourcing services. Fostering a sense of ownership, through cooperative practices or otherwise, could be a key advantage of P2P platforms compared to their commercial competitors that may help with attracting and retaining users.

Governance Recommendations for Platform Cooperatives

While AC Austin is governed by drivers on the platform, the group has both administrator and moderator members (who are also drivers) whose responsibility it is to ensure smooth functioning of the group, resolve conflicts, manage new member activations, and issue disciplinary actions. We note that AC Austin is not currently a platform cooperative and does not follow certain cooperative principles, like democratic member control. Nevertheless, the group boasts many benefits over commercial ridesourcing platforms, including local member involvement over important decisions and conflict management, much greater senses of community and ownership, and higher levels of overall satisfaction (among both drivers and riders). However, AC Austin also faces many governance challenges, including that they currently have no elections or voting, lack of transparency around leadership decision-making, erratic rules enforcement, lack of accountability, and occasional favoritism.

Based on barriers identified through AC Austin stakeholder interviews and member surveys, along with best practices from other platforms and cooperative organizations, we identify seven overarching recommendations for platform cooperative governance:

1) Regular and democratic voting – As one of the defining features of a cooperative, we recommend a one-member, one-vote policy for platform cooperatives. Cooperative ridesourcing platforms may want to consider establishing minimum membership requirements for voting rights and having multiple member co-ops within a broader federated platform cooperative. This approach would ensure that the most involved members have more of a voice and each local member co-op could share certain costs, like technology development.
2) Clearly outlined roles and division of responsibilities – Although distributing power and decision making among the membership base is a core goal of platform cooperatives, clearly defined roles and responsibilities within groups are necessary to sustain operations and provide accountability.
3) Clearly defined rules and regulations – There should be a clearly defined set of rules and regulations that a platform cooperative adheres to that is simple enough to follow and flexible enough to adapt to unforeseen circumstances. These bylaws should be written and accessible to everyone involved with the platform.
4) Appeals council comprised of members – Platform cooperatives should incorporate appeals processes through a grievance council, comprised of a diverse mix of members, to deal with issues of perceived mistreatment or unfairness brought up by members of the organization.
5) Strong emphasis on communication and transparency – Important decisions and voting processes, especially those that involve suspensions or bans, should be conducted in a transparent manner and justifications should be explained clearly to all members.
6) Thoughtfully designed platform functionality – A critical aspect of sharing platforms is the design of the platform itself. In relation to governance, this entails deeply thinking through the capabilities of different member types and permissions for who can see what and when, and how voting mechanisms work.
7) Incentives to encourage sustainable growth – The balance between ensuring consistent platform worker earnings and encouraging network growth is one of the key issues that will be critical for platform cooperatives to solve if they are to achieve significant scale. Incumbent drivers may have a vested interest in keeping the supply of drivers artificially low in order to maximize their own potential earnings. Approaches to encourage sustainable growth can include: referral bonuses, activity- or reputation-based incentives, transparent and regular business reports, and mechanisms to address full- vs. part-time driver tensions.

Governing and managing a sharing platform, let alone one that is cooperatively run, is a difficult task. Balancing the long-term interests of the group with individual motivations is a constant and demanding job. Indeed, drivers responding to our survey claimed that conflict management is one of the largest barriers to the growth of driver-controlled ridesourcing groups. Additionally, it remains unknown whether platform cooperatives can scale large enough to challenge commercial sharing platform incumbents. However, we

believe that in the long run, cooperatively-owned platforms have the potential to offer much more equitable and sustainable platform work opportunities than exist today, if they are implemented and governed thoughtfully.

Environmental Implications of Decentralized Ridesourcing Platforms

The rapid worldwide growth of ridesourcing services has raised important yet still largely unanswered questions regarding their environmental impacts. In addition, since little to no work has examined the environmental implications of decentralized platforms compared to their more centralized counterparts, we analyzed key metrics of AC Austin operations directly related to the environmental performance of ridesourcing systems. Through comparison to past studies of other ridesourcing services in Austin, we examine some of the environmental challenges and benefits of decentralized ridesourcing systems. We analyze and compare two key metrics directly related to the environmental performance of ridesourcing systems, including: 1) deadheading mileage, and 2) vehicle ownership impacts.

Deadheading refers to the distance between ridesourcing trips and to and from areas of rider demand with no passengers in the vehicle. Deadheading mileage has a notable impact on the overall vehicle miles traveled (VMT) and thus the greenhouse gas (GHG) emissions produced by ridesourcing services. Using operational and driver survey data, we estimate that 42% of total AC Austin miles are spent deadheading. By comparison, Ride Austin, the local non-profit app-based ridesourcing service, reported that 36% of total miles were spent deadheading during spring 2017 (Komanduri et al. 2018). While these differences are small and could be partly due to differences in overall network size, these results suggest that the decentralized ridesourcing service AC Austin performs similarly or slightly worse than app-based services from a GHG emissions per passenger-mile standpoint. In the long run however, ridesourcing cooperatives may have greater incentives than commercial companies (like Uber and Lyft) to reduce emissions from deadheading. While commercial ridesourcing platforms are incentivized to flood the market with drivers to ensure lower wait times for customers, ridesourcing cooperatives would have more of an incentive to minimize deadheading since members would have more control over how many drivers are active on the platform, rates, wages, and other key factors that affect supply and demand. In fact, driver advocacy groups like Rideshare Drivers United are advocating for a ridesourcing vehicle cap to curb congestion and emissions (RDU 2019).

We also find that AC Austin allows a portion of riders to not acquire a car. The reduction of personal vehicles due to ridesourcing availability is a crucial component in understanding the overall environmental impact of these services, because a car not purchased is a car not driven. Through comparison to a 2017 study, which found that 9% of former Uber and Lyft riders in Austin acquired a car due to the mid-2016 exit of Uber/Lyft (Hampshire et al. 2017), we find that just 3% of AC Austin respondents acquired a car at this time due to the Uber/Lyft exit. Additionally, when asked if they would have acquired a vehicle during the Uber/Lyft service suspension had AC Austin not existed, we found that 11% of our respondents would have acquired a vehicle. While these differences may be partly due to demographic variation, this finding suggests that a small but notable portion of AC Austin

riders did not purchase (and therefore did not drive) personal vehicles as a result of their AC Austin use. This, in turn, has VMT and GHG emission reduction effects for this group of users. Although more research is needed, these findings suggest that while there may be some slight advantages and disadvantages, AC Austin performs somewhat similarly to centralized ridesourcing platforms with respect to key environmental metrics like deadheading and vehicle ownership impacts. P2P platforms may also be able to mitigate negative environmental effects in cases where an incumbent competitor suspends services or is banned from operating.

Policy and Legal Considerations for Cooperative Ridesourcing Platforms

P2P platforms like AC Austin, and platform cooperatives, exist in a number of legal gray areas. Because their operations diverge from conventional capitalistic models, the law often excludes, overlooks, or applies inappropriately to such platforms. Two of the largest policy and legal barriers for ridesourcing platform cooperatives are: 1) Transportation Network Company (TNC) regulations, and 2) the application of employment laws.

A Transportation Network Company (TNC) is a company that uses an online platform to connect riders with drivers using their own personal vehicles. In the U.S., TNCs are primarily regulated at the state level and prominent TNCs include Uber and Lyft. Currently, AC Austin appears to fall outside of the definition of a TNC under Texas state law, since the AC Austin platform entity does not receive revenue. However, this would not be the case in other states, and AC Austin still likely falls under transportation provider regulations at the Austin city level. Policymakers should clarify regulatory ambiguities by legalizing and bringing down barriers for entities that quality as P2P ridesourcing cooperatives. Examples of such policies could include: creating a subset of TNCs for platform cooperatives that meet democratic governance and profit-sharing requirements, removing the requirement that the central platform receive compensation in order to meet the definition of TNC, allowing for flexible payment options, reducing the amount of insurance a cooperative TNC is required to obtain, and reducing cooperative TNC permit fees.

Whether ridesourcing drivers should be classified as employees is perhaps the most significant legal question these platforms face today. Many ridesourcing drivers are unhappy with their treatment by commercial ridesourcing companies, and some feel they have been misclassified as independent contractors. AC Austin and other platform cooperatives will need to wrestle with this issue as well. A cooperative structure would be well-suited to meet drivers' employment preferences, and drivers would have a voice in whether the platform would classify them as: 1) employees, or 2) independent driver-owners.

- Employee classification – Platform cooperative drivers could choose to be employees to be entitled to benefits like a reliable minimum wage, overtime pay, tax withholding, unemployment compensation, workers compensation insurance, the right to unionize, and the like. We recommend that larger cooperative ridesourcing platforms assume their drivers are employees, primarily because with multiple hundreds of members or more, each individual driver has very little voice in

employment policies and decisions that affect them. This would entail a worker cooperative structure, where its members would be drivers who are employed by the cooperative.

- Independent driver-owner classification – Cooperative owners sometimes prefer to avoid employee status and redirect funds that would pay for certain mandatory expenses (like workers compensation) to more desirable benefits (like health insurance). This may be preferred among smaller cooperatives that operate non-hierarchically and often have no real employer-employee dynamic. This would entail forming a consumer cooperative, where its members would be self-employed drivers who "consume" the services of the cooperative.

As policymakers continue to determine when employment laws cover gig economy workers like ridesourcing drivers, they should keep in mind the scenario where drivers are not exploited and voiceless workers for a large company, but are co-owners of a democratically managed enterprise.

Through empirical analysis of the P2P ridesourcing platform AC Austin, it is clear that decentralized ridesourcing networks can succeed and could possibly thrive given the right circumstances. Indeed, the vast majority of AC Austin drivers and riders we surveyed believe that driver-controlled ridesourcing networks could be repeated in other cities. If strategically implemented and thoughtfully managed, cooperative ridesourcing platforms have the potential to offer drivers better pay, more transparency, greater ownership, and a real voice in policies and decision making. As more work is mediated through online sharing platforms and as automation continues to improve, it is increasingly important to consider how distributed models of ownership and governance could improve outcomes for all workers and society at large. While there are many barriers that platform cooperatives must overcome, they represent a promising alternative to the current status quo of inequitable 'sharing economy' platforms.

What is Arcade City?

Arcade City (AC) Austin is a peer-to-peer (P2P) ridesourcing network, similar to Uber or Lyft, that links drivers using their personal vehicles to those requesting on-demand rides or other requests like food delivery. Unlike Uber and Lyft, AC Austin consists of a 36,000-member Facebook group where requests are posted to the group and fulfilled by drivers monitoring the page. The group operates without automated matching or other app-based functionalities, and relies on their network of drivers and moderators to coordinate on-demand rides, deliveries, and other services between requesters and drivers. There is no commission taken from drivers by the AC Austin platform and the majority of requests are paid for in cash, at a fixed rate of $2 per mile with a $10 minimum. At present, AC Austin does not operate according to cooperative principles, although this is something the group is considering as part of their future expansion plans. In this section, we discuss the history of Arcade City and how the AC Austin Facebook group works.

History of Arcade City

The idea for Arcade City was born on New Year's 2016 in Portsmouth, New Hampshire by Christopher David, when he helped organize ten drivers to volunteer free rides after a recent ban of Uber in the city and taxi boycotts against prior lack of regulatory action against Uber. The small group of drivers gave rides to about 100 people that night, around half of which were pre-scheduled through a website that David created (David 2019). David then took the idea of P2P ridesourcing to Austin, Texas in May 2016, when Uber and Lyft left practically overnight after the city voted for stricter fingerprint background checks for drivers (Kelly 2016). More than a half dozen other ridesourcing organizations emerged in their absence, and AC Austin was one of the first to launch after Uber and Lyft pulled out of Austin. David and Eric Green, who had past experience organizing drivers after a similar situation in Midland, Texas, launched the 'Arcade City Austin / Request a Ride' Facebook page about 36 hours prior to Uber and Lyft's exit from Austin. Within the first week, the group had grown to 10,000 members. At first, the AC Austin Facebook group materialized as a way to organize and add a basic vetting process to the "gypsy cabbing" that was commonplace in the first few weeks after the Uber and Lyft exit. While other app-based ridesourcing services that entered Austin at that time (like Ride Austin, Fasten, and Fare) had higher levels of ridership than AC Austin during the Uber/Lyft absence, the Facebook page was nonetheless serving a couple hundred rides on an average day.

About a year later in May 2017, Uber and Lyft returned to Austin when state law superseded Austin's city laws after a year of significant lobbying efforts by the two companies at the state capitol (Solomon 2017). Ridership among the competing ridesourcing platforms fell quickly after Uber and Lyft's return. Fasten's ridership reportedly dropped 16 percent shortly after the companies' return and Ride Austin's ridership fell by a whopping 55 percent in just one week after their return (Zeitlin 2019). At present, all of the ridesourcing platforms that entered Austin during Uber and Lyft's absence have since ceased operations in the city, with the exception of two: AC Austin and the local non-profit Ride Austin.

While the AC founding team has ambitions to expand across the U.S. and internationally, by far their most successful market has been in Austin using Facebook as the primary request platform. The founding team has developed an app (in beta mode) and has hopes to add ride matching and real-time ETA functionality, although these functions are not active at the time of writing. In April 2018, AC gained some traction in the Philippines after Uber merged with Southeast Asian company Grab, leading to unrest over market consolidation and fare increases. Over 20,000 drivers and riders downloaded the AC beta app, but local regulators issued a cease and desist to AC after it did not register as an official transportation network company (TNC) (Salim 2018). The current status of AC in the Philippines is unclear, although they seem to have retained a small network of drivers and riders in the Manila area. For the purposes of this report, we focus solely on AC's flagship Austin Facebook page as the core study subject.

How Arcade City Austin Requests Work

Making requests through the 'Arcade City Austin / Request a Ride' Facebook group functions as follows: 1) someone posts to the Facebook page requesting a ride or other driving task (food delivery, etc.), 2) a driver (or multiple drivers) respond with a collage displaying information about themselves and their vehicle and an ETA indicating how long it would take to drive to the requester's location, 3) the requester chooses a driver by replying to the comment thread or directly messaging their preferred driver. Finally, it is the selected driver's responsibility to indicate that the request is closed by replying "#Resolved" to the comment thread. In this way, other drivers scanning the page know to move on to other unfulfilled requests. An example ride request is shown in Figure 1, with two drivers responding and ultimately the first (and closest) driver being chosen and confirming that the request has been resolved.

Figure 1. Example Ride Request and Driver Responses

While over a hundred requests per day are typically made on the public AC Austin Facebook group (see 'operational analysis' section below), drivers that we spoke with believed that about half of all requests occur through direct messaging, and therefore do not appear on the public Facebook page. Thus, it is important to note that direct messaging between requesters and drivers who already have established personal relationships is a key (but unfortunately unmeasurable) avenue for requesting rides and other services among those involved with AC Austin.

Background

While AC Austin is a unique example of a functioning P2P sharing platform in the transportation sector, other groups across varying sectors are also emerging in response to increasing discontent with commercial sharing platforms. Many of these groups share similar overarching principles of disintermediation and broader distribution of power and decision making. However, there are a variety of operating and governance approaches taken across these different organizations. Platform cooperatives are one emerging alternative to commercial 'sharing economy' companies that involve cooperatively owned, democratically governed platforms to facilitate the sale of goods or exchange of services (Scholz 2014). There are also a number of groups exploring the use of blockchain and distributed ledger technology (DLT) in helping to facilitate transactions across P2P platforms, including AC. Although AC Austin does not currently operate as a cooperative, we believe that examining the governance approaches of various platform cooperatives could help to develop best practices and recommendations for both AC and other P2P platforms.

In this section, we review examples of transportation cooperatives and platform cooperatives to better understand the current and past landscapes of related organizations. We also cover the governance and management strategies adopted by some of these groups to provide context and later compare to approaches taken by AC Austin. Lastly, we explore past studies on the operations and travel behavior effects of ridesourcing services. We present key findings from other ridesourcing studies conducted in the Austin area, discuss how certain metrics relate to the results in this study, and cover gaps in understanding that this study helps to address.

Platform Cooperatives and Governance

Cooperatives have organized throughout history, most often in response to economic and social stress. The development of modern cooperatives is rooted in the response to the Industrial Revolution in England during the late 18th and early 19th centuries (UW Center For Cooperatives. n.d.). What is now commonly regarded as the prototype of the modern cooperative, the Rochdale Equitable Pioneers Society was formed in 1844 as a group of 28 men working as weavers in English cotton mills. The group developed a set of principles based on the values of self-help, self-responsibility, democracy, equality, equity, and solidarity, that are still used to guide cooperatives today (International Cooperative

Alliance n.d.). Cooperatives exist in many industries, including agriculture, insurance, retail, housing, banking, and others. In just the U.S., there are over 29,000 active cooperatives with 350 million cooperative memberships and over $650 billion in total revenues (Community-Wealth.org 2015). Some cooperatives have emerged in the transportation services industry, mainly in the form of taxi cooperatives. The oldest taxi cooperative in the U.S. that is still active today is Union Cab of Madison, Wisconsin, which formed in 1979 after two strikes against a traditional taxi service. Today, Union Cab is comprised of 260 workers and $6.7 million in annual revenue (Palmer 2015). As of May 2015, there were an estimated 930 workers in the U.S. employed at cooperative taxi companies, with more than 800 additional workers in mid-2016 after the successful launch of Green Taxi in Denver, Colorado (Palmer 2015). Additionally, a cooperative taxi company called ATX Co-op Taxi launched in Austin in October 2016 and is still active today (Hernandez 2017). However, traditional taxi companies and commercial ridesourcing companies command a far larger overall share of the U.S. on-demand transportation market compared to cooperative organizations. Ridesourcing's large market share in the U.S. is due to a variety of factors, including: low barriers of entry for drivers, the absence of restrictions on the supply of ridesourcing vehicles (unlike in the taxi industry), and the ease of use of ridesourcing apps and streamlined payment.

Mostly small-scale at present, a number of platform cooperatives have emerged in recent years with hopes of bringing more equitable ownership and governance to digital sharing platforms. Although they follow similar guiding principles as traditional cooperatives, platform cooperatives are unique in a couple of key ways. First, because work is directed and connections are made primarily through an online platform, workers often do not coordinate in person and in some cases may rarely (if ever) interact face to face. Second, many sharing platforms are comprised of workers who commit widely varying degrees of effort, ranging from working full-time hours to working on and off on a part-time basis. These key differences of platform versus traditional cooperatives warrant their own operating and governance considerations, which we discuss below and in the governance analysis section of this report.

Some examples of platform cooperatives include: Fairmondo, a German digital cooperative marketplace where sellers who co-own the platform connect with potential buyers; Stocksy, a successful stock photo website with nearly 1,000 artists and a revenue of over $10 million in 2016 (Marshall 2017); and Loconomics, a recently launched worker-owned platform for freelancing professionals in the San Francisco Bay Area (MIT Center For Civic Media 2015). Other than taxi cooperatives, there exist a small but growing number of shared mobility platform cooperatives, including: Eva, a ridesourcing cooperative in Montreal that began operations in May 2019 and now has 500 active drivers and a growing base of 17,000 users (Hayes 2019); Modo, a member-owned carsharing organization in British Columbia, Canada that has operated since 1997 and has more than 20,000 members (Modo 2019); and Partago, a Belgian electric carsharing cooperative operating in nine cities (Partago 2019).

Although the organizations mentioned above all identify as platform cooperatives, they take slightly different approaches to governance and decision making. Most of the

platforms have multiple classes or member types as part of their organizational structure. For example, both Stocksy and Loconomics have a board of directors elected by the broader membership, staff that work on the day to day operations of the group, and contributing artists (Stocksy) or service provider owners (Loconomics) that make up the majority of the member base. Each member type receives an agreed-upon number of seats to elect to the board, with a one member, one vote policy. Eva also takes a multi-stakeholder cooperative approach, but distinguishes members further by dividing between a non-profit foundation that oversees the formation of cooperative communities, arbitration, and technological development; and the community cooperatives themselves, which are each responsible for developing ride and pricing features, following local regulations, and implementing local marketing (Gaudreault & Isufi 2018). This 'federated cooperative' model may work well in cases where many individual cooperatives across different locations can have autonomy, yet share resources across one central organization that deals with technology development, legal issues, and other high-level tasks. We discuss recommendations for a possible federated platform cooperative structure in further detail in the governance analysis section.

Voting and decision-making processes vary across platform cooperatives as well. While the majority of platform cooperatives have one member, one vote policies, there are sometimes restrictions on what member types can participate in certain votes and different member types may receive a differing number of seats on the board. For example, the board of Loconomics is comprised of one member elected by staff, two appointed by nonprofit organizations, and the remainder (around 10) elected by service provider owners (Loconomics Cooperative, Inc 2019). Other platform cooperatives, like Eva, give one vote to each member, regardless of member type, for all open board seats. In addition, some platform cooperatives have developed streamlined methods for members to raise resolutions or propose new projects. For example, Stocksy allows members to initiate a resolution process by posting an "idea for discussion" within Stocky's intranet (Marshall 2018). Other members can then quickly vote on the idea to voice whether or not they believe the idea is worth additional attention. If an idea passes an initial member vote, the board reviews and assesses its feasibility. Once the board has accepted an idea, it is passes to a resolution committee made up of board and artist members, which works to develop a draft resolution before putting it to a final vote.

Although some platform cooperatives have an in-person general assembly meeting (yearly or otherwise), others conduct virtual meetings and hold online elections, which are critical when workforces do not have a dedicated physical space or are dispersed across many cities and countries. Many of the platform cooperatives we discussed conduct virtual meetings and debate issues on online forums. Some, like Stocksy, conduct their entire resolution process online. Striking the right balance between timely decision making and inclusionary in-depth discussion of issues is crucial to the success and development of platform cooperatives. Due to unique considerations of online platforms, organizational structures and functionalities must be thoughtfully designed in order to sustain successful platform cooperative operations. We discuss key governance recommendations further in the governance analysis section.

Past Ridesourcing Studies

There have been a number of past studies on the operational qualities of ridesourcing services like Uber and Lyft, including those examining time of day, day of week, trip occupancy, and trip distance distributions typical of ridesourcing services (SFCTA 2017; Schaller 2017; Feigon & Murphy 2018). There are also a number of studies that examine various aspects of ridesourcing travel behavior, including: mode substitution, trip purpose profiles, and vehicle ownership impacts (Alemi et al. 2017; Gehrke et al. 2018; Clewlow & Mishra 2017). In this study, we compare and contrast key operational and travel behavior results with past studies to determine differences and similarities between commercial ridesourcing services (like Uber and Lyft) and AC Austin.

Most notably, we compare findings in this study with those in two previous studies conducted in the Austin area, which allows us to compare impacts across the same geographical area. One is a study of Ride Austin, the local non-profit ridesourcing service, in which we are able to compare operational efficiency metrics (like deadheading and others) between an app-based service like Ride Austin and AC Austin (Komanduri et al. 2018). This allows us to compare key efficiency metrics between app-based platform services and P2P platforms that are more decentralized in nature. The second is a study of travel behavior and vehicle ownership impacts among former Uber and Lyft users due to the companies' exit from Austin in May 2016 (Hampshire et al. 2017). This study allows for direct comparison of mode substitution patterns and changes in vehicle ownership during the year that Uber and Lyft were absent from Austin. Hampshire et al. (2017) found that 9% of respondents acquired a personal vehicle due to the mid-2016 exit of Uber and Lyft and an additional 9% considered purchasing a personal vehicle due to the suspension but ultimately did not. Our study measures similar metrics on the effects that AC Austin had on members' personal vehicle selling and purchase postponing, especially of those that formerly used Uber and Lyft prior to their exit from Austin. This allows for direct comparison of vehicle ownership impacts between P2P and app-based ridesourcing services due to the unique circumstances of Uber and Lyft's abrupt and temporary absence from Austin. While are not able to produce a full environmental impact assessment given data limitations, these comparisons of key metrics across other studies conducted in Austin allow for initial insights into the environmental advantages and disadvantages of P2P ridesourcing services compared to more centralized approaches.

This study also fills gaps in the literature regarding critical functions of ridesourcing networks like when, why, and how often ride requests succeed versus fail. Some of the only publicly released information on trip request completion comes from Uber's publicly subsidized pilot operations in the small city of Innisfil, Canada, where just 75% of trip requests during late-2018 were ultimately fulfilled (Schaller 2018). We note that this rate is most likely much higher in large cities where the ridesourcing driver supply is larger and trip demand is higher. However, this hesitance to share operational metrics is likely due to the fact that these data are considered sensitive trade secrets by commercial ridesourcing companies. These companies may believe that releasing these data could harm their reputation or market position if shared with competitors or public agencies. For these reasons, the major ridesourcing companies in the U.S. (Uber and Lyft) rarely share certain

types of data with public entities or the general public. AC Austin's public operations through a Facebook group offer the unprecedented opportunity to examine understudied operational metrics of ridesourcing services, such as ride request failure and when, where and why it occurs.

The governance approaches of other platform cooperatives and findings from existing literature show that while there are some examples and past studies on the topics of P2P platforms and ridesourcing services, there are still many aspects that require further understanding. In this report, we study the P2P ridesourcing service, AC Austin, which links community drivers with those requesting rides, deliveries, or other services through a public Facebook group. Using AC Austin as a case study of a functional P2P sharing platform, we answer important outstanding questions around governance best practices, opinions and preferences of members, operational qualities, effects on travel behavior, and environmental impacts. The analysis is informed by multiple data sources, including: operational trip data, stakeholder interviews, and surveys of AC Austin riders and drivers. Our study is one of the first to provide empirical insights into the operations and governance practices of platform cooperatives by deeply analyzing a functioning P2P platform.

Methodology

This study uses three original sources to provide insights into AC Austin and the benefits and challenges of P2P platforms. These three original data sources include:

1) AC Austin operational data (request- and trip-level data spanning a full month of operations between mid-April and mid-May 2018),
2) In-person stakeholder interviews of various members involved with AC Austin (nine interviews in total, conducted December 2018), and
3) Rider and driver member surveys (deployed October 2019, receiving completed responses from 39 riders and 20 drivers).

These data allowed us to analyze both the quantitative aspects of AC Austin that allow the group to sustain continuous operations as well as the qualitative characteristics of P2P platforms. We discuss each of these data sources, analytical approaches taken, and data limitations in more detail below.

Operational Data

We collected operational data from AC Austin's Facebook group over the span of one month between April 16th and May 15th, 2018. We recorded trip-level attributes of every request made during the study month and cataloged corresponding driver, helper, or moderator responses to these requests. These attributes were manually scraped directly from the AC Austin Facebook group page. Recorded attributes include: member identifiers, date and time of requests, time elapsed before driver or helper/moderator responses, stated driver ETA, driver selection (if multiple drivers responded), special non-ride

requests like deliveries, whether the ride was pre-scheduled, and payment type (if specified). We also recorded whether or not the request was successfully completed. If the request failed, we noted the given reason for request failure (no drivers available, requester unresponsive, request canceled, etc.).

The operational data over three weeks included 4,405 requests from 1,070 unique requesters, averaging 147 public requests per day. There were 99 unique drivers responding to requests during the month. Approximately 24% of posted requests over the month were deleted for unknown reasons. While we could still record when the deleted requests occurred, who made the request, and the request text, we could not assess driver responses or matching success rates of these deleted posts, due to missing information.

We also used the Google Maps API to identify origins and destinations of trip requests. After data cleaning, we were able to discern valid trip origin and destination pairs for 43% of all requests over the study month. We were also able to collect origin information only for an additional 31% of requests, and destination information only for an additional 8% of the requests. Thus, in total, 81% of all requests were matched with a valid origin or destination geolocation. We hypothesize that the larger portion of valid origins compared to destinations arose because requesters will sometimes indicate their origin but not their destination in the description of request posts. These origin and destination data allowed us to analyze the spatial attributes of AC Austin trip-making behavior, which we present in the operational analysis section.

Stakeholder Interviews

Adam Stocker of the research team traveled to Austin in December 2018 and conducted nine in-person interviews in total with various stakeholders of AC Austin. The stakeholders were identified through their online presence and involvement with AC Austin. The interviewees included: two members of the founding team, two moderators, three drivers, and two riders. We also requested interviews from administrators of AC Austin but did not receive replies. We developed three expert interview questionnaires: one for drivers and moderators, another for riders/requesters, and another for founding team members. All three questionnaires asked about members' current and past involvement with AC Austin, usage of other ridesourcing services in Austin, opinions about the AC Austin platform functionality, and thoughts about the potential of P2P platforms in general. The driver/moderator questionnaire also covered operational qualities and governance details. The rider/requester questionnaire asked additional questions about trip-making behavior and vehicle ownership decisions. The founding team questionnaire asked extra questions regarding organizational model, legal considerations, and future plans. The interviews lasted an average of about one hour each. A $50 cash incentive was offered in appreciation of each interviewee's participation. Insights gained from stakeholder interviews were important in understanding the benefits and challenges of AC Austin and P2P platforms in general. Interview findings informed portions of the governance analysis section and also helped inform survey question design.

Rider and Driver Surveys

On Thursday, October 17, 2019, we deployed both a rider and driver survey to the AC Austin Facebook group in coordination with AC Austin administrators. We offered a guaranteed $10 Amazon gift card incentive for the first 50 completed respondents and the chance to win one of twenty $25 Amazon gift cards for those responding after the first 50. The surveys were deployed via a link in an announcement post that was "stickied" to show up at the top of the public Facebook request group. An invite post was also made on a non-public AC Austin driver-specific Facebook group. Because responses were initially slow to come in, we coordinated with AC Austin administrators to run an advertising campaign through Facebook for a couple of days starting on Tuesday, October 22, 2019. While this yielded a few more responses, researchers decided to invite respondents to take the survey by sending direct messages on Facebook to current and former participants of AC Austin. Between October 22 and October 30, 2019, about 90 message invites were sent to AC Austin drivers (and former drivers) and almost 300 message invites were sent to AC Austin riders (and former riders). This method yielded more responses and was more cost effective than the previous ad campaign. In total, the surveys were active for about two weeks and were closed on November 3, 2019. Overall, we received 39 completed rider surveys (completion rate of 65%) and 20 completed driver surveys (completion rate of 67%). The rider survey took 13 minutes to complete and the driver survey took 16 minutes to complete, on average.

Both surveys asked questions about members' past and current usage and experience with AC Austin and other ridesourcing services, opinions and preferences regarding AC Austin, and demographic profiles. The rider survey covered additional topics, including trip-making and mode substitution behavior as well as vehicle ownership impacts due to the unique fluctuations in ridesourcing service availability in Austin over the past few years. The driver survey also queried about vehicles typically used for driving, driving behavior differences between AC Austin and other services, and roles within the organization and employment status preferences. Survey findings are presented in the 'Survey Results and Travel Behavior Analysis' section of the report, and some of the results also informed the environmental metrics comparison.

Data Limitations

There are a few important limitations of our data sources that must be acknowledged. First, the time periods of original data source collection do not match up precisely. The operational data was collected over the course of spring 2018 and surveys were deployed during fall 2019. Since changes occurred during this time span (for example, the group reduced in size from about 43,000 to 36,000 Facebook members), some of the findings may not match exactly between data collection periods. However, we believe our key study takeaways hold true, regardless data collection timing. Another limitation is that we only collected operational data from requests posted to AC Austin's public Facebook group. According to sources familiar with the group, a substantial number of requests occur through direct messages between riders and drivers. Because these requests are never posted publicly on the Facebook group, we have no way to record them. Therefore, the

total trip volumes in our study are likely an underestimate of the actual activity of the group over the operational data collection timespan. Also regarding the operational data, we were unable to collect request origin and destination information for all of the requests since requests on AC Austin are made through Facebook posts as opposed to an app with geolocation capabilities, This is due to a variety of factors, including request posts that did not include specific enough locations and posts that did not include destinations altogether (e.g., "Pickup downtown ASAP"). However, we were successful in identifying valid origins for 74% of requests and valid destinations for 51% of requests. Although we were not able to collect spatial data for all request posts due to missing or non-specific information, we believe that these data provide ample insight into the spatial operating qualities of AC Austin. Additionally, we were not able to collect detailed activity data on driving that occurs *between trips*. Since AC Austin operates through a Facebook group as opposed to an app that continually tracks location, we could not obtain detailed information on driving that occurs between passenger-carrying trips (also known as deadheading). While we were able to derive fare-based trip distances from operational data and could estimate deadheading mileage through responses to the driver survey, these methods are not as accurate as obtaining activity data for all phases of driving. If AC Austin eventually migrates their operations to an app, these data would become easier to obtain from a technical standpoint. Lastly, because the AC Austin Facebook group page itself is the only way to contact active members, we launched the survey through Facebook posts and direct messages instead of emailing it out to members. These deployment differences may have led to a lower number of completed responses, since members had to not only see the survey invite post while browsing Facebook, but they also did not have the ability to easily earmark the survey for later as can be done in a typical email inbox. At any rate, we received an ample number of responses given these limitations and the relatively small active user base of AC Austin. Finally, we did not weight survey impacts by frequency of use or another metric and therefore findings from the surveys reflect effects found among the sample populations only.

Operational Analysis

To understand the scale of AC Austin's operations, trip-making patterns, the types of requests on the platform, and the overall effectiveness of the service, we examined one month's worth of activity data that we manually collected from the public Facebook group. These data allowed for deep examination of AC Austin's operational qualities and what factors contribute to successful operations of a decentralized P2P ridesourcing platform. In this section, we highlight four key areas of analysis, including: 1) participants and requests, 2) request types, 3) spatial distribution of requests, and 4) operational effectiveness.

Participants and Requests

During the month of study, there were a total of 1,070 unique requesters who made 4,405 cumulative public requests served by 99 unique drivers. We also tracked instances when members helped with request posts by commenting within the post thread in order to aid

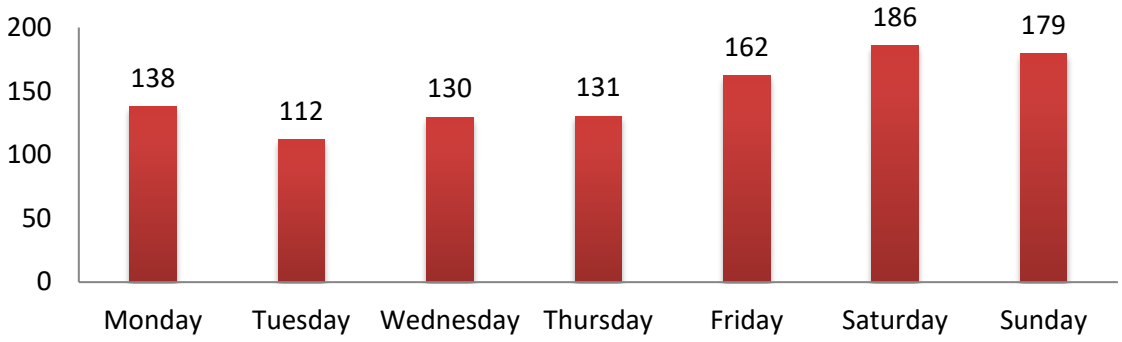
in the matching process, either with tags to a driver they think may be active or to "bump" the post back up to the top of the Facebook page for greater visibility. While there were only nine official moderators at the time of data collection, we found there were 127 unique helpers over the one-month period. This suggests that rider members also occasionally help out with post tagging and bumping. However, just two of the helpers (who are also official moderators) accounted for 58% of all help posts.

During the month of analysis, the average requester completed just over four successful ride or other requests, while the average driver completed about 27 ride or other requests. Like most sharing platforms, we find that a relatively small portion of participants make up the majority of activity in the group. While there are over 1,000 requesters in total, we find that just 128 requesters (about 12%) made up more than half of all requests. Similarly, just 16 drivers (about 16%) served more than half of all the requests on the platform during our study period.

Requests by Day of Week and Time of Day

As is the case with other ridesourcing platforms, there are a greater number of requests made on some days of the week than others. Saturday is the most active day, with 186 requests on average over the month. Friday and Sunday also receive relatively high numbers of requests, at 162 and 179 requests on average, respectively. These results show that Fridays and weekends receive a larger portion of requests compared to the average weekday, which is typical of most ridesourcing services (SFCTA 2017; Feigon & Murphy 2018). Tuesdays through Thursdays experience lower request rates than other days of the week, ranging from 112 to 131 requests, on average. The overall average was 147 requests per day over the study month. We note that these request counts reflect public requests that appeared on the Facebook group only, and actual request numbers through the AC Austin network are likely higher than the request counts shown here. Stakeholders we spoke with claimed that up to half of all AC Austin requests occur off-platform through direct messaging, and therefore are impossible to record and are not included in the numbers in Figure 2.

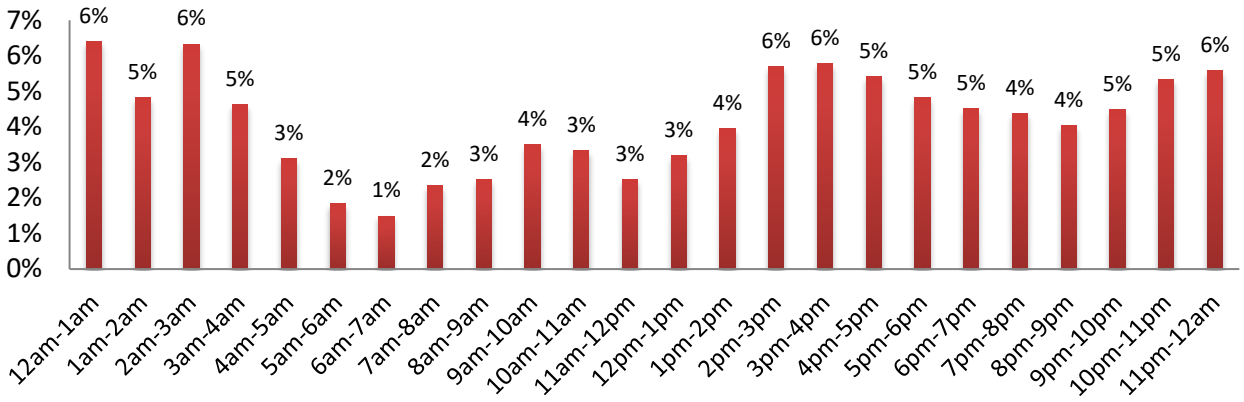
Figure 2. Average Public Requests by Day of Week



Requests also fluctuate by time of day. As shown in Figure 3, the majority of public requests are made between the hours of 2pm and 4am, with slight peaks from 2pm to 7pm and from

10 pm to 3am. Morning and early afternoon requests are not as common as late afternoon, evening, and early AM requests. AC Austin's time of day distribution is similar in some ways to those found in previous studies of commercial ridesourcing services like Uber and Lyft, with evening and late-night time periods being the most common for ridesourcing trip-making (SFCTA 2017, Komanduri et al. 2018). However, where commercial ridesourcing services typically see a significant drop in trips after midnight (even on weekends), AC Austin request volumes continue to hold steady through the evening into the early morning until finally tapering around 4am. This relatively higher portion of late evening/early AM requests suggests that AC Austin may be serving slightly different trip types compared to commercial ridesourcing services. We discuss trip purposes further in the survey analysis section.

Figure 3. Request Time of Day Distribution



Overall, we find that a greater portion of requests on the AC Austin platform are made on Fridays and weekends, and during the late afternoon, evening, and early AM time periods. Next, we discuss the types of requests that occur on the AC Austin platform.

Request Types

Although ride requests are the most common type of request occurring on the AC Austin Facebook group, constituting 91% of all public requests during the study month, delivery and other requests are also made through the platform. The 9% of non-ride requests are most often goods delivery requests, with 54% of these requests for food delivery, 6% for alcohol delivery, and 21% for other goods delivery. Additionally, 12% of non-ride requests are for moving help (furniture items or all-day moving help), 6% of non-ride requests are for car help (to jump an engine, unlock a car, etc.), and 1% are for other requests. Although they make up less than one in ten requests through the platform, the portion of non-ride requests is notable because it shows how flexible and easily customizable special requests are on the AC Austin platform, largely due to the functional simplicity of the platform itself. Commercial ridesourcing companies around the world have entirely different platforms for their food delivery services (e.g., Uber Eats, GrabFood, and others) because their ride-specific platforms are more rigidly built to only serve ride requests. In addition,

commercial ridesourcing companies do not offer moving and car help, which typically require using different commercial platforms altogether (like TaskRabbit and others). In this way, the simplicity of the AC Austin platform and the decentralized nature of operations enable a wider range of request types through a common platform.

Pre-scheduled rides are also common on AC Austin, comprising 18% of all public requests. Although most pre-scheduled requests are made just a few hours in advance, some requesters book rides for a day or more in advance. Pre-scheduled requests are slightly more common in the morning and early afternoon time periods and may reflect riders scheduling commute trips to work. Pre-scheduled ride functionality is a relatively new feature for commercial ridesourcing companies, and was adopted by Uber and Lyft around three years ago (Buhr 2016). Pre-scheduled ride functionality is another feature that is enabled by the AC Austin platform's simplicity.

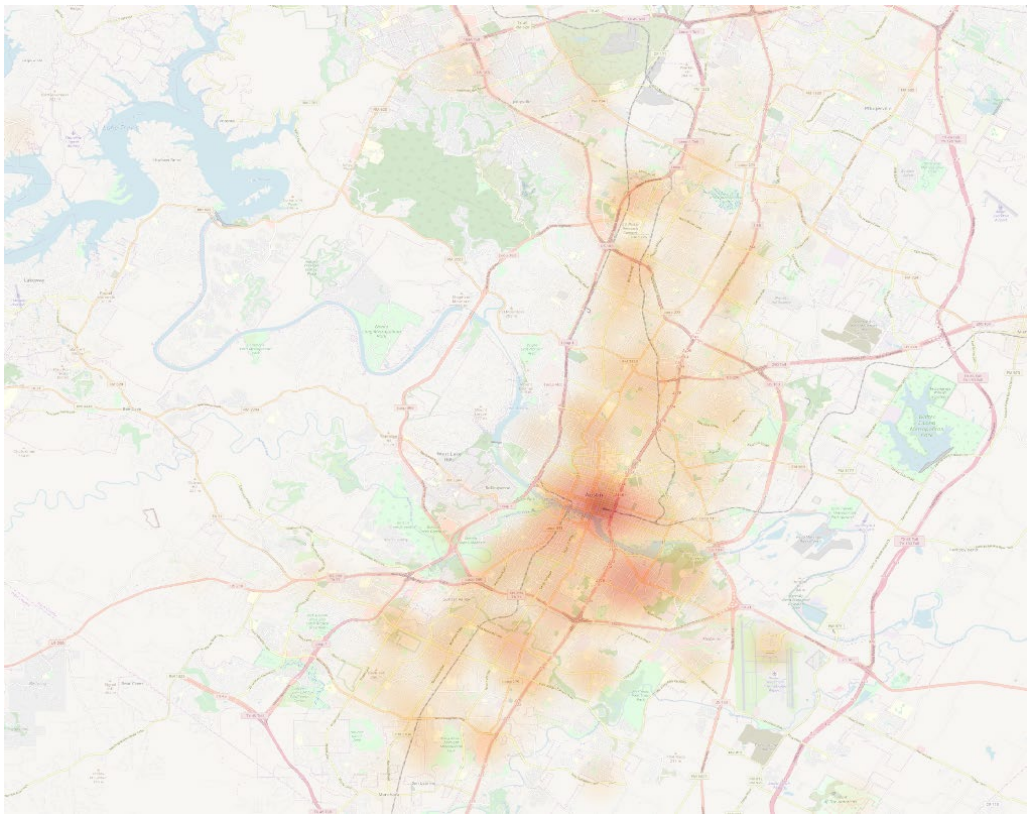
The AC Austin platform also allows for a diverse range of payment types, and requesters are able to specify their preferred payment type when posting a request. Forty percent of public requests over the month specified a preferred payment type, with 93% of those specifying cash as their preferred payment method. Venmo, credit card, debit card, PayPal, and Facebook Pay were also specified as payment types, among others. We discuss the importance of AC Austin's cash and flexible payment options in greater detail in the survey analysis section.

Spatial Distribution of Requests

In addition to understanding when and why AC Austin requests occur, we were also interested in where requests are most commonly occurring within the greater Austin area. By programmatically parsing request post text to identify trip origins and destinations and geocoding the results, we were able to determine request origins or destinations for 81% of requests over the study month.

When examining the spatial distribution of all geocoded AC Austin requests, we find that the operating area is generally within the city limits of Austin, with a small amount of activity in surrounding suburbs outside of city limits (e.g., Round Rock, Cedar Park). Figure 4 below displays a heatmap of the relative density of all geocoded public request origins, with redder shades indicating higher densities of trips and yellow shades indicating more moderate densities of trips. The heatmap shows that the most activity occurs in the downtown core of Austin and immediately adjacent neighborhoods, though requests also regularly occur in other areas, most notably northern and southern Austin neighborhoods bordered by Interstate 35 and the Mopac Expressway. We note that the operating area of AC Austin is smaller than those of Uber and Lyft in the Austin region, which both extend south to San Marcos, TX and farther north past Round Rock, TX (Uber n.d.; Lyft n.d.). AC Austin's smaller operating area is likely due to the smaller size of their network and active driver base compared to Uber and Lyft, among other reasons that we explore in greater depth later in this section.

Figure 4. Heatmap of All Geocoded Public Requests

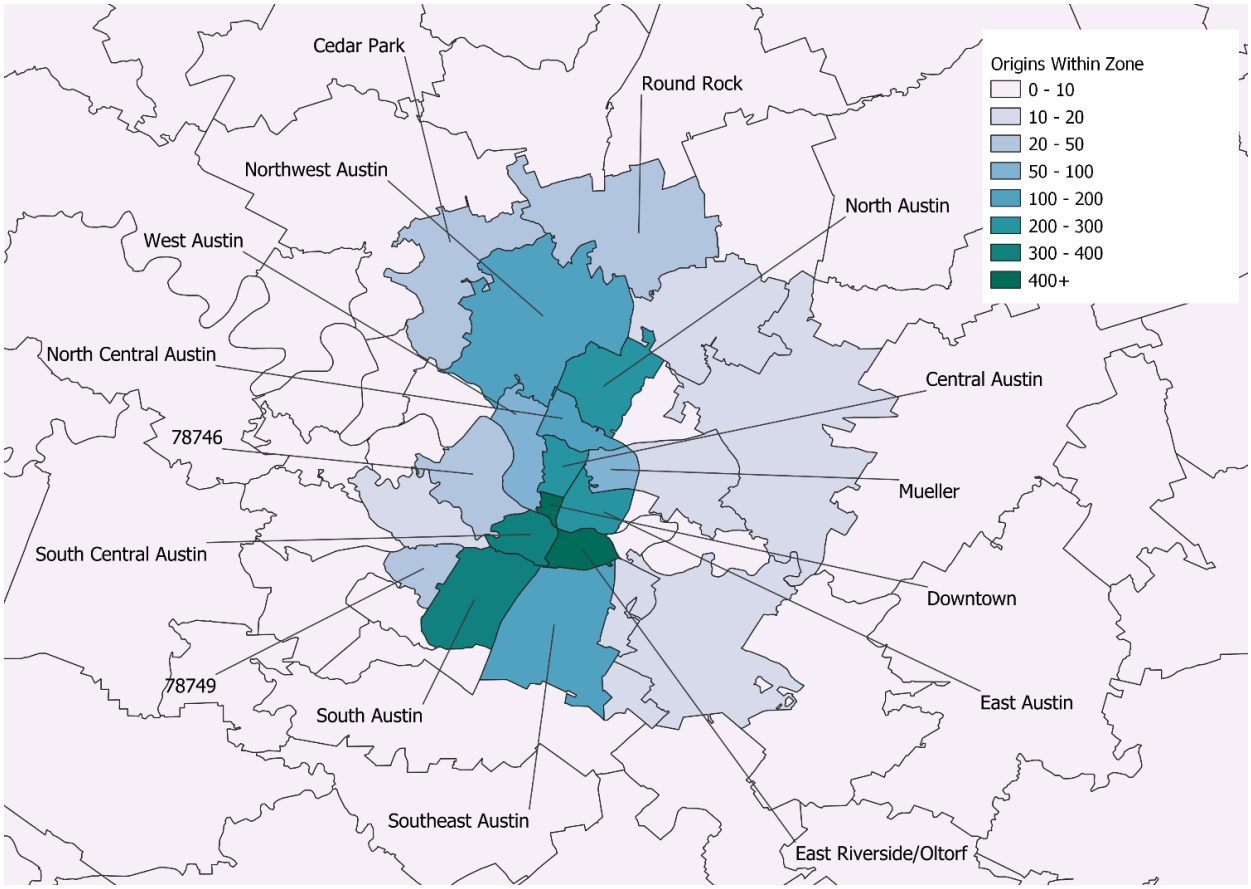


We also examined trip request origins and destinations by specific zones within the Austin region. Figure 5 shows request origins by zone, showing that certain areas within Austin are more common for AC Austin trips than others. Trip destinations were very similarly distributed so we chose not to display them here. Unsurprisingly, we find that downtown Austin is the most popular zone for trip origins and destinations, with almost a quarter of all geocoded AC Austin trips either starting or ending in downtown Austin. However, other zones receive large portions of AC Austin trip activity as well. The East Riverside/Oltorf, South Austin, and South Central Austin zones each contain around 15% to 20% of all trip origins or destinations. Altogether, these four zones (Downtown, East Riverside/Oltorf, South Central Austin, and South Austin) make up the majority of trip activity on the AC Austin platform, as 76% of all geocoded trips either start or end in one of these areas. Zones north of downtown (e.g., Central, North Central, and North Austin) receive a fair amount of trip activity as well (26% of origins or destinations are in one of these zones), but downtown and neighborhoods south of the Colorado River receive the greatest portion of activity. Areas farther from downtown receive far less request activity, as less than 10% of trip requests occur outside of the darker blue north-south area bounded by Northwest and Southeast Austin.

These results show that although AC Austin serves a majority of the city of Austin, the service is more commonly used in the downtown core and adjacent neighborhoods, and has large portions of ridership in neighborhoods on the south side of the city. The more

targeted geographical approach exhibited by AC Austin makes sense, as a relatively small network of drivers can increase their profitability by focusing on core areas and use cases in order to keep utilization rates high. We discuss how request matching success varies by geographical zone later within this section.

Figure 5. Total Monthly Requests Originating in Zone[1]



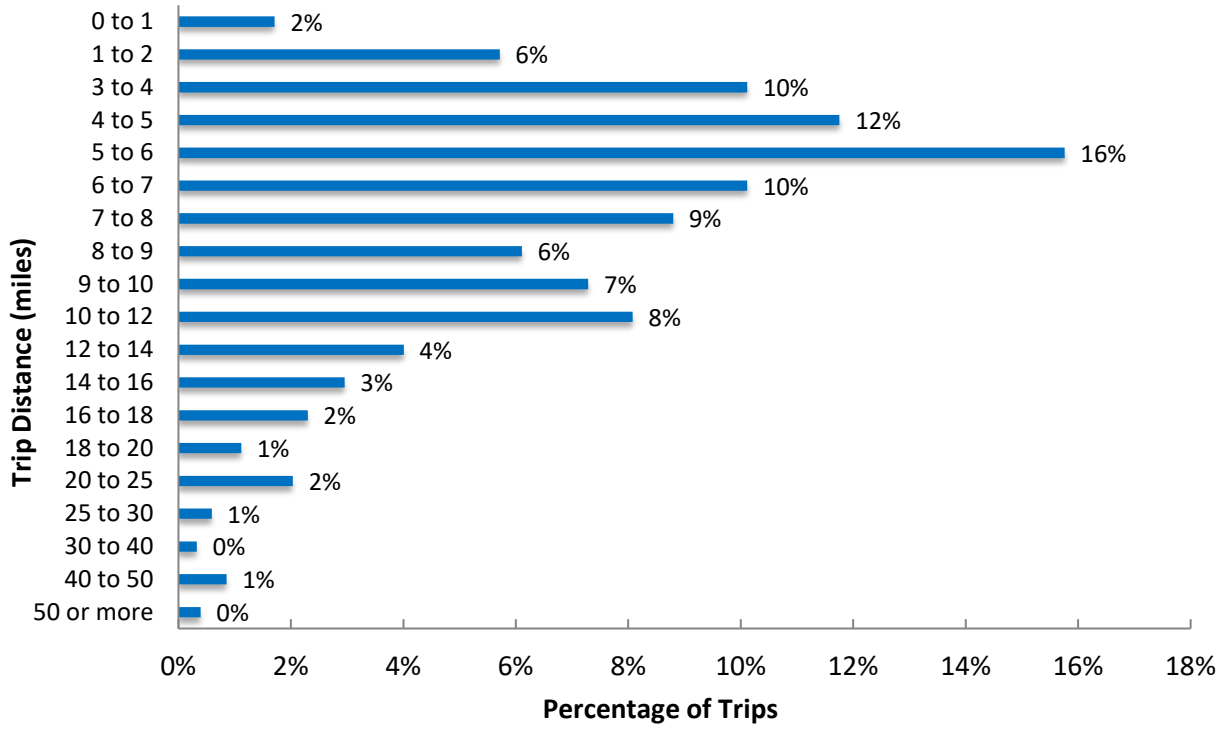
Trip Distances and Time of Day Considerations

In addition to where AC Austin requests occur, we also assessed trip distance and how trip-making patterns fluctuate throughout the day. We found an average trip-based distance of 7.6 miles and a median of 5.8 miles over the month. As shown in Figure 6, although the majority of trips are under 7 miles, there are a moderate portion of longer-distance trips, as almost a quarter of trips were more than 10 miles. This suggests that AC Austin may serve slightly longer trips, on average, than other ridesourcing services in the Austin area. For example, one study showed that the average Ride Austin trip is about 2.5 to 3.5 miles

[1] "Zones" aimed to reflect key neighborhoods/areas of Austin. Note that we only include labels for zones receiving more than 20 requests over the study month, and we left some zones unnamed (using zip codes instead). Each named zone is defined by the boundaries of the following zip codes - Downtown: 78701; East Riverside/Oltorf: 78741; East Austin: 78702, 78721, 78722; South Central Austin: 78704; Central Austin: 78712, 78705, 78751, 78756; West Austin: 78703, 78731; South Austin: 78745, 78748; Southeast Austin: 78744, 78747; North Central Austin: 78752, 78757; North Austin: 78753, 78758; Mueller: 78723; Northwest Austin: 78727, 78759, 78750, 78729, 78728, 78717; Cedar Park: 78613, 78726; Round Rock: 78664, 78681, 78655.

(Komanduri et al. 2018). This supports findings from the rider survey, where some respondents claimed that they use AC Austin for longer trips and other ridesourcing services for shorter trips, due to the price structure differential (AC Austin charges a flat $2/mile with a $10 minimum, while competitors typically use a combined time- and mileage-based fare).

Figure 6. AC Austin Trip Mileage Distribution (N=1,523)



We were also interested in understanding how AC Austin trip-making patterns vary throughout the day. We find that during the morning and afternoon hours, key zones outside of downtown like East Riverside/Oltorf, South Central Austin, South Austin, and North Austin experience the highest volumes of trip origins, with more than half of all trips originating in one of these four zones. During the morning and afternoon time periods, destinations in downtown Austin are the most common, making up almost a quarter of all trip destinations during these times. However, East Austin, South Austin, South Central Austin, and North Austin also experience moderate trip destination activity during the morning and afternoon hours as well. These morning and afternoon trips are likely comprised of those heading to work from neighborhoods outside of downtown along with those making social or recreational trips to downtown or other neighborhoods. In the evening, patterns shift as more trips begin to originate in downtown, likely reflecting those getting off work and heading home or to other recreational locations, along with those making non-work social or recreational trips from the downtown area. There also continue to be large portions of trips originating in downtown-adjacent neighborhoods, likely representing those going out for social or recreational trips or heading to a late-night job. Likewise, about a quarter of all evening trips end in downtown. Finally, during the late

night/early AM time periods (10pm to 7am) the highest concentration of trips originates in downtown, comprising up to 41% of all trips during these time periods. There are also moderate portions of trips starting in East and South Central Austin during this time. During the late night and early AM, zones like East Riverside/Oltorf and South Austin, along with Central and North Austin comprise the most popular destinations. These trip-making patterns likely reflect those heading home from social activities and restaurants/bars, along with those heading home from late-night service industry jobs. We examine trip purpose in further detail in the survey analysis section of the report.

In general, these results show that trip-making patterns fluctuate throughout the day with many riders heading to downtown and to adjacent neighborhoods in the morning, afternoon, and evening, and heading back home from work or social activities to more outlying neighborhoods during the late night and early AM time frames. Next, we discuss operational qualities and analyze when and why requests succeed or fail. We assess matching success rates and how they are impacted by time of day, response times, total wait times, and spatial factors.

Operational Effectiveness

Ultimately, the success of on-demand transportation networks is determined largely on how efficient they are at serving requests in a timely and reliable manner. For these reasons, we were interested in analyzing the operational effectiveness of the AC Austin platform by exploring driver response times to requests, total wait times, and the matching success rates of requests based on various temporal and spatial factors. Because AC Austin does not have a centralized operator (like many taxi companies) or automated dispatch algorithms (like commercial ridesourcing companies) that match riders with drivers, the network relies on drivers identifying and responding to requests themselves and on helpers and moderators to aid in the matching process by identifying potential drivers or calling additional attention to unresolved requests (known on the group as "bumping").

Overall, 96% of requests received some form of attention from a driver, helper, or moderator. Eighty-one percent of all public requests on the AC Austin platform during the study month were successfully matched with a driver. The success rate is lower for non-ride requests (67%) and slightly higher for ride requests (82%) and pre-scheduled requests (85%). For a decentralized ridesourcing network operating through a Facebook page, these matching success rates are surprisingly high. We discuss request matching success factors and reasons for failed requests in more detail in the upcoming discussion.

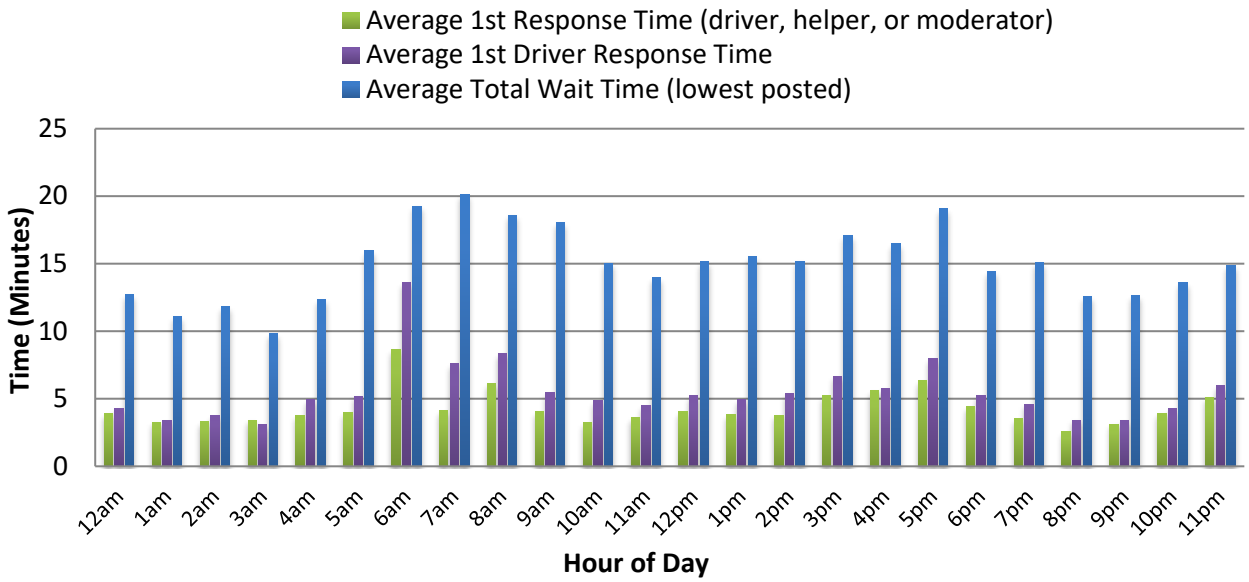
<u>Request Response Metrics</u>
The responsiveness of drivers, moderators, and helpers, and the time riders have to wait for drivers to arrive at their location are major factors contributing to successful matching and to the success of AC Austin in general. Typically, drivers will respond to ride and other requests with an estimated time of arrival (ETA) based on the specified location of the requester. A unique feature of this decentralized platform is that multiple drivers often respond to a single request. In cases where multiple drivers respond to a single request, the requester has the ability to choose which driver he or she prefers. While the majority of

requests have just one driver responding, at 66% of all requests, 20% of requests have two drivers responding, and 5% of requests have three or more drivers responding. Nine percent of requests do not receive a driver response. This equates to 1.23 drivers, on average, per request over the month. This is one of the most unique operational features of the AC Austin platform compared to commercial ridesourcing platforms, which do not allow riders to choose their driver but rather automatically provide matches based on proprietary algorithms.

On average, the time elapsed between a request post and the first response by a driver, helper, or moderator (which we refer to as "response time") is 5.1 minutes. For real-time ride requests (i.e., not pre-scheduled or non-ride requests), the average response time of the first responding driver is 5.5 minutes and the average lowest posted total wait time (response time plus ETA) is 14.9 minutes. We remove pre-scheduled and non-ride requests from response and wait time analyses due to incomplete ETAs for non-ride requests and longer response times for pre-scheduled requests, as pre-scheduled requests are often not responded to immediately since they are not as urgent.

Response and total wait times vary depending on the time of day. Figure 7 shows the average first response time (by a driver, helper, or moderator), the average first driver response time, and the average lowest posted total wait time by hour of the day, for real-time ride requests. We find that the lowest average response and total wait times occur during 8pm to 10pm and 1am to 4am, which exhibit response and wait times that are lower than the overall averages. During the 8pm-10pm and 1am-4am time periods, the average first response times are all less than 4 minutes, the average first driver response times are all 5 minutes or less, and the average total wait times are all less than 14 minutes. This pattern may be due to the relatively greater number of requests that occur during this timeframe (see Figure 3) and the larger supply of drivers that may be active during this time to meet the demand. This also suggests that the AC Austin network may be especially effective at serving certain trip types, like rides to restaurants/bars (8pm-10pm) and from restaurants/bars or late-night jobs (1am-4am), discussed further in the survey analysis section. Average response and wait times are longest during the early morning after 5am and are about average or slightly longer than the overall average during the afternoon time frame.

Figure 7. Average First Response and Total Wait Times by Hour of Day



Although there exists very little publicly available information regarding wait times of commercial ridesourcing services like Uber and Lyft, it takes longer on average for an AC Austin vehicle to arrive than a commercial ridesourcing vehicle. Indeed, the average wait times of the local nonprofit Ride Austin were longer than nine minutes when the service first launched but improved over time to six minutes (Komanduri et al. 2018). These longer wait times on AC Austin are likely due to the larger operational scale of competitors and the efficiency discrepancies between automated and non-automated matching processes. Next, we explore matching success rates and how factors like response times, wait times, and spatial trip attributes affect whether a request is successfully completed.

Matching Success and Response Rates

The time it takes drivers, helpers, or moderators to respond to requests and for drivers to arrive at the requester's location are key operational factors that influence whether an AC Austin request is successfully completed or not. Therefore, we analyze how first overall response times, first driver response times, and total wait times affect matching success rates. We also assess reasons for unsuccessful requests.

Nineteen percent of all requests on the AC Austin platform over the study month were not successful. In order to better understand why some requests failed, we classified failed requests into five categories based on rider, helper, and/or moderator comments to the request. Slightly more than half of the failed requests were due to the requester, with 1% being cancelled, 31% being resolved somehow (got a ride from a driver off-platform, from a friend, or from another ridesourcing service), and 21% having no follow-up response after drivers had responded. On the other hand, 29% of failed requests occurred because no drivers responded to the request. About 19% of these failed requests had an unclear outcome based on missing information in the comment thread of the request. It is possible that some of these requests we classified as failed were ultimately resolved through off-

platform direct messaging. For this reason, our measured matching success rate of 81% likely reflects a conservative estimate of the overall actual matching success rate. These results show that while some requests fail due to a lack of driver responses, a greater portion fail due to factors from the requester's side. However, we also note that requesters may find another option or cancel a request because AC Austin drivers were taking too long to respond to their post.

As with response and wait times, matching success rates also vary based on time of day. Table 1 shows the response and matching success rates of real-time ride requests by hour of the day. Response rates indicate that any driver, helper, or moderator responded to the request post. We find that the highest response and success rates occur during the late morning and early afternoon, as requests happening between 10am and 3pm have both higher than average response and success rates. Similarly, high response and success rates exist from 6pm to 11pm as well, overlapping with the generally faster response and wait times during the evening, as shown in Figure 9. Response and success rates are lowest from 5am to 8am, and 6am to 7am is the worst performing hour of the day with an 88% response rate and a 66% success rate, on average. These results show that although success rates vary throughout the day, ranging from 66% (6am-7am) to 92% (9pm-10pm), they are typically higher than two thirds at any given time of day.

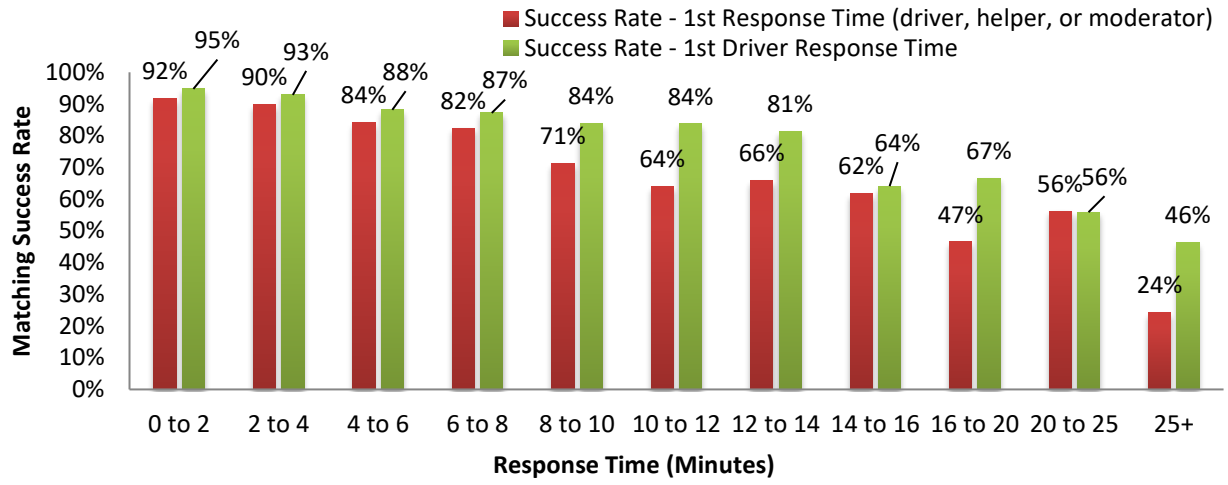
Table 1. Response and Matching Success Rates by Hour of Day

Hour of day	N	Response Rate	Success Rate
12am-1am	162	99%	83%
1am-2am	132	100%	83%
2am-3am	170	96%	75%
3am-4am	127	94%	79%
4am-5am	89	98%	83%
5am-6am	36	94%	75%
6am-7am	32	88%	66%
7am-8am	42	98%	69%
8am-9am	48	98%	77%
9am-10am	60	98%	80%
10am-11am	72	99%	86%
11am-12pm	54	100%	91%
12pm-1pm	69	100%	88%
1pm-2pm	98	98%	85%
2pm-3pm	123	96%	87%
3pm-4pm	119	92%	81%
4pm-5pm	127	96%	81%
5pm-6pm	99	96%	78%
6pm-7pm	105	95%	86%
7pm-8pm	126	95%	83%
8pm-9pm	104	99%	84%
9pm-10pm	128	98%	92%
10pm-11pm	127	99%	83%
11pm-12am	144	95%	80%

Although time of day is an important factor in determining matching success, the response and wait times themselves (as well as request origins and destinations, discussed below) have a greater impact on whether a request is successfully completed. Figure 8 displays matching success rates based on two separate response time factors, including: 1) the first response time by a driver, helper, or moderator, and 2) the first response time by a driver. These results show that there are significant drop-offs in matching success rates past certain first response and first driver response time thresholds. Regarding first response time, the matching success drops from 82% if the first response is within 6 to 8 minutes to 71% if the first response increases to 8 to 10 minutes. The matching success rate drops below 25% if the first response does not occur for 25 minutes or longer. These findings show that a driver, helper, or moderator response within eight minutes makes a substantial difference as to whether a real-time ride request will ultimately succeed or not. However, we note that spatial factors play an important role as well as response time, which we analyze further in the following section.

When we examine matching success rates by the time it took the first driver to respond, there are steadily decreasing but moderately high success rates from zero to 14 minutes, ranging from 95% if the first driver responds within two minutes to 81% if the first driver responds within 12 to 14 minutes. There is a large decrease in matching success rates if the first driver takes 14 minutes or longer to respond to a request, as the success rate drops from 81% (within 12 to 14 minutes) to 64% if the first driver responds within 14 to 16 minutes. The matching success rate drops below 50% at first driver response times of 25 minutes or more. The findings in Figure 8 suggest that matching success on the AC Austin platform is more likely when requests receive a driver, helper, or moderator response within eight minutes and a driver response within 14 minutes. These response time thresholds represent important user travel behavior factors to consider for those planning or operating on-demand transportation networks, especially platforms with decentralized operations. However, we note that automated matching systems like those employed by app-based ridesourcing services typically match requesters with drivers much more quickly than does AC Austin. While the Facebook-based platform that AC Austin employs gives drivers more flexibility to choose who and where they drive, it also makes the matching process less efficient than those used by app-based competitors.

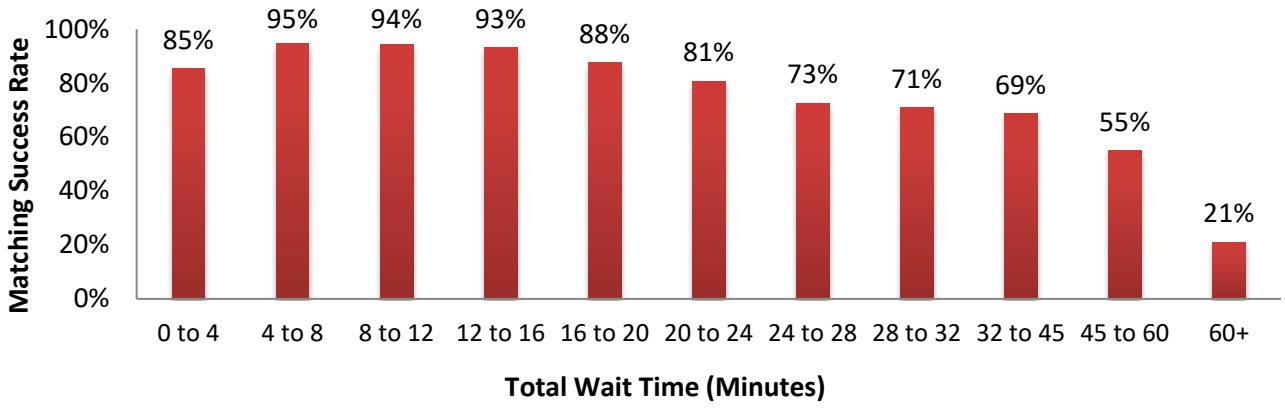
Figure 8. Matching Success Rates by First Response Time and First Driver Response Time



As with response times, matching success rates follow a similar pattern based on the total wait time, calculated by adding the driver's response time to their posted ETA. For our purposes, we consider the lowest total wait time of all responding drivers in the case that more than one driver responded to the request post. As displayed in Figure 9, matching success rates are higher than or equal to the overall average of 81% when the total wait time is less than 24 minutes. If the total wait time is 24 minutes or longer, the success rate drops to 73%. This pattern corresponds with the drop-off in first driver response time success rates at around 14 minutes. This closely parallels the key total wait time cutoff of 24 minutes, since the average posted driver ETA is around 10 minutes. Overall, the results in Figure 9 show that a good majority of AC Austin riders are willing to wait up to 24 minutes to receive a ride, and some are even willing to wait up to an hour. This suggests

that AC Austin riders may be more patient than those who only use app-based ridesourcing services, or that AC Austin riders may use the platform for trips that are not urgent. We note that the 0 to 4 minute total wait time matching success rate is relatively low likely because the sample of requests falling into this category was fairly small (N=34 as opposed to in the hundreds for most of the other groupings).

Figure 9. Matching Success Rate by Total Wait Time

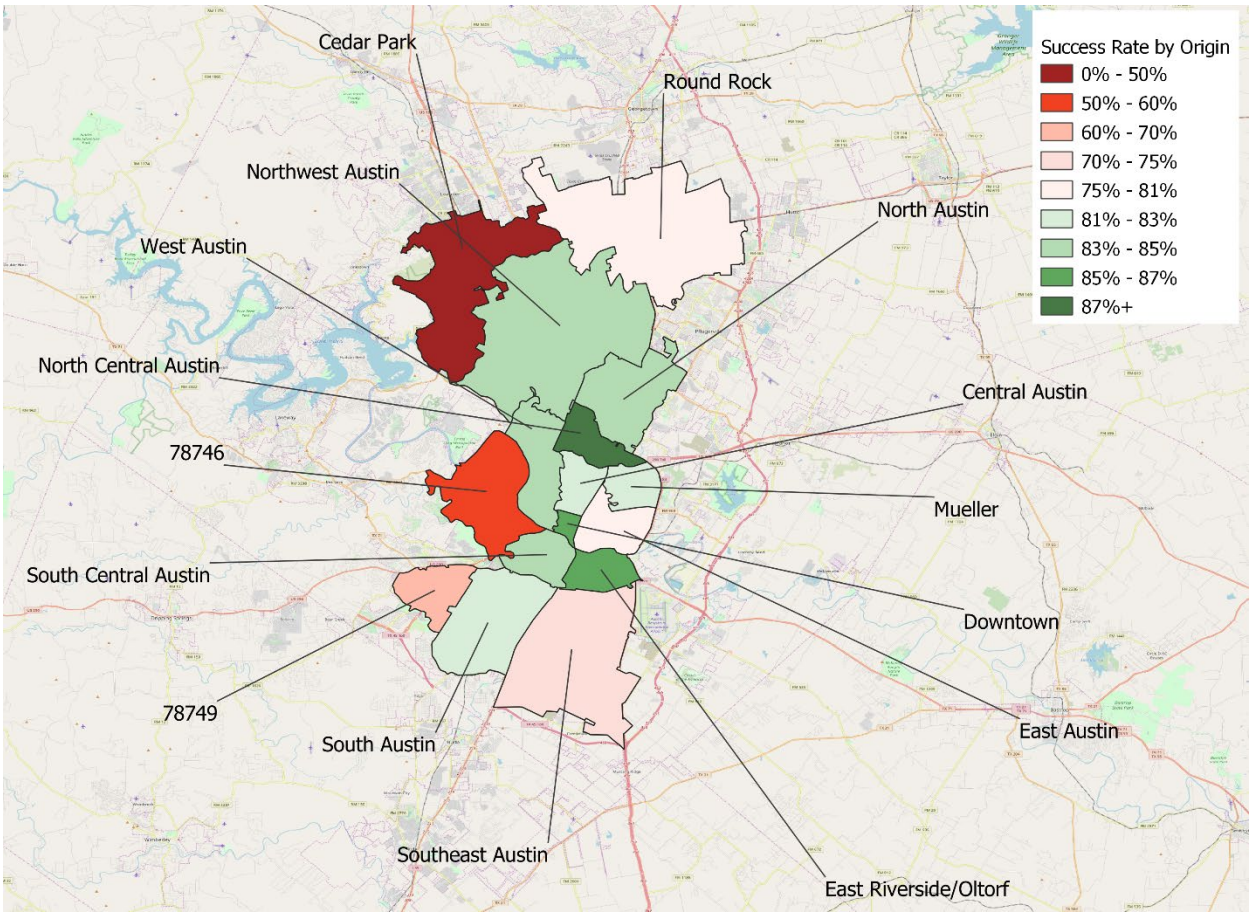


In general, we find that response and wait times have an important effect on whether a request is successfully matched. However, wait times are directly impacted by how far drivers are from requesters, and thus we must analyze spatial factors when assessing what factors affect matching success. In the next section, we explore how matching success rates and total wait times vary spatially across different areas of the Austin region.

Matching Success and Spatial Factors

Since wait times are affected by drivers' proximity to a requester's location, we were also interested in analyzing spatial factors that might lead to lower wait times and thus higher matching success rates. As discussed previously, certain areas of Austin receive higher portions of trip activity than others, with downtown and adjacent zones containing the majority of trip start and end locations. In general, we find that these same popular areas also perform well with regards to wait times and matching success rates. Trips starting or ending in the most popular zones of Downtown, East Riverside/Oltorf, South Central Austin, or South Austin all have matching success rates higher than the overall average of 81%. Other zones near the core of Austin like Central, North Central, and North Austin also perform better than the overall average matching success rate. Shown in Figure 10, we see that matching success rates begin to diminish in outlying zones that are farther from downtown. Figure 10 shows matching success rates by zone, color coded by whether the zone performed better (green) or worse (red) than the overall average rate of 81%. Note that we only display zones receiving more than 20 requests total for conciseness.

Figure 10. Matching Success Rate by Origin Zone



Better matching success rates in the core areas of Austin and diminishing success rates in outer areas are due largely to the lower wait times typically experienced by those requesting rides from core areas. For example, the average total wait time in downtown is 11 minutes, notably lower than the overall average wait time of around 15 minutes. Similarly, wait times meet or outperform the overall average in each of the zones surrounding downtown. Popular but farther away zones like South and North Austin have average total wait times of 16 minutes, still very close to the overall average. Interestingly, among the areas farther from downtown that have lower matching success rates, total average wait times are certainly higher than in the core zones but not usually more than about 23 minutes, on average. Overall, these results show, as expected, that core zones close to downtown have lower wait times and better matching success rates than areas farther from the core. However, wait times and matching rates still perform at somewhat reasonable levels in outlying zones, with matching success rates in the 70% range and total wait times in the low 20-minute range, on average. This suggests that while core areas make up the majority of trips and perform better from an operational standpoint, there are still successful trips occurring on the outskirts of Austin. While origin and destination are important factors in determining the success of an AC Austin request, it appears that total wait time (Figure 9) is the most important factor in whether a request ultimately succeeds or fails.

The operational analysis shows that while AC Austin does not perform as well as commercial app-based competitors with respect to wait times and matching consistency, the platform is still surprisingly effective and successfully matches about four out of every five requests with an average wait time of 15 minutes. While certain core areas and times of day perform better than others, the fact that the approximately 100 drivers of AC Austin (with only a portion of them active at any given time) successfully complete hundreds of rides per day across the 30th largest metropolitan area in the U.S. shows that decentralized ridesourcing platforms can succeed from an operational standpoint. In the future, if a decentralized ridesourcing cooperative were to implement an app and automate parts of the requester-driver matching process, performance would likely improve even further.

These results also uncover some key takeaways for those hoping to implement a ridesourcing cooperative or those starting up a ridesourcing network with a relatively small number of drivers. One finding is that carving out core operating areas and use cases are key to sustaining successful operations. AC Austin operates throughout the entire Austin area, but is most active in downtown and adjacent neighborhoods just south of downtown. Having a core defined operating area allows for a smaller network of drivers to ensure that requests are being met within reasonable wait times. Similarly, these results suggest that certain types of cities may be more suitable for small decentralized ridesourcing networks than others. Austin is a mid-sized, monocentric city, with a thriving nightlife scene. These factors lead to reasonable levels of rider demand within a geographical area centered around a downtown and a few core neighborhoods. These factors may make it easier for a relatively small decentralized network of ridesourcing drivers to serve this demand, although it is difficult to say for certain without another city to compare against. At any rate, the results from this section confirm that decentralized ridesourcing networks can succeed from an operational standpoint. Sustaining a decentralized ridesourcing network includes factors beyond simply meeting supply and demand, however, and we discuss important governance considerations regarding AC Austin and platform cooperatives in the next section.

Governance Analysis

The most critical distinction between commercial ‘sharing economy’ companies and platform cooperatives is in how decisions are made, and by whom, regarding organizational structure and activities conducted through the platform. Currently, most commercial sharing platforms are controlled by a private entity (e.g., Uber, Airbnb, etc.) that makes decisions regarding pay and commission rates, platform operations, and rules enforcement. While this more centralized model has some advantages around efficiency and logistics, it also has a variety of problems related to monopoly power, worker’s rights, and many other issues. The goal of platform cooperatives is to address many of these issues by increasing transparency and democratizing power among platform members themselves as opposed to being held by a third-party private entity.

There are many different approaches that platform cooperatives can take to try to achieve more democratic control and fairer outcomes for platform members. Although they do not currently operate as a cooperative, as a functioning P2P platform, AC Austin offers a fantastic case study to analyze the decision-making structures and processes of a decentralized platform. In this section, we examine AC Austin's current governance model and their future governance plans, mainly informed by stakeholder interviews and online materials. We conclude the section with recommendations for platform cooperative governance, based on empirical findings from AC Austin and a review of practices adopted by other cooperatives and decentralized organizations.

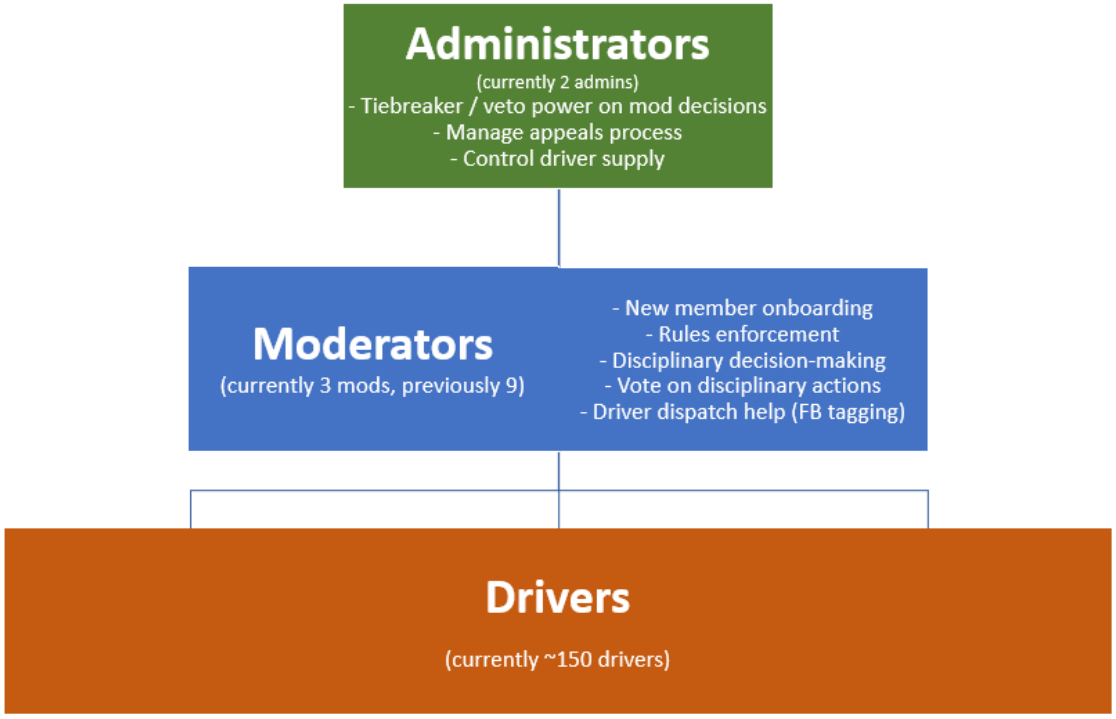
Current Governance Model

In this section, we discuss AC Austin's current organizational structure, governance, and management processes, which include how they activate new members, their infraction system, how conflicts are resolved, and position appointment processes.

Organizational Structure

While AC Austin is governed by drivers on the platform, the group has both administrators and moderators whose responsibility it is to ensure smooth functioning of the group, resolve conflicts, manage new member activations, and issue disciplinary actions. Administrators and moderators have additional capabilities beyond those held by regular drivers, which we describe in more detail below and illustrate in Figure 11.

Figure 11. Current Arcade City Austin Governance Structure



Administrators represent the highest level of authority and decision-making power in AC Austin. They have the last say on disciplinary decisions made by the moderators, including resolving ties and veto power. The administrators also serve to oversee the appeals process in the case that a member felt they received unfair treatment. In addition, they control the driver supply by allowing more drivers to join the page in anticipation of periods of high demand (holidays, special events, etc.) and by dropping inactive drivers. At present, there are two main administrators, one of whom is also the original creator of the AC Austin Facebook group.

Moderators manage the day-to-day operations of the group and are responsible for driver onboarding and background checks, new member activation, Facebook group monitoring and rules enforcement, voting on disciplinary actions, and driver dispatching help through tagging drivers so that they are aware of relevant request posts. The moderators have their own private Facebook group where they communicate between themselves and coordinate voting polls when necessary. There are three moderators as of the writing of this report although there used to be as many as nine moderators in the past. All of the current moderators are also active AC Austin drivers. According to those we spoke with in our stakeholder interviews, neither the moderators nor administrators are paid for their services.

Interestingly, since AC Austin functions through a Facebook group, there are certain pre-defined capabilities for those deemed administrators and moderators according to Facebook's standard group settings (Facebook n.d.). For example, administrators can appoint moderators, remove any member (including administrators and moderators), delete posts, and change certain group settings, while moderators can only remove regular members and delete posts. We were not able to ascertain whether these roles and governing structures were pre-meditated prior to group formation or whether they developed organically in part based on Facebook's standard group settings.

There are currently around 100 active drivers on the AC Austin platform. To the best of our knowledge, drivers do not have any required responsibilities beyond driving. However, based on stakeholder interviews it is clear that most drivers monitor the rider customer base and will report bad behavior to the moderators and/or administrators. We also observed through the operational data analysis that many drivers who are not moderators will also help the dispatching process through driver tagging and "bumping" of inactive request posts. For example, about a third of these dispatching help posts during our data collection period were made by regular drivers. All drivers (including moderators) are part of a private Facebook group, where they can communicate and discuss issues.

While riders and requesters are not directly involved in the governance of AC Austin, they are responsible for reporting issues with drivers to the moderators and administrators. Requesters do not have their own Facebook group (other than the public request page), but complaints are generally posted on the main AC Austin group page, or on a separate general Facebook group called "Arcade City Square."

Governance and management processes

Those involved with AC Austin manage and govern themselves and do not have a commercial third-party entity like Uber or Lyft onboarding new drivers, matching riders with drivers, and issuing disciplinary actions. For these reasons, the group has developed different governance and management processes to carry out a variety of tasks and resolve conflicts that arise. While AC Austin has a brief charter of rules and regulations document that outlines basic guidelines for drivers and consequences if they are broken, many of the stakeholders we spoke with claimed that governance processes are mostly informal and that the charter document is loosely followed. In this section, we outline many of the group's governance and management processes, including: new member activation, the infraction system, conflict resolution, and position appointment. Where relevant, we discuss how each particular process compares and contrasts to approaches taken by commercial 'sharing economy' platforms.

New member activation

When new riders or drivers wish to join AC Austin, moderators are tasked with managing the process of selecting who is or is not allowed to join and are responsible for onboarding new members. For new riders, this process is fairly simple: the rider initiates a request to join the group via Facebook. A moderator then reviews the rider's profile to make sure there are no obscene or inappropriate recent posts and ensures that the rider has been on Facebook for more than a year (in order to protect against fake profiles).

For aspiring AC Austin drivers, the process is more involved. In addition to ensuring the driver has been on Facebook for more than a year and does not have any inappropriate recent posts, moderators also require the completion of a driver registration form, where potential drivers provide the following information:

- Driver's license information
- Vehicle registration information and picture
- Proof of insurance
- Screenshots of other TNC profile(s)

The moderators we spoke with claimed that to become a new AC Austin driver, you must have been a driver with a TNC (Uber, Lyft, Ride Austin, etc.) for at least a year. The moderators check the prospective driver's information to ensure that they are indeed a registered TNC driver in the state of Texas and that they have passed all relevant background checks. The new driver also typically has to have a recommendation from an existing AC Austin member.

The process of signing up new rider members is slightly different than the process used by most major commercial ridesourcing companies, who typically do not screen new riders and simply require an email, phone number, and credit or debit card to sign up (Uber n.d.). Although AC Austin's method of screening riders is fairly rudimentary, moderators do perform a basic check on each prospective rider's online Facebook profile. On the other hand, the process of activating new drivers is very similar to the methods used by commercial ridesourcing companies, and AC Austin moderators even piggy-back on Uber

and Lyft's background check processes. However, the AC Austin leadership is much more selective about the number of new drivers that are allowed to join the platform, and some stakeholders claimed the group has a prospective new driver waitlist. This is the opposite strategy than that of most major commercial ridesourcing companies, who prefer to activate as many drivers as possible to ensure lower wait times and cheaper fares for riders (Hall & Krueger 2018). Because AC Austin is controlled by drivers themselves, they are much more sensitive to new drivers coming on to the platform since this might reduce their own earnings. While this worker-controlled approach has major benefits, including a much higher driver retention rate compared to commercial counterparts (David 2019), it may stagnate network growth if the supply of workers is purposefully constrained. This balance between ensuring consistent incumbent platform worker earnings and encouraging network growth is one of the key issues that will be critical for platform cooperatives to solve if they are to scale beyond small- to mid-sized niche user groups and a limited number of geographical markets.

Infraction system

When conflicts arise between members or rules are broken, moderators and administrators can step in and issue punishments to encourage corrective behavior. A unique feature of the AC Austin platform as compared to most commercial ridesourcing platforms is that both drivers and riders have more control and flexibility over posting and responding to requests, completing payments, and communicating directly with other members. While this flexibility has benefits related to special request making and promoting cooperation between members, certain unique problems also emerge that require regulation.

Minor infractions that typically result in a one hour to a one-day suspension, depending on severity, include:

- Not giving riders sufficient time to respond or choose their driver before moving on and posting on other rides. Drivers must wait at least 3 minutes before moving on to another request.
- Not posting a driver collage when offering a ride, which serves to provide driver identification and vehicle information.
- Posting inaccurate ETAs that lead to rider complaints.
- Stealing rides from other drivers by directly messaging requesters instead of posting on the public page, or heading immediately to the rider before they have been selected.
- "Superman syndrome," which refers to drivers trying to take on too many requests over a short time span and failing to complete some of the requests.
- No shows or late cancels on rides that were scheduled in advance.
- Advertising for other ride services not affiliated with AC Austin on the public page.

More serious infractions that may result in suspensions longer than one day include:

- Overcharging or non-payment. AC Austin has suggested rates of $2 per mile for one to four passengers and $3 per mile for five passengers or more, including a $10 minimum.

- Disrespect targeted at any member of AC Austin.

Offenses that result in permanent bans include:
- Driving under the influence
- Sexual assault or harassment
- Threatening comments to any member of AC Austin
- Physical altercation (but self-defense is OK)

The AC Austin driver group has a 'guild charter' document which outlines these rules and punishments. The charter describes a graduated punishment system where first, second, third, fourth, and fifth offenses over a short period of time would result in increasingly longer bans from the Facebook page. However, some stakeholders that we interviewed claimed that the graduated offense system was only loosely followed and at times was enforced erratically.

Conflict resolution

When more serious infractions or disputes between members occur, involved parties can communicate their concerns to a moderator or post to the driver Facebook group (not the public ride request page) to ensure visibility among all drivers. If deemed necessary, the moderators will confer and create a poll to vote on appropriate punishments or resolution measures among involved parties. The moderators will then pass their decision along to the administrators, who ultimately approve or deny what the moderators have recommended. According to the guild charter document, appeals may be made at any time and stakeholders we spoke with claimed that appeals are typically made by communicating directly with an administrator.

The Facebook platform functionality brings both pros and cons to the conflict resolution process. One advantage is that because most communication on the group happens via Facebook or text message, there is an auditable record of what occurred. In addition, GPS location screenshots (or the lack thereof) can also serve as evidence if a driver was not where they should have been for a pre-scheduled ride pickup, for example. However, disadvantages of the current platform for conflict resolution include: the special ability of moderators and administrators to delete complaint posts that they do not like and the lack of transparency in the punishment decision making process. Some stakeholders we spoke with contended that moderator voting and punishment selection was done in secrecy from the rest of the driver group and that as such, no one moderator would take responsibility for a controversial decision. At the same time, moderators we spoke with claimed that their disciplinary decisions were regularly vetoed by the administrators, which may affect performance and discourage moderators from future active participation.

Although there is likely room for improvement, AC Austin's conflict resolution processes are distinctly different from those employed by commercial players like Uber and Lyft. Commercial ridesourcing companies have little to no due process when enacting a driver suspension or handling appeals. Uber and Lyft drivers regularly complain about being deactivated from the platform for unfair reasons and cite erratic and often long processes

for becoming reactivated (Ridesharing Driver 2018). These decisions are made either algorithmically (e.g., star rating falls below a certain threshold) or by someone with little no know intimate knowledge of the local context or situation and may be relying on a single rider complaint or even less evidence to validate their decisions.

Alternatively, moderators and administrators (who themselves are drivers) with AC Austin have full control over important decisions like suspensions, deactivations, and appeals. While only a few members have these privileges and their selection process is unclear, AC Austin nonetheless is comprised entirely of local community members with an entrenched interest in ensuring the group's success. Moderators and administrators also have much more intimate knowledge about specific group members. If thoughtfully implemented, this local and community-based approach could lead to increased transparency, fairness, and long-term sustainability of sharing platforms. Conflict resolution processes in which local members are actively involved with decision making would represent a paradigm shift compared to procedures employed by commercial services that currently dominate most of the ridesourcing market.

Position appointment

As discussed, moderators and administrators help run the day-to-day operations of the group and have additional powers and responsibilities beyond those held by regular drivers. However, the processes in which administrators and moderators are selected and removed are not outlined within the charter rules document nor were the procedures clear from stakeholder interviews. According to those that we spoke with, the two administrators have continuously held their positions since the group was founded in mid-2016. Moderators are appointed by existing moderators or administrators but the exact method for selection was not clear from our discussions. An interviewee claimed that one particular new moderator was selected because the existing moderators thought that this person was already taking on leadership responsibilities within the group. Another member told us that moderators can be removed if enough drivers complain of misconduct, although they failed to cite a specific example where this had happened. Ideally, truly peer-to-peer sharing platforms would enact a system of democratically-elected and rotating management positions. We discuss potential approaches and recommendations further in the 'governance recommendations' section below.

Future Governance Plans

Although AC Austin has existing governance and management structures, as outlined in the previous section, the founding team has plans to expand beyond Austin by deploying an app (currently in beta) and developing tools to facilitate 'trustless cooperative behavior,' as outlined in their whitepaper (Arcade City Whitepaper Q1 2018). Their whitepaper and other online materials also outline support for driver "guilds," which are self-organizing groups who collaborate and share a common organization name and pool resources. In theory, there would be multiple driver guilds within the broader AC ecosystem, with both closed (by invitation only) and open guilds. There could even be many driver guilds within a single city. Guilds may elect to contribute to a collective resource pool to be managed within the guild that could fund licensing, insurance, or other services and equipment. The

guilds would also set guidelines and governance processes for managing ownership, profits, and funding decisions (Arcade City Whitepaper Q1 2018).

Various stakeholders we spoke with envision that there could be many different guild types that could serve particular interests or specialties, including:

- Full- or part-time driver guilds: Guilds may develop that cater to drivers who work varying amounts of time on the platform. For example, a full-time driver guild may charge a higher rate for membership but include more services, like insurance, equipment, or other perks. A part-time driver guild may charge a lower membership rate but only provide basic services.
- Specialized service or driver types: Guilds may form that serve particular use cases, like coordinated downtown pickups with on-street helpers, food or goods deliveries, or an all-female driver guild that serves female passengers.
- Location-based guilds: Guilds may form to serve different geographical areas of a given city. For instance, a north guild, south guild, and so on.
- Vehicle type: Guilds may segment based on vehicle type, and could include drivers with trucks, higher-capacity vehicles, or luxury vehicles.

The founding team envisions that guilds would gain experience points and go through levels based on their size, number of requests served, and tenure with good behavior. This approach, which one of the founding members told us was inspired by massively multiplayer online role-playing games (MMORPGs) like World of Warcraft, would presumably motivate guilds to "level up" through unlocking additional capabilities like having your guild be displayed first to riders and other incentives (David 2017).

The founders we spoke with claim that many of these ideas were also inspired by the natural development of AC Austin over the last three years. For the first year that AC Austin was in operation, there were multiple driver guilds (formerly called 'pods') that set their own rates, had their own branding, and conducted their own quality assurance processes. One driver we interviewed claimed that pods would share ride requests in order to keep customers satisfied and ensure that income stayed within the pod. For example, if a rider made a request to a particular driver that they liked, but that driver could not take the request at that time, the driver might recommend another driver in the pod and receive a 10% commission for passing along the work if the ride was ultimately completed. In addition, some drivers we spoke with claimed that resource pooling is common in AC Austin and typically occurs informally. Members have posted in the past seeking loans, donations, and other help from the community. Some interviewees claimed that they had made loans, helped riders in need by providing food, and even provided temporary housing when a member had been evicted. However, another driver claimed that some members have abused the group's generosity in the past, and that there has been little to no accountability for these abuses.

If thoughtfully implemented, guilds in sharing platforms could address many issues inherent in commercial sharing platform business models. Guilds would, in theory, be able to address local concerns much better than large corporations that often have little to no

local knowledge or presence. Similarly, there could also be more transparency in decision making and members themselves would have more control in influencing the direction of the platform and setting important metrics, like commission rates. With more driver control of important policies, guilds and the broader platform cooperative would be less likely to run afoul of employment laws. Guilds could also agree to pool and distribute resources that they might require, like insurance, and members could opt in to particular guilds that suit their own specific needs as opposed to being treated as homogenous contractors.

However, multiple guilds within a single city could also introduce a new set of challenges. The AC Austin leadership underwent major changes a few years into operating when those involved with a large pod and the incumbent administrators and moderators began to take issue with one another. Ultimately, this conflict resulted in the dismissal of the core leadership of the large pod and many drivers and former AC Austin leadership decided not to continue with the group as a result. While many members that we spoke with still thought multiple guilds in one city could work in the future and lead to positive outcomes, it is not clear how future guilds would manage these tensions. In addition, it is unclear what the process would be for ensuring that guilds are following certain standards and providing services at an acceptable quality level. The AC whitepaper claims that "a guild's charter may be cancelled if the guild is found to be operating outside of the fairness principles" (Arcade City Whitepaper Q1 2018). While the fairness principles outline a statement of values that guilds should adhere to related to non-discrimination, transparency, communication, and conflict resolution, it is not clear who would enforce these principles and whether enforcement would be carried out by local participants or external auditors.

The founding team also had a cryptocurrency token presale in November 2017 with plans to incorporate payment functionality using the token and to provide incentives for governance. The main goal of using blockchains in sharing platform applications is to remove central intermediaries, reduce transaction costs, and facilitate truly peer-to-peer transactions between participants on the network. Blockchain or cryptocurrency applications could, in theory, also play a role in guild governance. Voting, ownership stake, funds distribution, and other processes could not only be facilitated by a cryptocurrency token but some of these processes could potentially be executed using a blockchain-based smart contract. However, the benefits and drawbacks of using cryptocurrencies and blockchain technologies in a group such as AC or other sharing platforms are unclear at this time. Blockchains can introduce additional complexity and costs that may not make sense for certain applications. Many of the governance functions the group aims to implement do not necessarily require blockchains. For example, resource pooling, voting, and funds distribution could be all be executed using fiat currency and without blockchain-based smart contracts.

It is clear that the AC founding team has ambitious future plans that are in many cases different from the current operations of AC Austin. While some of these proposed features like guilds, experience point systems, and cryptocurrency/blockchain technologies may benefit those involved with sharing platforms, there are many outstanding issues that would need to be addressed for platforms that incorporate these features to succeed.

Clearly defined and well thought out roles, policies, and incentives would need to be developed to ensure the sustainability of cooperatively-run sharing platforms. In the next section, we discuss recommendations for platform cooperative governance and management, as informed by lessons learned from AC Austin and identified best practices of cooperative organizations.

Governance Recommendations

Governing and managing a digital sharing platform, let alone one that is cooperatively run, is a difficult task. Balancing the long-term interests of the group with individual motivations is a constant and demanding job. However, we believe that if implemented thoughtfully, cooperatively-run digital platforms have the potential to offer much more equitable and sustainable platform work opportunities than exist today. In this section, we explore how the benefits and challenges of AC's governance model, along with best practices from cooperatives and other digital platforms, could improve governance practices for platform cooperatives as they scale to more members and markets. We identify and discuss seven key governance recommendations for platform cooperatives, including:

- Regular and democratic voting,
- Clearly outlined roles and division of responsibilities,
- Clearly defined rules and regulations,
- Appeals council comprised of members,
- Strong emphasis on communication and transparency,
- Thoughtfully designed platform functionality, and
- Incentives to encourage sustainable growth.

<u>Regular and democratic voting</u>
Platform cooperatives should have periodic and democratic elections of new board members (referred to as administrators in AC Austin) and should hold votes on key measures. While many groups hold voting periods annually, the frequency with which votes among the entire membership occur will depend on the needs and preferences of each organization. It is also up to each particular organization to determine what issues are deemed important enough for the broader membership base to vote on, which members qualify to vote on particular issues, and what tenure periods of board members and management are appropriate.

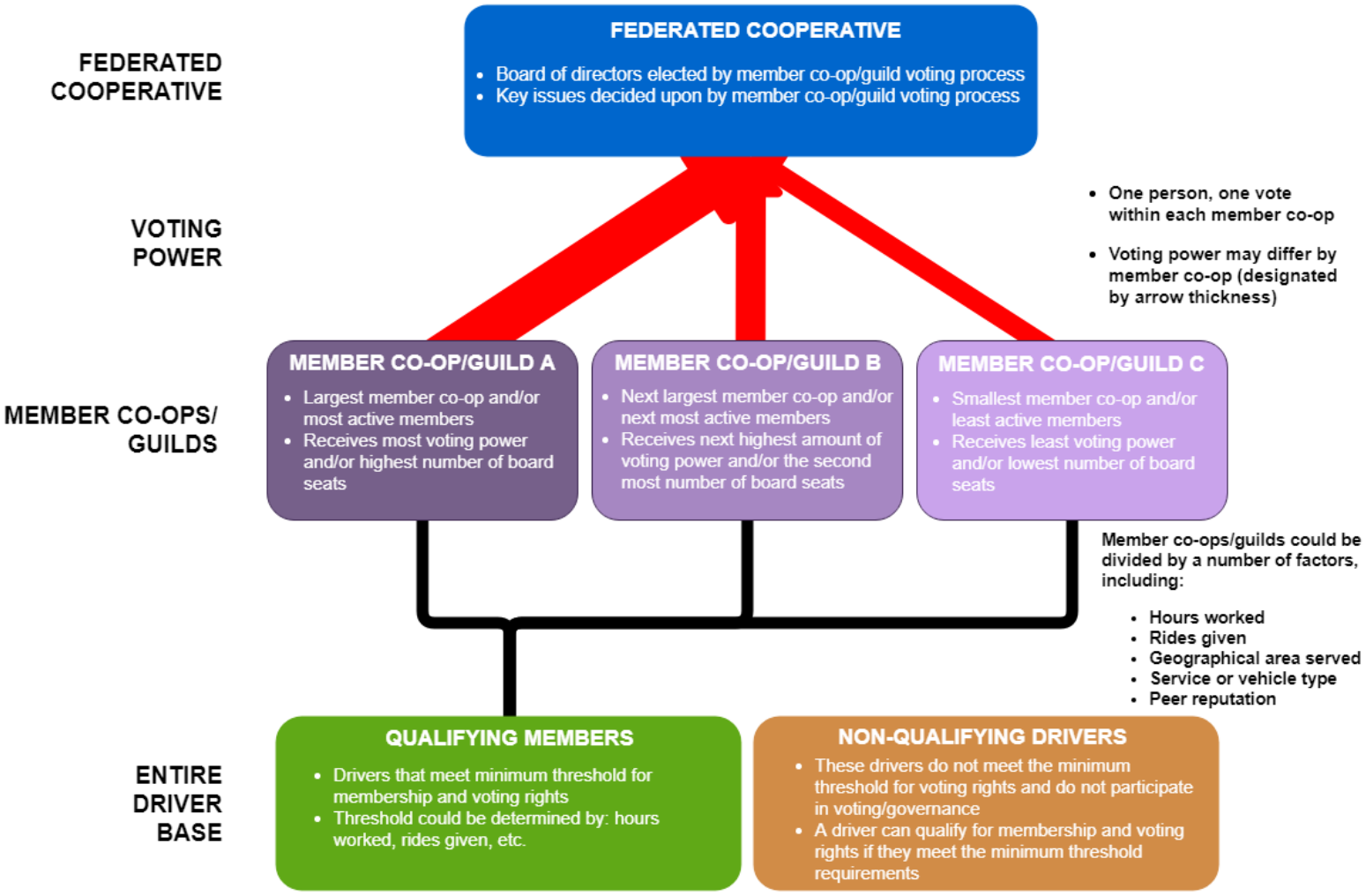
Many platform cooperatives have adopted a one-member, one-vote policy (including Stocksy, Fairmondo, and Loconomics, among others). Other proposed platforms envision a different approach with some form of weighted voting, where one or a variety of factors determine how many votes each individual is granted. For example, the proposed blockchain-based carpooling platform La'Zooz plans for compensation and voting power to be partly determined by a combination of contribution and reputation. Reputation would be determined through a peer-based rating system, where the community of members would rate the performance of each of their peers at the end of every month (La'Zooz 2015).

While there exist many different approaches to voting, we recommend a one-member, one-vote policy to ensure platform cooperatives operate on a cooperative basis (Co-OpLaw.Org 2019). We also recommend that platform cooperatives consider having multiple member cooperatives (which could also be referred to as guilds) whose members are allowed to vote on particular issues, elect certain board positions, or have weighted voting based on member co-op/guild patronage or membership size. This federated cooperative (or "cooperative-of-cooperatives") structure is allowed under California and other state's laws (California Legislative Information 2018). A multi-cooperative membership and voting structure may be plausible for larger platform cooperatives due to considerations unique to sharing platforms. One attribute of most digital sharing platforms is the duality between part-time and full-time workers. Sharing platforms typically engage many participants, but the majority work on a part-time basis and often for a limited time period. On the other hand, these platforms have a smaller core group of full-time workers who provide a much larger portion of the services on the platform (Mishel 2018). Due to these inherent differences, it may make sense for platform cooperatives to implement minimum membership requirements for voting rights and to establish multiple member co-ops within a broader federated platform cooperative. Each member within every member co-op would receive one vote, but member co-ops themselves could receive votes in proportion to time dedicated across the entire cooperative membership or other metrics. Factors that may be considered when determining membership qualifications for a particular cooperative could include one or many of the following metrics:

- Hours worked,
- Effort or output produced (e.g., rides given),
- Geographical area served,
- Service or vehicle type, or
- Peer-based reputation.

Voting power and capabilities could differ across member co-ops/guilds based on one or many of the above metrics or in any other mutually agreed-upon manner. If member co-ops were allocated voting power by hours worked, for example, this type of approach would effectively give those most involved with the platform more of a voice. Figure 12 outlines an example federated platform cooperative voting and member co-op structure, with three member co-ops/guilds (A, B, and C) ordered by size and/or activity of their members. The 'voting power' arrow thickness illustrates how member co-op votes may be weighted depending on the size or activity of each particular cooperative, with member co-op/guild A receiving the most voting power and member co-op/guild C the least.

Figure 12. Potential Voting and Federated Platform Cooperative Structure

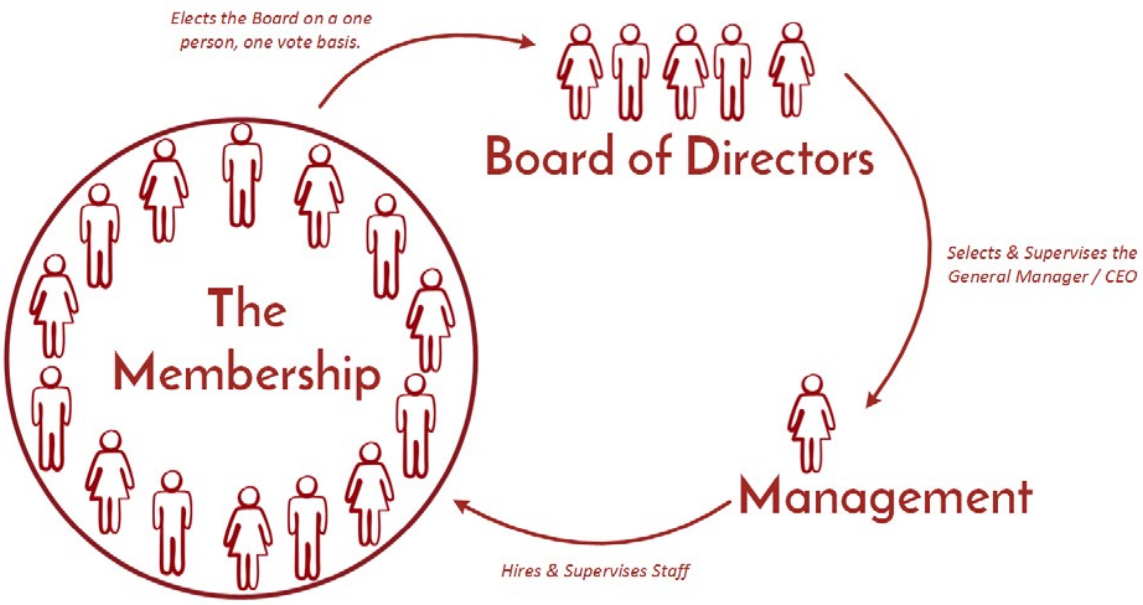


Although an approach like this intends to give more of a voice to more active workers, measures should be taken to ensure that part-time workers are still welcome and have their concerns heard. It is also important to keep in mind that some of these metrics may be harder to measure than others. For example, peer reputation is most likely more difficult to quantify than time dedicated or rides given. Ultimately, no matter how it is structured, democratic and regular voting should be a key feature in platform cooperative governance.

<u>Clearly outlined roles and division of responsibilities</u>

Although distributing power and decision making among the membership base is a core goal of platform cooperatives, clearly defined roles and responsibilities within groups are necessary to sustain operations and provide accountability. Strategies may vary depending on the particular group and their needs. However, we recommend platform cooperatives draw inspiration from identified best practices of governance systems for worker cooperatives, as outlined in Figure 13 below.

Figure 13. Model Governance System for Worker Cooperatives



Source: ICA Group 2015

In Figure 13, the membership signifies those who work at the organization and meet the minimum threshold for voting and ownership stake. In the case of a ridesourcing platform, the membership represents the active drivers on the platform. The membership is responsible for electing the board of directors and voting on significant policy matters. If there are different membership types or various member co-ops/guilds, each should have a representative say on who is elected to the board (see Figure 12 above). The stock photography platform cooperative Stocksy takes an approach similar to this, where each of the three classes of shareholders receive at least two representatives on the board of directors (Marshall 2018).

The board of directors is responsible for governance and policy issues that are not handled by the membership directly. The board also sets the strategic direction of the organization, selects management personnel, and approves the budget. The administrators of AC Austin could be considered the group's board of directors. The management are responsible for carrying out and overseeing the regular business of the organization. They have considerable influence over how the group functions but they do not have authority to set policy as managers, which is a task left for the board to decide. The moderators on AC Austin could be considered the management of the group. How often management positions are rotated should be carefully decided upon. For groups like AC Austin where the moderators are drivers themselves, a rotating moderator committee could allow for a greater diversity of members to have a voice in the management of the platform. Lastly, some platform cooperatives may find it helpful to convene other special committees that provide advice to the board regarding governance, finance, planning, education, or a

variety of other topics. These committees should be advisory in nature and can suggest but should not set policy directly.

While AC Austin has driver, administrator, and moderator roles that are similar to those outlined in Figure 13, there are differences in responsibilities and capabilities. First, the moderators of AC Austin do not hire and supervise drivers (since drivers are not employees) but instead they manage the platform on behalf of the organization. Also, AC Austin's administrators are not elected by the drivers themselves and they do not rotate over a period of time. In addition, the administrators of AC Austin have the authority to review and approve or deny all decisions made by the moderators. Cooperative members typically have the ability to remove board members and bring a board decision to a member vote if a requisite number of member signatures is obtained. To ensure clear and efficient division of responsibilities, we recommend that issues should only be brought to the board (administrators) if they: 1) affect a large number of members, 2) commit a substantial portion of resources of the organization, or 3) affect operations, personnel, or resources over a long time period (ICA Group 2015). Management can often get discouraged if they perceive that their decisions are not being well received and can be overturned easily.

In the case that a single platform cooperative organization expands to multiple cities, a clear and well thought out delineation of tasks and authority would be needed to achieve a balance between the interests of each local cooperative and those involved at the broader organizational level. It should be decided upfront what key issues and responsibilities will be dealt with internally versus what tasks and problems will be raised among organization-wide stakeholders. A federated network may be most effective in this case, since each local group could share the burden of start-up and technology development costs across multiple cooperatives (McCann & Yazici 2018).

Clearly defined rules and regulations

There should be a clearly defined set of rules and regulations that a platform cooperative adheres to that is simple enough to follow and flexible enough to adapt to unforeseen circumstances. These bylaws should be written and accessible to everyone involved with the platform. If there are graduated punishment systems, they should be followed fairly and apply to all members in the organization, including those who hold special positions. For AC Austin, their regulatory system is ambiguous in some ways and this uncertainty can lead to abuse of the system. Striking a careful balance between being too informal and being overly prescriptive is key to the long-term success of platform cooperatives. The open-source Loconomics cooperative bylaws can serve as an example regulatory document for those hoping to form a platform cooperative (Loconomics Cooperative, Inc. 2019).

Appeals council comprised of members

Platform cooperatives should incorporate appeals processes through a grievance council, comprised of a diverse mix of members, to deal with issues of perceived mistreatment or unfairness brought up by members of the organization. Issues should only be brought to the grievance council if they cannot be resolved directly between the parties involved. In addition, grievance councils should restrict the types of problems that they address to limit

what the council handles and ensure the quality of decisions made remain high. Only complaints that involve a violation of existing policy, address a situation for which there is no existing policy, or call into question the fairness of an existing policy should be considered by the council (ICA Group 2015).

Currently, the AC Austin administrators serve as the final decision makers for member appeals, which can bring up conflicts of interest if complaints are directed at leadership or if they would negatively affect members that the administrators like. An appeals council should comprise of diverse members of the organization and not just one type of member, in order to ensure issues are scrutinized by those who hold a variety of viewpoints. The Independent Drivers Guild (IDG), which represents over 65,000 For-Hire Vehicle drivers in New York City, has a process that gives members the right to go before an appeals panel if they wish to challenge a platform deactivation (Independent Drivers Guild n.d.). However, the IDG itself is funded by Uber, and Uber also has the power to determine which drivers can sit on the appeals panel (Eidelson 2016). Ideally, a platform cooperative appeals council would be funded and run by the members themselves.

Strong emphasis on communication and transparency

Those involved with platform cooperatives should strive toward maintaining regular and transparent communication between all members on the platform. Since digital sharing platforms use technology to connect members and customers with each other and typically involve minimal amounts of in person interaction, it is especially important that communication channels are open to all and that important decision-making processes are transparent. Due to the distributed nature of the work environment, streamlined communication channels are crucial to the success of platform cooperatives. A key to effective communication among cooperatives is to ensure that important information is summarized and shared widely in a timely fashion, while more detailed information (like meeting minutes) is made available for those who are interested (ICA Group 2015).

AC Austin uses a combination of public and private Facebook groups that serve various communication purposes, including: the public ride request group, a more general-purpose "Arcade City Square" group, a private drivers-only group, and a private moderator and administrator group. Complaints can be brought up at any time on any of the public or private pages. However, voting on punishments occurs on the private moderator group and interviewees we spoke with claimed that results were typically not disclosed publicly to all members of the group. Voting processes, especially those that involve suspensions or bans, should be conducted in a transparent manner and justifications should be explained clearly to all members. Although digital sharing platform members often coordinate remotely, occasional in person meetings and events can help immensely with strengthening bonds and building a sense of community. AC Austin stakeholders that we spoke with told us that the group used to have in person meetings and events when they were first starting up, but that the meetings had ceased to happen over time. Some claimed that certain tensions present in the group might be eased through regular in person meetings and events.

Other communications considerations may include enabling a "free press" ran by members inside the organization that could distribute a newsletter or other materials to all

members. This can help strengthen workplace democracy by encouraging open exchanges between those who hold different viewpoints and by facilitating discussion about controversial issues (ICA Group 2015).

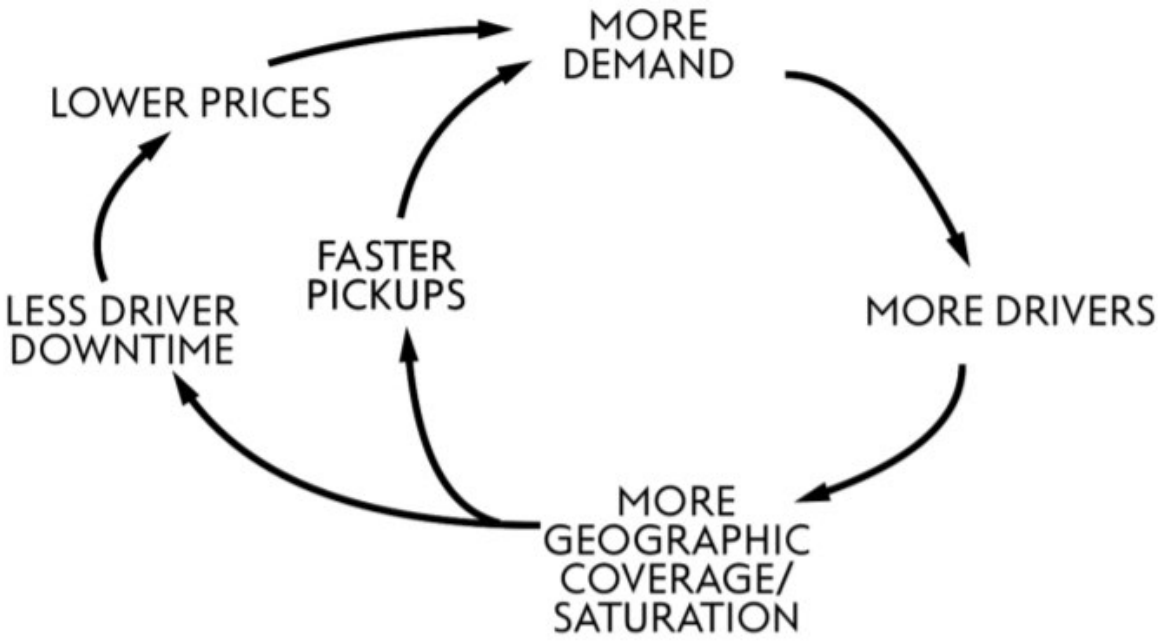
Thoughtfully designed platform functionality

A critical aspect of digital sharing platforms is the design of the platform itself. In relation to governance, this entails deeply thinking through the capabilities of different member types and permissions for who can see what and when. Those involved with group administration and management may need to be given certain special functional abilities, for instance, the ability to issue a temporary suspension or to remove banned members from the group. However, platform designers should be extremely careful and think through how certain permissions and functionalities could potentially be abused. For example, Facebook's standard group settings allow administrators and moderators to delete posts on the group (Facebook n.d.). This is problematic for AC Austin, since administrators and moderators could abuse their power by keeping certain members from efficiently using the platform or by preventing complaints against leadership from being voiced on the public forum. Those designing a platform cooperative should spend time understanding how different capabilities and functionalities of the platform itself may consolidate power, and should invest effort into designing mechanisms to encourage cooperation among members. Existing tools may help with running efficient platform cooperatives and could be modified to meet a particular organization's needs. For example, Loomio is free and open-source software that enables discussion among remote groups and collaborative decision making through voting (Loomio 2019). At the same time, some platform cooperatives may find it necessary to build their own tools and applications in order to meet their own unique needs and desired functionalities.

Incentives to encourage sustainable growth

The rapid growth of commercial ridesourcing platforms has been, at least in part, attributed to an unrestricted supply of drivers in most cities in which they operate. This has allowed for positive network effects to be realized which has been integral to the growth of companies like Uber and Lyft. The diagram shown in Figure 14 is a basic illustration of how positive network effects occur, where adding more participants to the network increases the value of the platform to each participant. However, managing platform supply and demand is a delicate balance. If too many drivers join the platform, then driver earnings may decrease and some drivers may leave the platform. Similarly, if too many riders join the platform wait times and availability may deteriorate, which could cause users to leave the platform (McCann & Yazici 2018). Larger societal problems like traffic congestion and increased emissions can also occur with an oversupply of ridesourcing drivers, which we discuss at length in the environmental metrics section.

Figure 14. Positive Network Effects for a Ridesourcing Platform



Source: McCann and Yazici 2018

Achieving these positive network effects is critical for a platform's success. Beyond the challenge of balancing driver supply and rider demand, ridesourcing cooperatives will need to be able to incentivize growth among their existing driver base. Incumbent drivers may have a vested interest in keeping the overall number of drivers on the platform artificially low in order to maximize their own potential earnings (McCann & Yazici 2018). This effect seems to be happening with AC Austin, as those we spoke with claimed that the administrators are sometimes overly hesitant to allow additional drivers onto the platform. Reluctance to growth could diminish positive network effects, making it difficult for platform cooperatives to achieve scale and challenge larger commercial players.

Since a ridesourcing cooperative would be largely controlled by the drivers themselves, mechanisms should be implemented to encourage sustainable levels of driver growth. Possible approaches to be considered include:

- Tenure-, activity-, or reputation-based incentives: Tenure, activity, or reputation could partially influence driver earnings or bonuses. Such an approach may motivate experienced and well-liked drivers to foster sustainable platform growth since their own earnings potential could increase over time with growth of the network and continued high-quality performance. Some platforms, including AC, propose using cryptocurrency tokens to incentivize platform adoption and stewardship. Early adopters who hold tokens would, in theory, be motivated to grow the platform in hopes of increasing the token's value. However, it is unlikely that a cryptocurrency token alone could align incentives in a way that produces long-term platform value (Barrera 2019). Riders could also be given loyalty or

activity-based incentives for using the platform, and many surveyed riders indicated they would like to see AC Austin implement this type of feature (Figure 41).

- Referral bonuses: Similar to programs enacted by other sharing platforms, bonuses could be given to drivers and riders who refer new participants that then meet a certain activity threshold. This is one fairly simple mechanism that could encourage growth among the user base. Many drivers we surveyed stated that they would welcome referral bonuses as part of AC Austin (Figure 31).
- Informed and transparent growth decisions: Who makes decisions about the appropriate number of drivers and how these decisions are made is of critical importance. Depending on the situation, decisions could be made at the federated cooperative or the member co-op/guild levels. Adjustments to the driver supply should be conducted in a timely fashion and agreed upon by the appropriate members. Decisions to modify the driver supply should be informed as much as possible by open data and analysis. For example, a monthly statistics report could show key metrics, including changes in total active drivers, riders, rides given, and overall revenue, so that decisions to either increase or restrict driver supply could be contemplated in an informed manner. Transparent information and analysis may help ease some of these concerns among incumbent drivers. For example, Stocksy (the stock photography platform cooperative) removed their previously-set cap after member-owners voted to remove it in order to meet ongoing client demand, succeed in new markets, and remain competitive through ongoing diversification (Matthews 2018).
- Mechanisms to address full- vs. part-time driver duality: There may be inherent tensions between drivers who work on a full-time basis and those who work only part-time, especially if full-time drivers perceive that their earnings are being negatively impacted by new or part-time drivers. Multiple member co-ops/guilds (as outlined in Figure 12) could help ease some of these tensions by giving full-time drivers more of a voice. However, mechanisms will also need to ensure that full-time drivers do not use this power to actively discourage growth by skewing policies to unfairly favor themselves.

In addition to incentivizing drivers, it is also important to properly incentivize platform cooperative founders to take on the risk associated with starting up a new organization. Approaches to incentivize founders could include: having a founder class, special board seats or voting abilities, and stock options, among others (Wiener 2017). One of the key outstanding questions is whether platform cooperatives can scale large enough to challenge commercial sharing platform incumbents. These approaches and others will be important to consider to encourage the sustainable growth of platform cooperatives.

Although it is impossible to foresee all of the governance and management challenges that a platform cooperative might face, this section helps identify some overarching recommendations based on empirical findings from AC Austin and best practices from other platforms and cooperative organizations. Ultimately, those designing platform cooperatives should begin with basic governance structures and then customize as needed once more users begin to engage with the platform and issues become better understood.

Governance and management structures should always strive for simplicity and should be easy to interact with, yet encompassing enough to handle a wide range of potential problems. While platform cooperatives are in their infancy and best practices are still largely under development, it is our hope that additional experimentation and support will lead to the proliferation of more equitable and sustainable digital sharing platforms in the future.

Survey Results and Travel Behavior Analysis

The study team deployed a rider and driver survey via Facebook over an approximately two-week span during October 2019. The rider survey received 39 completed responses and the driver survey received 20 completed responses. The purpose of these surveys is to better understand who uses AC Austin, how often and why they use AC Austin and other ridesourcing services, travel impacts and driving behavior, as well as preferences and opinions related to AC Austin and P2P platforms in general. Although the results from these survey samples may not necessarily reflect the entire AC Austin user base, these findings nonetheless provide important insights into AC Austin and P2P platforms. In this section, we present survey results and divide the discussion into four main categories, including: 1) demographics, 2) initial use of ridesourcing and AC Austin, 3) driver survey results, and 4) rider survey results.

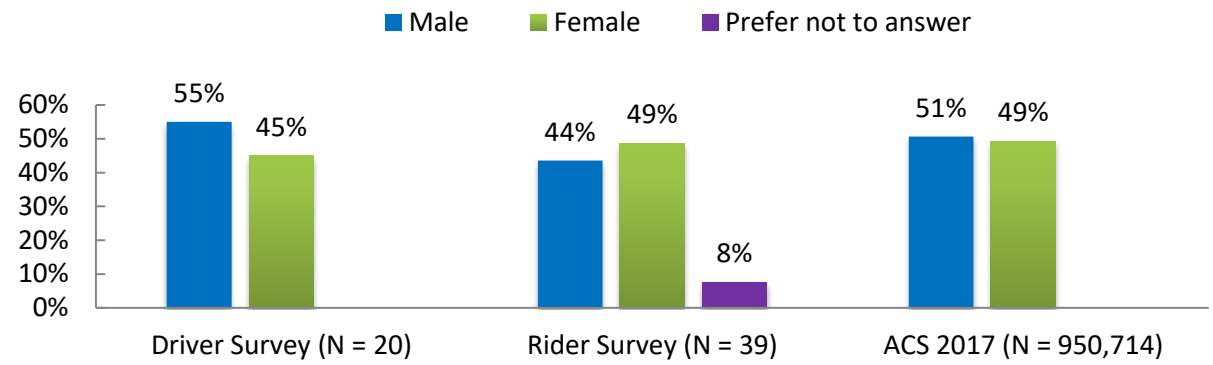
Demographics

First, we present demographic results among both driver and rider respondents to understand the backgrounds of those that use AC Austin. We combine driver and rider results in this section and compare distributions to those found in the general population of the Austin area, where appropriate. We obtained general population statistics from the American Community Survey (ACS) 2017 1-year estimates (U.S. Census Bureau ACS 2017) and the Bureau of Labor Statistics (BLS 2018).

Gender

The gender distribution among the rider survey matches up somewhat closely with the general population distribution in the ACS, with a fairly even split of males and females. We note that 8% of rider survey respondents preferred not to answer the question on gender. Meanwhile, the driver survey contains a slightly higher proportion of males (55%) than females (45%). However, past studies have shown that ridesourcing drivers are comprised more heavily of males than females, with one study estimating that almost three-quarters of Uber drivers are male (Cook et al. 2019). These findings suggest that AC Austin may have a higher proportion of female drivers compared to other ridesourcing services, although this effect could also be due to survey respondent bias.

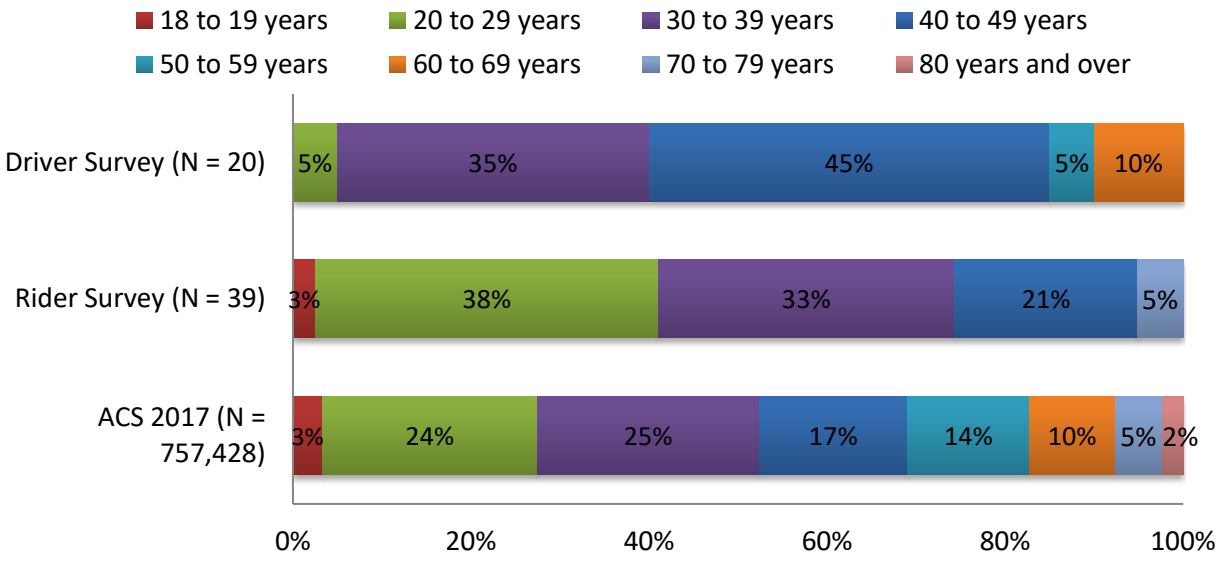
Figure 15. Gender Distribution of Driver and Rider Survey Respondents



Age

When examining the age distributions of respondents, we find that drivers tend to be older than riders. The average age of driver respondents is 43 while the average age of rider respondents is 34. The majority (80%) of drivers are between the ages of 30 and 49 years old, while 41% of riders are under the age of 30. We find that both driver and rider respondent populations have smaller portions of older adults than exist in the general population of Austin. This may be due to the fact that AC Austin requires users to have a Facebook page and to be relatively smartphone-savvy in order to use the request group.

Figure 16. Age Distribution of Driver and Rider Survey Respondents



Employment status

We asked respondents of both driver and rider surveys to indicate their employment status. Respondents were able to select multiple answer options shown in Table 2, if applicable (e.g., employed part-time and student). Driver respondents were also able to answer that ridesourcing driving is their primary occupation. We found that the majority of

respondents to both surveys are employed full-time, with smaller portions indicating that they are employed part-time, are a student, or are unemployed. Somewhat interestingly, just 25% of driver survey respondents answered that ridesourcing driving is their primary occupation. Additionally, about a third of the driver respondents indicated that driving constitutes more than half of their monthly income. Although this proportion may seem low, it actually matches up fairly closely with past estimates that suggest about a quarter to a third of ridesourcing drivers drive on a full-time basis (Parrott & Reich 2018). However, we note that our driver survey sample is somewhat small, and the actual portion of full-time ridesourcing drivers among the AC Austin driver base may differ from the survey results.

Table 2. Employment Status of Driver and Rider Survey Respondents

Employment Status	Driver Survey (N = 20)	Rider Survey (N = 39)
Not applicable, rideshare driving is my primary occupation (drivers only)	25%	-
Employed full-time	55%	74%
Employed part-time	5%	18%
Student	0%	5%
Stay-at-home parent	0%	0%
Unemployed, active job seeker	5%	3%
Unemployed, not currently seeking a job	5%	3%
Retired	0%	0%
Other	10%	0%

Employment sector

We also asked the rider respondents that are currently employed about the sector in which they are employed. By comparing the rider occupation distribution to the distribution among the general population of Austin (BLS 2018), we were able to identify which employment sectors were over- or under-represented among the rider sample. We asked this question partly because anecdotal evidence from the stakeholder interviews suggested that a large portion of the rider base works in the restaurant, bar, and nightlife service industries. Indeed, we find that the portion of rider respondents working in food preparation and serving related jobs is slightly higher than the portion working in this industry among the general Austin population. Additionally, 8% of rider respondents work in arts, design, entertainment, sports, and media occupations while just 1% of those in the general population do the same. Other industries that are overrepresented among rider respondents include transportation and material moving occupations. Sectors that are underrepresented include office and administrative support.

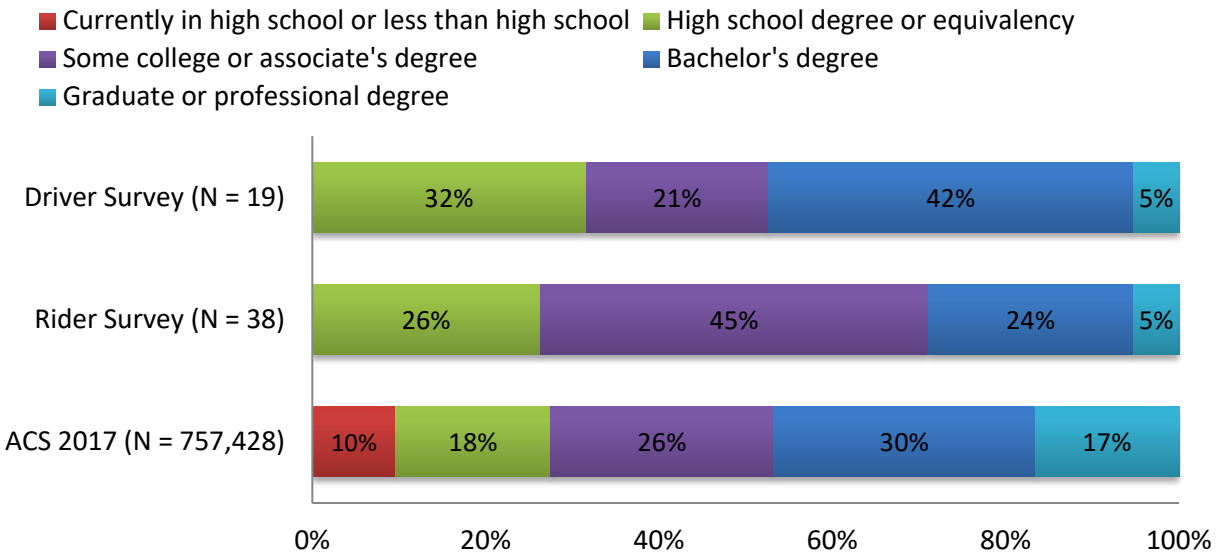
Table 3. Employment Sector of Rider Survey Respondents

Occupational Group	Rider Survey (N = 36)	Austin BLS 2018
Food preparation and serving related	14%	9%
Management	6%	5%
Business and financial operations	8%	5%
Computer and mathematical	3%	3%
Architecture and engineering	0%	2%
Life, physical, and social science	0%	1%
Community and social service	3%	2%
Legal	3%	1%
Education, training, and library	6%	6%
Arts, design, entertainment, sports, and media	8%	1%
Healthcare practitioners and technical	3%	6%
Healthcare support	0%	3%
Protective service	3%	2%
Building and grounds cleaning and maintenance	0%	3%
Personal care and service	6%	4%
Sales and related	14%	10%
Office and administrative support	6%	15%
Farming, fishing, and forestry	3%	0%
Construction and extraction	0%	4%
Installation, maintenance, and repair	3%	4%
Production	3%	6%
Transportation and material moving	11%	7%

Education

Next, we examine the educational attainment of driver and rider survey respondents. We find that all driver and rider respondents have at least a high school degree or equivalency. Interestingly, we find that a higher proportion of driver respondents have bachelor's degrees or higher (47%) than rider respondents who have a bachelor's or higher (29%). This may in part be due to age differences between driver and rider respondents, as drivers were shown to be older than riders, on average. Nonetheless, these results are different than the educational distributions found in previous studies on Uber and Lyft, which show that riders are generally more highly educated than drivers and the general population (Rayle et al. 2016; Clewlow & Mishra 2017; Gehrke et al. 2018; Schaller 2018).

Figure 17. Educational Attainment of Driver and Rider Survey Respondents



Race/ethnicity

We also asked respondents of both surveys to indicate their race/ethnicity. Respondents could select multiple races/ethnicities, if applicable. Three driver respondents and five rider respondents preferred not to answer the question. As in the Austin general population, both driver and rider respondent populations are primarily comprised of those identifying as white or Hispanic/Latino. While the driver survey contained the same number of white and Hispanic/Latino respondents, the rider survey was comprised of a greater portion of white respondents, who make up the majority of the rider respondent population (65%). These trends match fairly closely with the general population of the Austin area, although some races/ethnicities are slightly underrepresented in the survey populations, including Asian and Black/African American persons.

Table 4. Race/Ethnicity of Driver and Rider Survey Respondents

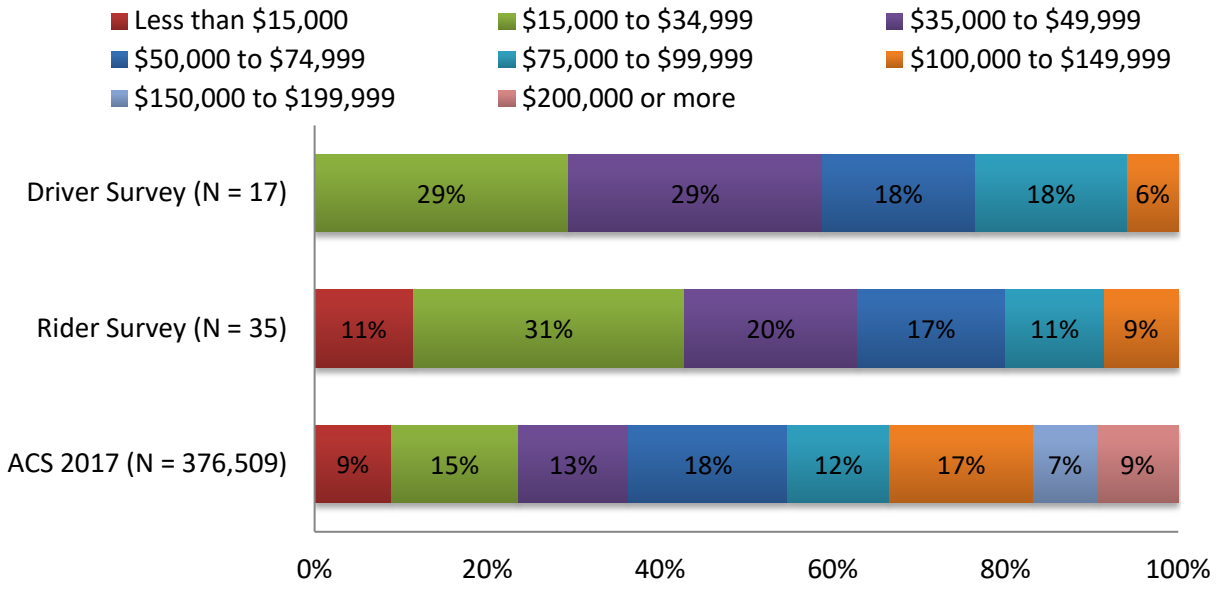
Race/Ethnicity	Driver Survey (N = 17)	Rider Survey (N = 34)	ACS 2017 (N = 950,714)
American Indian and Alaska Native	0%	3%	0%
Asian	6%	0%	8%
Black or African American	6%	3%	7%
Hispanic or Latino	41%	26%	34%
Native Hawaiian and Pacific Islander	0%	0%	0%
White	41%	65%	48%
Two or more races	6%	3%	3%

Income

Lastly, we asked respondents to indicate their gross (pre-tax) household income in 2018. We note that three driver respondents and four rider respondents chose not to answer the question on income. The average incomes and income distributions across both the driver

and rider surveys match up somewhat closely, although drivers have slightly higher household incomes than riders, on average. The average household income among driver survey respondents is $54,000 while the average income among rider respondents is $49,600. We note that driver incomes include all income sources and not just income solely from driving. Driver and rider respondents' household incomes are generally lower than the household incomes found among the general Austin population, and there are no respondents who made $150,000 or more over the past year, while 17% of the general population had this level of household income or higher during 2018. Similar to the educational distributions, these findings are counter to what many previous studies on other ridesourcing services like Uber and Lyft have found: that drivers typically have lower incomes that riders (Mishel 2018). Additionally, some studies have found that Uber and Lyft riders have higher incomes than the general population, on average, although results on this topic have been more mixed (Rayle et al. 2016, Clewlow & Mishra 2017). These findings again suggest that the demographic makeup of AC Austin members, especially riders, is somewhat different than the demographic distributions of Uber and Lyft users.

Figure 18. Income Distributions of Driver and Rider Survey Respondents



Overall, the demographic distributions of AC Austin driver and rider respondents show that there are important distinctions between drivers and riders. Driver respondents tend to be older than riders, have slightly greater levels of educational attainment, and have slightly higher total household incomes than riders. The educational and income differences are the opposite of distributions found among Uber and Lyft users, as riders are typically better educated and have higher incomes than drivers. Additionally, there is a somewhat even split of male and female driver respondents, which is different from the generally male-skewed makeup of Uber and Lyft drivers. While these results are subject to a degree of survey bias, they nonetheless point to some interesting differences between AC Austin members and typical users of commercial ridesourcing services like Uber and Lyft.

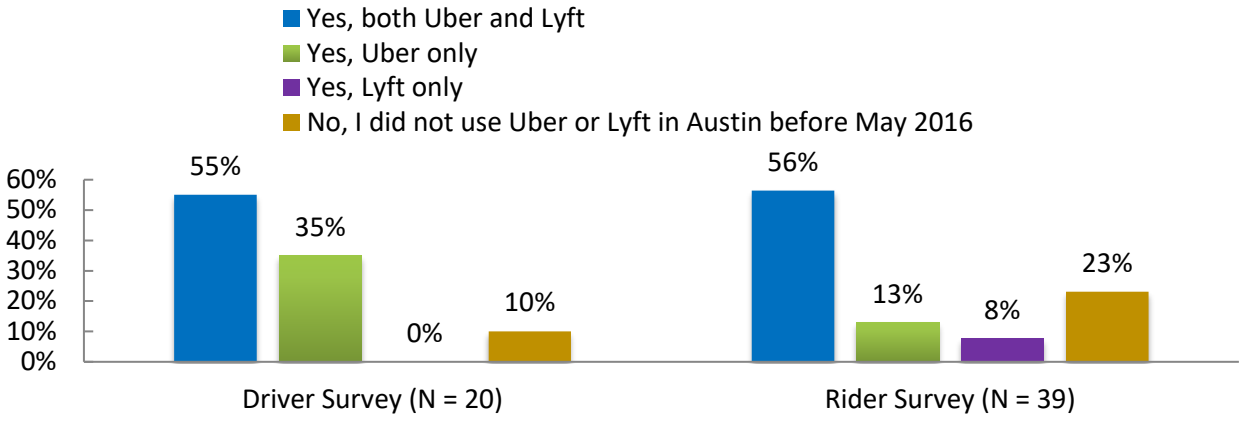
Next, we examine driver and rider respondents' first use of ridesourcing services in the Austin area and AC Austin specifically.

Initial Use of Ridesourcing and Arcade City Austin

Due to the unique nature of AC Austin's launch following Uber and Lyft's exit from the Austin market, we asked respondents about their initial use of ridesourcing services in the Austin area to better understand respondents' past usage of these services. We present results on initial usage from both driver and rider surveys and discuss current use and usage changes in subsequent sections.

The majority of both driver and rider survey respondents had used Uber and/or Lyft in Austin prior to the services' May 2016 departure from the city. Only 10% of driver and 23% of rider respondents had not used either service in Austin prior to May 2016. This shows that most of the respondents had experience using other ridesourcing services prior to using AC Austin, although almost a quarter of rider respondent did not use Uber and/or Lyft in Austin at this time.

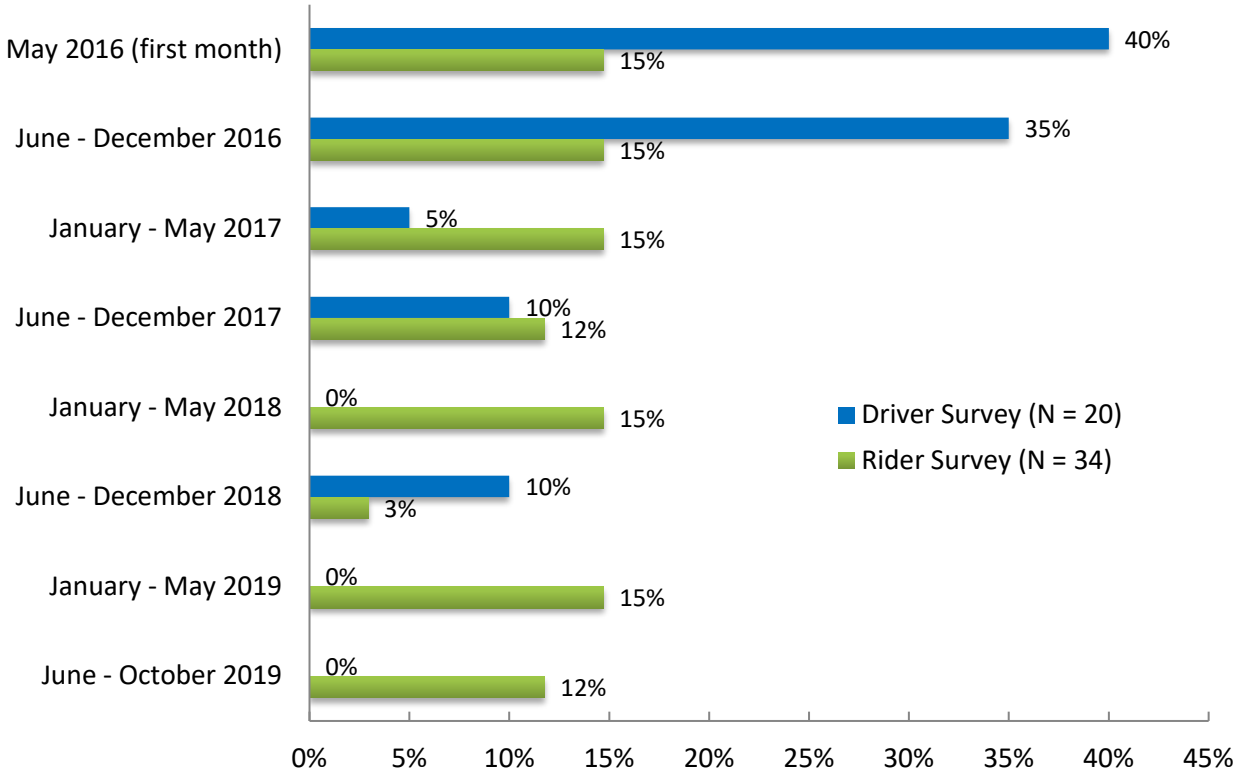
Figure 19. Did you use Uber and/or Lyft in Austin before they exited in May 2016?



We also asked respondents when they first used AC Austin, to the nearest month. AC Austin first launched in May 2016 just prior to the exit of Uber and Lyft. The majority of driver survey respondents first drove with AC Austin during the first calendar year of operation (2016), when Uber and Lyft were absent from Austin. Forty percent of driver respondents first used AC Austin in May 2016, during the first month of operation. On the other hand, rider respondents' initial use of AC Austin is distributed more evenly. While about half (44%) of the rider respondents first used AC Austin during the year that Uber/Lyft suspended their services (May 2016 – May 2017), the other half (56%) joined more recently, after Uber and Lyft had returned to the city. We note that there may exist respondent bias that could lead to distributions that do not reflect the overall AC Austin user population. However, these results suggest that there is a core group of driver members that have used AC Austin from start, but that rider membership tenure varies and

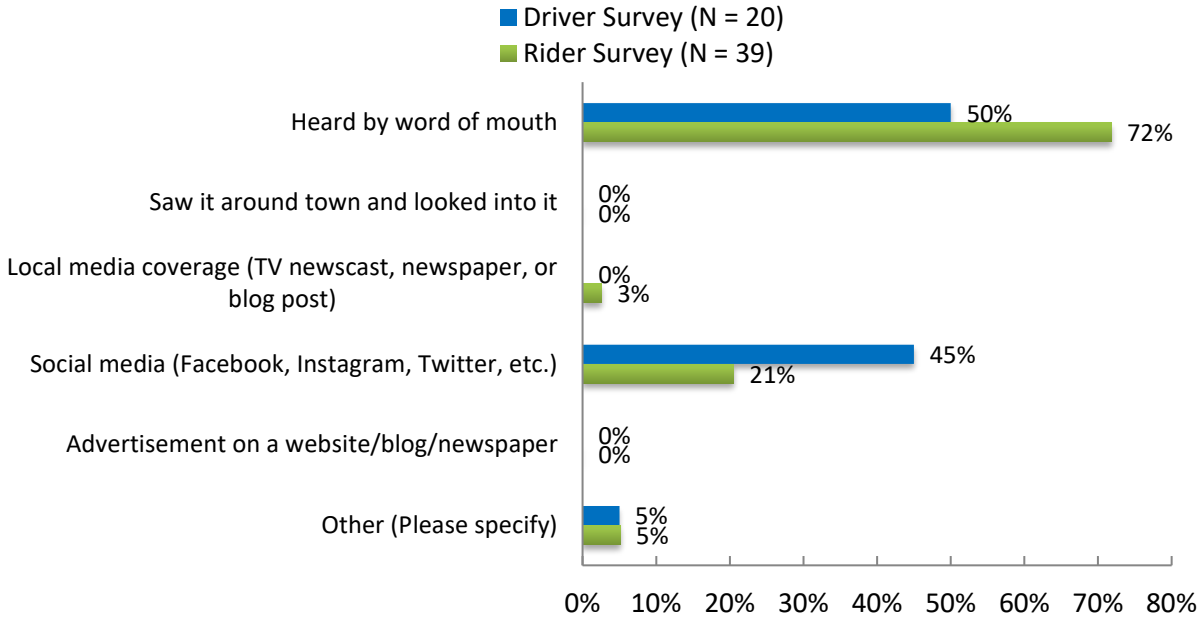
new rider members are recruited continuously, even with the renewed presence of Uber and Lyft in Austin.

Figure 20. Month of First Arcade City Austin Use



To better understand how AC Austin initially reached members, we asked respondents of both surveys how they first heard about AC Austin. Interestingly, the majority of rider respondents heard about AC Austin through word of mouth (72%), while driver respondents were more evenly split between those hearing through word of mouth (50%) and those learning about it through social media platforms like Facebook, Twitter, and Instagram (45%). These results provide insights for those wishing to launch P2P sharing platforms, suggesting that while driver/provider members may be able to be reached through a combination of social media advertising and word of mouth, rider/consumer members are more often successfully recruited through hearing about the service from someone they know. Ridesourcing driver advocacy groups like Rideshare Drivers United (RDU), based in Los Angeles, have also shown success in recruiting driver members through relatively affordable targeted social media advertising campaigns on Facebook and other social media platforms (Dolber 2019).

Figure 21. How did you first hear about Arcade City?



Next, we discuss results from the driver survey about driver respondents' use of ridesourcing services, their vehicle ownership, and their preferences and opinions regarding AC Austin, P2P platforms, and ridesourcing organizations in general.

Driver Survey Results

To better understand the driving behavior and preferences of AC Austin drivers, we asked questions about drivers' use of various on-demand services, reasons for using AC Austin, and opinions and preferences about driving and platform features. We divide driver survey-specific results into six subsections, including: 1) driving behavior, 2) vehicle ownership, 3) reasons for using AC Austin, 4) organizational role preferences, 5) P2P platform preferences and opinions, and 6) employment status preferences.

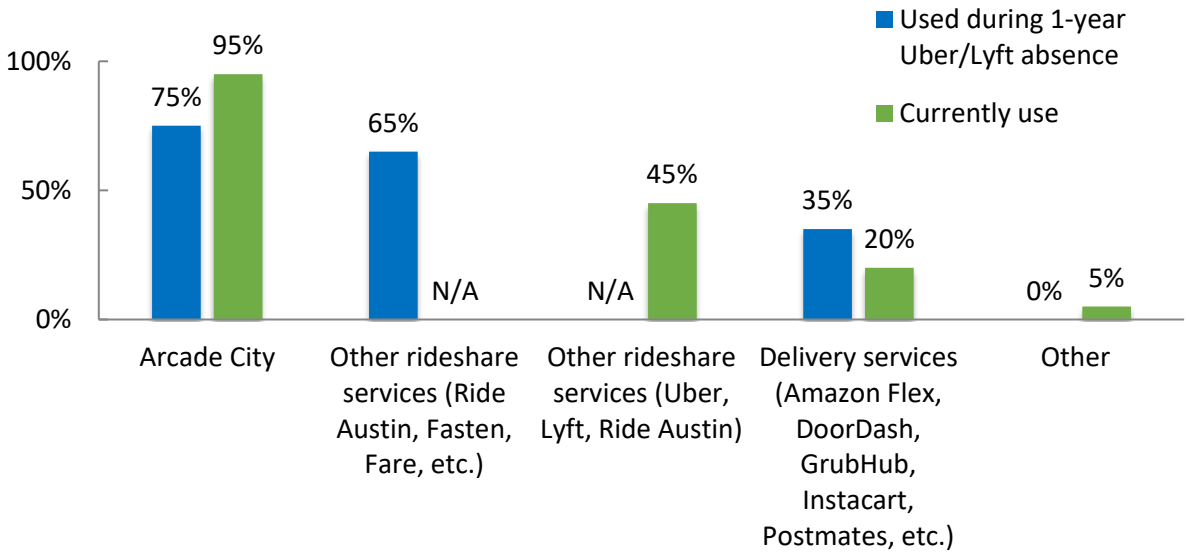
Driving Behavior

While all of the driver survey respondents have experience driving with AC Austin, many also currently drive or drove in the past on other on-demand platforms. We asked driver respondents questions about their current and past usage of various services in order to better understand which services AC Austin drivers use and whether the return of Uber and Lyft in May 2017 substantively impacted their use of different services.

Figure 22 below shows the proportion of driver respondents that used different on-demand services during the year that Uber and Lyft were not in Austin (mid-2016 to mid-2017) and the proportion that use these services currently. We find that the majority of driver respondents use AC Austin at present (95%) and a slightly lower proportion also used it during the Uber/Lyft suspension (75%). We note that the proportion of respondents who currently use AC Austin may be higher than those who used it in the past

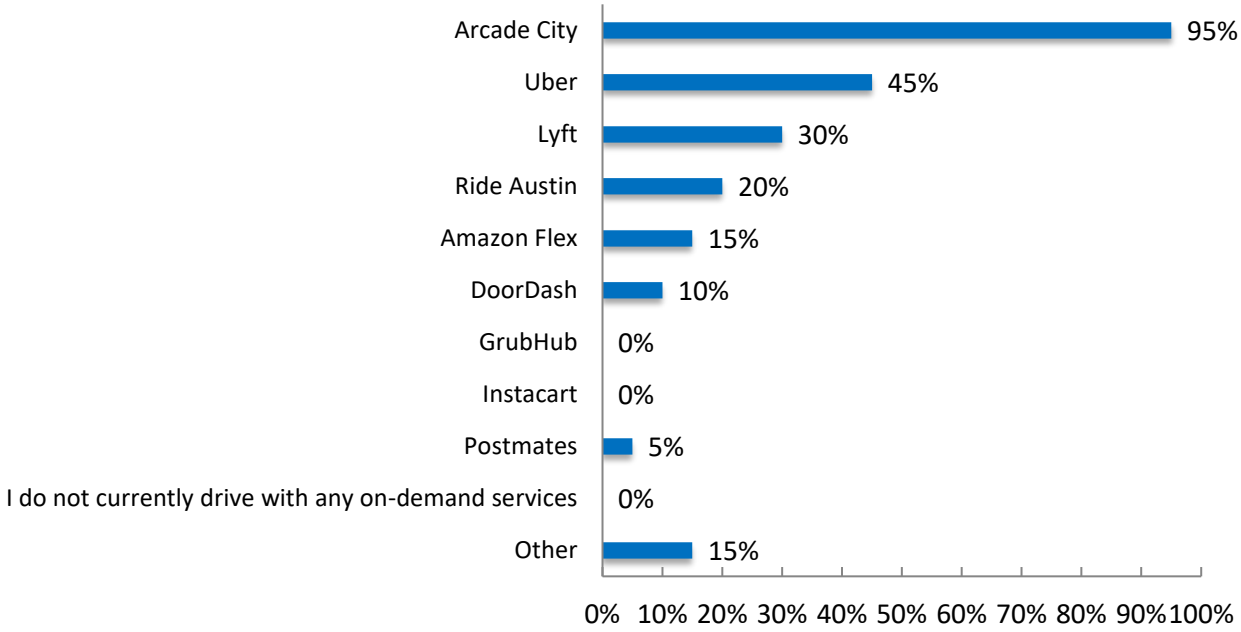
due to survey bias (i.e., those who currently use a service are more likely to take a survey about it). Interestingly, about half (45%) of the driver respondents currently also use other ridesourcing services (Uber, Lyft, and Ride Austin) while a slightly greater portion (65%) used other ridesourcing services during the Uber/Lyft absence (Ride Austin, Fasten, Fare, etc.). Again, this may be due to survey bias, since drivers that switched to primarily driving with Uber or Lyft and currently drive very little or not at all for AC Austin are less likely to take a survey about AC Austin. While there likely are a number of former AC Austin drivers that no longer use the service at least in part due to Uber/Lyft's return to Austin, this driver segment is not well represented among the driver survey sample. Twenty percent to about a third of respondents drive or used to drive for on-demand delivery services like Amazon Flex, DoorDash, and others.

Figure 22. Driver Respondent Current and Past Use of On-Demand Services (N=20)



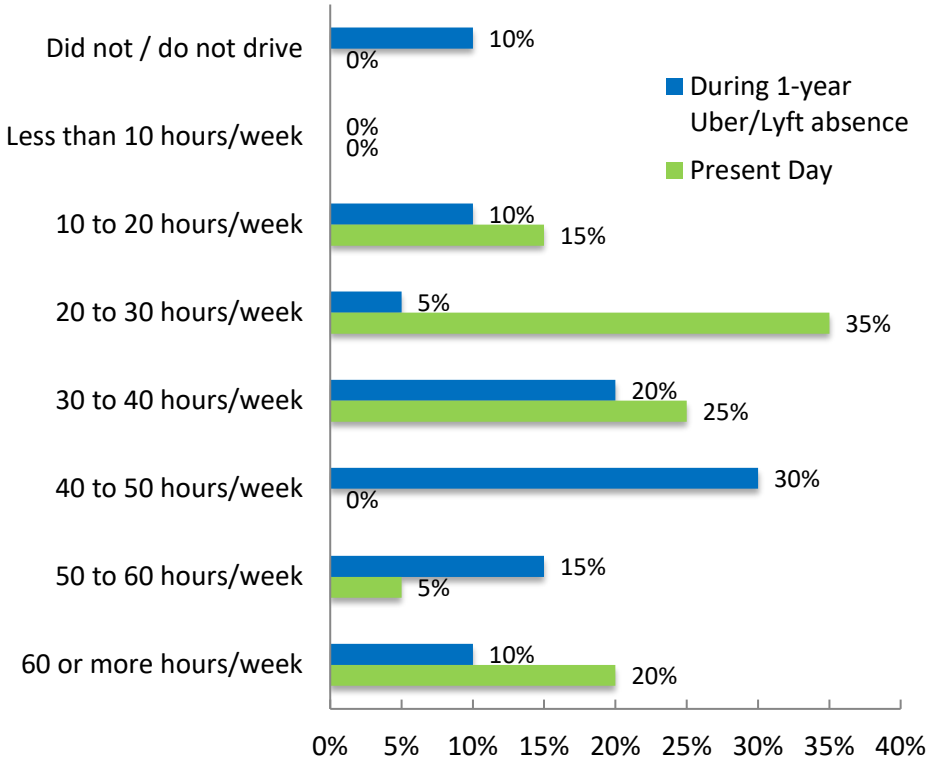
In terms of which specific services drivers currently drive with, Figure 23 below shows that other than AC Austin, the highest proportion of drivers also drive with Uber (45%), followed by Lyft (30%), and Ride Austin (20%), with smaller portions driving with delivery services like Amazon Flex, DoorDash, and Postmates. Two of the respondents selecting that they drive for 'other' services selected delivery services not listed (Uber Eats and Shipt) and one noted that they drive for a taxi service. Driver respondents currently drive for 2.4 services (including Arcade City), on average.

Figure 23. On-Demand Services that Driver Respondents Currently Use (N=20)



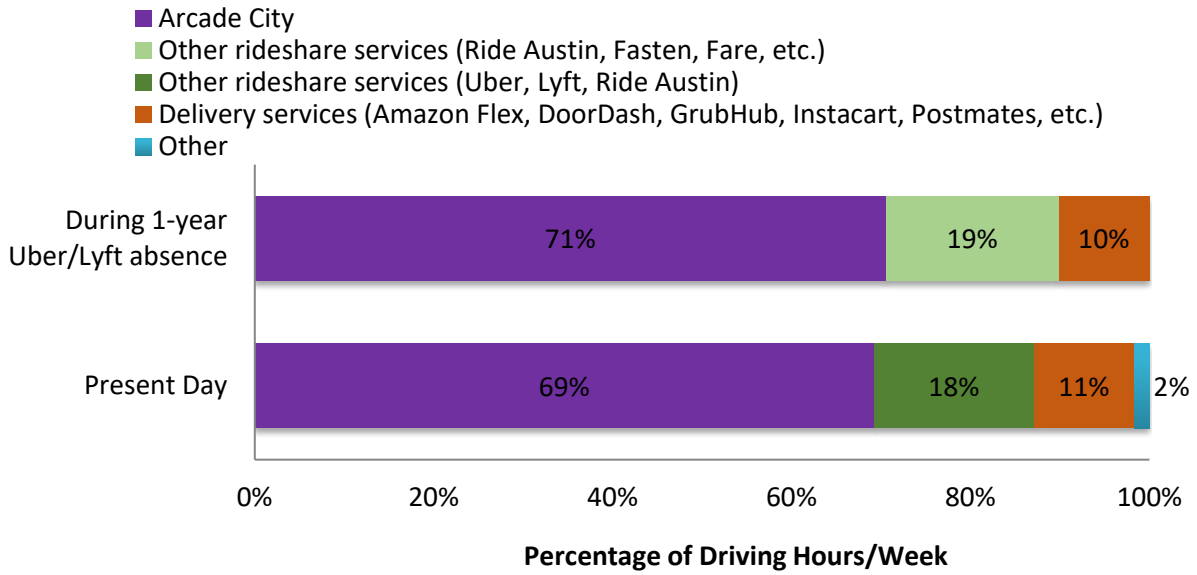
We were also interested in understanding how many hours each of the driver respondents drove, both in total and across different on-demand services. To examine this, we asked respondents how many hours in an average week they drove with various on-demand services, both during the year that Uber and Lyft were not in Austin and currently. We calculated on-demand driving frequency totals (across all services) for each driver respondent, with results displayed in Figure 24. We find that at present, about half of the driver respondents work part-time for on-demand platforms (less than 30 hours/week) and half work full-time (30 hours/week or more). On average, our driver survey sample drove slightly more hours per week during the 1-year Uber/Lyft suspension (36 hours/week on average) than they do currently (33 hours/week on average). We note that because on-demand driver hours can fluctuate over time for a variety of reasons, including employment and lifestyle changes, the results in Figure 24 merely show that our driver survey sample represents a fairly active set of on-demand service drivers.

Figure 24. Average Hours per Week Driven Across All On-Demand Platforms (N=20)



One hypothesis that the research team had going in to the study was that the return of Uber and Lyft in mid-2017 had a negative impact on driver (and rider) use of AC Austin. While it is difficult to compare frequency changes in on-demand driving and attribute these changes directly to the return of Uber/Lyft as opposed to other factors (employment changes, etc.), we are able to compare the portion of time that driver respondents spent driving with AC Austin versus other services. One might expect that the return of Uber and Lyft to Austin decreased the proportion of time drivers spend driving for AC Austin. Uber and Lyft undoubtedly regained a significant portion of Austin's passenger demand upon their return (Tryba & Goldenberg 2017), and it is possible that AC Austin drivers were enticed to migrate to these other services that had more consistent levels of passenger demand. However, we find a surprisingly consistent portion of hours driven with AC Austin versus other on-demand services both during and after the Uber/Lyft suspension. Shown in Figure 25, active driver respondents spent 71% of their driving time on the AC Austin platform during the one-year Uber/Lyft absence, on average. At present, the proportion driver respondents spend with AC Austin compared to other services is very similar, at 69% of total driving hours/week, on average. Both during and after the Uber/Lyft suspension, 18% to 19% of driver respondents' driving time is spent on other ridesourcing platforms (Ride Austin, Fasten, Fare, etc. during the suspension, and Uber, Lyft, and Ride Austin currently). During both time periods, 10% to 11% of driver respondents' time was spent driving with other delivery services, on average. One respondent currently drives taxis and represents the 2% of current 'other' driving.

Figure 25. Portion of Driver Respondents' Hours Driven with Various On-Demand Services (N=20)

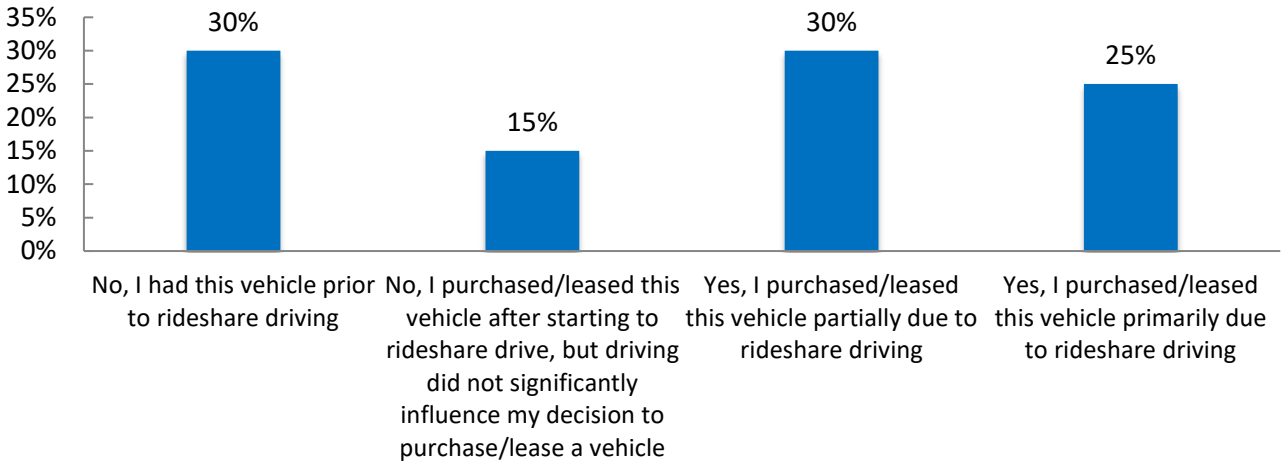


The findings in Figure 25 are somewhat surprising, considering that Uber and Lyft reestablished dominant market position in Austin after their mid-2017 return. However, we note that there are a number of factors that may contribute to these results. Since we are only examining a survey sample of drivers and not a cumulative number of drivers or aggregate hours driven, we cannot account for net reductions in driving on the AC Austin platform nor can we account for the total number of drivers that may have left the platform over this time period. In addition, inactive drivers are known to be dropped from the AC Austin platform (and are also unlikely to have taken the survey), so it is possible that some of these former drivers shifted much of their driving to Uber and Lyft after the services returned to Austin. At the very least, these results show that active AC Austin drivers prioritize driving with AC Austin over other on-demand platforms. This continues to be true at present, even though Uber and Lyft have been operating in Austin for more than two years since their return and command a much larger share of the overall Austin ridesourcing passenger demand.

Vehicle Ownership

We asked driver respondents to indicate the make, model, and year of the vehicle that they primarily use for ridesourcing driving and we also queried whether this vehicle was purchased specifically for ridesourcing driving. Respondents' vehicles were fairly new overall, with a median model year of 2015. Most of the reported vehicles were compact or sedan makes, with a few being SUVs or trucks. As shown in Figure 26, more than half (55%) of the driver respondents claimed to have purchased or leased their vehicle either partially or primarily due to ridesourcing. These findings show that a significant portion of AC Austin driver respondents purchased vehicles specifically for ridesourcing driving.

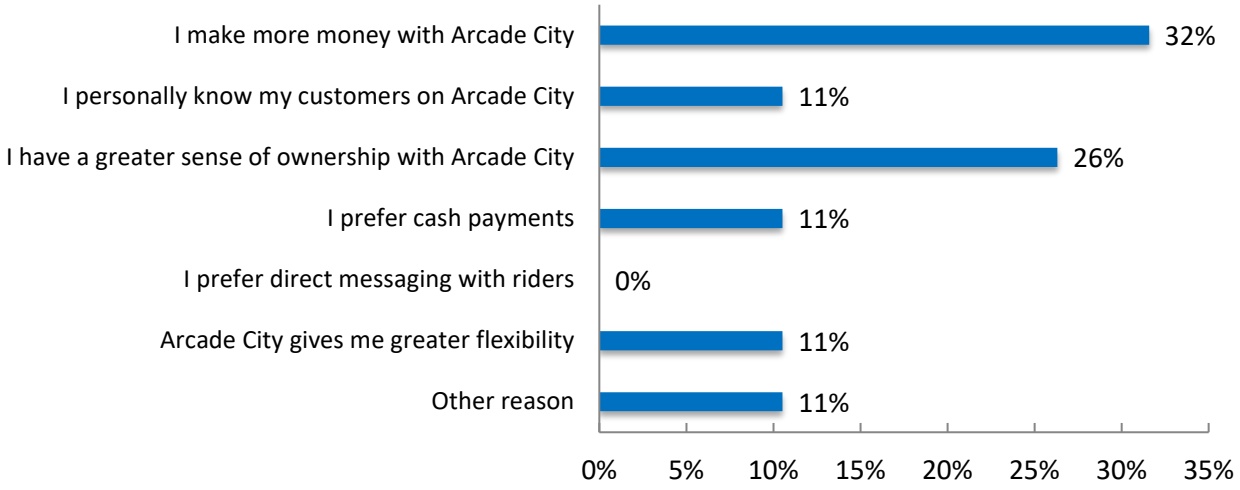
Figure 26. Did you purchase or lease your vehicle specifically for ridesourcing driving? (N=20)



Reasons for Using AC Austin

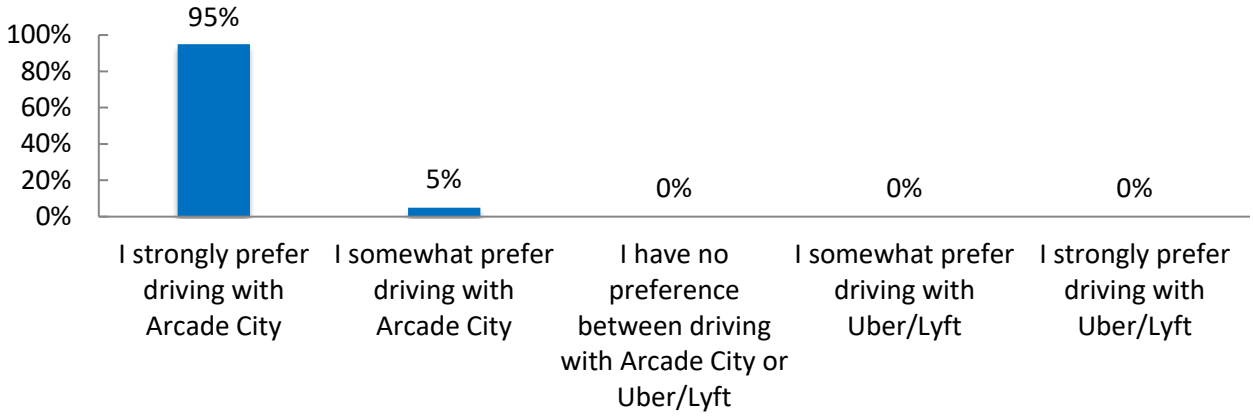
To better understand why drivers use AC Austin as opposed to other ridesourcing platforms, we asked respondents to choose their primary reason for using AC Austin instead of competitors. Figure 27 below shows that about a third of driver respondents use AC Austin instead of other on-demand platforms because they make more money. This result is somewhat unsurprising, as this finding was clear after stakeholder interviews and AC Austin takes no commission from rides, making potential driver earnings higher than they are through platforms that take commission like Uber and Lyft. Interestingly, the next most common reason for using AC Austin instead of competitors was that drivers have a greater sense of ownership with AC Austin, with 26% of respondents selecting this as their main reason. This shows that a notable portion of AC Austin drivers are motivated to drive with the platform not only due to financial reasons but because they feel a greater sense of ownership and participation. This may be due in part to the sense of powerlessness that drivers have on commercial ridesourcing platforms, where policies, rates, and suspensions are largely outside of their control. This suggests that giving platform workers actual ownership stake and a real voice are crucial advantages that cooperative and P2P platforms have over larger commercial competitors when recruiting and retaining drivers. Other reasons for using AC Austin include that drivers personally know their customers (11%), prefer cash payments (11%), and feel that AC Austin is more flexible than alternatives (11%). We note than one of the driver respondents claimed that they do not drive with AC Austin anymore because they moved from the Austin area.

Figure 27. What is the primary reason you drive with Arcade City instead of other on-demand services? (N=19)



Because many of the AC Austin drivers currently drive or drove in the past with other ridesourcing platforms like Uber and Lyft, we asked respondents whether they prefer driving with AC Austin or Uber/Lyft, in general. The results were undeniably in favor of AC Austin, with all driver respondents indicating that they somewhat or strongly prefer driving with AC Austin over Uber/Lyft. We note that there likely exists bias in our driver respondent population that led to these results, since all but one of the respondents are currently active AC Austin drivers. Nonetheless, the results show a strong preference toward AC Austin among the driver respondents.

Figure 28. Overall, do you prefer driving with Arcade City or with Uber/Lyft? (N=20)



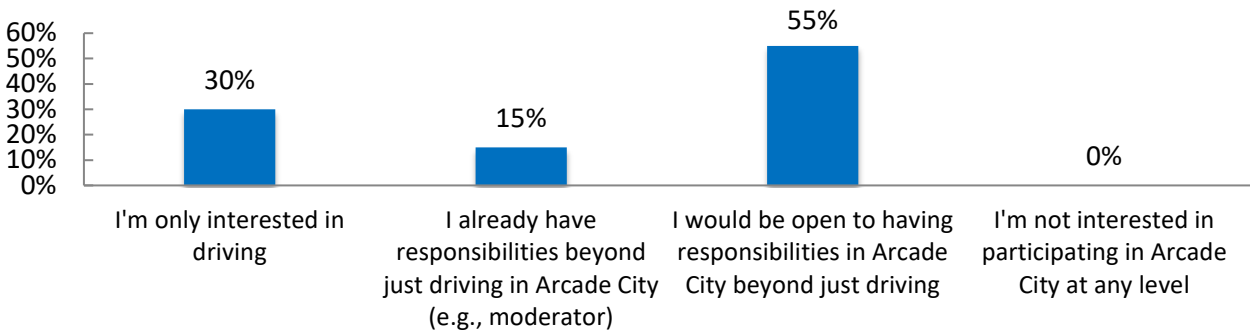
To follow up, we asked respondents to briefly describe their reasons for the preferences that they indicated in Figure 28 above. Respondents reiterated many of the responses from Figure 27, including that AC Austin offers better pay and takes no commission, enables drivers to establish relationships with customers and have regular clientele, and that it allows for greater flexibility around choosing what rides to accept and transparency

around the identity of riders. A few of the comments mentioned that AC Austin is more fun and enjoyable than Uber/Lyft and that there is a "greater sense of family." One driver noted that they feel safer as a female driver on the AC Austin platform compared to driving with Uber or Lyft.

Organizational Role Preferences

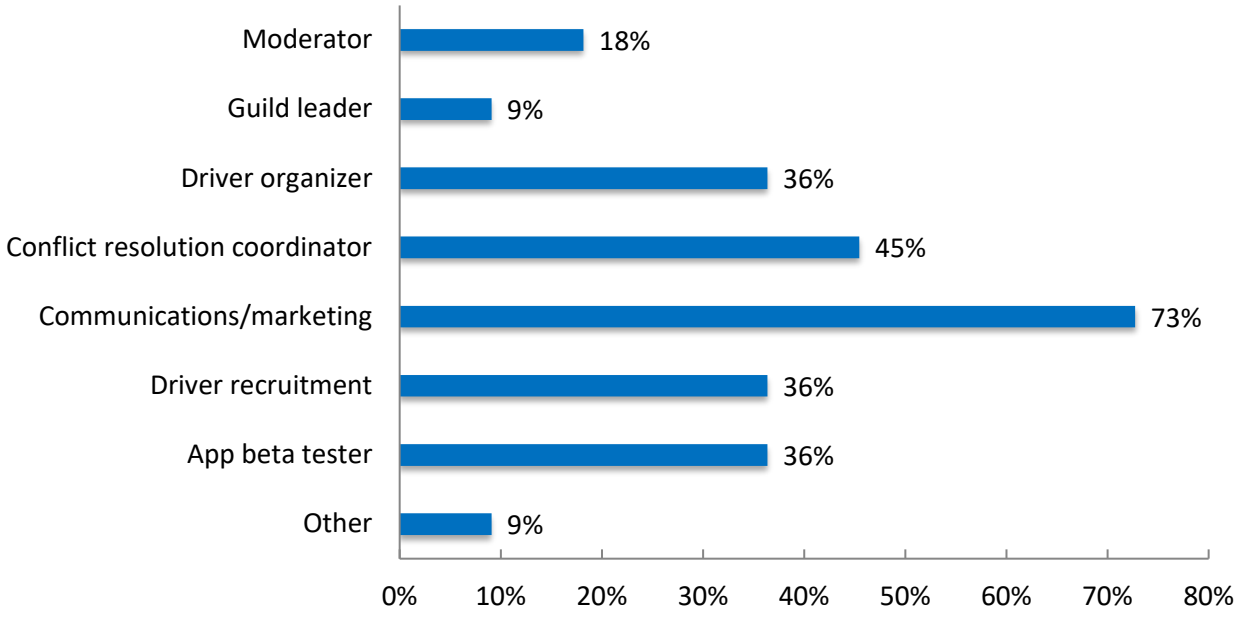
Since platform cooperatives may require certain workers to take on additional roles beyond the normal course of platform work (in this case driving), we asked driver respondents whether they would be open having responsibilities with AC Austin beyond driving. Figure 29 shows that the majority of driver respondents (55%) are open to having responsibilities beyond just driving, suggesting that demand to take on additional roles within AC Austin is fairly high among drivers. Meanwhile, 30% are only interested in driving, and 15% noted that they already have responsibilities other than driving. Of the three driver respondents that already have responsibilities beyond driving, all were moderators and one was also an administrator.

Figure 29. What is your desired level of participation within Arcade City? (N=20)



If respondents indicated that they would be interested in a role beyond driving, they were asked to select all the roles they might be interested in taking on. Almost three quarters (73%) of these respondents indicated that they would be open to taking on a role in communications/marketing, 45% said they would be open to being a conflict resolution coordinator, and 36% were open to app beta testing. Thirty-six percent also noted they would be interested in taking on driver recruitment and the same portion said they would be open to driver organizing. A smaller portion of driver respondents were open to being a moderator (18%) or guild leader (9%). While many roles will need to be executed for a ridesourcing cooperative to be successful, these results suggest that drivers themselves may be motivated to take on a variety of roles that would be necessary to sustain certain key operations.

Figure 30. What kind of role might you be interested in with Arcade City? (N=11)

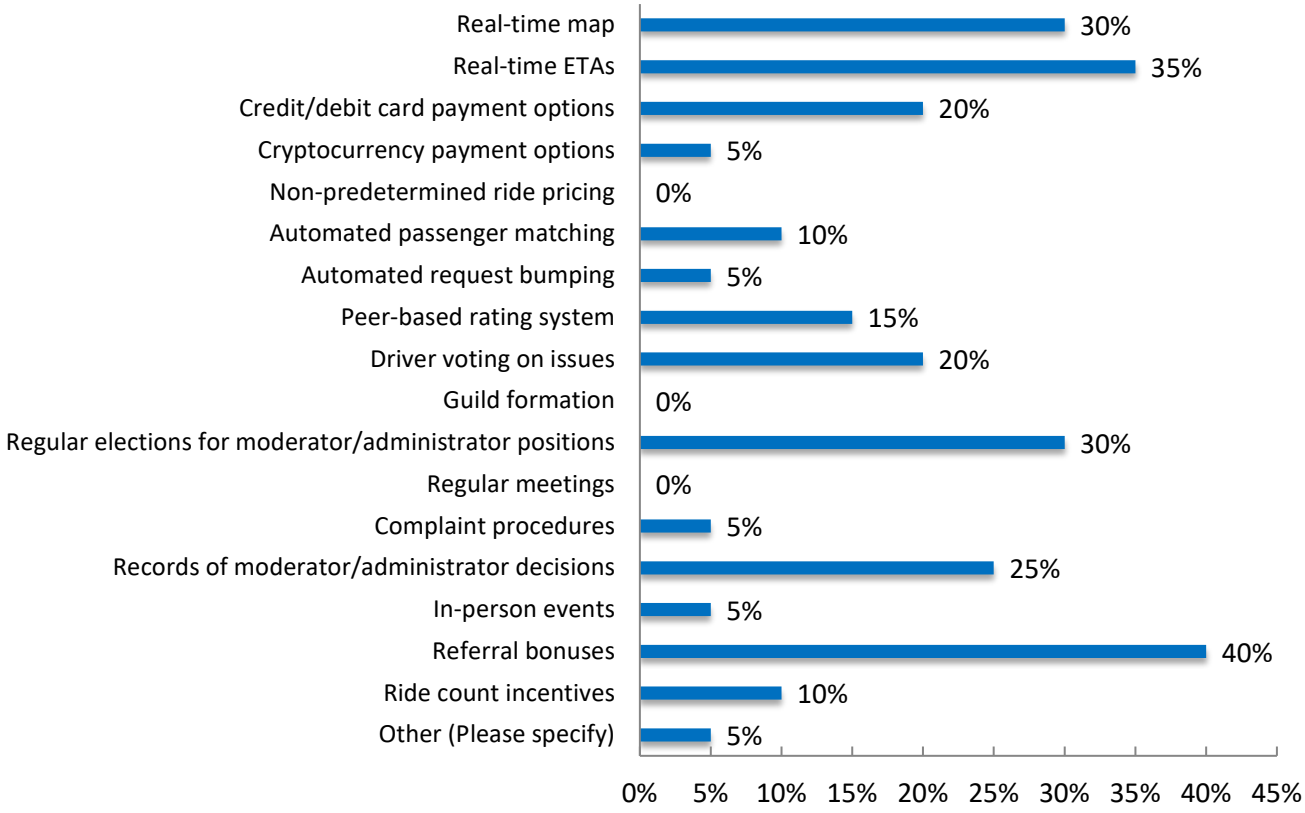


Lastly, we asked respondents whether they would require monetary compensation to take on the additional responsibilities that they had indicated previously. The vast majority of those willing to take on additional roles stated that their responsibilities or time dedicated would depend on compensation. One driver respondent indicated that they would definitely need to be paid to perform additional responsibilities. Currently, moderators and administrators of AC Austin are not monetarily compensated for the additional work that they complete. However, our results suggest that if more drivers are to participate in roles beyond driving, some level of compensation (whether monetary or otherwise) will likely to necessary to sustain this participation at meaningful levels of time or effort dedicated. Next, we discuss results on driver respondent preferences and opinions about AC Austin and P2P platforms in general.

P2P Platform Preferences and Opinions

Since AC Austin drivers have real-world experience participating in a functioning P2P platform, they are uniquely positioned to offer insights into the challenges facing P2P platforms and opinions on how to potentially improve operations. We asked respondents what features not already included as part of AC Austin they would like to see implemented. Respondents were able to select up to three features that they considered most important from the list of features shown in Figure 31 below.

Figure 31. Driver Respondents: What features would you like to see implemented in Arcade City? (N=20)



Referral bonuses were the most commonly chosen feature, with 40% of driver respondents indicating they would like this feature incorporated in AC Austin. This finding shows the importance of having incentives in order to successfully grow a P2P network. Referral bonus incentives can also uphold a sense of fairness to reward those that are most actively recruiting new customers and drivers.

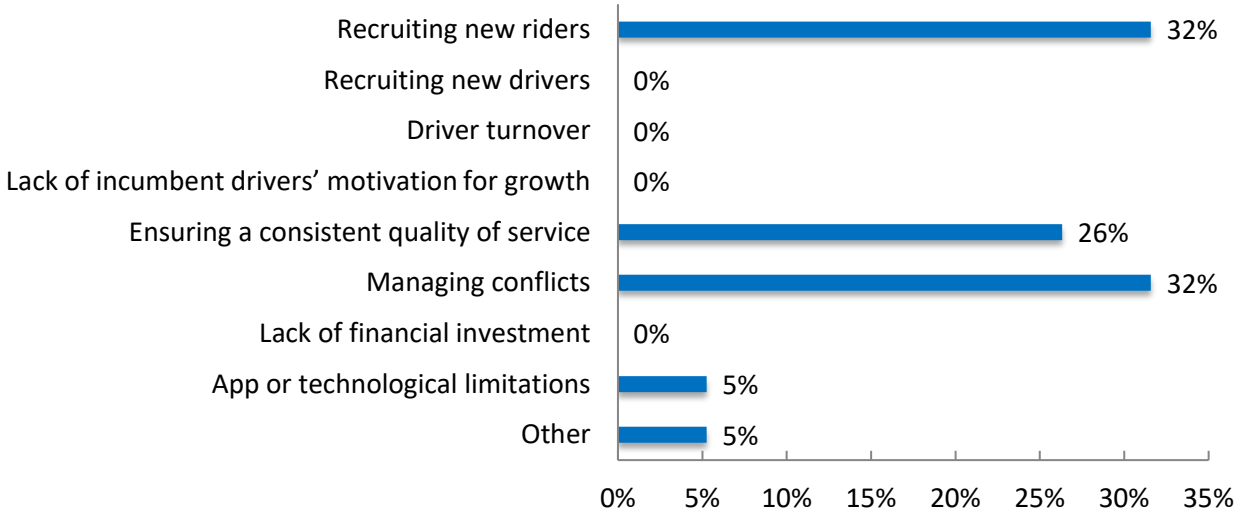
Other popular potential features relate to leadership selection and accountability. Thirty percent identified that they would like regular elections for moderator and administrator positions, 25% would like to see records of decisions made by moderators and administrators, and 20% believe there should be driver voting on issues. As noted in the governance analysis section, the AC Austin leadership is not currently elected by the broader membership and decisions made by moderators and administrators are not always transparent. The fact that driver respondents commonly selected these features related to leadership practices over other potential technology improvements or incentive features underscores the importance of transparency and democratic practices in P2P platforms.

The AC founding team is developing a mobile application, but it is in beta mode at the time of writing and does not feature a real-time map, ETAs, integrated payment, or automated

matching functionalities that are standard among app-based competitors. About a third (35%) of driver respondents noted that real-time ETAs would be helpful and a similar proportion noted that they would like real-time maps (30%). Additionally, 20% claimed that they would like credit and debit card payment options. While these features are typically common among app-based ridesourcing platforms, AC Austin has yet to incorporate these features into their operations.

To gain insight into the challenges faced by P2P platforms, we also asked driver respondents to indicate what they believe to be the most significant barrier to the growth of driver-controlled ridesourcing groups like AC Austin. Interestingly, the most common answers were that managing conflicts and recruiting new riders are the largest barriers to the growth of driver-controlled ridesourcing groups, with 32% of driver respondents each selecting these as the most significant barriers. Based on the results from Figure 31, referral bonuses may be one of a variety of strategies to help recruit new riders. Ensuring a consistent quality of service was also a commonly identified barrier, with 26% of driver respondents selecting this as the most significant barrier. Interestingly, technology and financial limitations were not commonly identified as being the most significant barrier to growing driver-controlled ridesourcing groups, as only one respondent selected 'app or technological limitations' as the primary barrier. These results suggest that internal issues like conflict management and consistent service quality, along with recruiting and retaining new customers, are perceived by drivers as the most important factors for driver-controlled ridesourcing groups to succeed.

Figure 32. Most Significant Barrier to the Growth of Driver-Controlled Ridesourcing Groups (N=19)

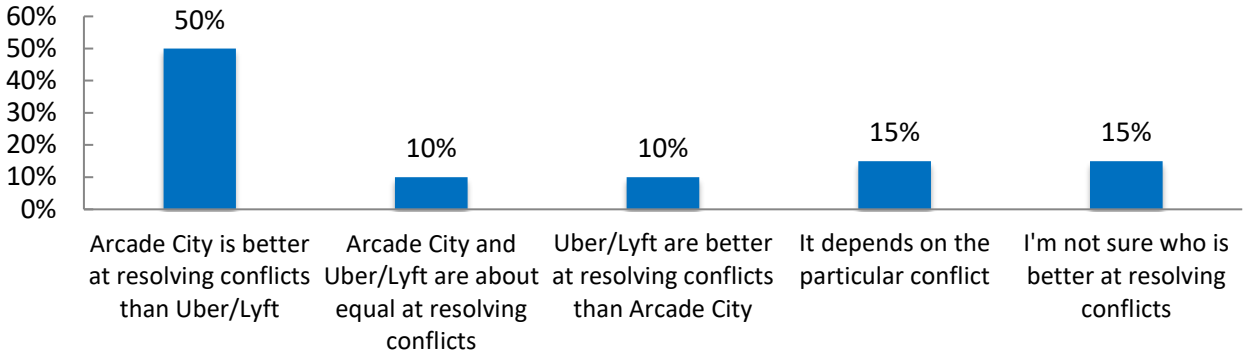


Since successful conflict resolution practices are an important part of managing sharing platforms, we asked driver respondents whether they thought AC Austin or Uber/Lyft are better at resolving conflicts. Shown in Figure 33, half of the driver respondents claimed that AC Austin is better at resolving conflicts than Uber/Lyft. Opinions were somewhat mixed

however, with 30% of respondents indicating that it either depends on the particular conflict or that they are not sure which groups are better at resolving conflicts. Ten percent claimed that Uber/Lyft are better at resolving conflicts and the same proportion said that AC Austin and Uber/Lyft are about equal at resolving conflicts.

These results are somewhat interesting, because although conflict management was identified as a key barrier to the growth of driver-controlled ridesourcing groups like AC Austin, many driver respondents still believe that AC Austin does a better job than Uber/Lyft at resolving conflicts. This may be due in part to the community-oriented nature of AC Austin, as conflicts can be resolved among drivers, riders, and moderators that know each other, as opposed to going through the largely automated and opaque processes that Uber, Lyft, and most large commercial sharing platforms employ.

Figure 33. Do you believe Arcade City or commercial ridesourcing companies like Uber and Lyft are better at resolving conflicts? (N=20)



We asked driver respondents to share their opinions on a series of topics related to AC Austin and P2P platforms. Answer options used a five-point Likert scale (strongly agree to strongly disagree) and results are displayed in Table 5 below. A couple of the statements received unanimous agreement, with all driver respondents agreeing with the statements: "Driver-controlled rideshare networks like Arcade City in Austin could be repeated in other cities" and "Overall, I am satisfied with my experience driving with Arcade City." The other three statements received more mixed opinions. Interestingly, opinions were fairly evenly split between whether driver respondents would rather use an AC Austin app than the Facebook page to receive requests. Thirty percent of driver respondents agreed that they would rather use an app, 35% disagreed, and another 35% neither agreed nor disagreed. Since the idea of guilds is central to the future plans of the AC founding team, we asked whether drivers thought that multiple self-governing guilds would be a positive addition. While 40% agreed that guilds would be a good thing, the same proportion were neutral toward the idea of multiple guilds. Twenty percent did not agree that multiple guilds would be a positive addition to AC Austin. We also asked drivers' opinions on the amount of say they feel they have within AC Austin. While almost half (45%) of the respondents are satisfied with the amount of say that they have, 30% felt neutral and a quarter were not satisfied with the say they feel that they have.

Table 5. Driver Respondents' Opinions on P2P Platforms and AC Austin (N=20)

Statement	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Driver-controlled rideshare networks like Arcade City in Austin could be repeated in other cities	65%	35%	0%	0%	0%
Multiple self-governing driver groups ('guilds' or 'pods') as part of Arcade City would be a good thing	30%	10%	40%	15%	5%
If available, I would rather use an Arcade City app to accept requests instead of the Facebook page	20%	10%	35%	30%	5%
Overall, I am satisfied with the amount of say I have within Arcade City	25%	20%	30%	15%	10%
Overall, I am satisfied with my experience driving with Arcade City	65%	35%	0%	0%	0%

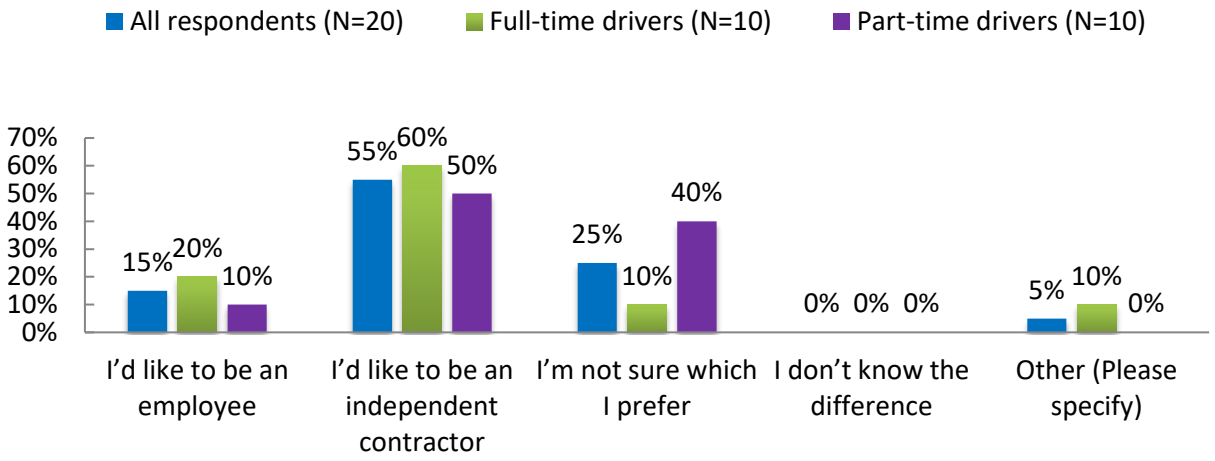
The results in Table 5 suggest that while there are mixed opinions on the functional details of AC Austin, including whether guilds or an app should be implemented, all drivers we surveyed believed that driver-controlled ridesourcing groups could succeed in other cities and were satisfied with their AC Austin driving experience overall. Lastly, we asked driver respondents about their employment preferences regarding working for sharing platforms.

Employment status preferences

Since employment classification is currently one of the key issues facing sharing platforms in the U.S., we asked driver survey respondents about their preferences regarding employment status. We first asked respondents what type of employment relationship they would like to have with ridesourcing organizations. Just 15% of all driver respondents said they would like to be an employee, compared to 55% of all respondents who claimed they would like to be an independent contractor. However, a quarter of all driver respondents were not sure which employment classification they would prefer. We also analyzed results between full-time drivers (who drive 30 hours per week or more with on-demand platforms, on average) and part-time drivers (who drive less than 30 hours per week with on-demand platforms, on average). When examining preferences between full- and part-time drivers, we see more certainty among the answers from full-time drivers, and a slightly higher portion of full-time drivers that would like to be employees (20%). However, a majority (60%) of full-time driver respondents still prefer to be independent contractors. A notable portion (40%) of part-time driver respondents were not sure which employment classification they would prefer. These results match up closely with results from a 2019 survey of Uber and Lyft drivers from across the U.S., as about 15% of drivers from that survey would also prefer to be employees (Campbell 2019). Another study of ridesourcing drivers in San Francisco found that while a higher portion of surveyed drivers preferred employee status (47%), a majority still preferred being an independent contractor (Dubal 2019).

These results suggest that even among full-time drivers, many do not necessarily want to be classified as employees. This could be due to a variety of factors, including that driver respondents may perceive that being classified as employees would decrease their driving schedule flexibility and ability to drive for multiple platforms. However, the large portion of part-time drivers that are not sure which employment classification they would prefer suggests that not all drivers have enough of an understanding of the tradeoffs between employee and contractor classifications to have a strong preference for one or the other. Additionally, some legal scholars have argued that the question of ridesourcing driver employment status is fundamentally the wrong one, and that instead effort should be directed toward understanding what kinds of protections platform workers want and need (Dubal 2019).

Figure 34. What type of employment relationship would you like to have with rideshare organizations?

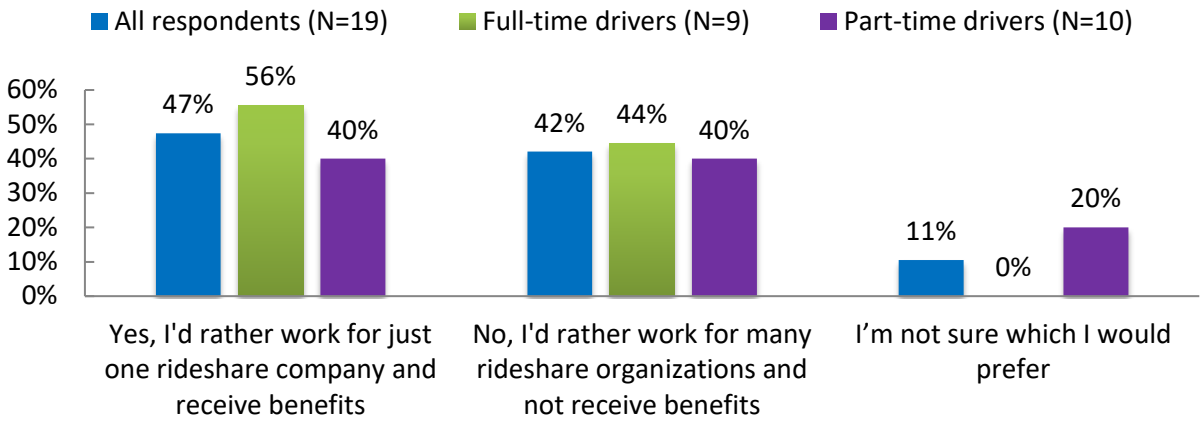


To follow up the employment classification question, we asked driver respondents a much more specific hypothetical question about their preferences for receiving benefits through a single ridesourcing platform. When examining Figure 35, we see that there are fairly evenly split opinions among all driver respondents on whether they would rather work for just one ridesourcing platform on a regular schedule and receive benefits (47%) or whether they would prefer to work for many platforms on a flexible schedule but not receive benefits (42%). We also note that 11% of all driver respondents were not sure which option they would prefer. This shows that although just 15% of the driver survey respondents would like to be classified as employees, almost half would like to receive benefits from one ridesourcing organization.

When we break these results out by full- and part-time drivers, we find that a slightly greater portion of full-time drivers would prefer to work for just one platform and receive benefits than the portion of part-time drivers that prefer the same, although the sample sizes are small here and therefore do not provide conclusive evidence of this trend. Similar

to the employment classification results in Figure 34, a greater portion of part-time drivers are not sure which option they would prefer (20%), while no full-time driver respondents said that they were unsure of their preference. These results suggest that AC Austin drivers are split on whether receiving benefits but working a more regular schedule for one ridesourcing company would be worth the associated tradeoffs. It is important to note that the reasons for employment preferences in Figures 34 and 35 are complex and unique to each individual driver respondent and their experiences driving with AC Austin and other services, and therefore it is difficult to draw conclusive deductions from these data alone.

Figure 35. If you could receive benefits (health insurance, paid time off, etc.) by working on a regular schedule for only one rideshare organization, would you prefer this over having the ability to work on a flexible schedule for multiple platforms but not receive any benefits?



The employment status preference results are especially interesting given the current debate around 'gig worker' employment classification laws in states like California, which aim to reclassify on-demand platform drivers from independent contractors to employees (California Legislative Information 2019). Although the driver respondent sample is small and comprised of AC Austin drivers, as opposed to those that solely work for larger ridesourcing companies, only a minority of driver respondents wish to be classified as employees. This pattern also holds true among full-time drivers, with just 20% preferring to be classified as employees. However, the large portion of part-time drivers that are not sure if they prefer to be an employee or independent contractor suggests that many drivers may not be informed enough to have a strong opinion on the issue.

When asked about receiving benefits like health insurance and paid time off from a ridesourcing company if they were limited to working for just one company on a more regular schedule, almost half of the driver respondents preferred the option where they could receive benefits. This shift in preferences between these two questions from Figures 34 and 35 shows that the possibility of receiving benefits is attractive to many driver respondents. At the same time, results are about evenly split, with around half of the driver respondents not wanting to give up flexible schedules and the ability to drive for multiple ridesourcing groups in exchange for benefits. This suggests that flexibility is valued very

highly among at least a portion of the driver respondents. We note that the question regarding benefits is hypothetical in nature, and that in theory, on-demand drivers could work on flexible schedules as employees for one or more ridesourcing operators and still receive benefits. One study even suggests that regulators could append the right to set one's own time schedule into state labor codes to better meet the professed needs of ridesourcing drivers (Dubal 2019).

The results discussed throughout this driver survey section suggest that a cooperative structure could be well-suited to meet many of preferences indicated by AC Austin drivers. A platform cooperative would offer more flexibility, greater ownership, and a real voice in the policies that are set and the kinds of benefits that are extended. Such a cooperative ridesourcing group could elect for its members to be employees, where they could operate on flexible schedules and also receive a more livable wage and employee protections. On the other hand, they could instead function as independent drivers using a cooperative platform and maintain flexibility but also have access to a collective platform that provides themselves benefits that they would not otherwise receive as typical independent contractors. We discuss employment classification considerations for cooperative ridesourcing groups in greater detail in the policy and legal implications section of this report. In the next subsection, we present rider survey-specific results to better understand the travel behavior impacts and reasons for using AC Austin among riders.

Rider Survey Results

Understanding why riders use AC Austin is important when considering factors that make P2P platforms attractive to customers. In addition, assessing the travel behavior impacts due to AC Austin and the unique fluctuations in the Austin ridesourcing market over the past few years can offer insights into how travelers react to abrupt changes in shared mobility availability. To better understand these effects, we asked riders questions about their use of AC Austin, reasons for use, preferences and opinions, and recent travel behavior with AC Austin. We divided rider survey-specific results into four subsections: 1) ridesourcing use and changes in use, 2) reasons for using AC Austin, 3) P2P platform preferences and opinions, and 4) AC Austin travel behavior impacts.

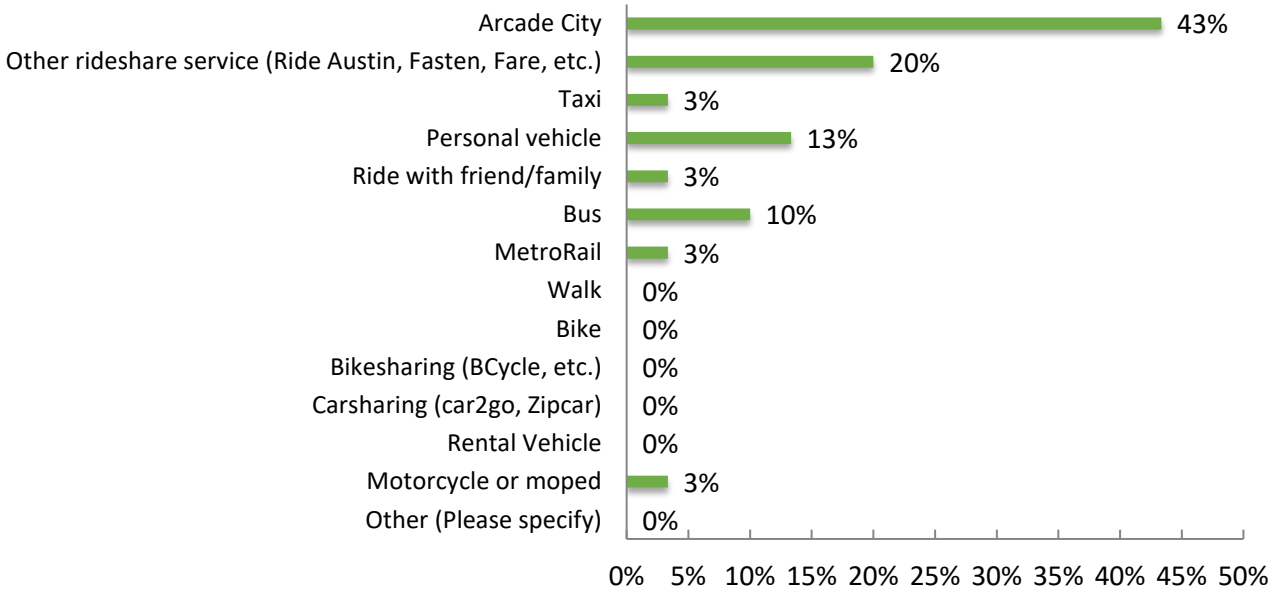
<u>Ridesourcing Use and Changes in Use</u>
The mid-2016 exit of Uber and Lyft in Austin and their subsequent return in mid-2017 provide opportunities to examine how those affected by the service suspension shifted their travel behavior due to these changes in service availability. Additionally, AC Austin riders represent a special subset of Austin ridesourcing users that have access to a unique P2P ridesourcing option that was available immediately upon Uber/Lyft's 2016 exit.

As previously shown in Figure 19, the majority of rider respondents had used Uber and/or Lyft before they exited Austin in mid-2016 (77%). To understand how these riders shifted the travel they used to make with Uber and/or Lyft, we asked them how they most commonly made the trips that they formerly took using Uber/Lyft during the one-year service suspension. Shown in Figure 36, we see that most rider respondents used either AC Austin (43%) or another ridesourcing service (20%) to make their former Uber/Lyft trips.

However, ridesourcing services were not always a one for one replacement for these former Uber/Lyft trips, as 37% of respondents commonly used modes other than ridesourcing for these former trips. Thirteen percent of respondents most commonly used a personal vehicle and 10% used the bus to make these former Uber/Lyft trips.

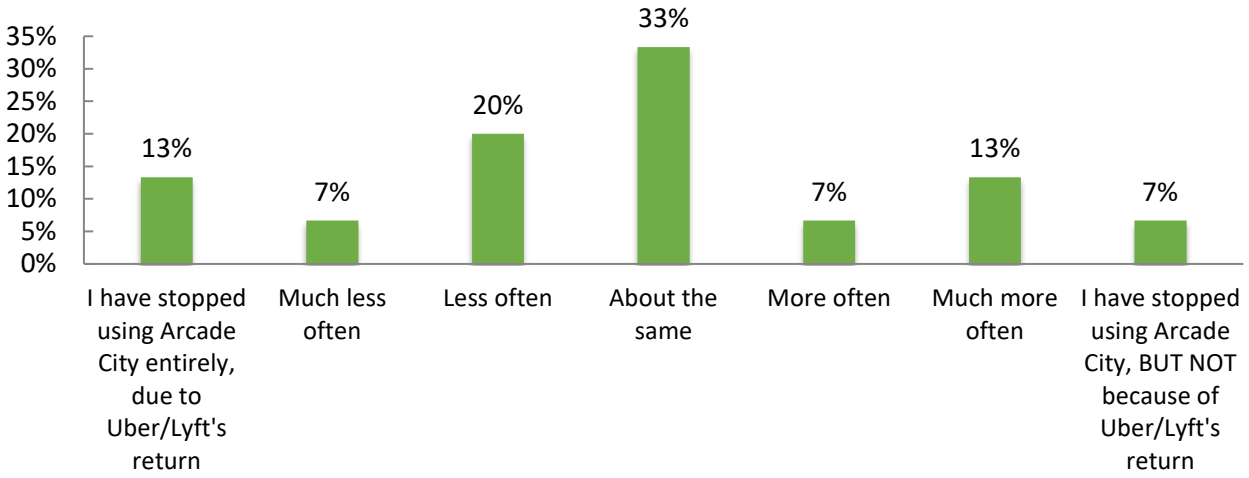
A previous study on how Uber/Lyft riders in Austin most commonly made their former Uber/Lyft trips during the suspension showed that while about 42% used another ridesourcing service (like Ride Austin or Fasten), 41% used a personal vehicle for these trips (Hampshire et al. 2017). The lower rate of personal vehicle substitution among our AC Austin rider sample is likely due to the generally lower rates of vehicle ownership and different demographic makeup of AC Austin riders compared to the overall population of Uber/Lyft riders in Austin.

Figure 36. During the year that Uber and Lyft were not in Austin, how would you most commonly make the trips that you used to make with Uber or Lyft? (N=30)



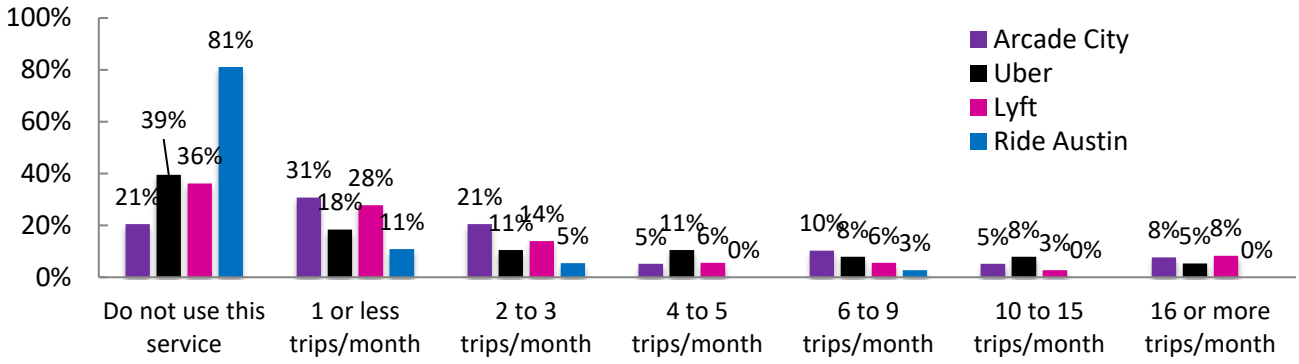
In addition to how riders shifted their travel behavior due to the exit of Uber/Lyft in mid-2016, we were also interested in how their behavior changed once Uber and Lyft returned to Austin about a year later. As shown in Figure 37, many of the riders who had used AC Austin prior to May 2017 decreased their use of AC Austin due to Uber and Lyft's return. Twenty seven percent said that they now use AC Austin less or much less often, and 13% stopped using AC Austin entirely, due to Uber/Lyft's return. However, 33% of respondents use AC Austin about the same amount before and after Uber and Lyft's return, and 20% claim to use AC Austin more often after Uber/Lyft's return. Overall, while a notable portion of rider respondents use AC Austin less often after the return of Uber and Lyft, some use AC Austin the same or even more often than they did during the service suspension. Some riders may perceive that Uber/Lyft's service quality decreased upon their return to Austin, as a few respondents mentioned in their comments.

Figure 37. Did the return of Uber and Lyft to Austin in May 2017 impact how often you use Arcade City? Overall, because Uber/Lyft returned, I use Arcade City… (N=15)



While rider respondents' use of different ridesourcing services has no doubt shifted over the last few years due to changes in availability of different services, we were also interested in understanding respondents' current use of different ridesourcing services in Austin. In Figure 38, we see that rider respondents not only use AC Austin, but a mix of ridesourcing services. Rider respondents currently use AC Austin slightly more frequently than other ridesourcing services, with around half (49%) making two or more trips per month, on average. However, many respondents also currently use Uber and Lyft somewhat frequently as well, with 42% using Uber and 36% using Lyft two or more times per month. Only a small portion of respondents currently use Ride Austin (19%). These results show that AC Austin riders use a variety of ridesourcing services as opposed to just AC Austin. This may be due to using different services for different situations or trip purposes, which we examine further in upcoming subsections.

Figure 38. Rider Respondents' Current Usage Frequency of Ridesourcing Services (N=39)

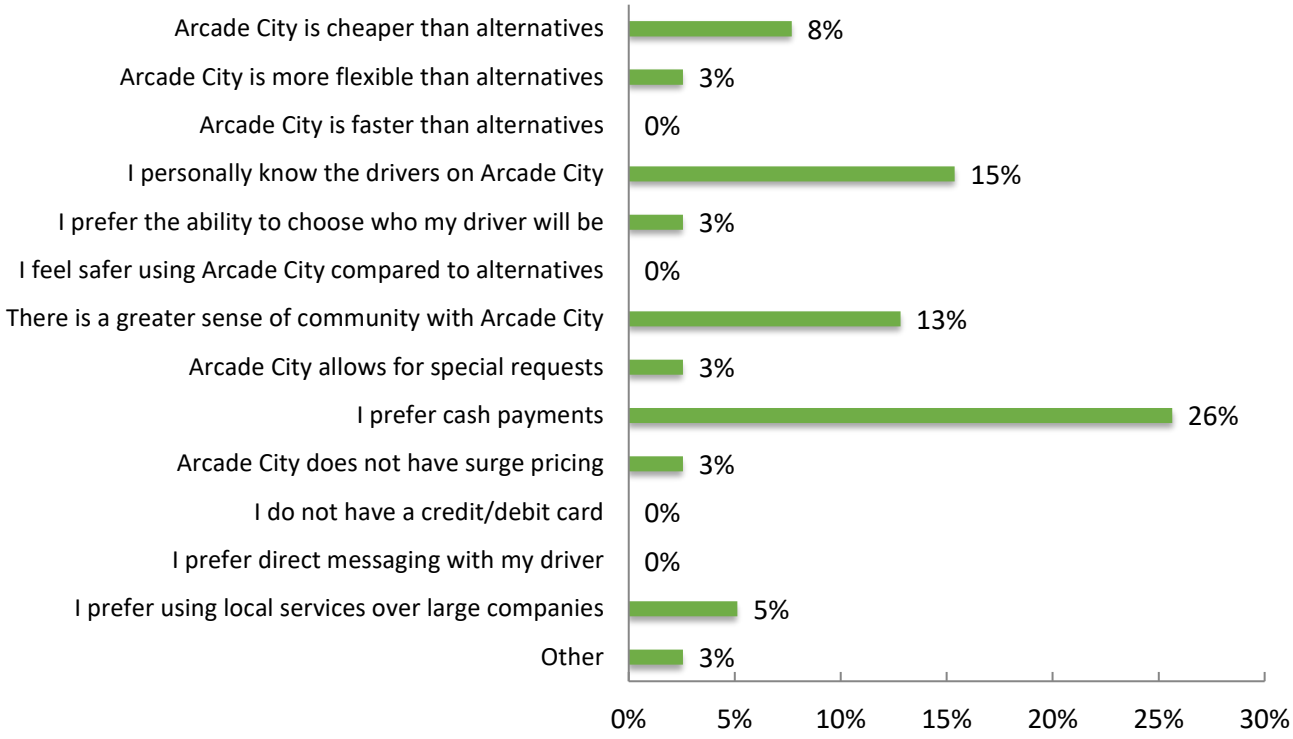


Reasons for Using AC Austin

As in the driver survey, we also asked a series of questions to gain insight into why riders use (or have stopped using) AC Austin. Based on responses to previous questions about current usage rates, we determined that eight rider survey respondents had stopped using AC Austin. We asked this subset of respondents why they had stopped using the service. Three respondents claimed that AC Austin is more expensive than alternatives, and another three said that they prefer app-based services. One respondent indicated that they feel less safe using AC Austin compared to alternatives and one respondent noted that they had moved from the Austin area. We also asked these rider respondents who no longer use AC Austin the main reason for why they used to use the service. Three respondents used AC Austin because other good ridesourcing options were not available at the time, and another three claimed that AC Austin was cheaper than alternatives. One respondent preferred cash payment and one noted that they simply wanted to try AC Austin out.

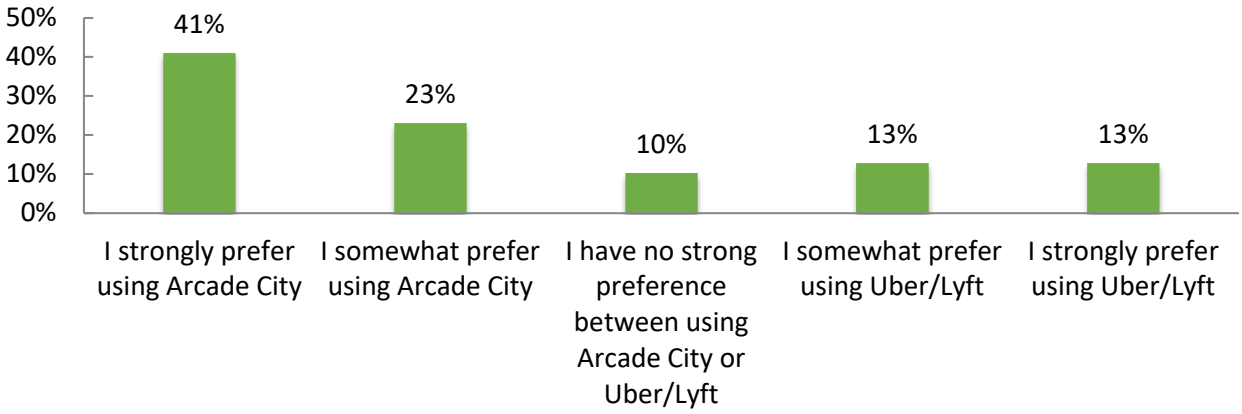
Although some rider respondents do not currently use AC Austin, the majority of respondents (80%) are active users of the service. To better understand what motivates current riders to use AC Austin, we asked rider respondents to choose their primary reason why they use AC Austin instead of other on-demand services. Respondents were asked to choose one reason from the list of options shown in Figure 39 below. We find that the most common reason that riders use AC Austin over competitors is because of the cash payment option, with 26% selecting this as their primary reason. Based on stakeholder interviews, the research team had identified cash payment as an important feature of AC Austin and a preference among many riders, but it is interesting to note that over a quarter of riders feel that this is the most important reason for their use of AC Austin. The next most commonly chosen reasons include that riders personally know the drivers on AC Austin (15%) and that there is a greater sense of community with AC Austin (13%). Similarly, driver respondents also noted the importance of a sense of ownership and community with AC Austin compared to commercial competitors. A small but notable portion of rider respondents use AC Austin because it is cheaper than alternatives, which may be the case for longer-distance trips or when Uber and Lyft are implementing surge pricing (AC Austin does not use surge pricing). Overall, these results show that cash payment options and a sense of community where riders and drivers know one another are the main reasons that riders use AC Austin. The fact that a notable portion of both rider and driver respondents indicated a greater sense of community and ownership as key reasons for using AC Austin suggests that P2P platforms could attract users through adopting more community-oriented practices.

Figure 39. Primary Reason for Using Arcade City Instead of Other On-Demand Services (N=31)



Since the majority of AC Austin rider respondents also have experience using other ridesourcing platforms like Uber and Lyft, we asked respondents whether they prefer using AC Austin or Uber/Lyft, in general. Almost two-thirds of rider respondents prefer using AC Austin over Uber/Lyft. Twenty-six percent felt the opposite way and prefer using Uber/Lyft instead of AC Austin, and 10% indicated that they have no strong preference between the services. Although the majority of rider respondents prefer using AC Austin instead of Uber/Lyft, opinions were more mixed than in the driver survey, where every single driver respondent preferred AC Austin to Uber/Lyft. This suggests that while many of the riders and drivers involved prefer AC Austin, the perceived benefits of AC Austin compared to Uber/Lyft are greater among drivers than they are among riders.

Figure 40. Rider Respondents' Preferences Between Arcade City and Uber/Lyft (N=39)

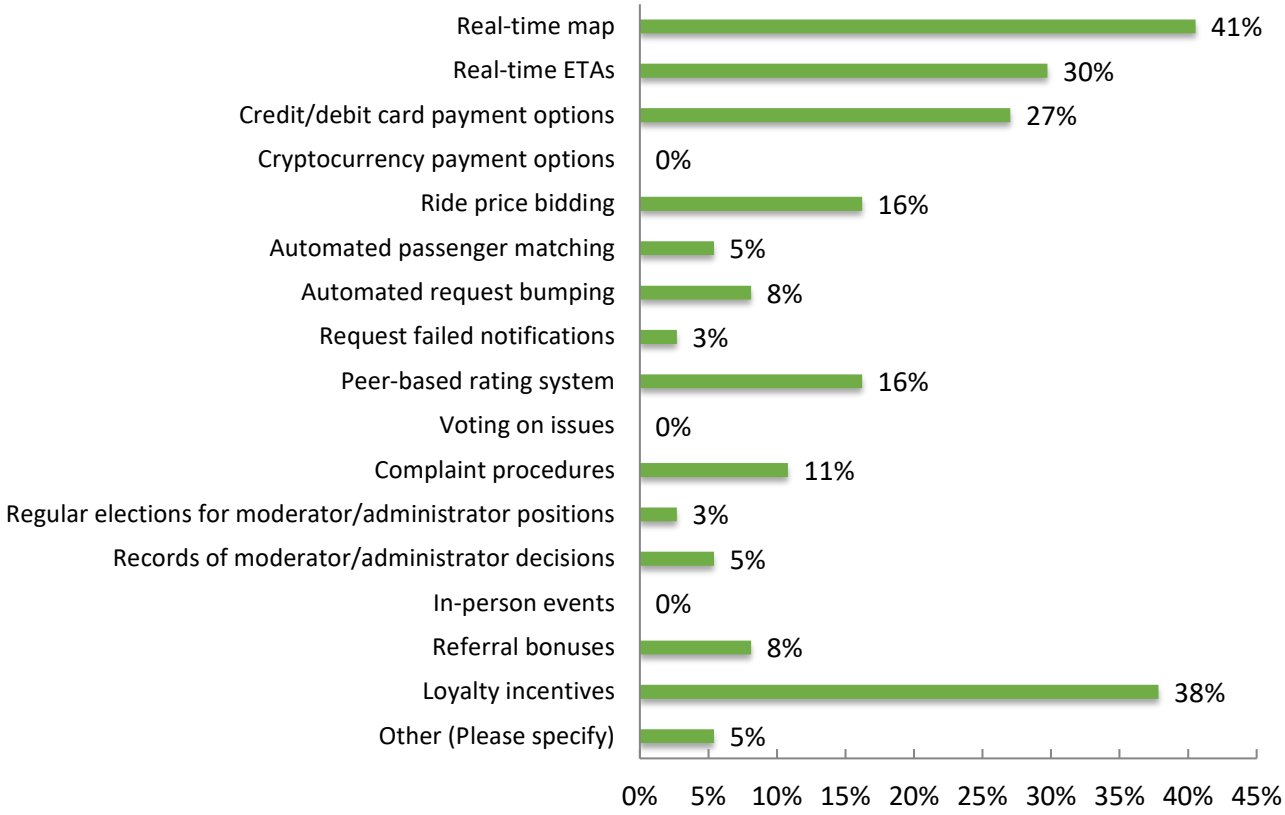


As in the driver survey, we asked a follow up question and queried rider respondents to briefly describe the reasons for the preference they chose in Figure 40. Among those who prefer AC Austin, many reiterated that they enjoy the community feel and personally knowing the drivers. One respondent mentioned that they prefer AC Austin because they feel that Uber/Lyft drivers are often impolite and their driving is sometimes reckless. A couple of rider respondents said that they use Uber/Lyft for shorter rides since it is cheaper but AC Austin for longer rides or pre-scheduled trips. Those who prefer Uber/Lyft mentioned that those services are typically quicker, easier, and more reliable than AC Austin. One respondent claimed that favoritism among AC Austin drivers can also occur and lead to longer wait times, whereas this is not a problem with Uber and Lyft's automated dispatching methods.

<u>P2P Platform Preferences and Opinions</u>

As in the driver survey, we also asked rider survey respondents their opinions about the challenges facing AC Austin and P2P platforms in general. We asked rider survey respondents what features they would like to see implemented that they believe would improve AC Austin. Respondents could select up to three potential features from the list shown in Figure 41. These features were very similar to the list shown to driver respondents, with a few rider-specific changes.

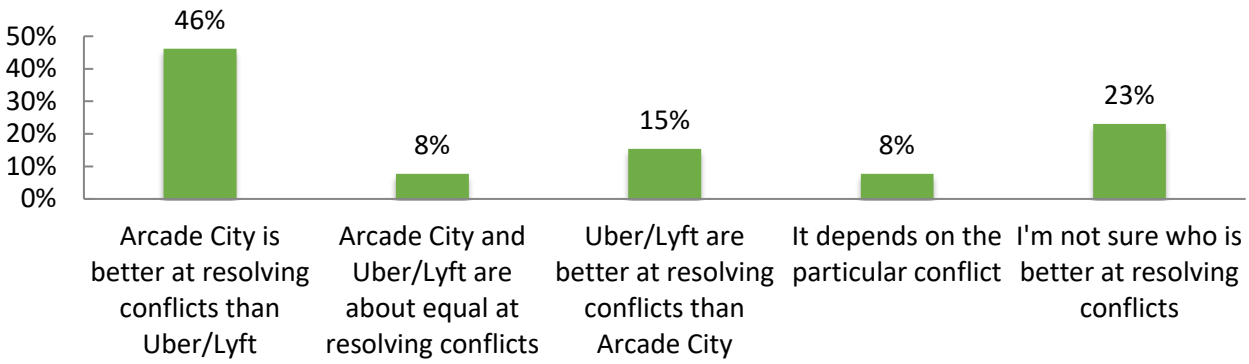
Figure 41. Rider Respondents: What features would most improve your experience with Arcade City? (N=37)



Similar to driver survey respondents, the real-time map, ETAs, and credit/debit card payment options were some of the most commonly chosen features that rider respondents would like to see implemented. In addition, loyalty incentives were chosen by 38% of rider respondents as a feature that would most improve their experience with AC Austin. Being able to bid on the price of a ride and a peer-based rating system were each chosen by 16% of respondents as being important features to improve AC Austin. Not surprisingly, governance features like regular elections for leadership and records of moderator/administrator decisions were not very commonly chosen as important features to riders, while these features were much more commonly identified by drivers as being important. Interestingly, complaint procedures were identified as one of the top three most important features by only 11% of rider respondents and 5% of driver respondents. This may indicate that other features like maps and usage incentives are more important than streamlined complaint processes, which may be important for only a portion of members who have actually experienced problems that required voicing complaints. Overall, these findings suggest that functionality and monetary incentive features are more important to AC Austin riders than voting, transparency, and other governance features, which are of greater importance to drivers.

Similar to the driver survey, we also asked rider respondents whether they believed AC Austin is better at resolving conflicts than Uber/Lyft. As in the driver survey, almost half (46%) of rider respondents believe that AC Austin is better at resolving conflicts. However, almost a quarter (23%) of rider respondents noted that they are not sure who is better at resolving conflicts, a lower portion than chose the same option among driver respondents. This may be due to drivers having more experience with ridesourcing platform conflicts than riders have, simply due to the fact that drivers typically interact with these platforms for much greater lengths of time. Fifteen percent of rider respondents claim that Uber/Lyft are better at resolving conflicts, 8% noted that the platforms are about equal at resolving conflicts, and another 8% said it depends on the particular conflict. Overall, many of the riders may perceive that AC Austin is better at resolving conflicts than larger commercial sharing platforms due to the community-oriented nature of the group.

Figure 42. Rider Respondents: Do you believe Arcade City or commercial rideshare companies like Uber and Lyft are better at resolving conflicts? (N=39)



As with the driver survey, we asked riders to share their opinions regarding three statements related to AC Austin and P2P platforms. Respondents indicated their opinions by answering how strongly they agreed or disagreed with the following statements in Table 6 on a five-point Likert scale. Similar to results from the driver survey, the vast majority of riders believe that driver-controlled ridesourcing networks could be repeated in other cities. Not a single rider or driver respondent disagreed with this statement, suggesting that those who have experience with one such group (AC Austin) think that driver-controlled groups could be replicated in other areas. The majority (83%) of riders agreed that they would rather use an AC app to make requests instead of through Facebook. This differs from driver respondents, who were fairly split as to whether an app would be beneficial. This may be because drivers feel that they have more control to accept or ignore requests through the Facebook page, while riders believe they would benefit from the ease and simplicity offered by app functionalities. Lastly, the majority of rider respondents claimed they are satisfied with their experience using AC Austin. Although a small portion (8%) were not satisfied with their AC Austin experience, these results are similar to the results from the driver survey which received unanimous agreement of overall satisfaction with AC Austin.

Table 6. Rider Respondents' Opinions on P2P Platforms and AC Austin (N=39)

Statement	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Driver-controlled rideshare networks like Arcade City in Austin could be repeated in other cities	67%	21%	13%	0%	0%
If available, I would rather use an Arcade City app to make requests instead of the Facebook page	62%	21%	10%	5%	3%
Overall, I am satisfied with my experience using Arcade City	62%	23%	8%	5%	3%

In the next subsection, we examine travel behavior impacts due to AC Austin and other ridesourcing services by asking rider respondents about their last trip using AC Austin.

AC Austin Travel Behavior Impacts

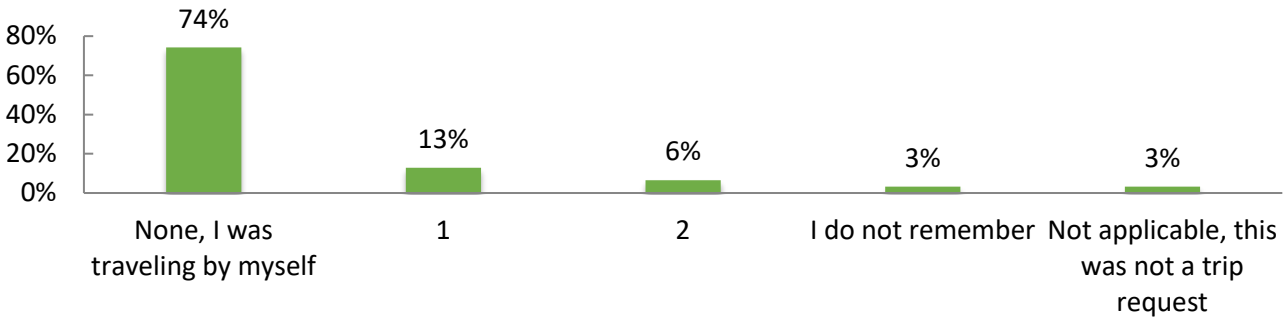
In order to assess the travel behavior of AC Austin riders, we asked rider survey respondents to answer a series of questions about their most recent trip using AC Austin. This method allows respondents to recall a recent and discrete event which is often preferred to asking about travel behavior changes more generally over a long period of time, because a recent trip event is easily recallable and therefore reported more accurately. After filtering for those who do not currently use AC Austin, we analyzed most recent trip results from 31 rider respondents.

Respondents' most recent trips were most commonly taken on Thursdays, Fridays, and Saturdays, although trips were distributed across most days of the week. However, we note that 26% of rider respondents could not remember the day of their last AC Austin trip. We also asked rider respondents to report the time of day of their most recent AC Austin trip. Respondent trip distributions by time of day matched up fairly closely with the actual distributions found in the activity data (Figure 3). As in the activity data, late night trips between the hours of 10pm and 2am were the most common trip time period among rider survey respondents and made up 40% of respondents' last trips. The fact that these day of week and time of day distributions match up fairly closely with activity data means that our sample can be considered at least somewhat reflective of actual trip-making patterns that occur on the AC Austin platform. We next asked rider respondents questions about the details of their most recent trip, including if any others were traveling with them, the purpose of their trip, and what they would have done if AC Austin and other ridesourcing services had not been available.

We find an average trip-based occupancy of 1.28 passengers per AC Austin trip, based on rider survey responses. As shown in Figure 43, almost three quarters of AC Austin rider respondent trips were single-passenger trips. Thirteen percent had two passengers total, six percent had 3 passengers total, one respondent did not remember how many others they were traveling with during their last trip, and one respondent indicated that their last

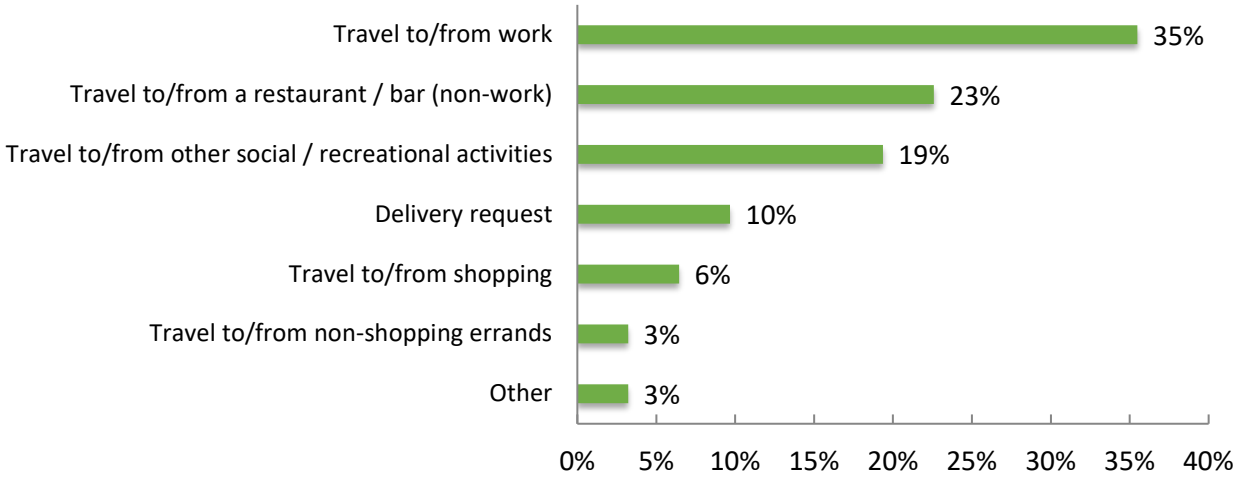
request on AC Austin was a delivery request. While our survey sample may not reflect the exact occupancy rates across all AC Austin trips, these data suggest that AC Austin trips have slightly lower average occupancies than Uber and Lyft. Studies of Uber and Lyft suggest that these services have average trip-based occupancy rates (not including deadheading) of around 1.4 to 1.5 passengers (Henao & Marshall 2018; Gehrke et al. 2019). The slightly lower occupancy rate for AC Austin compared to Uber and Lyft may be due to the lack of a pooled ride service like uberPOOL or Lyft Shared rides, or to the fact that a greater portion of AC Austin trips are made during the late night time frame and thus could be more likely to serve passengers traveling alone to or from late-night jobs.

Figure 43. How many other passengers were you traveling with during your most recent Arcade City trip? (N=31)



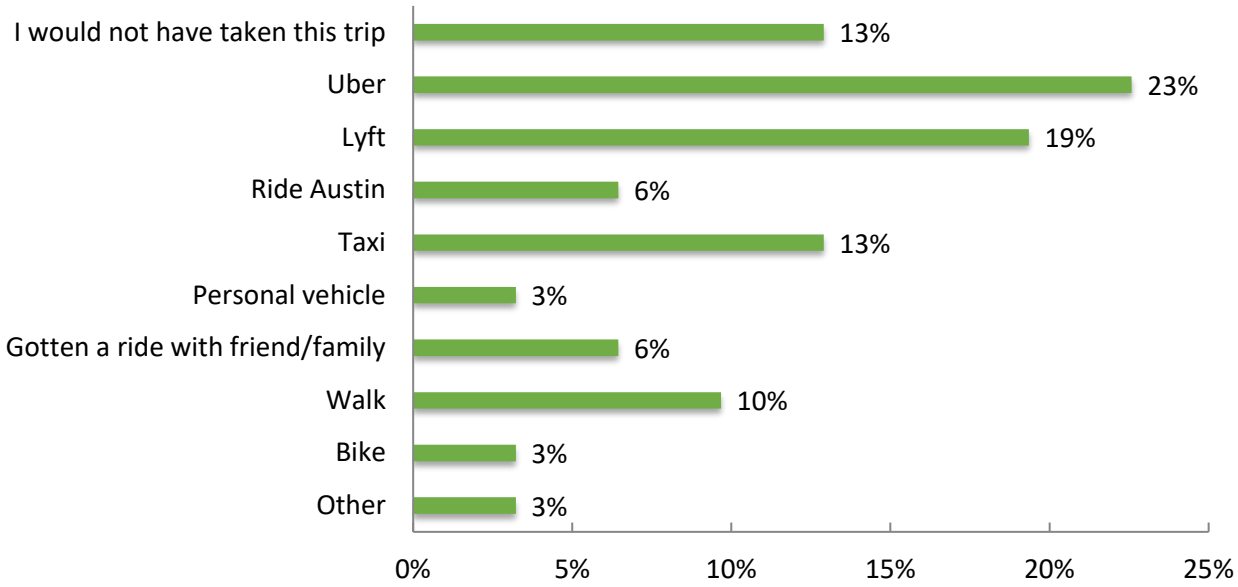
We asked rider respondents the purpose of their last trip to better understand what types of trips are being taken with AC Austin. The most common trip purpose was travel to or from work (35%), followed by travel to or from a restaurant or bar (23%), and travel to or from other social and recreational activities (19%). Ten percent of respondents indicated that they made a delivery request for their last request, and a few were traveling to or from shopping or non-shopping errands. Interestingly, there exists a much higher proportion of work trips made using AC Austin than the distribution of work trips among those using Uber and Lyft. Past studies have shown that just one sixth of trips using Uber and Lyft are made to travel to or from work, with the majority of trips being made for travel to and from social and recreational or restaurant/bar purposes (Rayle et al. 2016; Hampshire et al. 2017). While trips are also made for social purposes with AC Austin, the portion of work trips occurring on the platform is notably large. When we examine these trips by time of day, we find that almost half (45%) of these work trips were taken between the hours of 9pm and 3am. This provides empirical evidence that supports what some stakeholders mentioned during our interviews: that a major customer segment of AC Austin riders are service industry staff (servers, bartenders, entertainers, etc.) commuting to and from their late-night job. It follows that these riders also prefer the cash payment option of AC Austin, as shown previously in Figure 39, since many of these users likely make a portion of wages in cash tips and prefer using cash to pay for rides. These findings show that an important portion of AC Austin riders use the service to commute to and from late-night jobs.

Figure 44. Purpose for Most Recent Arcade City Trip/Request (N=31)



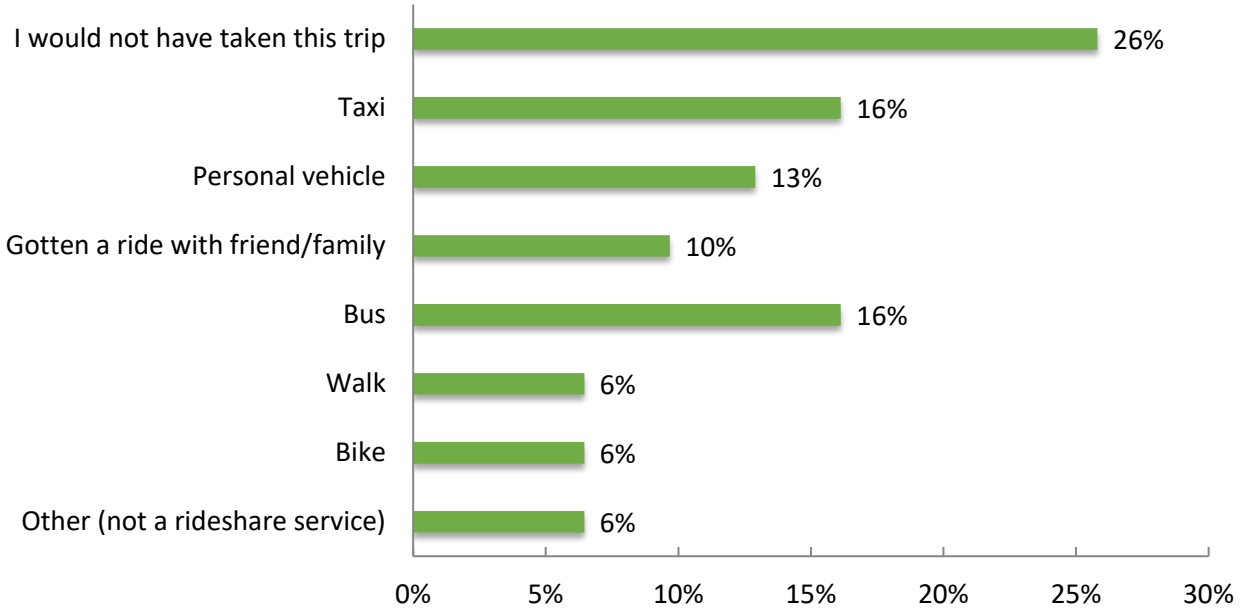
To assess the transportation modes that AC Austin riders shift from when they take AC Austin trips, we asked respondents how they would have made their last trip had AC Austin not been available. Not surprisingly, most rider respondents would have used another ridesourcing service like Uber, Lyft, or Ride Austin (48%) or taken a taxi (13%), had AC Austin been unavailable. However, a notable portion would not have made the trip entirely (13%), and 10% would have walked. Nine percent would have gotten a ride or driven in a privately-owned vehicle. This shows that while AC Austin is mostly replacing other ridesourcing or taxi trips, it is also inducing a portion of trips that would never have occurred and is replacing a portion of driving and walking trips as well.

Figure 45. Mode Substitution Had Arcade City Not Been Available (N=31)



We also asked respondents how they would have made their most recent trip if no ridesourcing services were available. Surprisingly, about a quarter of the rider respondents would not have taken their last trip if ridesourcing services did not exist. This is higher than the portions of Uber/Lyft riders who similarly would not have made their last trip had ridesourcing been unavailable, which range from about 5% to 12% (Rayle et al. 2016; Gehrke et al. 2018; Henao 2018). Higher portions of respondents than in the previous question would have driven a personal vehicle (13%) or gotten a ride with a friend or family member (10%), if ridesourcing services were unavailable. A greater proportion of rider respondents would have used the bus and a similar portion as in the previous question would have used a taxi. Interestingly, among those that commuted to or from work for their last AC Austin trip, 30% noted that they would not have taken their last trip, and another 30% would have taken the bus. This suggests that AC Austin and other ridesourcing services may be filling an important service gap for late-night workers during times when certain bus lines may run infrequently or not at all.

Figure 46. Mode Substitution Had No Ridesourcing Services Been Available (N=31)



The results to the most recent trip questions suggest that AC Austin may be filling an important transportation service gap in Austin. The large portion of late-night work trips taken by AC Austin riders, along with the fact that many of these riders would not have made it to work at all had AC Austin and ridesourcing services not been available, show that P2P ridesourcing platforms may be able to serve specific traveler segments whose needs may not be well met by existing transportation options.

Environmental Metrics Comparison

The rapid worldwide growth of ridesourcing services has raised important questions regarding their environmental impacts. On one hand, ridesourcing platforms that have existed for less than ten years now account for billions of miles on roadways around the world (U.S. SEC 2019), which has important implications for greenhouse gas (GHG) emissions. On the other hand, while a portion of trips are induced (i.e., would not have been made if ridesourcing did not exist), the majority of these ridesourcing trips are not appearing out of thin air. As shown in Figure 46, many are replacing trips that would have otherwise occurred using a similar transportation mode like a taxi, or with other modes like a personal vehicle or public transit. In addition, as we will discuss further in this section, a small portion of ridesourcing riders are selling or deciding not to purchase a car due to their ridesourcing use. A car not owned is a car not driven, and a wealth of past research has shown that the vehicles miles traveled (VMT) by carless and car-light households is disproportionately lower than the VMT of households that own proportionally more vehicles (Office of Energy Efficiency & Renewable Energy 2018). Therefore, mobility services that enable some users to get rid of or not purchase a car altogether typically reduce VMT among this subset of users, even when considering the added miles due to their ridesourcing use. The balance of these VMT producing and reducing effects brought on by ridesourcing is a topic of ongoing debate among transportation professionals, and more research is needed to determine the exact VMT and GHG effects of the services.

While we were not able to analyze the overall VMT and GHG emission impacts of AC Austin due to data and other limitations[2], we were able to assess certain key metrics that influence environmental performance, which we compare with similar metrics from centralized app-based ridesourcing services. Through these comparisons to past studies of other ridesourcing services, we are able examine some of the environmental challenges and benefits of decentralized ridesourcing systems compared to their more centralized counterparts. In this section, we cover two key metrics directly related to the environmental performance of ridesourcing systems, including: 1) deadheading mileage, and 2) vehicle ownership impacts.

Deadheading Mileage Comparison

One of the first components necessary for measuring the environmental impact of a mobility service is the total VMT produced by the service. VMT can be translated into GHG emissions by applying fuel economy factors to determine total emissions produced by a

[2] There are many reasons why a full VMT/GHG emissions analysis was ultimately deemed impractical by the research team. Large fluctuations in AC Austin ridership and the overall rider pool during the year that Uber/Lyft were not in Austin, after Uber/Lyft returned to Austin, and into the present day make it difficult to accurately determine the scale of rider-side VMT impacts. For example, within just the yearlong period of study, the group diminished in size from about 43,000 to 36,000 members. Since we were only able to track a month of ride activity due to the necessity of using manual data collection methods, it is difficult to accurately measure these changes in scale. Additionally, because AC Austin is a relatively small network and the majority of riders also use other ridesourcing services, it is difficult to assess how much VMT reduction is attributed to AC Austin, specifically, versus other ridesourcing services like Uber and Lyft.

given fleet. However, the total VMT that ridesourcing services produce is larger than just the directly observable trip-based miles. Ridesourcing vehicles (along with taxis, buses, and other transportation services) must deadhead some distance between trips and to and from areas of high demand with no passengers in the vehicle. These deadheading miles, along with trip-based miles, must be considered when assessing the overall VMT and GHG impacts of ridesourcing services. Past studies have shown that the deadheading miles produced by ridesourcing services are significant, ranging anywhere from about 35% to 47% of total miles (Cramer & Krueger 2016; George & Zafar 2018; Fehr & Peers 2019).

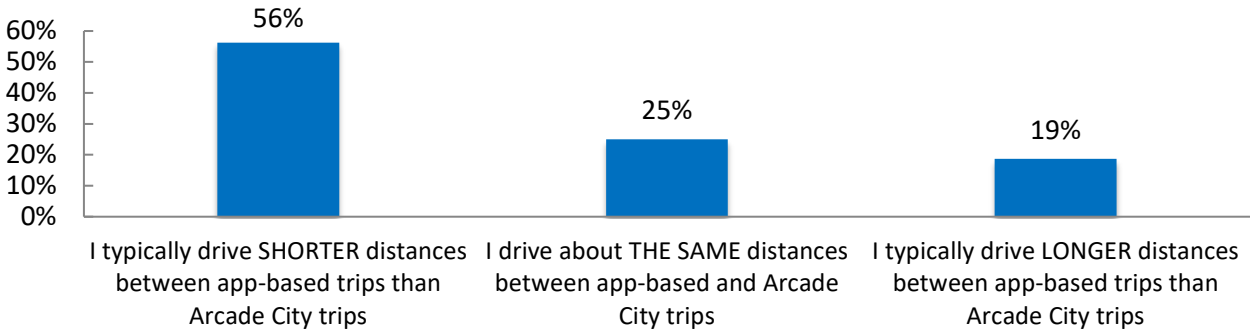
Since the percentage of deadheading miles has such a notable impact on the overall VMT and GHG produced by ridesourcing services, we were interested in comparing whether the portion of deadheading miles differed between decentralized systems like AC Austin and more centralized app-based systems. Since AC Austin has a much smaller share of the Austin ridesourcing market compared to Uber, Lyft, and Ride Austin, a comparison of performance metrics like deadheading miles offers more insight than comparing the overall VMT produced by AC Austin, which is no doubt orders of magnitude smaller than the VMT produced by these other services. For example, during spring 2017, Ride Austin produced about 1.2 to 1.8 million miles per month in total (Komanduri et al. 2018). By comparison, we estimate that AC Austin produced around 49,100 total miles during the mid-April to mid-May 2018 data collection period, about 24 to 37 times lower than the miles produced by Ride Austin a year earlier. Since their mid-2017 return to Austin, Uber and Lyft likely produce an even larger number of total miles, although these data are unavailable to the public.

To estimate the deadheading miles produced by AC Austin over the study month, we use both activity data from the operational analysis combined with data from the driver survey. From geocoding trip origins and destinations, we were able to measure the total trip-based mileage produced by AC Austin during the month. Since we were not able to collect trip distances for all trips due to deleted requests and missing/unclear origin or destination information, we assumed these missing trips to be the median measured trip distance of 5.8 miles. In total, AC Austin produced 28,600 trip-based miles over the study month. However, this mileage does not account for deadheading miles driven between trips. Because it was not possible to collect non-trip information from the AC Austin ride request group, and since tracking drivers ourselves was outside of the budgetary scope of this project, we used the driver survey to estimate deadheading mileage of AC Austin drivers. In the driver survey, we asked respondents to indicate about how many miles they typically drive between trips when driving with AC Austin (from the end of one trip to the start of the next). Although deadheading mileage likely varies on a per-trip basis, the answers to this question provided an estimate of driver deadheading on the AC Austin platform. On average, driver respondents indicated that they drove 4.65 miles between AC Austin trips. Applying this to the 4,405 trips over the month, we estimate that a total of 20,500 deadheading miles were driven during the month, meaning that the AC Austin system produced approximately 49,100 miles in total during mid-April to mid-May 2018. In turn, this equates to about 42% of total AC Austin miles that were spent deadheading. By comparison, about 36% of Ride Austin miles constituted deadheading during spring 2017 (Komanduri et al. 2018). Although deadheading miles are city-specific and no public data

exist on deadheading from Uber and Lyft in the Austin area, a recent study of Uber and Lyft in six other major U.S. cities shows similar levels of deadheading percentages, ranging from 40% to 47% (Fehr & Peers 2019). These data suggest that while AC Austin likely has a higher deadheading rate than app-based competitors like Ride Austin, the rate does not appear to be outrageously high and is in a similar range as rates found in other studies.

Since estimating deadheading miles using a survey instrument is not the most precise methodology, we also asked surveyed driver respondents whether they typically drive shorter, the same, or longer distances between trips with app-based ridesourcing services (Uber, Lyft, and Ride Austin) compared to AC Austin. In Figure 47, we see that the majority (56%) of AC Austin drivers typically drive shorter distances between app-based ridesourcing trips than between AC Austin trips. A quarter of the driver respondents indicated that they drive about the same distances between trips on each platform, and 19% noted that they typically drive longer distances between app-based trips than AC Austin trips. These results reflect our deadheading percentage comparison above showing that AC Austin has a greater portion of deadheading miles than the app-based service Ride Austin. However, it is interesting to note that a portion of respondents felt that they drive the same or even longer distances between app-based trips than AC Austin trips. This may be due to the fact that AC Austin drivers are not automatically matched with and forced to accept trip requests that are far away from their current location. In this way, some AC Austin drivers may only choose to give rides when they are close to the requester, and therefore it is possible that some drivers deadhead less when they are driving with AC Austin. While it is likely that AC Austin has higher deadheading rates overall than app-based competitors in Austin, this finding suggests that AC Austin's P2P platform may allow a modest portion of drivers to deadhead less when they are selectively using the AC Austin platform.

Figure 47. Do you typically drive shorter, about the same, or longer distances between trips when driving with app-based rideshare services like Uber/Lyft/Ride Austin compared to Arcade City? (N=16)



Based on the data presented above, AC Austin most likely performs worse than its app-based competitors in Austin with regards to the percentage of miles spent deadheading. This has negative implications regarding environmental effects, since a greater portion of miles spent empty to serve the same number of passenger-miles will produce higher

equivalent emissions per passenger, all else equal. However, we note that it is difficult to separate how much of the discrepancy between AC Austin and Ride Austin's deadheading percentages are due to decentralized operations versus simply due to the smaller operational scale of AC Austin. In other words, a smaller network of drivers serving a similar geographical area will almost certainly have higher deadheading rates than a larger network of drivers serving the same area. Therefore, it is difficult to tease out how much of AC Austin's deadheading inefficiency is due to its decentralized and manual matching process, and how much is due to the fact that there are simply less drivers on the network. At any rate, there is no reason why a ridesourcing cooperative could not also operate using an app to reduce operational inefficiencies like deadheading. Eva, the Montreal-based ridesourcing cooperative, is operating using an app and has a network of 500 active drivers, with 500 more in the process of joining as of November 2019 (Hayes 2019).

At scales larger than that of AC Austin's operations, high rates of deadheading can become a massive problem for cities and lead to increases in traffic congestion and emissions. Already, cities like New York City have instituted a cap on the amount of deadheading that ridesourcing services like Uber and Lyft can produce, which the companies are both currently fighting in court (Teale 2019). High volumes of driver deadheading miles can often result from too many drivers being active on a ridesourcing platform at a given time. When there is not enough passenger demand to be spread among active drivers, empty vehicles and deadheading mileage increase. However, commercial ridesourcing companies like Uber and Lyft are incentivized to flood the market with drivers, even if this increases deadheading, in order to ensure lower wait times for customers. This also has a perverse effect on driver wages, as drivers in most U.S. markets currently make money only when there is a paying rider in the vehicle. In a cooperative model, where members have more control over how many drivers are active on the platform, rates, wages, and other key factors that affect supply and demand, there may be more of an aligned incentive for such a group to minimize deadheading mileage. Indeed, driver advocacy groups like Rideshare Drivers United are pushing for a ridesourcing vehicle cap to curb congestion and emissions, and improve driver profitability (RDU 2019).

In summary, although the portion of miles spent deadheading on the AC Austin platform is higher than the deadheading rates of app-based platforms like Ride Austin, ridesourcing cooperatives in the long run could have greater incentives to reduce ridesourcing emissions from deadheading compared to commercial companies like Uber and Lyft. Next, we discuss vehicle ownership impacts among AC Austin riders both currently and in the year that Uber and Lyft were not in Austin.

Vehicle Ownership Impacts Comparison

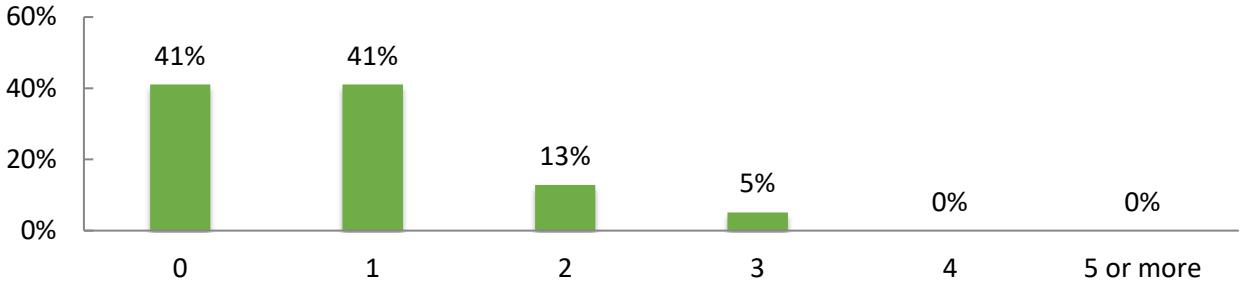
The effect that ridesourcing services have on enabling a small portion of riders to reduce the number of vehicles they own is a crucial component in understanding the overall environmental impact of mobility services. Past studies have shown that around 9% to 13% of ridesourcing passengers reduced the number of household vehicles that they own, at least in part, due to ridesourcing (Clewlow & Mishra 2017; Henao 2018). Because these riders no longer have access to a personal vehicle (or have vehicle fewer household

vehicles than before), they experience reductions in household VMT relative to what they would have produced if they had purchased or continued owning a vehicle. Past studies on shared mobility have documented this phenomenon with carsharing services like car2go, where 11% to 12% of members reduced their vehicle ownership which led to a 4% to 18% net reduction in GHG emissions per household, depending on the city (Elliot & Shaheen 2016). Although ridesourcing services are more popular and produce more VMT overall than carsharing, one still must take into consideration the same VMT and GHG emission reductions due to reductions in household vehicle ownership, in order to fully assess the environmental impacts of ridesourcing. Therefore, in this section, we discuss the vehicle selling and suppression effects of AC Austin both during Uber and Lyft's service suspension and at present. Through survey design mirroring a past study on ridesourcing impacts in Austin during the Uber/Lyft suspension (Hampshire et al. 2017), we are able to measure the portion of riders that did not acquire a vehicle due to AC Austin's presence and compare these effects to those among other Austin ridesourcing users who had not used AC Austin.

Current Vehicle Ownership

To assess how AC Austin and the changes in availability of ridesourcing services in Austin have impacted rider respondents' vehicle ownership rates, we asked a series of questions about current and past vehicle ownership and reasons for changes in ownership, if applicable. First, we asked rider respondents how many vehicles they currently own. In Figure 48, we see that while a slight majority of respondents own at least one vehicle, 41% do not own a car. This is a much higher rate of carless households than is found among the general public of Austin, as only 6% of all Austin households do not own a vehicle (Governing n.d.). This suggests that the AC Austin rider population owns much fewer vehicles than the average vehicle ownership rates across the general Austin population.

Figure 48. Current Number of Vehicles Owned by Rider Respondents (N=39)



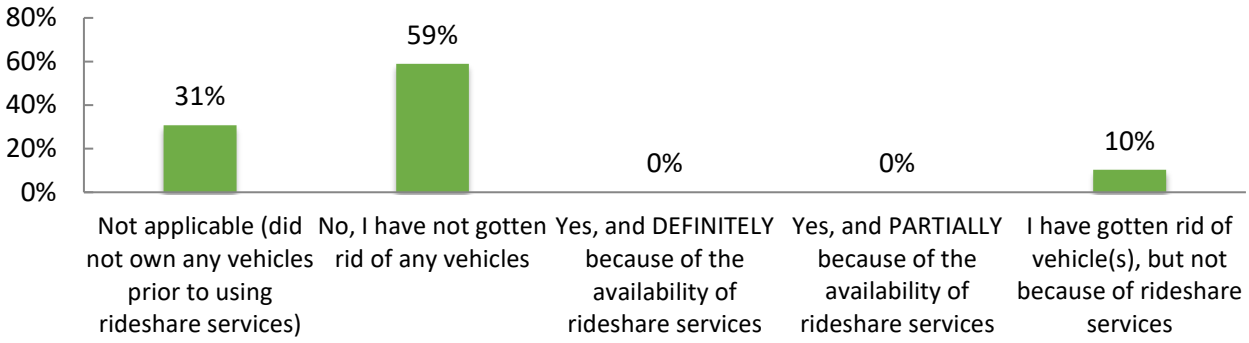
Next, we asked a number of questions about whether rider respondents' vehicle ownership status has changed due to ridesourcing services or had changed in the past due to the yearlong absence of Uber and Lyft. We also asked about AC Austin's effect on respondents' decision to purchase a vehicle both at present and in the past.

Vehicle Selling

We asked rider respondents whether they had gotten rid of any vehicles due to the availability of ridesourcing services (all of them, including Uber, Lyft, and other services),

and found that none of the rider respondents had gotten rid of a vehicle (Figure 49) due to ridesourcing. This suggests that ridesourcing services did not substantially induce the selling of personally-owned vehicles among AC Austin riders.

Figure 49. Have you gotten rid of any vehicles because of ridesourcing services? (N=39)



Vehicle Suppression During Uber/Lyft Absence

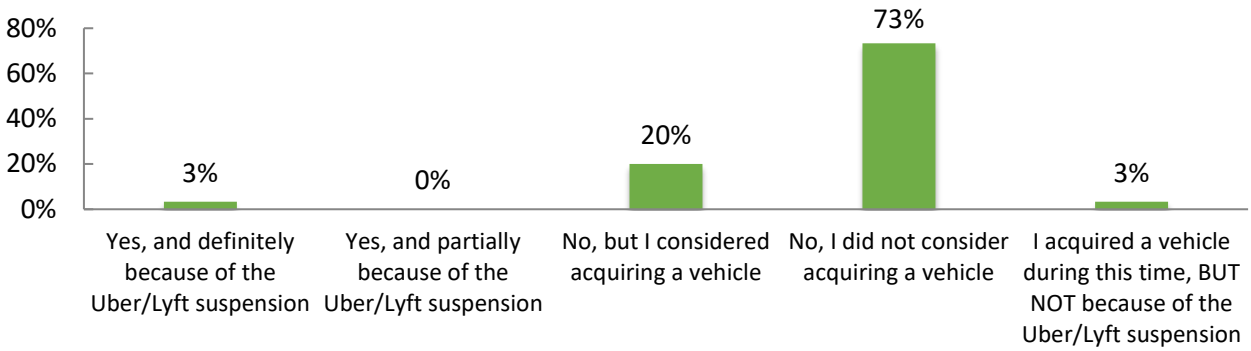
In addition to vehicle selling, we were also interested in examining whether the exit of Uber and Lyft in mid-2016 had caused rider respondents to acquire a personal vehicle (or additional vehicle if they already owned one or more), due to the suspension. This unique event presents a natural experiment to measure vehicle suppression due to ridesourcing services. Vehicle suppression occurs when the presence of ridesourcing services causes a rider not to purchase a personal vehicle that they would have otherwise, had ridesourcing not existed. Suppression has a notable role in mitigating the VMT and GHG emissions produced by ridesourcing services and therefore is an important metric to measure when assessing the transportation and environmental impacts of these services.

Although measuring suppression is often conducted using hypothetical stated preference questions (e.g., "would you acquire a vehicle if ridesourcing were unavailable?"), the Uber/Lyft service suspension in Austin allows for more accurate revealed preference measurement of suppression rates. A 2017 study of former Uber and Lyft riders in Austin examined this revealed suppression effect and found that 9% of respondents acquired a personal vehicle due to Uber/Lyft's exit from Austin in mid-2016. An additional 9% considered purchasing a personal vehicle during this time, but ultimately did not. The remaining 82% did not consider acquiring a personal vehicle due to the suspension (Hampshire et al. 2017).

For comparison purposes, we used a similar methodology and asked AC Austin rider respondents if they acquired a vehicle during mid-2016 to mid-2017 as a result of the Uber and Lyft service suspension. In Figure 50, we see that just one of the rider respondents (3%) acquired a vehicle due to the service suspension, lower than the 9% found in the Hampshire et al. (2017) study. However, 20% considered acquiring a vehicle, higher than the 9% who considered a vehicle purchase in the Hampshire et al. (2017) study. Still, the majority of rider respondents (73%) did not consider acquiring a vehicle during this time.

Although our survey sample sizes are smaller than those in the Hampshire et al. (2017) study, these results suggest that AC Austin riders acquired personal vehicles at a lower rate (3%) during the service suspension than Uber and Lyft users who did not have experience using AC Austin (9%).

Figure 50. During the year that Uber and Lyft were not in Austin, did you acquire a vehicle as a result of their service suspension? (N=30)

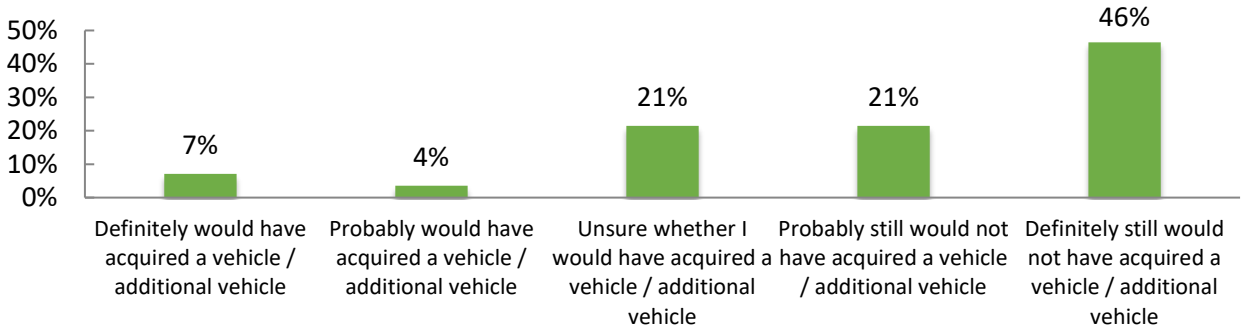


Since AC Austin riders represent a smaller subset of the overall Uber/Lyft rider population in Austin, we were also interested in assessing the impact that AC Austin, specifically, had on vehicle purchasing during the service suspension. The period immediately after the Uber/Lyft service suspension was tumultuous, and thousands of riders had to find other transportation solutions practically overnight for the trips they used to make with Uber and Lyft. Since many of the app-based competitors were not active yet or were still working out app bugs during the period immediately after Uber and Lyft's exit, those we spoke with claimed that AC Austin's Facebook-based solution offered a relatively stable ridesourcing solution during this crucial time. Therefore, the research team hypothesized that AC Austin may have had an effect on vehicle acquisition behavior during the one-year Uber/Lyft service suspension.

To measure this possible effect, we asked the rider respondents that did not acquire a vehicle during the service suspension if they would have acquired a vehicle during this time had AC Austin not existed (Figure 51). Indeed, we found that 11% of these respondents would have acquired a personal vehicle (or additional vehicle) had AC Austin not been available during the one-year Uber/Lyft suspension. In addition, 21% of these rider respondents were unsure whether they would have acquired a vehicle (or additional vehicle), had AC Austin been unavailable. These findings suggest that AC Austin, in particular, kept a small but notable portion of their riders from acquiring a vehicle after Uber and Lyft exited Austin temporarily in mid-2016. If we assume AC Austin had a similarly-sized active rider base at the time as recorded during our data collection (it is likely their rider base was actually larger during the suspension), then AC Austin alone was responsible for keeping at least 65 cars off the road in Austin during the Uber/Lyft absence. Although AC Austin riders represent a small subset of the overall Austin ridesourcing passenger base, AC Austin likely had beneficial effects on reducing overall VMT and GHG

emissions at this time through enabling a portion of riders not to acquire a vehicle due to the Uber/Lyft service suspension. P2P ridesourcing platforms may be useful in promoting vehicle ownership reductions and keeping vehicles from being purchased, especially in cases where an incumbent competitor suspends services or is banned from operating, which continues to happen in ridesourcing markets around the world (Warren 2019).

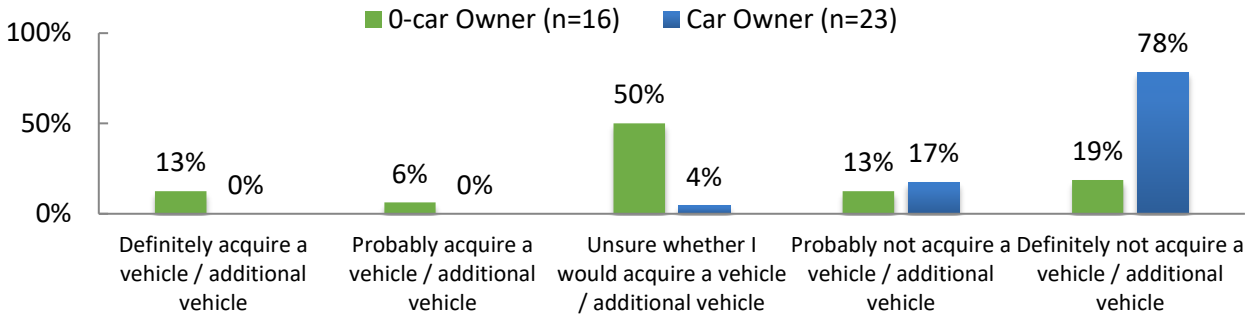
Figure 51. If Arcade City had not existed during the Uber/Lyft service suspension, would you have acquired a vehicle? (N=28)



Current Vehicle Suppression

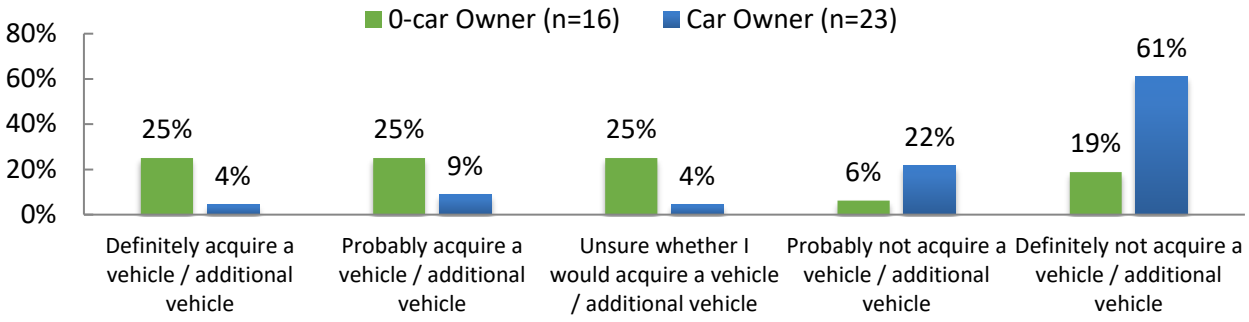
Lastly, we asked rider respondents whether the presence of AC Austin and other ridesourcing services are affecting their decision to acquire a vehicle, at present. We asked respondents if they would acquire a vehicle (or additional vehicle) if AC Austin were to suddenly disappear from the Austin region. In Figure 52, we split respondents by whether they currently own or do not own a car, and find that the majority of respondents would not acquire a vehicle or are unsure whether they would acquire a vehicle, if AC Austin were not available. However, 19% of 0-car owners said that they would probably or definitely acquire a vehicle if AC Austin were unavailable, while no current vehicle owners said the same. These results show that AC Austin is having a small but noticeable impact on preventing some riders, especially those who do not currently own a car, from purchasing a personal vehicle. The fact that half of the 0-car owner respondents are unsure whether they would acquire a vehicle suggests that the vehicle purchase decision would be a difficult one, if AC Austin were to suddenly disappear from the city.

Figure 52. If today, Arcade City suddenly disappeared from the Austin area would you acquire a vehicle? (N=39)



Next, we asked rider respondents if they would acquire a vehicle (or additional vehicle) if all ridesources services (including Uber, Lyft, Ride Austin, and Arcade City) suddenly disappeared from the Austin area. From Figure 53, we see that half of the 0-car owner respondents would acquire a car, if no ridesourcing services existed in Austin. Additionally, 13% of vehicle owner respondents would also acquire a vehicle. The portions of those who would acquire a vehicle if all ridesourcing services disappeared are much higher than those found in Figure 52, in the hypothetical situation where only AC Austin were to disappear. These findings suggest while AC Austin has a modest effect on keeping some riders from purchasing a personal vehicle, the availability of all ridesourcing services more generally is having a much larger suppression impact than just AC Austin alone. This makes intuitive sense, as the impact of all ridesourcing services combined is greater than the effects from just one. In addition, Uber and Lyft regained significant market share since their return in May 2017, and app-based services are generally more reliable than AC Austin's Facebook dispatch system.

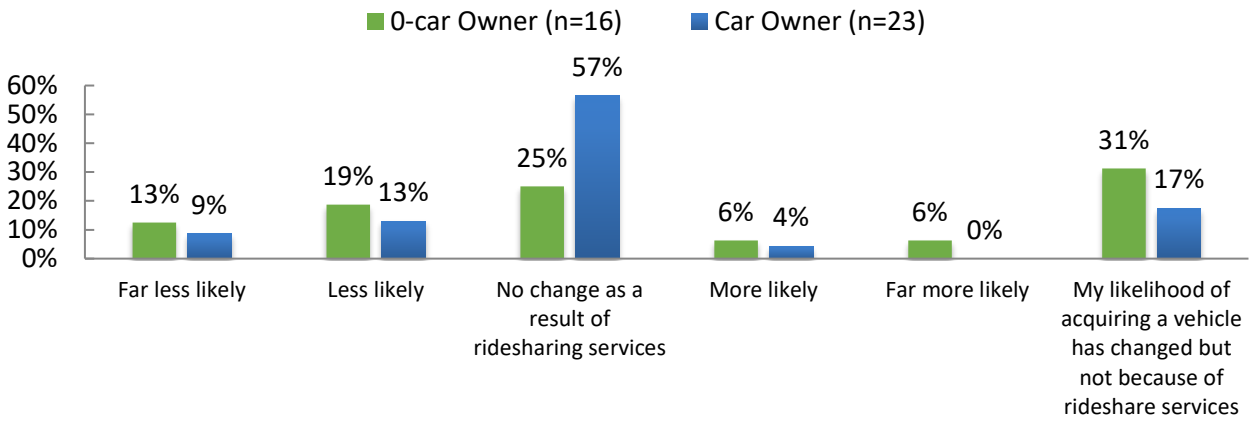
Figure 53. If today, *all ridesourcing services* (including Uber, Lyft, Ride Austin, and Arcade City) suddenly disappeared from the Austin area would you acquire a vehicle? (N=39)



Figures 52 and 53 show that non-trivial portions of rider respondents, especially those who do not currently own a car, are presently suppressing a vehicle purchase due to AC

Austin and other ridesourcing services. However, to determine the effect that these services have on sustained vehicle suppression over a longer period of time, we asked respondents how likely they are to acquire a vehicle in the next few years, as a result of their ridesourcing use. Results are displayed in Figure 54, and show that 31% of 0-car owners and 22% of car owners are indeed less likely to acquire a vehicle in the next few years due to ridesourcing. At the same time, 25% of 0-car owners and 57% of car owners identified that they experienced no change in their likelihood to purchase a vehicle in the next few years as a result of ridesourcing services. Interestingly, 31% of 0-car owners and 17% of car owners said that their likelihood of acquiring a vehicle over the next few years has changed, but not because of ridesourcing services. A small portion of rider respondents claimed that they are more likely to purchase a vehicle in the next few years due to their ridesourcing use. These results suggest that while a considerable portion of rider respondents feel that ridesourcing has impacted their longer-term vehicle purchasing decisions, the majority of respondents experience no change or changes that are not due to ridesourcing services.

Figure 54. As a result of your ridesourcing use, how likely are you to acquire a vehicle in the next few years? (N=39)



These vehicle ownership impact results show that AC Austin riders tend to own less vehicles than the average Austinite. The findings also show that while none of the rider respondents have sold a personal vehicle due to ridesourcing services, notable portions are replacing the need to acquire a vehicle with AC Austin and other ridesourcing services. These suppression effects are more pronounced among those who do not currently own a vehicle, and ridesourcing services seem to be helping a portion of riders from needing to acquire a vehicle both now and in the near-term future. However, whether AC Austin and other ridesourcing services can help keep a portion of riders from acquiring a personal vehicle over the span of many years is still an unanswered question. The results suggest that AC Austin performs similarly to centralized ridesourcing platforms with respect to vehicle ownership impacts, and had an important circumstantial role in keeping a portion of riders from purchasing a vehicle during the one-year Uber/Lyft absence. While keeping personal vehicles from being acquired and driven is likely one of the most beneficial

environmental impacts brought on by ridesourcing services, more research is needed to determine if the GHG emissions reduced through vehicle ownership reduction and travel behavior changes are enough to outweigh the additional GHG produced by ridesourcing operations.

In the next section, we review policy and legal issues relevant to AC Austin and cooperative ridesourcing groups more generally to better inform how groups like AC Austin may be able to fit into current and potential future policy and legal structures.

Policy and Legal Implications Review

P2P platforms like AC Austin, and platform cooperatives (which AC Austin might one day become), exist in a number of legal gray areas. Because their operations diverge from conventional capitalistic models, the law often excludes, overlooks, or applies inappropriately to such platforms. In this section, we identify the two largest barriers for ridesourcing platform cooperatives: 1) Transportation Network Company (TNC) regulations, and 2) the application of employment laws. After describing these legal challenges, we offer suggestions to both the platforms themselves and to policymakers to help bring down barriers for cooperative ridesourcing companies.

Legal Challenges for Arcade City Austin and Similar Cooperative Ridesourcing Models

This section discusses TNC laws in Texas and elsewhere, and explains why AC Austin does not meet the definition of a TNC and the implications that this has for the platform and its drivers. We then examine a second major legal question P2P platforms must confront, which is whether members should be classified as employees.

Arcade City's informal structure and the application of TNC laws

A Transportation Network Company (TNC) is a company that uses an online platform to connect riders with drivers using their own personal vehicles. Because such operations fall outside the definition of taxicab franchises and other industries already subject to regulation, almost all states have enacted legislation specifically to regulate TNCs. While some state laws merely prescribe insurance requirements, most provide a more comprehensive regulatory framework. The laws explicitly authorize TNCs and typically require TNC permits, driver and vehicle standards, insurance, passenger protections, and include a number of other specific policies and procedures.

In most cases, cities made the first move to regulate ridesourcing services, not states. When states did pass legislation, 40 of the bills included partial or complete preemption of city regulation of TNCs, preventing cities from adopting more rigorous regulatory frameworks (Moran et al. 2017). This was the case in Texas. Austin adopted an ordinance in May 2016

that required fingerprint-based background checks of TNC drivers, which Uber and Lyft reacted to by suspending their operations in the city. In May 2017, those companies returned to Austin when the governor signed House Bill (HB) 100 into law, state legislation that legalized and regulated TNCs (without a background check requirement) and nullified Austin's ordinance (Moran et al. 2017).

AC Austin has claimed that it is not a TNC, and has not registered as one with the Texas Department of Licensing and Regulation (Texas Department of Licensing and Regulation n.d.). Indeed, as AC Austin currently operates, it appears to fall outside the definition of a TNC under the Texas statute regulating such entities. Texas law defines a TNC as "a corporation, partnership, sole proprietorship, or other entity that, for compensation, enables a passenger to prearrange with a driver, exclusively through the entity's digital network, a digitally prearranged ride" (Texas Occupations Code § 2402.001(5)). AC Austin does not meet the "for compensation" element of the TNC definition. Money changes hands only between riders and individual drivers, but AC Austin as a platform does not take a cut of the proceeds, nor do drivers or riders pay any kind of fee to the platform.

Texas is not the only state to define TNCs as a platform that earns revenue as an entity. For example, in New York, a TNC is an entity that uses a digital network "to connect transportation network company passengers to transportation network company drivers" to provide a prearranged trip (NYS Vehicle & Traffic Law § 1691(3)). "Transportation network company drivers" is defined, in part, as an individual who "[r]eceives connections to potential passengers and related services from a transportation network company in exchange for payment of a fee to the transportation network company" (NYS Vehicle & Traffic Law § 1691(4)(b)).

Additionally, the Texas definition provides that rides are prearranged "exclusively through the entity's digital network" (Texas Occupations Code § 2402.001(5)). AC Austin facilitates peer-to-peer connections among riders and drivers through their Facebook page, but drivers commonly share their phone numbers when responding to a ride request, and ask the potential rider to call or text them. AC Austin drivers also report arranging rides with customers outside of the Facebook platform.

In every other respect, AC Austin does meet the definition of a TNC: It arranges rides through a digital network (i.e., a Facebook group). Even though AC Austin does not operate through an app owned by the network, it would likely still meet this part of the definition, since a "digital network" is defined as one "offered or used" (not necessarily owned) by the TNC (Texas Occupations Code § 2402.001(2)). There are a number of operations to which the statute explicitly does not apply, but none of them describes AC Austin (Texas Occupations Code § 2402.001(5).[3] It seems an odd outcome that, simply because the

[3] "The term does not include an entity that provides: (A) street-hail taxicab services; (B) limousine or other car services arranged by a method other than through a digital network; (C) shared expense carpool or vanpool arrangements; or (D) a type of ride service for which: (i) the fee received by the driver does not exceed the driver's costs of providing the ride; or (ii) the driver receives a fee that exceeds the driver's costs associated with providing the ride but makes not more than three round-trips per day between the driver's or passenger's place of employment and the driver's or passenger's home." Texas Occupations Code Section 2402.001(5)

network itself does not charge a fee, it is exempt from TNC regulation. However, recent enforcement actions have targeted individual AC Austin drivers rather than the platform itself (Hammons 2019). The city of Austin has cited drivers for not having chauffeur permits or valid operating authority. If the AC network is not a registered TNC at the state level, drivers are subject to the same local regulation as taxis and limos, regulation that has not been preempted by state law. To be a taxi driver or other chauffer, a driver needs a chauffer's license and must operate under a valid operating authority or taxi franchise (Austin Municipal Code § 13-2-3(A)). The definition of a "chauffeur" under the Austin Municipal Code is "a person who operates a ground transportation service vehicle dispatched either by hail, telephonic, radio, or any electronic communication, including an E-Hail indicating the location of a passenger for immediate or prearranged transportation service"(Austin Municipal Code § 13-2-1(5)). "Ground transportation" covers all types of chauffeured transportation other than charter bus service ((Austin Municipal Code § 13-2-1(20)). Essentially, the city may regulate all drivers who offer transportation services, unless they drive for a TNC, in which case they are subject to the state TNC law.

The process for obtaining a chauffeur's license is far more involved than driving for a TNC. Applicants must obtain a fingerprint background check; show evidence of work authorization in the United States; obtain and submit a certified Texas driving record; and take an in-person test covering customer service, traffic violations, landmarks, and ordinance related questions (City of Austin n.d.).

Beyond this, if AC Austin is not a TNC, it would need to register as a taxi franchise and comply with more burdensome regulations than a TNC. Cities often regulate how many taxi licenses or medallions are allowed, how prices are set, and what vehicles may be used. Taxi drivers usually need taximeters or other equipment, must maintain commercial driver's insurance, and undergo fingerprint background checks. The network would also need to significantly alter its operations. It would need to use a uniform fleet of vehicles and accept street hails, for example.

In many states, a network like AC Austin would still fall within the definition of a TNC. For example, California's definition is similar to Texas's except the entity would qualify as a TNC if the drivers are compensated for giving the rides, even if the central entity is not (California Public Utilities Code § 5431(c)). If a cooperative ridesourcing network was instead registered and regulated as a TNC, compliance would be simpler but still not a good fit for its current structure and operations. About half of all states do not allow TNCs to accept cash payment. This functions to exclude lower income individuals who may not have a credit card or bank account, though it also reduces the risk of workplace violence for the drivers. AC Austin drivers receive payment in a number of ways, including cash, PayPal, and Venmo. It is also common for states to require electronic receipts for payment, insurance at the entity level, data collection and data protections, driver and vehicle vetting, and identification (such as license plate numbers, which not all AC Austin drivers share in advance with their riders). Many of these requirements would likely prevent an informal collective of drivers and riders from connecting over Facebook, but would necessitate an app with sophisticated tracking and payment capabilities, as well as backend support staff to comply with data management requirements. In addition, in Texas a TNC

license currently costs $10,500. Thus, a free platform facilitated entirely by volunteers would likely not be feasible.

As it stands, AC Austin and other informal, cooperative ridesourcing networks that may form, do not cleanly fall into the definition of existing categories of transportation providers. To fit themselves into one of these categories would require significant changes to their operations. Later, this chapter will discuss whether such changes may be worthwhile, and/or what policies could be enacted to support cooperative ridesourcing platforms.

Are platform cooperative drivers employees?

Whether ridesourcing drivers should be classified as employees is perhaps the most significant legal question ridesourcing platforms face today. AC Austin and other platform cooperatives will need to wrestle with this issue as well. Lawsuits against ridesourcing companies Uber and Lyft number in the dozens, most of them class actions, with claims of underpayment of wages, tip-stealing, unfair labor practices, and other state and federal labor law violations. The number of cases would be much higher if it weren't for the forced arbitration clause in contracts its workers must sign. This clause requires workers to resolve their claims in closed-door, non-court settings. Although there is no official count of arbitration claims against the companies (due to their secret nature), there is evidence from SEC and court filings that Uber is currently facing 60,000 arbitration claims, and Lyft is facing almost 3,500 arbitration claims (Smith 2019).

Drivers are clearly unhappy with their treatment by conventional ridesourcing companies, and some feel they have been misclassified as independent contractors, when they should be given the protections afforded employees. There is not yet clear case law on whether TNC drivers are legally entitled to the protections afforded employees. Most courts and government agencies use a balancing test of many factors to evaluate whether someone is properly classified as an independent contractor. These factors, largely derived from common law, include who controls how the work is performed, whether the worker uses their own tools or equipment, the length of the engagement, whether the worker is supervised, whether the worker is engaged in a distinct occupation from the employer, and the like. The factor that generally holds the most weight is who exerts control over the work (Anderson 2018). Although TNC drivers use their own cars, choose their hours of work, and are not directly supervised, they also have no control over setting their own rates or most of the specifics of the job, often work for a particular TNC for indefinite periods of time, can be unilaterally terminated as a driver by the company, and perform the primary work of the company (providing on-demand rides). Thus, there are factors that weigh both in favor and against TNC drivers being considered employees under labor and employment law.

The state of California has recently addressed this ambiguity by passing legislation intended to clarify that TNC drivers are not independent contractors. Although Assembly Bill (AB) 5, passed in September 2019, is a state law applicable only to companies operating in the state (Cal. Assemb. B. 5 2019), California is the largest economy in the country and its laws are frequently used as models for other states' legislation. For these

reasons, Uber and Lyft are preparing for a legal fight and a ballot proposal to oppose the legislation (Campbell 2019).

Replacing the old balancing test under *S. G. Borello & Sons, Inc. v Dept. of Industrial Relations* (1989) 48 Cal.3d 341, California's AB 5 codified a three-factor "ABC" test, which the California Supreme Court adopted in *Dynamex Operations v. Superior Court*, (2018) 4 Cal. 5th 903, to determine whether a worker should be designated as an employee or independent contractor. A worker is now presumed to be an employee, and not an independent contractor, unless the hiring entity can show *all* of the following: (1) The worker is free from the control and direction of the hiring entity in connection with the performance of the work, both under the contract for the performance of the work and in fact; (2) The worker performs tasks that are outside of the usual course of the hiring entity's business; (3) The worker is customarily engaged in an independently established trade, occupation or business of the same nature as the work performed for the hiring entity (Cal. Assemb. B. 5 2019).

Drivers for commercial TNCs might meet the first prong of the test, but would generally fail the second and third. Providing rides is certainly within the "usual course" of Uber or Lyft's business (though they are claiming this is not the case). And these companies likely cannot claim that drivers have an "independently established trade, occupation or business" as drivers, especially when many of them work full-time hours for only one, or perhaps two, of these companies.

Platform cooperatives are different from Uber and Lyft in that the drivers function much more like independent businesses, making it less likely that their drivers would be considered employees. Cooperatives are democratically governed by their members and there is often no clear "master-servant" relationship characteristic of an employment setting. Members may collectively decide to forego certain benefits required for employees, such as workers compensation insurance, in order to keep more of their pay, or to collectively provide themselves with alternative benefits. While cooperative members may also choose to treat themselves as employees (and sometimes must, depending on the circumstances and relevant legal jurisdiction), in other cases employee status is not the most beneficial or strategic choice.

As it currently operates, AC Austin would likely not be considered a hiring entity at all due to its peer-to-peer nature. The platform does not pay its drivers, and does not extract part of the fare; all money is exchanged directly between the driver and rider. The platform cannot even be said to operate commercially at this point. But even if the platform did require income from its drivers to cover its costs, it could be structured as a membership fee rather than a portion of the fare. As long as drivers and riders continue to arrange services and exchange payment directly, and drivers have sufficient control over the terms of their work and the operations of the platform, the platform likely will not be considered an employer of the drivers. Rather, drivers would be seen as independent businesses, and co-owners of a platform that provides, at cost, the technology needed for them to operate.

Still, there is legal ambiguity in the employment status of worker-members of platform cooperatives, and it could be easy for a platform to slip into employer territory unwittingly, especially in a state where a statute like AB 5 governs. Even a cooperatively owned and managed entity may need to classify its drivers as employees if, for example, it receives its income as a percentage of driver fares and operates at a profit, or exerts control over the rates charged and other conditions of the drivers' work, or if it removes drivers from the platform without significant due process. There are steps that platforms and policymakers can take to mitigate this ambiguity, which will be discussed below.

Recommendations for Arcade City Austin and Other Similar Platforms

In this section, we provide recommendations for AC Austin and other P2P or platform cooperatives with respect to navigating TNC laws and employment laws.

<u>Accept regulation as a TNC and adjust operations accordingly (or advocate for policy change)</u>
In the absence of a statute designed specifically for informal or cooperative ridesourcing platforms, AC Austin and networks like it should register as a TNC and comply with the requirements under their state's TNC law. As described above, failure to comply with TNC law will subject the drivers to enforcement of local laws regulating chauffeurs and taxi drivers, with which they cannot comply while driving their own vehicle using the Arcade City platform.

In states where core features of the cooperative platform (such as its non-commercial nature) causes it to fall outside the definition of a TNC, drivers could consider engaging in policy advocacy to either change the TNC statute or to enact new legislation specifically for decentralized, P2P ridesourcing. But many states do not require the platform to receive income from rides in order for it to be a TNC. And those that do would likely still consider such a platform a TNC, assuming it met the other elements of the definition.

Even if the platform was not required to begin acting commercially in order to register as a TNC, it will likely need to adjust its operations in other ways in order to comply with state law. In most cases, the platform will need a way to track more data than is currently available through a site like a Facebook page, in order to comply with state regulations. Data that TNCs must collect and make available for audit (or in some cases, share regularly with the state) commonly includes rides requested and fulfilled, response time between the request and when the vehicle arrived, miles and hours logged by drivers, and complaints issued by riders (California Public Utilities Code § 5440.5(a)(1)(I)). Regularly collecting such data through Facebook group posts would be labor intensive, and trips generated through direct messaging would be even more difficult to track. Drivers would need to submit to a background check (though TNCs generally are only required to use a "name-based" background check provided by a private company, rather than a fingerprint background check conducted by state or local agencies) (Moran et al. 2017).[4] The platform

[4] No states require fingerprint background checks, but a few of the cities that are authorized to regulate TNCs, such as New York City, do require fingerprinting.

would need to procure insurance and a TNC permit, share drivers' information including license plate numbers, give an electronic receipt to riders, and may be required to give riders the ability to request a wheelchair accessible ride (Moran et al. 2017).

Compliance with TNC regulations will require more administrative capacity and income at the platform level for groups like AC Austin. Collecting the required data will likely necessitate a mobile app or other technology, or at a minimum, significant backend support to collect and organize such data from drivers. This may seem prohibitive to a network that itself generates no income, but open source apps are becoming more widely available, bringing down the cost to develop a mobile ridesourcing platform. LibreTaxi is one example, available for free at https://libretaxi.org. Additionally, Ride Austin, the only non-profit ridesourcing organization in the U.S., is also planning to open source its software. "The software will be free to use and build upon – effectively eliminating the large technology hurdle to start a rideshare alternative" (Ride Austin 2019).

The network could also consider collecting a modest fee from its riders in order to fund the administrative capacity and costs associated with TNC regulation compliance. Becoming a compliant TNC would likely involve forming a legal entity and hiring administrative staff; however, the drivers may or may not need to be employees, as described in the next section. Ideally the platform would form as a cooperative entity, controlled by the drivers, and operate at-cost to provide the services needed to the drivers (including a compliant TNC structure). This would demand more structure than the platform may have initially envisioned, but would still be in stark contrast to the exploitative, dominant ridesourcing platforms, keeping the governance and profits still primarily with the drivers.

Either treat drivers as employees or independent driver-owners

Currently, AC Austin is not an employer since it does not operate commercially at all, and no money flows into or out of the central entity. However, should AC Austin start collecting a portion of the fares paid by riders, it could be considered an employer of the drivers. Given the legal battles that conventional ridesourcing platforms face, and especially in jurisdictions governed by statutes similar to AB 5, it is not advisable to treat drivers as independent contractors. However, where drivers both operate independently and are owners of a platform that operates for their benefit, they could avoid employee status even when the platform operates commercially.

In a platform cooperative, the drivers would have a voice in whether the platform would classify them as employees or owners. As is evidenced by the driver mobilization against Uber and Lyft, many drivers would prefer to be classified as employees and be entitled to benefits like a reliable minimum wage, overtime pay, tax withholding, unemployment compensation, workers compensation insurance, the right to unionize, and the like. However, cooperative owners sometimes prefer to avoid employee status and redirect funds that would pay for certain mandatory expenses (like workers compensation) to more desirable benefits (like health insurance). A cooperative ridesourcing platform can likely structure itself to legally achieve either status, by organizing as either a worker cooperative or as a consumer cooperative. As a worker cooperative, its members would be drivers who

are employed by the cooperative. As a consumer cooperative, its members would be self-employed drivers who "consume" the services of the cooperative.

In the worker cooperative model, the platform employs its worker-members. As an employer, the platform would pay the drivers, file a Form W-2 for each driver and withhold payroll taxes. Riders would pay the platform directly for its services carried out by the drivers. The platform would also need to register as an employer in the state or states where it operates, cover the drivers with workers compensation insurance, and track their hours to ensure proper wages are paid.

Although not legally necessary, it would be advisable for the platform to form a legal entity. The primary reason for a legal entity is liability protection (since the cooperative as a whole could be liable for harm caused by a driver), but an entity can also help solidify the cooperative nature of the enterprise. Almost any entity can operate like a worker cooperative with the proper cooperative practices in its governing documents, but many states have a specific legal entity for cooperatives. These entities legally require one-member, one-vote governance; profit sharing among members on the basis of patronage; and capped returns on non-member investments. Deviating from these cooperative practices would require converting to a new entity type entirely. Most states with cooperative entities also require a company to form as a cooperative entity to use the word "cooperative" in its name. These states typically also provide a securities law exemption for member investments and simplified mechanisms for valuing memberships and buying out departing members.

Although the platform will incur additional costs as an employer, drivers will not be required to pay the 15.3% self-employment tax (12.4% for social security and 2.9% for Medicare) or file quarterly estimated taxes (Internal Revenue Service 2019). Instead, the platform will pay the employer and employee portion of that tax, and withhold the employee portion from the drivers' pay. The platform would pay other required taxes and fees inapplicable to self-employed drivers, such as unemployment insurance contributions. Although not necessarily a legal requirement, the platform may also offer group health insurance and cover some portion of the drivers' premiums, which would be tax-deductible to the cooperative. Such insurance would likely be a better deal than self-employed drivers could obtain on their own.

These costs, and the added administration burden, will require more to be deducted from the fares that drivers receive; however, a platform cooperative is likely to more easily bear these costs than a conventional company like Uber or Lyft. This is because cooperatives do not have significant (if any) investment capital extracting profits, nor CEOs making exorbitant salaries. A recent estimate of the CEO-to-worker pay ratio in the United States is 296:1; the largest U.S. worker cooperative, in contrast, has not had a ratio higher than 11:1 (Rieger 2016). Rather, profits would be shared with the drivers on the basis of their patronage (i.e., how much they drive or other factors discussed in the governance analysis section), and the cooperative would be governed on a one-person, one-vote basis, giving drivers a voice in policies such as compensation and benefits.

Additionally, as a cooperative providing a socially beneficial service, it may actually have a funding advantage. In many states, cooperatives enjoy a securities law exemption, allowing owners to invest without expensive regulatory filings. The cooperative could consider becoming multi-stakeholder, allowing riders as well as drivers to become members, invest and receive a modest return and a voice in governance of the company. Cooperatives have had success with Kickstarter and other fundraising and investment campaigns, as investors and donors are motivated by the social return their dollars could help achieve. Finally, cooperatives enjoy a federal tax advantage: profits returned to drivers on the basis of their patronage ("patronage dividends") are tax-deductible to the cooperative (26 U.S.C. §§ 1381-1388). Thus, the platform could potentially pay little to no federal income tax, depending on how much of the profits are returned to drivers.

Cooperative members might decide that avoiding employee status is advantageous. In addition to avoiding certain costs they may not find worthwhile (such as workers compensation), classifying members as non-employee owners would allow undocumented immigrant drivers to be co-owners and drivers, since the cooperative would not be required to collect an I-9 and check work authorization status of its drivers. In the case of a cooperative start-up, drivers might collectively agree to earn less than minimum wage and forego other benefits in order to bootstrap the business, which is common practice for entrepreneurs. As long as the drivers have significant control over their work, and they are operating as independent business owners, they can avoid creating an employer-employee relationship with the platform cooperative.

To avoid employee status in this context, cooperative members would operate as self-employed drivers. Rather than a worker cooperative model, the platform would be a consumer cooperative, with drivers "consuming" the platform's services. Drivers should retain control over the fares they charge and they hours they work, and they should receive payment directly from the rider (whether through cash or peer-to-peer online payment). These measures will help establish that drivers operate their own business and are not employed by the cooperative. The platform should serve merely as a tool that the drivers own, manage, and use to facilitate their businesses. To that end, it is more appropriate for the cooperative to collect regular fees directly from the drivers to cover its costs, rather than to collect fares from riders and pay drivers a portion of that income. Any surplus from driver fees at the end of the year would be returned to drivers as patronage dividends in proportion to the amount they paid. As in the worker cooperative model, drivers would democratically govern the cooperative, ensure that the platform's policies are transparent, and prioritize the interests of the drivers.

Although the drivers would not be employees, and therefore could not access benefits like unemployment insurance or workers compensation, the cooperative could potentially provide other benefits to its members. The members could decide to contribute to a fund that would provide compensation to drivers unable to work due to illness or disability, for example. The cooperative could potentially negotiate for a group health plan for its members with better premiums than what they could find on their own. Although the drivers could not unionize as employees, they could form Guilds or committees to ensure that all voices are being heard in the cooperative's governance. Rather than providing

benefits required as an employer, the cooperative's members can collectively decide what services and benefits would best serve its drivers.

Policy Recommendations to Enable Cooperative Ridesourcing Platforms

In this section, we provide policy recommendations aimed at balancing the unique challenges faced by platform cooperatives, the social benefit that such platforms can provide, and the public interest of protecting both drivers and riders in their use of a ridesourcing platform.

Legalize and incentivize cooperative ridesourcing models

A decentralized, cooperative platform for peer-to-peer ridesourcing does not fit neatly within the boxes of taxi or TNC. Technically speaking, AC Austin and other networks like it are not legal. Should such a platform attempt to register as a TNC, it would likely be denied a license based on its failure to conduct background checks, meet insurance requirements, or compile the appropriate data, and based on its cash-based transactions. The fact that drivers and riders often communicate and arrange rides outside of the platform could also be problematic.

However, there are policy reasons to encourage such structures. Platform cooperatives are non-extractive, and do not deduct significant portions of a driver's fare in order to pay dividends to shareholders and fund exorbitant CEO salaries. Instead, if they collect income at all, they do so to cover their backend costs, as well as any collectively-approved plans for expansion, and any excess income is refunded to members as patronage dividends in proportion to the amount they paid. Drivers thus would earn more per ride with a platform cooperative than when driving for a conventional TNC. Platform cooperatives are democratically governed and prioritize the interests of the members (in this case, the drivers).

When such platforms facilitate a true P2P connection, like AC Austin's, drivers have much more control over which rides to respond to, what kind of services to offer (AC Austin drivers sometimes perform functions other than driving, such as food delivery), and to a certain extent, what rates to charge. Riders can select their driver and make special needs known, allowing for better accommodation of women who would like a female driver, and riders with special needs such as a service dog or a wheelchair. It is not uncommon for drivers and riders to exchange contact information and build a trusted relationship over time.

There is precedent for relaxing regulation or providing exemptions for certain P2P activities. Ridesharing (e.g., carpooling) between home and work, even when money changes hands, and even when drivers and riders are meeting for the first time, is already exempt from regulation under Texas and Austin law, for example. The Texas TNC law states that the term "transportation network company" does not apply to (1) "shared expense carpool or vanpool arrangements;" or (2) a ride service for which the fee does not exceed the driver's costs; or (3) a ride service where the fee exceeds the driver's costs, but the ride is between either the driver's or passenger's home and work, and no more than three

round trips are made per day (Texas Occupations Code Section 2402.001(5)). Similarly, Austin's definition of regulated ground transportation services does not include rideshares, which are defined as "the travelling of two or more persons by any mode of private passenger vehicle, including, but not limited to, carpooling, vanpooling, buspooling, to any location incidental to another purpose of the driver, for which compensation is neither accepted, collected, encouraged, promoted, or requested" (Austin Municipal Code section 13-2-1(3)&(19)). "Compensation" under the Austin code does not include reimbursement for expenses (Austin Municipal Code section 13-2-1(8)). Under these laws, drivers could receive reimbursement for vehicle operating costs up to the standard mileage reimbursement rate established by the U.S. General Services Administration, which is $0.58 per mile in 2019 (U.S. General Services Administration n.d.). However, if drivers are compensated for their time, even if there is no central entity extracting profits from their work, they are immediately subject to TNC or ground transportation service regulation. Thus, AC Austin drivers, who typically charge $2-3 per mile, could not take advantage of the rideshare exemption.

State and local regulators should consider platform cooperative ridesourcing to be in a middle ground between these two arrangements. Drivers are compensated for their time in addition to their immediate expenses; however, there is no central entity that is extracting profits from the transaction. Rather, there is a driver-controlled platform providing its services to the drivers for free or at cost. Without a profit-maximizing entity driving down wages and working conditions, the public is less likely to face the safety risk posed by exploited drivers forced to work exceedingly long hours to make ends meet. Similarly, since the platform is not operating on a for-profit basis, an argument can be made that it should not be subject to the same regulations as commercial ventures.

Another category of peer-to-peer interactions that are subject to fewer regulations are those where there is a direct transaction between the producer and consumer. In many states, for example, farmers who sell unprocessed products directly to consumers are subject to fewer regulations than third-party retail vendors of those products. The idea is that consumers need less regulatory protection when they are able to communicate directly with the producer and ask any questions they feel necessary to protect themselves (Orsi 2012). In the case of AC Austin, since riders are able to select their drivers, can contact them directly, and the transaction is openly visible to the members and moderators of the platform, riders are arguably better protected than in an Uber or Lyft transaction where many of these decisions are made by the central entity. Of course, such openness also raises privacy concerns, requiring P2P platforms and policymakers to consider both the risks and benefits of this degree of transparency.

Examples of policies that can legalize and bring down barriers for P2P ridesourcing cooperatives include:

- Creating a subset of TNCs for platform cooperatives that meet democratic governance and profit-sharing requirements;
- Removing the requirement that the central platform receive compensation in order to meet the definition of TNC;

- Allowing flexibility around payment, including cash payments and mobile payments through services like PayPal and Venmo;
- Reducing the amount of insurance the cooperative TNC is required to obtain;
- Reducing TNC permit fees for cooperatives, which can range from $1,000 to over $100,000, depending on the state, acknowledging that the entity functions at-cost for its members.

States and cities should also consider providing incentives to cooperative TNCs, to encourage such companies to form as, or convert to, more empowering and less extractive business models. Incentives for platform cooperative drivers could also encourage greater driver participation on those platforms, making them more likely to be successful. The city of Austin has already experimented with incentivizing desirable behavior among TNCs and other transportation services by giving drivers exclusive access to pick up and drop off areas at major events and popular nightlife spots in exchange for undergoing a voluntary fingerprint background check. Such drivers would be eligible to display a badge on their vehicle or app profile which gave them the special access, and also advertised their participation to potential customers (Theis 2016).

Governments can consider creating a cooperative TNC certification which provides a similar badge and incentives. States and cities can take other steps to promote platform cooperatives, such as subsidies, public recognition, and giving such entities preference in public-private partnership opportunities. Cities, counties, and transportation agencies have created public-private partnerships with Uber and Lyft for a variety of services, including subsidized rides for disadvantaged communities and first- and last-mile to public transit services, among other use cases (New York Public Transit Association, Inc. n.d.). It is not uncommon for states and cities to provide bid discounts to small businesses, or women- or minority-owned businesses, in the request for proposals (RFP) process. Agencies could similarly establish a preference for cooperative platforms, giving them an advantage in competing for contracts.

<u>Pass statutory language clarifying when a cooperative owner is not an employee</u>
Most of the litigation and legislative activity around who is an employee is intended to clarify who can be properly classified as an independent contractor, and who must be treated as an employee. However, this discussion leaves out a third category of workers: business owners. These workers are not independent contractors, because the work they provide is for the business they own, not a separate business they contract with as a self-employed individual. While there have been a few cases that evaluate when a business owner should also be classified as an employee (the leading one being *Clackamas Gastroenterology Associates v. Wells*, 538 US 440 (2003)), statutes like AB 5 do not address that scenario. There is thus significant ambiguity in the law that cooperatives have to navigate.

In a cooperative ridesourcing platform, drivers who collectively govern the business and share profits could still be considered employees because they would be not be performing tasks "outside of the usual course of the hiring entity's business." Where drivers are

consumer members of a platform cooperative, the cooperative is likely to not be considered an employer, because this statute only applies to hiring entities—though that term is not defined. And in the worker cooperative model, where the platform receives rider fares and pays the drivers, it is unclear whether its driver-owners would be subject to a statute like AB 5. It is recommended that worker cooperative ridesourcing platforms assume their drivers are employees, primarily because with potentially hundreds of members or more, each individual driver has very little voice in employment policies and decisions that affect them. But smaller worker cooperatives that operate non-hierarchically often have no real employer-employee dynamic, yet the law could still require members to be treated as employees.

As states continue to determine when employment laws cover gig economy workers like ridesourcing drivers, they should keep in mind the scenario where drivers are not exploited and voiceless workers for a large company, but are co-owners of a democratically managed enterprise. Where a platform operates at-cost for its drivers, who have significant ownership and control over their work, statutes should clarify that such drivers are not employees of the cooperative. This exemption should not apply to large cooperatives with an elected governing body that decides the employment policies that affect the drivers, such as wages and working conditions. Drivers in these cooperatives would certainly be better off than drivers for Uber and Lyft, but should still be afforded employment protections when their effective control over their work is more limited. But in a platform structured as a consumer cooperative, where drivers operate independently and have control over important business choices, statutes should make clear that the platform is not their employer.

Conclusion

Although small scale, the fact that AC Austin has continuously operated using a decentralized and truly P2P approach for more than three years provides empirical evidence that P2P ridesourcing services can sustain operations. Since the return of Uber and Lyft to Austin in May 2017, every one of the more than half dozen other commercial competitors that entered Austin during their absence (Fasten, Fare, etc.) has since ceased operations in the city. The only two ridesourcing organizations that survived Uber/Lyft's return are AC Austin and the local non-profit Ride Austin. The fact that the two alternatively organized platforms are the only ones still operating alongside Uber and Lyft in Austin speaks volumes to the long-term economic sustainability of platforms that are not exploitative and that prioritize the needs of drivers. While AC Austin does not currently function as a cooperative, their founding team has plans to incorporate cooperative practices in the future. There are also other promising examples of cooperative ridesourcing platforms that are beginning to emerge, including Eva, which boasts a growing network of 500 driver members in Montreal, Canada (Hayes 2019).

Bringing cooperative principles to online sharing platforms has the potential to improve worker pay, increase transparency, foster a sense of community, and give workers actual

say on important group policies and decisions. However, many barriers still exist that make it difficult for these groups to succeed. Attracting and retaining users, incentivizing sustainable network growth, addressing policy ambiguities, and navigating unclear legal landscapes are all problems that most platform cooperatives will face. While this report recommends approaches for handling a number of these barriers, there are other key issues that we spent less time discussing, like a lack of sufficient funding, data ownership and privacy issues, and other hurdles. Additionally, an incumbent commercial platform could decide to incorporate one or many of the approaches we discuss in this report, though a major existing platform fully converting to a cooperative seems unlikely at the time of writing. Although additional in-depth evaluations are needed, we believe that this effort and others like it can increase awareness and understanding of the unique benefits and challenges facing platform cooperatives. It is our hope that with further experimentation and deeper understanding, platform cooperatives will be able to thrive and will ultimately provide more equitable opportunities for platform workers.

Acknowledgements

We would like to thank the Alfred P. Sloan Foundation, whose Energy, Environment and the Digital Economy grant allowed for the undertaking of this study. Specifically, we would like to thank Dave Rejeski, Lovinia Reynolds, and Reid Lifset for helping administer the grant and for their guidance throughout the course of the project. Thanks also go to Matthew Takara for providing invaluable support with data collection, literature compilation, and data processing. We thank members of the Sustainable Economies Law Center who helped initiate and support this effort, including Yassi Eskandari, Ricardo Samir Nuñez, and Sue Bennet. Much thanks to Coral Trimble for cover page design. We would like to thank Christopher David and David Nayer of Arcade City for their help with survey deployment and interview coordination. Finally, thanks go to the all the members of Arcade City Austin, especially to those who participated in this study by taking our survey or agreeing to an interview.

References

Alemi, F., G. Circella, S. Handy, and P. Mokhtarian (2017). "What Influences Travelers to Use Uber? Exploring the Factors Affecting the Adoption of On-Demand Ride Services in California." Transportation Research Board 96th Annual Meeting, Washington, D.C., https://trid.trb.org/view.aspx?id=1439233.

Anderson, K. (2018). Independent contractors might actually be employees. American Bar Association. Retrieved from https://www.americanbar.org/groups/litigation/publications/litigation-news/featured-articles/2018/independent-contractors-might-actually-be-employees.

Arcade City Whitepaper Q1 (2018). Blockchain-Based Platform Cooperativism For a New Sharing Economy. Retrieved from https://docs.google.com/document/d/1M6W0mgV6a_88QelEdAhwg73a3lYj5OBFew38Y1e-Rfc/edit#

Barrera, C. (2019). Economics of Tokenized Incentives 3: Token Value Won't Align Stakeholders. Retrieved from https://medium.com/prysmeconomics/economics-of-tokenized-incentives-3-token-value-wont-align-stakeholders-545cffa4f58

Buhr, S. (2016). Lyft will now let you schedule trips ahead of time. Retrieved from https://techcrunch.com/2016/05/23/lyft-will-now-let-you-schedule-trips-ahead-of-time/

Bureau of Labor Statistics (BLS) (2018). Occupational Employment and Wages in Austin-Round Rock – May 2018. Retrieved from https://www.bls.gov/regions/southwest/news-release/occupationalemploymentandwages_austin.htm

Cal. Assemb. B. 5 (2018-2019), Chapter 296 (Cal. Stat. 2019).

California Legislative Information (2019). AB-5 Worker status: employees and independent contractors. Bill Text. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201920200AB5

California Legislative Information. (2018). Corporations Code: Title 1, Division 3, Part 2. Cooperative Corporations, Chapter 1, Article 4. Retrieved from http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=CORP&division=3.&title=1.&part=2.&chapter=1.&article=4

Campbell, Alexia Fernandez (2019, October 29). Uber and Lyft have launched a campaign to avoid government regulation in California. Vox. Retrieved from https://www.vox.com/identities/2019/10/29/20938109/ab5-uber-lyft-ballot-initiative-referendum.

Campbell, H. (2019). Lyft and Uber Driver Survey 2019: Uber Driver Satisfaction Takes a Big Hit. The Rideshare Guy. Retrieved from https://therideshareguy.com/uber-driver-survey/

City of Austin, Chauffeur's Permit Application (n.d.). Retrieved from http://austintexas.gov/sites/default/files/files/Transportation/Ground_Transportation/Chauffeur_Permit_Requirements___Application_11282017.pdf.

Clewlow, R., and G. Mishra (2017)." Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States." Institute of Transportation Studies, University of California, Davis, Research Report UCD-ITS-RR-17-07, https://trid.trb.org/view/1485471.

Community-Wealth.org (2015). Cooperatives. (2015). Retrieved from https://community-wealth.org/strategies/panel/coops/index.html

Cook, C., Diamond, R., Hall, J., List, J.A., & Oyer, P (2019). The Gender Earnings Gap in the Gig Economy: Evidence from over a Million Rideshare Drivers. Retrieved from https://web.stanford.edu/~diamondr/UberPayGap.pdf

Co-OpLaw.Org. (2019). What are Cooperatives. Retrieved from https://www.co-oplaw.org/co-op-basics/what-are-cooperatives/

Cramer, J., and A.B. Krueger (2016). "Disruptive Change in the Taxi Business: The Case of Uber." American Economic Review 106, no. 5: 177-182, https://www.aeaweb.org/articles?id=10.1257/aer.p20161002.

David, C. (2017). Arcade City Guild Leader Initiation. Retrieved from https://medium.com/@millennialchris/arcade-city-guild-leader-initiation-2cb96ec5b9b

David, C. (2019). Celebrating three years of Arcade City. Retrieved from https://blog.arcade.city/celebrating-three-years-of-arcade-city-19cb44ee26fd

Dolber, B. (2019). From Independent Contractors to an Independent Union: Building Solidarity Through Rideshare Drivers United's Digital Organizing Strategy. Media, Inequality & Change Center. Retrieved from https://www.miccenter.org/wp-content/uploads/2019/10/Dolber_final-2.pdf

Dubal, V.B. (2019). An Uber Ambivalence: Employee Status, Worker Perspectives, & Regulation in the Gig Economy Available at SSRN: https://ssrn.com/abstract=

Eidelson, J. (2016). Uber Found an Unlikely Friend in Organized Labor. Retrieved from https://www.bloomberg.com/news/articles/2016-10-27/uber-found-an-unlikely-friend-in-organized-labor

Elliot, M. & Shaheen, S. (2016). Impacts of car2go on Vehicle Ownership, Modal Shift, Vehicle Miles Traveled, and Greenhouse Gas Emissions: An Analysis of Five North American Cities. UC Berkeley Transportation Sustainability Research Center. Retrieved from http://innovativemobility.org/wp-content/uploads/2016/07/Impactsofcar2go_FiveCities_2016.pdf

Facebook. (n.d.). What is the difference between an admin and a moderator in a Facebook group? | Facebook Help Center. Retrieved from https://www.facebook.com/help/901690736606156

Fehr & Peers (2019). “Estimated TNC Share of VMT in Six US Metropolitan Regions (Revision 1).” Memorandum to Brian McGuigan, Lyft and Chris Pangilinan, Uber.

Feigon, S. and C. Murphy (2018). Broadening Understanding of the Interplay Between Public Transit, Shared Mobility, and Personal Automobiles. Pre-publication draft of TCRP Research Report 195. Transportation Research Board, Washington, D.C.

Gaudreault, R. & Isufi, D. (2018). Eva White Paper. Retrieved from https://whitepaper.eva.coop/WP.pdf

Gehrke, S., A. Felix, and T. Reardon (2018). “Fare Choices: A Survey of Ride-Hailing Passengers in Metro Boston.” Report #1. Metropolitan Area Planning Council, https://www.mapc.org/farechoices/

Gehrke, S., A. Felix, and T. Reardon (2019).” Substitution of Ride-Hailing Services for More Sustainable Travel Options in the Greater Boston Region.” Transportation Research Record 1-9. https://doi.org/10.1177/0361198118821903.

George, S.R., and M. Zafar (2018). “Electrifying the Ride-Sourcing Sector in California: Assessing the Opportunity.” California Public Utilities Commission Policy and Planning Division, http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/About_Us/Organization/Divisions/Policy_and_Planning/PPD_Work/PPD_Work_Products_(2014_forward)/Electrifying%20the%20Ride%20Sourcing%20Sector.pdf.

Governing (n.d.). Vehicle Ownership in U.S. Cities Data and Map. Retrieved from https://www.governing.com/gov-data/car-ownership-numbers-of-vehicles-by-city-map.html

Hall, J.V. & Alan B. Krueger (2018). "An Analysis of the Labor Market for Uber’s Driver-Partners in the United States," ILR Review, vol 71(3), pages 705-732.

Hammons, A. (2019, January 24). Sting Operations target Arcade City ride-hailing drivers. CBS Austin. Retrieved from https://cbsaustin.com/news/local/sting-operations-target-arcade-city-ride-hailing-drivers.

Hampshire, R., C. Simek, T. Fabusuvi, X. Di, and X. Chen (2017). “Measuring the Impact of an Unanticipated Suspension of Ride-Sourcing in Austin, Texas.” SSRN Scholarly Paper, Social Science Research Network, https://papers.ssrn.com/abstract=2977969.

Hayes, R. (2019). Worker-Owned Apps Are Trying to Fix the Gig Economy's Exploitation. Vice. Retrieved from https://www.vice.com/en_ca/article/pa75a8/worker-owned-apps-are-trying-to-fix-the-gig-economys-exploitation

Henao, A. (2017). “Impacts of Ridesourcing-Lyft and Uber-on Transportation Including VMT, Mode Replacement, Parking, and Travel Behavior.” Doctoral dissertation, University of Colorado at Denver, http://digital.auraria.edu/content/AA/00/00/60/55/00001/Henao_ucdenver_0765D_10823.pdf.

Henao, A., and W.E. Marshall (2018). “The Impact of Ride-Hailing on Vehicle Miles Traveled.” Transportation pp 1-22. https://doi.org/10.1007/s11116-018-9923-2.

Hernandez, N. (2017). Reviving Austin's Cab Industry: ATX Co-op Taxi splits the difference between traditional taxis and ridesharing. The Austin Chronicle. Retrieved from https://www.austinchronicle.com/news/2017-04-28/reviving-austins-cab-industry/

ICA Group. (2015). Democratic Governance: The Design of Governance Systems for Worker Cooperatives. ICA Group. Retrieved from https://institute.coop/sites/default/files/resources/Democratic-Governance-The-Design-of-Governance-Systems-for-Worker-Cooperatives.pdf.

Independent Drivers Guild. (n.d.). Benefits - Independent Drivers Guild. Retrieved from https://drivingguild.org/idg-benefits/

Internal Revenue Service (2019). Self-Employment Tax (Social Security and Medicare Taxes). Retrieved from https://www.irs.gov/businesses/small-businesses-self-employed/self-employment-tax-social-security-and-medicare-taxes.

International Cooperative Alliance (n.d.) The Rochdale Pioneers. Retrieved from https://www.ica.coop/en/history-co-op-movement/rochdale-pioneers

Kelly, H. (2016). Uber and Lyft to leave Austin after losing fingerprinting vote. Retrieved from http://money.cnn.com/2016/05/08/technology/uber-lyft-austin-vote-fingerprinting/index.html

Komanduri, A, Zeina, W., Proussaloglou, K. & Jacobs, S. (2018). “Assessing the Impact of App-Based Ride Share Systems in an Urban Context: Findings from Austin.” Transportation Research Record. 2672(7) pp. 34–46.

La’Zooz. (2015). La’Zooz White Paper. Retrieved from https://www.weusecoins.com/assets/pdf/library/LaZooz Blockchain Taxi Whitepaper.pdf.

Loconomics Cooperative, Inc. (2019). Loconomics Cooperative Bylaws. Retrieved from https://loconomics.gitbooks.io/loconomics-cooperative-bylaws/content/

Loomio. (2019). What is Loomio? Retrieved from https://help.loomio.org/en/user_manual/getting_started/what_is_loomio/

Lyft (n.d.). We’ve got your easy ride across town, Austin. Retrieved from https://www.lyft.com/rider/cities/austin-tx

Marshall, A. (2017). Elevating an industry: The Stocksy United story. Retrieved from https://cooperativesfirst.com/blog/2017/06/23/2017622elevating-an-industry-the-stocksy-united-story/

Marshall, A. (2018). Elevating an industry: The Stocksy United story | Co-operatives First. Retrieved from https://cooperativesfirst.com/blog/2017/06/23/2017622elevating-an-industry-the-stocksy-united-story/

Matthews, D. (2018). With Growth on the Horizon, Stocksy United Removes its Membership Cap. Co-operatives First. Retrieved from https://cooperativesfirst.com/blog/2018/05/31/with-growth-on-the-horizon-stocksy-united-removes-its-membership-cap/

McCann, D., & Yazici, E. (2018). Disrupting Together: The Challenges (and Opportunities) for Platform Co-operatives. New Economics Foundation. Retrieved from https://neweconomics.org/uploads/files/Disrupting-Together.pdf.

Mishel, L. (2018). Uber and the labor market Uber drivers' compensation, wages, and the scale of Uber and the gig economy. Economic Policy Institute. Retrieved from https://www.epi.org/publication/uber-and-the-labor-market-uber-drivers-compensation-wages-and-the-scale-of-uber-and-the-gig-economy/

Mishel, L. (2018). Uber and the labor market: Uber drivers' compensation, wages, and the scale of Uber and the gig economy. Economic Policy Institute. Retrieved from https://www.epi.org/publication/uber-and-the-labor-market-uber-drivers-compensation-wages-and-the-scale-of-uber-and-the-gig-economy/.

MIT Center For Civic Media (2015). 9 Working Examples of Platform Cooperatives. Retrieved from https://civic.mit.edu/2015/11/13/9-working-examples-of-platform-cooperatives/

Modo (2019). Retrieved from https://www.modo.coop/

Moran, M., Ettelman, B., Stoeltje, G., Hansen, T., and Pant, A. (2017). Policy Implications of Transportation Network Companies. Retrieved from the Texas A&M Transportation Institute website: https://policy.tti.tamu.edu/congestion/policy-implications-of-transportation-network-companies/.

New York Public Transit Association, Inc. (n.d.). Transit & TNCs. Retrieved from https://nytransit.org/resources/transit-tncs/205-transit-tncs.

Office of Energy Efficiency & Renewable Energy (2018). FOTW #1047, September 17, 2018: Daily Vehicle Miles Traveled Varies with the Number of Household Vehicles. Retrieved from https://www.energy.gov/eere/vehicles/articles/fotw-1047-september-17-2018-daily-vehicle-miles-traveled-varies-number

Orsi, J. (2012). Practicing Law in the Sharing Economy: Helping People Build Coopertives, Social Enterprise, and Local Sustainable Economies. Lanham: American Bar Association.

Palmer, T. (2015). Worker Cooperative Industry Research Series: Taxis. Democracy at Work Institute. Retrieved from https://institute.coop/sites/default/files/resources/TaxiIndustryProfile.pdf

Parrott, J.A., and Reich, M. (2018). An Earnings Standard for New York City's App-based Drivers: July 2018 Economic Analysis and Policy Assessment. Center for New York City Affairs & Center on Wage and Employment Dynamics. Retrieved from

https://static1.squarespace.com/static/53ee4f0be4b015b9c3690d84/t/5b3a3aaa0e2e72ca74079142/1530542764109/Parrott-Reich+NYC+App+Drivers+TLC+Jul+2018jul1.pdf

Partago (2019). Retrieved from https://www.partago.be/

Rayle, L., D. Dai, N. Chan, R. Cervero, and S. Shaheen (2016). "Just a Better Taxi? A Survey-Based Comparison of Taxis, Transit, and Ridesourcing Services in San Francisco." Transport Policy 45 (January 2016):168-178, http://dx.doi.org/10.1016/j.tranpol.2015.10.004.

Ride Austin (2019). RideAustin to release rideshare software to jumpstart networks of rideshare alternatives around the globe. PR Newswire. Retrieved from https://www.prnewswire.com/news-releases/rideaustin-to-release-rideshare-software-to-jumpstart-networks-of-rideshare-alternatives-around-the-globe-300931015.html

Rideshare Drivers United (RDU) (2019). Drivers Bill of Rights. Retrieved from https://drivers-united.org/p/drivers-bill-of-rights

Ridesharing Driver. (2018). Fired from Uber: Why drivers get deactivated, and how to get reactivated. Retrieved from https://www.ridesharingdriver.com/fired-uber-drivers-get-deactivated-and-reactivated/

Rieger, S. (2016). Reducing economic inequality through democratic worker-ownership. The Century Foundation. Retrieved from https://tcf.org/content/report/reducing-economic-inequality-democratic-worker-ownership.

Salim, Z. (2018). Ride-Hailing App 'Arcade City' Wants To Fill The Void Left By Uber - But Is It A Scam? Vulcan Post. Retrieved from https://vulcanpost.com/638090/ride-hailing-app-arcade-city-is-it-a-scam/

San Francisco County Transportation Authority (SFCTA) (2017). TNCs Today: A Profile of San Francisco Transportation Network Company Activity. Retrieved from: http://www.sfcta.org

Schaller, B. (2017). Unsustainable? The Growth of App-Based Ride Services and Traffic, Travel and the Future of New York City. Schaller Consulting

Schaller, B. (2018). The New Automobility: Lyft, Uber and the Future of American Cities. Schaller Consulting. Retrieved from http://www.schallerconsult.com/rideservices/automobility.htm

Scholz, T. (2014). Platform Cooperativism vs. the Sharing Economy – Medium. Retrieved from https://medium.com/@trebors/platform-cooperativism-vs-the-sharing-economy-2ea737f1b5ad

Smith, R. (2019, August 8). Gig companies are facing dozens of lawsuits over workplace violations. National Employment Law Project. Retrieved from https://www.nelp.org/publication/gig-companies-facing-dozens-lawsuits-workplace-violations/#_edn9.

Solomon, D. (2017). One Year After Fleeing Austin, Uber and Lyft Prepare a Fresh Invasion. Retrieved from https://www.wired.com/2017/05/one-year-fleeing-austin-uber-lyft-prepare-fresh-invasion/

Teale, C. (2019). Uber sues NYC over deadheading, licensing caps. Smart Cities Dive. Retrieved from https://www.smartcitiesdive.com/news/uber-sues-nyc-over-deadheading-licensing-caps/560593/

Texas Department of Licensing and Regulation, Transportation Network Companies. Retrieved from https://www.tdlr.texas.gov/tnc/tnc.htm.

Theis, M. (2016). Drivers would get benefits for passing a fingerprint-based background check. Austin Business Journal. Retrieved from https://www.bizjournals.com/austin/news/2016/01/28/council-passes-fingerprint-incentive-program-for.html.

Tryba, A. & Goldenberg, M. (2017). What we learned from the first week of Uber & Lyft returning to Austin. Medium. Retrieved from https://austinstartups.com/what-we-learned-from-the-first-week-of-uber-lyft-returning-to-austin-5451a34889e7

U.S. Census Bureau, American Community Survey (ACS) (2017). Selected characteristics, American Community Survey 1-year estimates.

U.S. General Services Administration (n.d.). Privately owned vehicle (POV) mileage reimbursement rates. Retrieved from https://www.gsa.gov/travel/plan-book/transportation-airfare-pov-etc/privately-owned-vehicle-pov-mileage-reimbursement-rates.

Uber (n.d.). Austin: Get a ride. Travel. Explore. Retrieved from https://www.uber.com/global/en/cities/austin/

Uber. (n.d.). How do I create an Uber account? Retrieved from https://help.uber.com/riders/article/how-do-i-create-an-uber-account--?nodeId=fdfc0273-f67e-4545-9885-f89d0ca0aacf

United States Securities and Exchange Commission (U.S. SEC) (2019). Form S-1 Registration Statement: Uber Technologies, Inc. Retrieved from https://www.sec.gov/Archives/edgar/data/1543151/000119312519103850/d647752ds1.htm

UW Center For Cooperatives (n.d.) Cooperatives in the U.S. Retrieved from http://www.uwcc.wisc.edu/whatisacoop/history/

Warren, T. (2019). Uber loses its London license as regulator cites a 'pattern of failures.' The Verge. Retrieved from https://www.theverge.com/2019/11/25/20981492/uber-london-ban-license-renewal-transport-for-london-tfl-response

Wiener, J. (2017). Cooperatives and Founder Incentives. Jason Wiener|p.c. Retrieved from http://jrwiener.com/cooperatives-and-founder-incentives/

Zeitlin, M. (2019). How Austin's failed attempt to regulate Uber and Lyft foreshadowed today's ride-hailing controversies. Vox. Retrieved from https://www.vox.com/the-highlight/2019/9/6/20851575/uber-lyft-drivers-austin-regulation-rideshare