Ensuring Equitable Transportation for the Disadvantaged: An Examination of Paratransit Usage by Persons with Disabilities During the COVID-19 Pandemic

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Background on ADA Paratransit

- **A mobility service for people with disabilities**
  - Required by ADA (the Americans with Disabilities Act of 1990)
  - Provided by public transit agencies and often operated by contractors
  - An on-demand shared service using vans or small buses
  - Offered to areas within a certain distance to the fixed route transit
  - Drivers provide assistance to riders, as needed

How does ADA Paratransit Operate?

- Eligibility certification
- Dial-a-ride (booking a trip)
- Origin-destination shared ride service

Pandemic Measures

- Reduction in vehicle capacity
- Stringent sanitization routine
- Suspending in-person certification
- Incorporating new services (e.g., food & grocery delivery)

Impacts and Implications

- Long-standing cost efficiency challenges
- Increasing need for service innovations

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Research Questions

- How have the **ridership** and **trip purposes** of ADA paratransit service changed since the outbreak of the COVID-19 pandemic?

- At the **individual level** of paratransit users, what factors explain their changing levels of service usage in response to the pandemic?

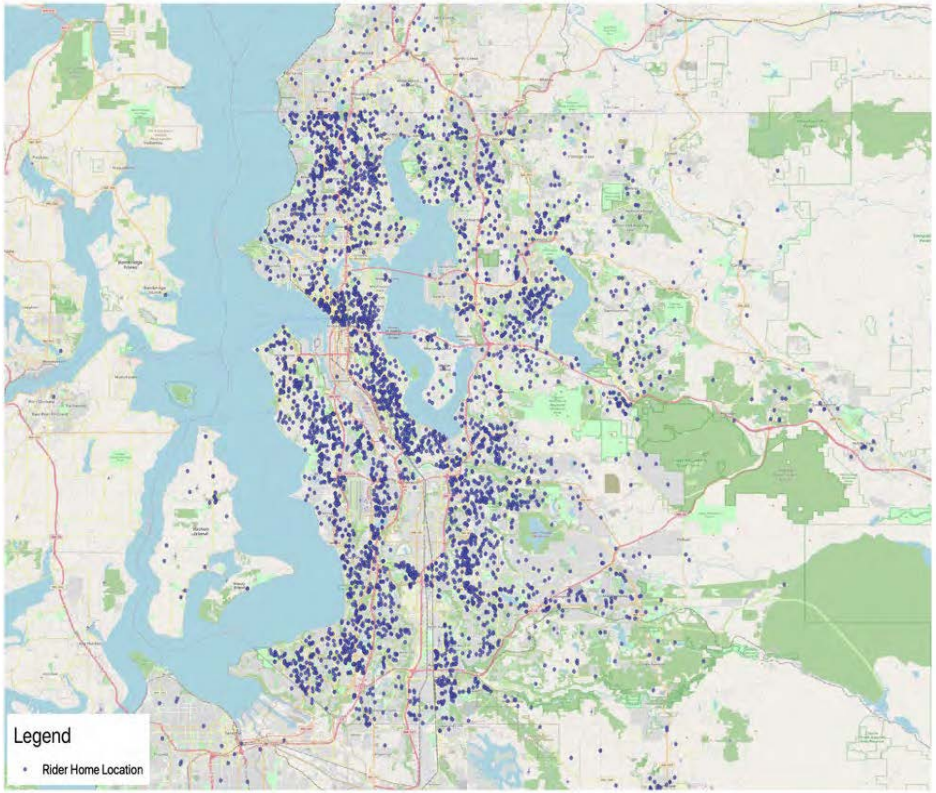
Study Area

- **Access Transportation Program in Seattle Region**
  - ADA paratransit service provided by King County Metro

King County METRO

We'll Get You There

Home locations of all Access riders



Data and Methodology

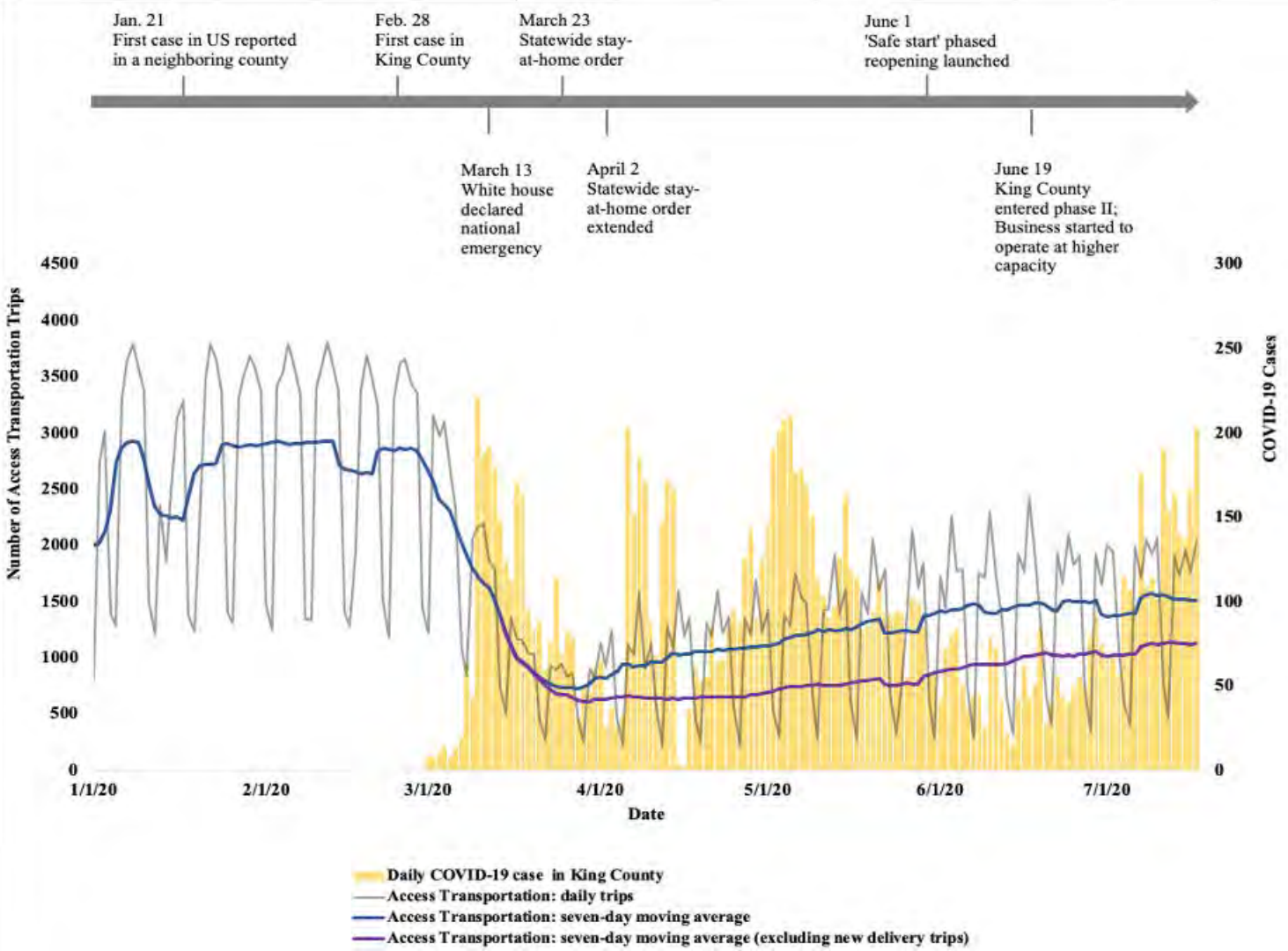
- **Data: Access Transportation Program data from Jan 2019 to July 2020 (14 months pre-pandemic and 5 months during pandemic)**
  - **14,534 riders**
    - **Rider data include** age, gender, ADA eligibility information, travel preference and location information, etc.
  - **1,328,287 trips**
    - **Trip data include** origin, destination, scheduled time, mobility aids needed, etc.

Data and Methodology

- **Methods: descriptive statistics and statistical modeling**
  - **Descriptive statistics** for ridership trends and changes in trip purposes
  - **Multivariate regression model** for identifying factors that can help explain riders' changing level of service usage

Access Transportation Ridership Trends

*** Only showing 2020 data**



Changes in the Access Transportation Trip Purposes

	February 2020 Before COVID-19		April 2020 During COVID-19	
	N	%	N	%
Work	8383	25%	1366	15%
School	314	1%	0	0%
Medical	7204	21%	7006	77%
Adult Day Care	5832	17%	5	0.1%
Personal	10228	30%	445	5%
Recreational	1279	4%	0	0%
Others	813	2%	234	3%
Trip Purpose Known	34053	100%	9056	100%
Trip Purpose Unknown	46835		10666	
Total	80888		19722	

Regression Model

- **Sample size:** 5671 riders who used ADA services in February 2020 (prior to the outbreak of the pandemic)

- **Dependent variable:** whether the rider continues to use the service in April 2020 (one month after the outbreak of the pandemic)

- **Independent variables:** rider's sociodemographic characteristics, disability conditions, pre-pandemic travel demand, neighborhood socio-economic characteristics, neighborhood built environment characteristics

Regression model results
(will explain in plain language in next few slides)

Whether a pre-existing rider decided to keep using the service (Yes = 1 / No = 0)			
	Coef.	Std. error	Sig.
age < 30 (ref: 30-60 years old)	-0.914	0.153	***
age > 60 (ref: 30-60 years old)	-0.224	0.074	***
Female (Yes =1)	0.127	0.072	*
prefer door-to-door (ref: prefer curb to curb)	-0.27	0.073	***
prefer hand-to-hand (ref: prefer curb to curb)	-1.563	0.387	***
have commuting needs (Yes = 1)	-0.313	0.138	**
have medical needs(Yes = 1)	2.926	0.164	***
number of trips in February	0.035	0.003	***
log (avg. trip distance in February)	-0.04	0.046	
adopt delivery service (Yes = 1)	0.318	0.089	***
block group: % housing units without vehicles	1.103	0.392	***
block group: % people of color	0.038	0.193	
block group: log (median income)	-0.463	0.098	***
block group: log (population density)	0.028	0.048	
block group: log (retail accessibility)	0.006	0.036	
block group: log (service accessibility)	0.027	0.042	
Constant	3.757	1.248	***

Regression model findings (part 1)

Variable group	More likely to use ADA ride service during the pandemic	Less likely to use ADA ride service during the pandemic
Demographics	Riders who are between 30 and 60 years old	Young riders (<30 years old) and senior riders (>60 years old)
	Female riders	Riders of other genders
Disability conditions	Riders who preferred curb-to-curb pick-up and drop-off	Riders who preferred door-to-door or hand-to-hand pick-up and drop-off

Regression model findings (part 2)

Variable group	More likely to use ADA ride service during the pandemic	Less likely to use ADA ride service during the pandemic
Travel demand	Riders without commuting needs	Riders with commuting needs
	Riders with medical needs	Riders without medical needs
	Riders who had higher number of trips in February	Riders who had lower number of trips in February
	Riders who adopted delivery service	Riders who did not adopt delivery service
Neighborhood characteristics	Riders who lived in neighborhoods with lower vehicle ownership	Riders who lived in neighborhoods with higher vehicle ownership
	Riders who lived in neighborhoods with lower median income	Riders who lived in neighborhoods with higher median income

Findings & Recommendations (1)

- Riders with **higher health risks**, particularly **older** riders and those with **severe disabilities**, tended to **stop** using the service.
  - They may need to seek alternative travel modes with higher costs, ask family members or friends for help, or forego trips and leaving some essential needs unmet.
  - We encourage transit agencies to continue to promptly develop and implement strict safety measures, and immediately inform riders about such efforts when future disruption happens

Findings & Recommendations (2)

- A substantial percentage of riders, especially riders with **medical needs** and riders who lived in neighborhoods with **lower car ownership** and **lower income**, continued to rely on the service.
  - This suggests that the paratransit service serves as the ‘safety net’ for riders who must travel during the pandemic but lack other options.
  - Paratransit providers should consider prioritizing services for neighborhoods with disadvantaged populations, if capacity is limited.

Findings & Recommendations (3)

- Adding **food and grocery delivery service** was an innovative strategy for ADA paratransit operators, which made effective use of available vehicles and drivers to meet the needs of the disadvantaged while minimizing the risk of contracting COVID-19 through transportation
  - Paratransit service providers should consider actively building partnership with food banks and other community organizations.

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

Research Questions

- How did paratransit services and operation norms change **in response to the pandemic**?
- What are the impacts of a **returning demand** on paratransit service efficiency, equity & quality?
- What are some innovative ways for transit agencies to **maintain post-pandemic equitable paratransit services**?

Pandemic measures

Sanitization Routine

Capacity Reduction

Drivers & Clients Safety

In-person Certification

Post-pandemic Challenges

1- Returning ridership (timeframe, size, shape)

2- Long-standing cost efficiency challenges.

3- Offered services (alternatives, innovations)

Methodology

- **In September 2020** we conducted semi-structured recorded interviews with **15 decision-makers, planners, and drivers** working with KCM Access paratransit.
- 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 codes and themes for analysis.
- We ran word frequency queries and clustering to generate (initial) **codes**

Cases/Themes

Case classification

Decision makers

Planners (dep. managers)

Access Drivers

Themes generation

Codes (labels)

Themes (similar codes)

Timeline (COVID19)

Findings

Changes in employment and attitude among employees

Drivers:

- Reduced working hours (from 40 to less than 20)
- KCM furloughed about **100** and laid off **50 drivers.**
- Drivers were not severely impacted by COVID19 (none got infected).
- Clients also reduced all types of interactions with drivers, including small talk.
- Impacted drivers' social lives directly, to reduce the risk of infection among their families and friends

Findings

Findings

Changes in employment and attitude among employees

Planners & managers:

- No significant changes in their working hours, job stability, and safety concerns as they worked remotely.
- All decision-makers had to do more **coordination** with other organizations; and constantly adjust their policies.
- Planners became more involved in decision-making processes by making timely recommendations.

Changes in employment and attitude among employees code book

Codes and subcategories		Selected quotes from interviewees	No. Mentions	No. cases
Clients enjoy a reduced capacity		*"A lot of people were happy because they were the only ones on the bus."*	2	1
Employment changes	**Lay-offs**	*"King County was unable to do furlough anymore, so we had to lay off less than 50 people."*	5	4
	New tasks	*"I work at the sanitization station now; that is a change in my job."*	2	2
	Less work	*"I noticed from my steps app, I used to have 7,000 steps on average, now it is only around 3,000."*	6	6
	Financial help	*"So, during this lockdown, I was given my paycheck for a total of 40 hours or like full-hours."*	2	2

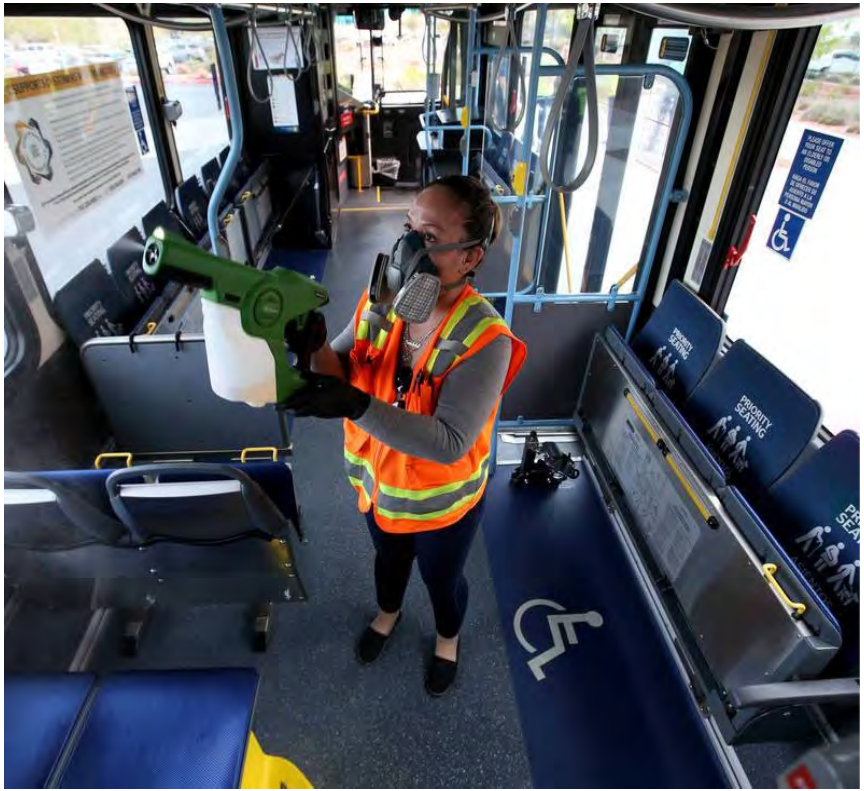
Findings

Changes in operations and services

- KCM installed **sanitization stations** across the county.
- KCM incorporated **new services** (transportation for pandemic response, food delivery);
- KCM entered special contracts with cabulance (dedicated crew that arrived with full PPE) to **transport COVID19-positive** cases;
- KCM reduced **trip capacity** to increase social distancing;
- KCM installed **driver shields** & provided masks, sanitizers, and gloves for Access drivers.

Sanitization stations

- **Three** stations across King County;
- Drivers were required to stop by a sanitization station every **2 to 3 trips**;
- Include a hospital-grade disinfectant, focusing on high-touch areas
- These stations acted as an additional precautionary measure;
- Provided more job security to some drivers who worked there.



Food Delivery

- Access program has partnered with **25 nonprofits** to deliver grocery & hot meals;
- Served **10,000** families by Sep 2020;
- Managed by food banks & meal programs;
- Access lacks the **infrastructure** and **experience** for food delivery;
- Contract challenges (Lifting packages);
- Lack of clear timetable and information;

Changes in operations and services code book

Codes	Selected quotes from interviewees	No. mentions	No. cases
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

Anticipated challenges and threats

- The **lack of existing plan** for the recovery period;
- Relying on **pivotal events** and then adapt their plans and policies accordingly. (first death, vaccines…)
- **Uncertainty** about the future of pandemic-related measures and services such as food delivery.
- Concerns about enough capacity to accommodate needs.
- Funding challenges (federal CARES Act 25% of KCM revenue, KCM relied on reserves and stimulus).
- **The food delivery** services increased financial challenges because "there is not money clearly identified for it”.

Findings

Findings

Recovery scenarios and post-pandemic services

- Relying on **monitoring and forecasting ridership**;
- **Disparity of opinions** on returning demand levels;
- Safety & mobility needs of clients is the main priority;
- Some indicated KCM plan to **set specific triggers** and systematic plans & switching promptly when needed.
- The interviewees agreed **that sanitization routines and stations** should be continued post-pandemic;
- Many planners and decision-makers agreed that **food delivery should also continue** as a service but not necessarily using Access vans and systems.

Recovery scenarios and Post-pandemic paratransit Code book

Codes and subcategories	Selected quotes from interviewees	No. Mentions	No. Cases
Continue food delivery service	"There needs to be some mechanism for food delivery."	3	2
Continue sanitization	"I just really want them to keep the sanitization stations in place."	2	2
New business models	"Do we start making changes to our capital fleet that will ingrain a new type of business model and operation…?"	2	1
Ridership	"Don't think Access ever goes back to previous levels."	4	2
Uncertainties	"What are our options to move forward?"	4	2
Access clients are the first priority	"Our first priority for paratransit is Access customers, their safety and needs are met."	5	4
Primary goal is safety	"Safety of employees and passengers. "	6	6

Discussion

Guidelines and resources

- The pandemic **revealed a lack of a pandemic-response plan;**
- **Safety should be considered, when** serving a vulnerable group that requires direct physical interactions;
- The delay and occasional **inconsistencies** among state, federal & public health regulations jeopardized client safety.
- Paratransit should consider developing **consistent service guidelines for pandemics and other foreseeable major disruptive events**.

Discussion

Diversifying paratransit services

- The future of pandemic-related policies and actions, and the impacts of returning demand are uncertain.
- **Diversifying paratransit services** to include food delivery can provide cost savings and increase travel efficiency.
- Alternative services through **contractors or public-private partnerships,** including TNCs, food delivery, pharmacies…
- Such delivery services increase safe alternatives for paratransit riders instead of commercial delivery services.

Discussion

Scenario planning

- Transit agencies should have a phased plan for recovery that captures the change in ridership and services & understand **the changes in trips/riders characteristics.**
- They should consider planning for a more **proactive response** to the recovery period and possible scenarios.
- Transit agencies should better coordinate with main destinations such as senior centers.
- KCM planning should include scenarios to **equitably transporting persons to vaccination.**

Discussion

Resilience lessons from the pandemic

- It is important to improve the resilience of essential services.
- Transit agencies should consider an **effective emergency response programs, infection control & alternatives service;**
- Transit agencies should consider partnerships with Transportation Network Companies (TNCs) and other programs to provide alternative paratransit services;
- Such ride-sourcing services could increase resilience, reduce costs, & improve service flexibility and convenience.

Discussion

TNCs-Paratransit Partnerships

Opportunities/Goals

- Scheduling flexibility
- Increase service levels
- Increase cost efficiency

Limitations/Benchmarks

- TNCs business model challenges
- Dynamic pricing of trips
- Efficiency of ADA paratransit

Trip Diversion Benchmarks

TNCs business model challenges	• Type of trips that can be diverted (Client disability & required assistance)
Dynamic pricing of trips	• The subsidy offered by transit agencies • The trip length it typically covers
Efficiency of ADA paratransit	• Cost-efficiency of ADA paratransit trips • Determining service areas for TNCs

TNCs potential trip diversion

- By applying **the first condition (mobility assistance)** results show that **29%** of Access trips can be diverted to TNCs.
- By applying **the second condition (trip distance)** a total of **63%** of Access trips can be diverted (**70.8%** during off-peak and **32.7%** during peak)
- **Intersecting the two conditions** result in a maximum of **18%** of total Access trips that can be diverted to TNCs.
- The percentage can go up to **21%** if the dynamic subsidy is applied.

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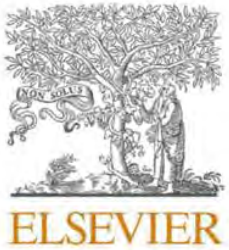

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Thank you

Q&A