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Paratransit services for people with disabilities in the Seattle region during the COVID-19 pandemic: Lessons for recovery planning

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ABSTRACT

Introduction: Along with all public transit services, paratransit services for people with disabilities experienced substantially reduced demand and an increased need to provide equitable services while protecting their clients and staff’s safety during the COVID-19 pandemic. Paratransit services provide a lifeline for their clients’ essential mobility needs, including access to medical appointments and grocery stores. In the absence of pre-existing pandemic response plans, examining transit agencies’ responses to provide paratransit services during the pandemic can help inform planning for post-pandemic recovery and future disruptive events.

Methods: In September 2020, we conducted semi-structured interviews with 15 decision-makers, planners, and drivers working for the primary transit agency in the Seattle region – King County Metro – and its paratransit contractors. Interview questions were designed to identify current services, policy gaps, and critical challenges for recovery planning and post-pandemic paratransit services. Interview transcripts were analyzed using NVivo software to obtain essential themes.

Results: The interviewees provided insights about (1) paratransit service changes in response to the pandemic, (2) anticipated impacts of a returning demand on paratransit service efficiency, equity, and quality during the recovery period, and (3) innovative approaches for maintaining post-pandemic equitable paratransit services while balancing safety measures with available resources.

Conclusions: Study findings suggest that paratransit service providers should consider (1) developing guidelines for future disruptive events, (2) examining alternative methods for food delivery to clients, (3) planning scenarios for delivering equitable services in the post-pandemic recovery period, and (4) increasing resilience possibly by establishing partnerships with transportation network companies.

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https://doi.org/10.1016/j.jth.2021.101115
Received 30 December 2020; Received in revised form 5 April 2021; Accepted 14 June 2021
Available online 23 June 2021
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1. Introduction

The COVID-19 pandemic has severely disrupted transportation. It changed how much people move around, who stays at home, which trips to take, and perceptions of the safety of different transportation modes, leading to reduced overall transportation demand, especially for shared rides and public transport (Dixon, 2020; Ewoldsen, 2020; Hadjidemetriou et al., 2020; Nguyen et al., 2020). With reduced ridership, public transportation, including paratransit services, is faced with many operational and efficiency challenges (Huang et al., 2020). Paratransit, as specified by the Americans with Disabilities Act (ADA) in the United States, is an origin to destination service: passengers are picked up from their home locations and transported to their destination points on request, which usually is reserved by telephone (Thatcher and Gaffney, 1991; Minot, 2018; Gonzales et al., 2019). Pandemic-related measures adopted by transit agencies engender substantial changes in paratransit service delivery options and policy enforcement, as paratransit providers attempt to comply with ADA requirements while protecting the safety of riders and drivers.

ADA paratransit has long been challenged with an increasing demand for the service. Transit agencies obligated to comply with ADA paratransit regulations face considerable financial burdens due to high operational costs (Gibbs and Polan, 2016; Kaufman et al., 2016). Paratransit providers need to balance operational efficiency and service quality by adopting measures to reduce costs while maintaining equitable service (Burkhardt, 2010; Fi and Chen, 2015; Talley, 1990). The social and spatial equity goals of paratransit services are essential to ensure the inclusion of low-income communities, people of color, and people with limited English proficiency (Zhang et al., 2013).

During the pandemic, paratransit services experienced an unprecedented reduction in demand (Weiner and Armenta, 2020). Many paratransit riders chose not to travel due to concerns over public health, social distancing, and cancellation of activities and appointments for which they would have typically used paratransit services (Rudin Center and Sam Schwartz, 2020; Weiner and Armenta, 2020). This decrease in demand has facilitated transit agencies’ response to the local and federal pandemic regulations by reducing vehicles’ capacity, increasing sanitization measures, suspending in-person eligibility assessments, and incorporating new services such as food delivery. Pandemic-related measures challenge transit agencies’ ability to maintain safe, equitable, and effective services for people with disabilities (Abdullah et al., 2020).

Agencies and organizations recognize the urgency to identify the best approaches for restoring transportation services post-pandemic, especially for persons dependent on paratransit services for their basic life needs (Grant and Bowen, 2020; Weiner and Armenta, 2020). The disruptions in paratransit service delivery during the pandemic make it challenging to predict the shape of the service post-pandemic, especially considering cost implications. As transit agencies strive to resume their operations during the recovery period, it is vital to examine how the pandemic has changed the transportation needs of people with disabilities and the operations of paratransit services (Grant and Bowen, 2020).

Transit agencies are faced with uncertainties about the returning ridership, including the gradual lifting of state and local policy restrictions, the availability of effective vaccines, and restoring confidence in public transit safety. With uncertain resources and potential recovery scenarios, paratransit providers could face service limitations threatening their riders’ wellbeing. Such challenges engender opportunities for innovations to serve the mobility needs of people with disabilities beyond the traditional paratransit model while enhancing system resilience.

Access Transportation, the federally required paratransit service for people with disabilities operated by King County Metro (KCM) in the Seattle area, has been proactively responding to COVID-19 challenges by adjusting its policies and services. King County, including Seattle, has a land area of 2116 square miles (5480 km²) and an estimated 2019 population of 2,252,782 persons. With a fleet of over 373 accessible vehicles, Access had typically served over 12,000 clients across urban and rural areas in King County, delivering around a million trips per year (Baruchman, 2019). During the first six months of the pandemic, Access ridership has decreased to an average of 40% of its usual rates, with the first two months experiencing a 75% loss of ridership (Wang et al., 2021). As indicated by Access drivers, vehicles that would typically transport 15 clients a day had a decreased ridership to about six clients during the pandemic.

KCM is continuously monitoring changes in ridership, conducting surveys, and following up on reopening phases and state and local guidelines. Through a series of interviews with KCM paratransit decision-makers, planners, and drivers, we examined the impact of COVID-19 on Access Transportation and explored approaches to plan for post-pandemic paratransit services guided by three questions:

1) How did paratransit services, operation norms, demand, and trip characteristics change in response to the pandemic?
2) What are the anticipated impacts of a returning demand on paratransit service efficiency, equity, and quality during the recovery period?
3) What are some innovative ways for transit agencies to maintain post-pandemic equitable paratransit services while balancing safety measures and available resources?

2. Methods

We coordinated with a senior transportation manager of KCM to select interviewees involved in different aspects of paratransit operations. We also coordinated with a paratransit service contractor of KCM to select Access drivers for interviews considering diversity in age, gender, race, and length of service. We customized our semi-structured interviews with questions pertaining to each staff group’s knowledge, experience, and perspectives.

We interviewed a total of 15 staff working with KCM and the contractors for paratransit, Solid Ground, and MV Transportation,
including three decision-makers, six transportation planners, and six drivers. The interviewees varied in their work experience with paratransit, ranging from 1 to 40 years. The range of the interviewees’ job responsibilities included decision making, ADA eligibility, Access contracts, scheduling systems, customer data, technology, and day-to-day operations.

Our interview questions focused on gaps in existing knowledge about paratransit services during the pandemic. We tailored the questions to the interviewee’s experience with Access, work duties, and changes in their overall role with Access during the pandemic. The questions for decision-makers aimed to understand the decision-making process related to pandemic-responsive policies, including the criteria or guidelines considered, interactions with other agencies, and external sources for health-related information. We also asked questions about their plans for the recovery period, including anticipated challenges and criteria to forecast ridership.

Our interviews with planners included operation-related questions, such as their day-to-day tasks, experience, and observations of changes in trip characteristics during the pandemic (e.g., trip purpose, service area, frequency, riders). We also asked questions about changes in services and procedures such as food delivery services, eliminating in-person eligibility assessments and long-term recovery plans. Our interviews with drivers focused on their adaptation to pandemic-related policy measures and anticipation of post-pandemic services. The questions focused on their work experiences, such as changes in work duties, client behaviors, and trip characteristics, as well as on their perspectives on existing and foreseeable challenges.

Most interviews took place online, using video-calling software, with a few conducted over the phone if preferred by the interviewee. We obtained human subjects review approval from the University of Washington and obtained interviewee consent for recording each interview. Most interviews took 20–30 min.

After the interview recordings were transcribed and checked for errors, we used NVivo, a computer-aided qualitative analysis software, to identify patterns and commonalities among the responses. To ensure data confidentiality, interviewees’ personal identifiers were removed after they were classified into the categories of decision-makers, planners, and drivers. We ran word frequency queries for all interview data and then for each category separately. The word frequency queries along with unexpected interviewee statements were used to generate codes that were grouped into subcategories and themes.

3. Results

Analysis of the interviewee data yielded themes that were analyzed for the pandemic, recovery period, and post-pandemic phases. These themes included attitudes/feelings, pandemic-related changes, pandemic challenges, pandemic-related measures, policymaking and priorities, recovery actions needed, post-pandemic expectations, recovery planning and preparations, and survival kit; which includes traits, mechanisms and team norms that assisted KCM to respond to the pandemic challenges in a timely manner.

3.1. Paratransit services during the pandemic

3.1.1. Changes in employment, ridership and trip characteristics

Several interviewees noted that almost 30% of Access riders stopped using the service after COVID-19 stay-at-home orders took effect in March 2020. Further, they observed that most continuing riders minimized their use of Access services to essential trips only due to increasing health concerns (Wang et al., 2021). Fig. 1 illustrates the average daily ridership by month before and during the pandemic, which is consistent with the information provided by the interviewees.

The decision-makers emphasized the importance of understanding the impact of ridership reduction on resources and operations and referred to the stay-at-home orders and business closures as key factors behind this drop. The planners and drivers had more specific observations on the changes in Access trip characteristics. Drivers reported a decrease in ridership from 10-15 rides to 6–10 rides per day.

Many planners indicated that trip purposes had changed due to health concerns and the closures of adult day health and senior centers that previously constituted a significant portion of the trips. Work from home and stay-at-home orders affected peak travel and ridership trends. Allocating resources and scheduling drivers became more difficult due to unclear geographic and temporal trends.

![Fig. 1. Access paratransit average daily ridership by month, January 2019–June 2020 (Source: King County Metro).](image-url)
For drivers, the reduced ridership changed their work routine and threatened their work status. While drivers who worked 40 h per week felt little change, two drivers worried about losing their jobs because of reduced demand. Two other drivers reported that decreased ridership improved the pace and timing of trips, making their jobs relatively easier. However, drivers indicated financial concerns when asked about the pandemic’s long-term impact. Most of them indicated that they did not have enough work hours due to reduced demand. Although the federal government’s stimulus packages have provided excellent support, KCM and MV announced that they would cover the rest of the hours for drivers who are not receiving 40 h. However, as indicated by one driver, such support is “really short time, and hopefully, it will last for 3 or 6 months.”

The plummet in demand from late February to April of 2020 forced KCM to furlough about 100 employees, enabling employees to retain their health benefits and apply for unemployment through the end of June 2020. KCM also laid off 200 part-time drivers, including 50 drivers who worked for Access paratransit, representing 6% of the transit operator workforce and 25% of the 786 current part-time transit operator workforces. One manager said, “King County could not fund furlough anymore, so we had to lay off less than 50 people.” Also, everyone working with Access indicated their commitment to reducing unemployment. Another manager who works with Solid Ground indicated that they “provide administrative funds for Access, support, and finance HR and communications to undo the barriers and protect people from poverty.” Aside from unemployment issues, the workforce is not severely impacted by COVID-19. All interviewed drivers indicated that they do not know anyone who has got infected from work. They also mentioned that KCM would quarantine any driver who comes in contact with clients who reported they were infected with the COVID-19 virus after their trips with Access. One driver said, “I don’t know anyone who tested positive, but there were a couple of people quarantined for two weeks. I assume that they tested negative because they were back to work, so I cannot say anyone actually had it.”

Drivers reported fewer clients used wheelchairs to access the service, thereby decreasing physical interactions with the drivers. Clients also reduced all types of interactions with drivers, including small talk. Many clients communicated their concerns about physical interactions with drivers when offered assistance. As indicated by decision-makers, planners, and drivers, some clients wanted exclusive (non-shared) rides or refused taxi-operated trips, putting them in a smaller confined space with the drivers. Most clients used the service only for essential purposes, such as medical appointments (especially dialysis) and groceries. Despite clients’ worries about using Access during the pandemic, some drivers mentioned that many clients felt good about the vans’ reduced capacity and faster service. Table 1 highlights relevant themes and codes, the number of mentions, and the number of interviewees who mentioned each code.

3.1.2. Changes in day-to-day tasks and responsibilities

While decision-makers and planners did not witness significant changes in their working hours, job stability, and safety concerns as they worked remotely, the disruption mainly was how and what they did as their daily tasks. For decision-makers, COVID-19 added many policy concerns that needed an immediate response. One decision-maker said, “COVID-19 has changed how we did business.” Another decision-maker said, “The pandemic is evolving, and changes are consistently growing.” All decision-makers we interviewed indicated that they had to do more coordination with other organizations and with the management level to develop a “Coronavirus action plan” in less than 24 h, with no resources or guidelines to draw upon because “… there was not any pandemic response plan.” Decision-makers were faced with a constant need to adjust their policies and comply with state and local orders related to the pandemic.

During the pandemic, planners became more involved in decision-making processes by making timely recommendations. Planners became less focused on operations and more focused on ensuring riders’ safety. One planner said, “there was no more efficiency talk.” Because the pandemic-associated challenges were “brand-new,” planners had to quickly adapt to changes and assist with action plans.

Table 1
Themes, codes, and selected quotes that pertain to pandemic-related changes in paratransit services from all interviewees.

| Theme                  | Codes and subcategories | Selected quotes from interviewees                                                                 | Number of mentions | Number of interviewees |
|------------------------|-------------------------|-----------------------------------------------------------------------------------------------------|--------------------|------------------------|
| Pandemic related       | Clients enjoy a reduced | “A lot of people were happy because they were the only ones on the bus.”                            | 2                  | 1                      |
| changes                | capacity                |                                                                                                     |                    |                        |
|                        | Employment changes      | “King County was unable to do furlough anymore, so we had to lay off less than 50 people.”          | 5                  | 4                      |
|                        | Lay-offs                | “I work at the sanitation station now; that is a change in my job.”                                 | 2                  | 2                      |
|                        | New tasks               | “I noticed from my steps app, I used to have 7000 steps on average, now it is only around 3000.”   | 6                  | 6                      |
|                        | Less work               | “So, during this lockdown, I was given my paycheck for a total of 40 h or like full-hours.”         | 2                  | 2                      |
|                        | Financial help          |                                                                                                     |                    |                        |
|                        | Client interactions     | “Now clients don’t want to try to talk too much. They only focused on what they needed.”          | 5                  | 3                      |
| Low demand             |                         |                                                                                                     |                    |                        |
|                        |                         | “If at the normal time, we pick up in the whole day like 10 to 15 people. Now, we can pick a maximum of 6-10 or 12 people.” | 5                  | 5                      |
| New services           |                         | “We added many new services, such as transportation for pandemic response and food delivery.”      | 4                  | 3                      |
| Trip characteristics   |                         | “Primarily, we would do kidney dialysis. We stopped doing the senior centers altogether.”          | 16                 | 8                      |
|                        |                         | “So primarily, it’s doctor appointments. And grocery runs.”                                        |                    |                        |
for events such as changes in government orders related to the pandemic. Many planners indicated that their jobs have become more collaborative, involving more meetings, discussions, and to some extent, informing the decision-making process and new policies.

Drivers also had their share of challenges. Many drivers experienced a change in their work status or workload, often now working for reduced hours. All interviewees mentioned a change in work duties in that both drivers and other staff assisted with cleaning work. According to KCM’s precaution rules, drivers were required to return to their company’s designated sanitation base for cleaning after every two or three pick-ups. One interviewee shifted from working as a driver to join the cleaning staff at the base. Every driver was equipped with a sanitizer for use when needed.

Because the disruption impacted staff groups differently, the feelings and attitudes about pandemic-related issues varied across interviewees; drivers felt the most threats and most frequently expressed worries. Many drivers mentioned the impacts of the changes in their work hours, duties, and processes and the sacrifices they made being front-line workers, such as reduced social interaction with their families and friends to minimize the risk of getting them infected. Decision-makers and planners did not report any health-related worries. Instead, most staff were proud and happy with the speedy response to the issues that they were facing. In general, all interviewees emphasized the importance of communication and teamwork to their resilience as staff and the maintenance of paratransit services. Such key mechanisms and team norms have served as a survival kit for the quick adaptation to the swift pandemic changes and challenges. Table 2 includes themes, codes, and selected quotes associated with staff attitudes and feelings.

3.1.3. Challenges in operations

Coupled with reduced ridership, KCM reduced their paratransit services to essential trips to destinations such as grocery stores, medical clinics, and pharmacies. While restricting trip purposes came with a risk of ADA non-compliance, it appeared as the only practical response given the lack of resources and guidelines. Although Access vehicles have an average capacity of 11 clients, one planner indicated that the software used to distribute trips was adjusted to allow only three seats per vehicle, reducing the overall capacity to nearly a quarter of what it normally accommodates. Many planners and drivers indicated that some riders choose not to travel, so this has not been a source of contention. One driver reported, “some clients wanted nothing but exclusive rides, and objecting to being in close contact when we sent taxis to them.”

Without the right tools and infrastructure, Access paratransit faced many challenges while incorporating food delivery services. Access fleet consists mainly of cutaways that vary by size but typically range from narrow-body to 102 inches, with a length ranging between 20 and 25 feet, in addition to a few wheelchair-accessible MV1 taxis that are no longer made, but still in use in some places (DeMay 2018). Cutaways, also known as a minibus, are vehicles built with a bus body on top of truck chassis, which on average can take up to 15 passengers, including the driver. Cutaways also feature a low floor enabled by an automatic “kneeling” suspension and a ramp instead of a wheelchair lift (National Academies of Sciences, Engineering, and Medicine, 2018; Baruchman, 2019). Planners indicated that it has been challenging to maximize the floor area of Access vehicles and estimate the number of packages each can carry. One planner said, “we are a system that is built to transport people, not packages. Challenges of food delivery include estimating the number of packages that can fit in each Access vehicle, expose drivers for lifting and add a new service that was not part of the KCM contract with MV, who delivers Access services.”

Also, food delivery services for both Access clients and non-clients were managed directly through food banks and other meal programs, which caused logistical complications such as information sharing and documentation. Access program has partnered with 25 nonprofits, including food banks, to deliver grocery and hot meals to ADA clients and non-clients and served over 10,000 families by September 2020 (Rynning, 2020). Customers in need of food delivery contact their local food bank whenever needed, including Access paratransit riders who could not visit food banks or other social service providers due to COVID-19. In addition to requests made individually, recipients had different preferences for receiving their packages, and drivers received this information through different channels, including phone calls, shared sheets, or text messages. There was much variety in the sources of the food, the types of food requested, the clients requesting the food, and the frequency of delivery, so delivery activities necessarily varied each week, which complicated the delivery process without a regularly-recurring group template ride. Access drivers are picking up food boxes, lunches, meals, and shelf-stable food at food banks, senior centers, Northwest Harvest, and other nonprofits. Access drivers had not previously delivered packages as part of their job. One planner said that “Tracking parcels and delivery requires a whole infrastructure that Access

Table 2

| Theme | Codes and subcategories | Selected quotes from interviewees | Number of mentions | Number of interviewees |
|-------|-------------------------|----------------------------------|--------------------|-----------------------|
| Attitude and feelings | Confidence in the system | “No, nothing too major, nothing that we have not been able to handle.” | 11 | 6 |
|                   | Worries and sacrifices   | ‘Now with football season, my father and I were used to hanging out together and watch games together but I haven’t been able to do that because I am susceptible for the virus.’ | 14 | 5 |
| Survival kit (assets) | Communication            | “So enjoying and feeling happy, because you will help those people who don’t have any car and who don’t have anybody to help them going to grocery.” | 12 | 6 |
|                   | Quick adaptation         | “Do we have the trigger right and know when to switch” | 5 | 5 |
|                   | Team work                | “Our biggest asset is working together to adapt to rapid changes” | 7 | 5 |


Similarly, transporting COVID-19 patients was a challenge for Access decision-makers, who struggled to ensure their service’s safety while meeting the needs of clients equitably. Such service exposes drivers to a higher risk of infection, so KCM offered drivers a choice about transporting COVID-19-positive clients before they designated different fleets and separate routes for that purpose. KCM entered some special contracts with cabulance companies with a dedicated crew that arrived with full PPE to transport COVID-19-positive passengers. Although KCM has substantially reduced trip capacity to increase social distancing, with most trips comprise a single passenger, there is an inevitable close contact inherent in drivers’ jobs who offer different assistance types to ADA clients. KCM trained drivers to constantly follow all safety measures, including mask-wearing, sanitization, and keeping the windows open when possible. One planner said while commenting on the challenges that drivers face keeping safe, “So unless they got their windows open so fresh air is coming in and recycling air in the vehicle, they are going to be breathing the same here that the person behind them is breathing. With the fires and smoke and the upcoming winter season, the climate makes it challenging for drivers to keep the windows up.” To tackle weather challenges and clients’ complaints regarding opening windows, KCM has installed driver shields for additional protection.

MV Transportation, the contractor delivering Access service, provided masks, sanitizer, and gloves for Access drivers while giving them additional break time for frequent handwashing. Drivers were required to stop by a sanitization station every two to three trips to thoroughly clean Access vehicles using a hospital-grade disinfectant, focusing on high-touch areas like buttons, handholds, and rails. Three different sanitization stations act as bases for deep sanitation and cleaning the Access vehicle fleet funded and designated by KCM and spatially distributed at different locations across the county, so drivers do not have to return to their home base if they are distant. These sanitization stations are used as an additional precautionary measure in case COVID-19-positive clients used the service without declaring or knowing they have the virus. One driver said, “in the beginning, it was after every rider, but now we do a couple of rides and then go back to the base for cleaning. There are like three different bases that we go to, so we are not always coming back to our home base, based on our location.” The sanitization stations helped protect drivers from the virus and unemployment. Some Access drivers had their jobs change to work in these stations and contribute to cleaning the vehicles. Table 3 includes selected quotes about COVID-19 operational challenges.

### 3.2. Paratransit services during the recovery period

#### 3.2.1. Anticipated challenges and threats

The interviewees indicated a lack of existing plans or guidelines for the recovery period. The planners were fully engaged in responding to the current challenges of the pandemic and thought that there would be enough time in the future to plan for recovery. KCM staff monitor ridership and pivotal events and then adapt their plans and policies accordingly. For example, the first COVID-19 death in the United States on February 28, 2020, was an Access client, which served as the first pivotal event for KCM and led to a pandemic-response plan “in less than 24 h”. During our interviews conducted in September 2020, many staff members indicated that vaccine availability was expected to be the second pivotal point as part of planning for the recovery period.

Although there was a lack of a clear recovery plan and approach, there was an ongoing debate on whether some pandemic-related measures and services should continue during and after the recovery period as permanent services. While many planners agreed that the food delivery service should continue, they highlighted the challenges regarding costs, infrastructure, and driver training.

Having enough capacity to accommodate Access clients’ mobility needs is a significant threat as communicated by different staff groups. Because riders may have deferred seeking care for some of their medical needs, their demand for paratransit services may increase during recovery as they address those medical problems.

There are always challenges for funding public transportation in general, and paratransit in particular, because it is a costly operation. During the pandemic, funding challenges have increased because KCM funding heavily relies on sales tax, which drastically dropped during the pandemic, and fare collection that KCM eliminated to increase social distancing. KCM received about $240 million from the federal CARES Act, covering about 25% of KCM revenue. Once the federal funds ran out, KCM relied on reserves and additional stimulus. Although KCM has a good reserve policy, some planners indicated the food delivery services have added more financial challenges because “there is not money clearly identified for that service.” KCM used Federal Emergency Management Agency reimbursement, and the COVID Relief Fund offered through the U.S. Department of the Treasury to operate this new service, although future funding is uncertain. Table 4 highlights some relevant codes and selected quotes that highlight recovery challenges.

### Table 3

| Theme | Codes and subcategories | Selected quotes from interviewees | Number of mentions | Number of interviewees |
|-------|-------------------------|----------------------------------|--------------------|-----------------------|
| Pandemic-related challenges | Early pandemic uncertainties | "Know at the beginning of March - it was a lot about handling uncertainties." | 4 | 2 |
| | Food delivery challenges | "There is not an end date to it, which makes it more challenging. The challenge is on folks who rely on food services." | 15 | 6 |
| | Lack of resources and guidelines | "No resources across the country or the company. There was not any pandemic response plan." | 4 | 2 |
| | Transporting COVID-19 positive clients | "We have a separate location for the team who serve positive customers or test positive." | 6 | 5 |
3.2.2. Recovery scenarios

With many uncertainties, the interviewees suggested that one method to prepare for recovery planning is to monitor and forecast ridership continuously. While decision-makers and planners varied on whether they expected demand to return to pre-pandemic levels or whether there should be a complete change in the business models, they mostly agreed on meeting the mobility and safety needs of Access clients as their main priority. This approach involves setting specific triggers and systematic plans and being able to switch promptly when needed.

The interviewees agreed that sanitization routines and stations should be continued during recovery to ensure clients’ safety. Many planners and decision-makers agreed that food delivery should also continue as a service but not necessarily using Access vans and systems. Table 5 highlights some of the issues associated with post-pandemic scenarios.

4. Discussion

Transit agencies have experienced many challenges during the COVID-19 pandemic related to reduced demand and safety concerns from the contained environments inside the vehicles. ADA paratransit has additional challenges in serving vulnerable persons, many of whom lack alternatives but have continuing mobility needs. While transit agencies have adapted to many of the pandemic-related challenges, there are existing and continuing mobility needs. While transit agencies have adapted to many of the pandemic-related challenges, there are existing and continuing mobility needs.

4.1. Guidelines and resources

The pandemic revealed a lack of a pandemic-response plan. Because ADA paratransit serves a vulnerable group that requires physical interactions for eligibility certification and assistance in embarking and disembarking vehicles, safety should always be prioritized. Staff involved with eligibility certification indicated the availability of pandemic-response plans but all other staff indicated the lack of such guidelines.

Agencies obligated to offer paratransit services were faced with balancing resources for providing services while fulfilling health-related orders. The delay and occasional inconsistencies among state, federal, and public health regulations caused a delay in responsive actions that may have jeopardized client safety. For example, mask mandates and social distancing were not enforced from the beginning of the pandemic, which increased health-associated risks. ADA paratransit should consider developing consistent service guidelines for pandemics and other foreseeable major disruptive events.

4.2. Diversifying paratransit services

KCM was faced with high operational costs, budget challenges, and reduced demand but succeeded in incorporating new services and adapting its infrastructure to a new environment. These services include incorporating food delivery that was organized through the food banks and transporting front-line employees. The new services helped the agency reduce the number of lay-offs and provided an essential service for people who preferred to reduce travel. Most of the pandemic-related policies and actions were implemented without time for examining long-term implications, so the future of these services and the impacts of returning demand are uncertain.

Although many staff indicated the importance of having a permanent food delivery service to reduce grocery store trips and expand options for Access clients, this service may be discontinued when the demand for paratransit returns to pre-pandemic levels.

Diversifying paratransit services to include food delivery can provide cost savings because each one-way food delivery trip replaces a round trip to a grocery store or food bank and can be scheduled for travel efficiency. While the current ADA paratransit system is not designed for food delivery, transit agencies may find alternatives through contractors or public-private partnerships, including Transportation Network Companies (TNCs), food delivery services such as DoorDash and Grubhub, meal programs, and community centers. KCM should also consider expanding its coordination with other essential services such as pharmacies to incorporate medicine delivery. Such delivery services increase safe alternatives for paratransit riders, who otherwise might use more costly commercial delivery services.

Table 4
Themes, codes, and selected quotes that highlight the challenges of paratransit services during the recovery phase.

| Theme                     | Codes and subcategories | Selected quotes from interviewees                                                                 | Number of mentions | Number of interviewees |
|---------------------------|-------------------------|-----------------------------------------------------------------------------------------------------|--------------------|------------------------|
| Recovery challenges       | Budget challenges       | "There will be budget reductions, but we are keeping our service levels in the contract."            | 5                  | 5                      |
|                           | Funding new services    | "How can we continue to get funding to help support these services?"                               | 3                  | 3                      |
|                           | Enough capacity         | "So if the demand goes back again, we need to ensure we have enough capacity."                     | 4                  | 3                      |
|                           | Public health issues    | "Public health issues - some riders have deferred their health care, which might increase more chronically sick people." | 2                  | 2                      |
|                           | Roadblocks for food delivery | "If we were at full demand - as many customers as last year, we would not be able to meet it, not enough vehicles nor drivers to accommodate them." | 5                  | 3                      |
|                           | Actions needed for recovery | "We need to develop a phased approach with a certain percentage of service change - month over month." | 8                  | 3                      |
4.3. Scenario planning

Because transit agencies had reduced resources to respond to increased safety needs and reduced demand, having a phased plan for recovery that captures the change in ridership and services is crucial to maintain equitable services. Although transit agencies succeeded in adapting to meet pandemic-associated needs, they should consider planning for a more proactive response to the recovery period and various possible scenarios.

In addition to monitoring ridership and forecasting changes, transit agencies should consider working to better understand the changes in ridership characteristics, including trip purposes, client demographics, the geographic distribution of trips, and reasons behind such changes. With such information, transit agencies can better coordinate with institutions such as senior centers which serve as potential destinations and anticipate their reopening dates and capacity. COVID-19 vaccinations were not available at the time this study was conducted. KCM planning should include scenarios for equitably transporting persons to vaccination sites as vaccinations have become available.

4.4. Resilience lessons from the pandemic

The resilience of a paratransit system is enhanced when transit agencies learn from previous experiences and generalize those lessons to solve anticipated new disruptions (King County Metro, 2020). There is much to learn from the COVID-19 pandemic to better prepare for future infectious diseases and natural, social, and economic threats. Resilience requires robust internal and external coordination, teamwork, and infrastructure that allows people to protect themselves and their communities. To improve the resilience of essential services such as ADA paratransit, transit agencies need effective emergency response programs, infection control, and affordable alternatives. Some transit agencies are now exploring possible partnerships with Transportation Network Companies (TNCs) to provide alternative services for persons with disabilities. Such ride-sourcing services could increase resilience, reduce costs, and raise service flexibility by enabling same-day trip scheduling. Similarly, partnering with delivery companies, such as food delivery services and meal programs, could diversify essential services offered through paratransit at a reduced cost and increased convenience.

4.5. Study limitations

Several limitations should be considered in interpreting the results of this study. First, the selected interviewees may not be representative of all staff who work for KCM and its contractors. Second, the experiences of Access paratransit services in King County may not be representative of those of other U.S. paratransit systems. Third, the interviews were conducted in September 2020 but the impacts of COVID-19 on transportation may change as the pandemic evolves. Finally, the interviews were conducted using video-calling software or by phone and may have missed some of the feelings, attitudes, or insights that could have been captured by in-person interviews.

4.6. Conclusion

Although infrequent, pandemics are one of many risks that transportation systems can face. It is essential to plan for and efficiently implement infectious disease control strategies while maintaining a focus on the safety and equity needs of the populations being served. The lessons learned from the pandemic responses may help strengthen the ability of all transportation agencies to respond to future challenges while sustaining and increasing mobility services.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
Declarations of competing interest

The authors have no financial conflicts of interest to disclose.

Acknowledgments

We thank Don Okazaki at King County Metro (KCM) for selecting interviewees from planners and decision-makers and tailoring the interviews to fit the expertise of each. We thank Kari Ware at Solid Ground for organizing and selecting the drivers for the interviews. We also thank John Rochford and Matthew Weidner at KCM for providing supportive data and insights to assist our research. Finally, we thank the decision-makers, planners, and drivers who participated in our interviews.

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Declaration of competing interest

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