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## Incorporating Ride-Sourcing Service into ADA Paratransit

Opportunities & Challenges for Public Transit Agencies

# Project Background

This project is a collaboration between UW and King County Metro, which converged on the interest of exploring the emerging role of TNC in paratransit services.

The two parties worked together on a research proposal funded by both King County Metro and Pactrans tech transfer.

**Principal investigator (UW):** Qing Shen

**Co-investigators (KCM):** Don Okazaki; Jeremy Trenhaile

**Researcher/s (UW):** Lamis Ashour

**Other collaborators:** Matthew Weinder, John Rochford, Casey Gifford

# 01

## **Research Background**

- ADA Paratransit Background
- Alternative services
- Research Questions



# ADA Paratransit (Background)

## **Transit agencies provide mobility services for people with disabilities:**

- An origin to destination (on-demand) complementary transportation service;
  - Within the fixed-route jurisdictional boundaries;
  - Often operated by a private contractor (vanpool, taxicab);
  - Drivers provide assistance to riders, as needed;
  - Assistance includes curb to curb, door to door, and hand to hand.
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# How Paratransit Works



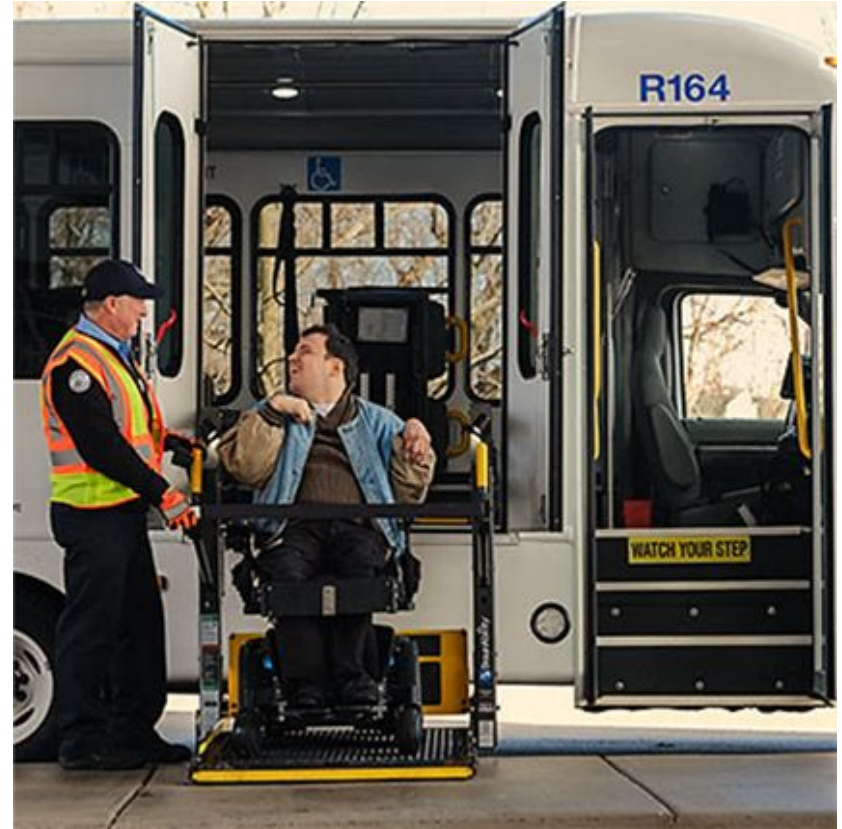
Eligibility certification



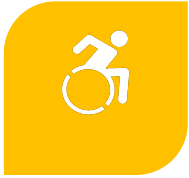
Dial-a-ride (Booking trips)



Origin-Destination  
(Share a ride)



## Paratransit challenges



1- EQUITY GAPS



2- HIGH OPERATIONAL COSTS



3- INCREASING DEMAND



4- QUALITY OF SERVICE

## Alternative solutions



Incentivize fixed-route usage (fares, accessibility, marketing).



**Partnering with TNCs or taxi companies.**



Right-sized vehicle (some riders don't need specially equipped vehicles).



# Definition of ADA Alternative Services

*\* Approved by FTA legal counsel on TCRP J 07 SG 14 panel*

- Transit agency subsidized mobility option for ADA paratransit customers;
  - Mode choice is totally up to the customer;
  - Transit agency can offer/suggest a service option without “steering” customers;
  - Choosing to use the alternative service for a trip does not impact customer’s ADA paratransit eligibility or right to schedule trips on ADA paratransit service;
  - None of the vehicles used are owned, operated or controlled by transit agency
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# Transit agency-TNC partnerships

- New mobility services, including **ride-sourcing**, create exciting opportunities for building new partnerships between transit agencies and private providers
- **The motivation for transit agencies** to partner with TNCs in service provision is to **improve mobility** by filling service gaps, **increasing options** for people with disabilities, and **lowering operational cost**.





## Research Questions

1- What are the **opportunities and barriers** to the delivery of same day paratransit services through transit agencies - TNCs partnerships?

Case studies and lessons learnt

2- Under which **conditions/scenarios** can partnering with TNCs efficiently & equitably supplement paratransit?

Scenario planning & data analysis

# 02

## **Case Studies**

- Pilots Locations
- Subsidy System
- Pilot design
- Lessons Learnt

Agency/program	Location	Subsidy	Restrictions/limits
<b>MBTA (The Ride Flex)</b>	Boston, Massachusetts	<b>\$2</b> paid by the client Subsidy up to <b>\$40</b> per trip	Monthly cap based on the rider's past RIDE usage. New riders <b>2 trips/month</b>
WMATA (Abilities Ride)	Houston, Texas	<b>\$5</b> paid by the client Subsidy up to <b>\$15</b> per trip	Up to 4 rides/day. Trips must begin and end in Maryland
Capital Metro (Ride   Austin)	Austin, Texas	<b>\$5</b> paid by the client Subsidy up to <b>\$15</b> per trip	Areas that lack fixed-route services but has enough paratransit riders
MTA (E-hail pilot)	New York	Free, with an upper subsidy limit of <b>\$15</b> per trip	Monthly ride cap to 16 a month, and cap the per-ride subsidy at \$15
RTC On-Demand	Southern Nevada	Clients pay the initial <b>\$3</b> and RTC will pay the next portion to cover a 10-mile trip.	Monthly ride cap based on previous 6-month paratransit ridership

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## ADA Paratransit

Conventional ADA paratransit  
service (vanpool)



## Same-day service

alternative paratransit service  
operated through TNC







# Lessons Learned | Opportunities

## **1- Increasing mobility options**

Increasing available alternatives for riders and service coverage

## **2- Scheduling flexibility (Same day)**

The biggest advantage for riders is scheduling flexibility through same day scheduling

## **3- Cost reductions (per trip)**

In some case the cost per trip was reduced by 80%, and the overall cost by 20%

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## Lessons Learned | Barriers

### **1- Demand-Shifts and Pricing:**

TNCs ability to provide a same day service induces additional travel demand, which challenges the cost efficiency of the service;

### **2- Subsidy and rides cap:**

Transit agencies must carefully set their subsidy amount and rides cap to TNC services, considering service equity, operational and cost efficiency.

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## Lessons Learned | Barriers

### **3- Riders limitations:**

An individual's ability to use an alternative service is affected by the individual's disability, required assistance, vehicle's accessibility & ability to use smartphones.

### **4- Trip allocation considerations:**

Allocating trips to TNCs should consider the trip length, type of accommodations, and paratransit efficiency.

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# 03

## **Access Paratransit**

- Access Transportation
- Why Same Day Service?
- Current Pilot Goals
- Pilot Project Plan

# Access Transportation Overview

- Access Transportation is the ADA complementary paratransit service provided by KCM;
- Under **normal service conditions**, Access provides approximately **1,000,000** trips for upwards of **12,000** registered users annually.



# Why Same Day Service?

- “Provide the **best possible** public transportation services and improve regional mobility and quality of life in King County.”
- Increase mobility options and flexibility through **same day service**;
- Increase the **efficiency** of paratransit trips.



# Pilot Plan

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- Restarting pilot project after postponing due to COVID-19 pandemic
- Design review process that will incorporate customer feedback and align with County and Metro goals
- Pilot will incorporate lessons learned from research project
- Tentative launch planned for **Q3 2022**

# 04

## **Scenario Planning**

- Research Questions
- Analysis Benchmarks
- Trip Diversion Conditions
- Scenario Planning





## Research Questions

1- What are the **opportunities and barriers** to the delivery of same day paratransit services through transit agencies - TNCs partnerships?

Case studies and lessons learnt

2- Under which **conditions/scenarios** can partnering with TNCs efficiently & equitably supplement paratransit?

Scenario planning & data analysis

## Opportunities/Goals

### Transit agencies goals & motivations



Scheduling flexibility



Increase service levels



Increase cost efficiency

## Limitations/Benchmarks

### TNCs limitations & paratransit specifics



TNCs business model challenges



Dynamic pricing of trips



Efficiency of ADA paratransit

# Measuring 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

## TNC operational limitations

Drivers training & FTA compliance

Limited availability of WAV

**Curb-to-curb trips only**

## Operational efficiency

Spatial variations

Mile/passenger for each trip

**Efficiency Cold/Hot spots**

## TNC Dynamic pricing

Surge Multiplier

Peak/non-peak hours

**Trip length per subsidy**

# Benchmarks (conditions)

# Condition One:

## Mobility assistance

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### Trips diversion should consider:

- Clients Disability type/level
- Mobility assistance required from driver
- TNCs drivers vs. Access drivers
- ADA regulations for assistance
- **Curb to curb trips only**



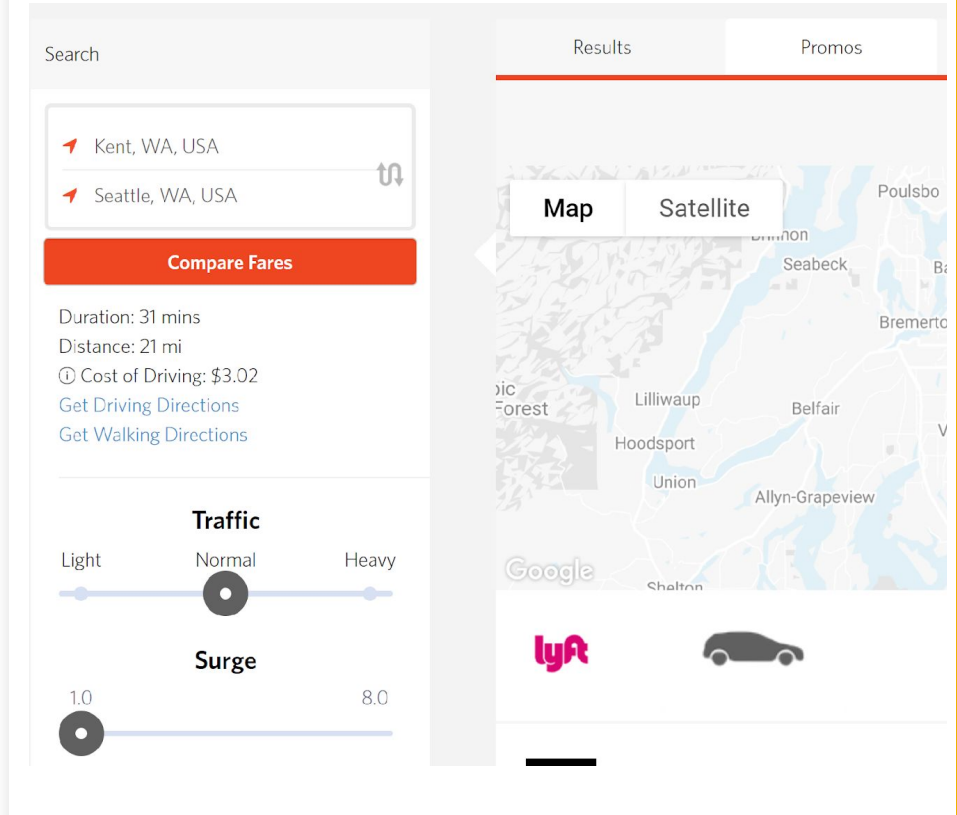
# Condition Two:

## Trip Distance/Subsidy

### Trip diversion should consider:

- TNC dynamic pricing;
- Subsidy amount;
- KCM are offering **\$40** as initial subsidy;
- Two trip-distance thresholds:

	Non-peak hours	Peak hours
Subsidy	\$40	\$40
Miles	10 miles	5 miles

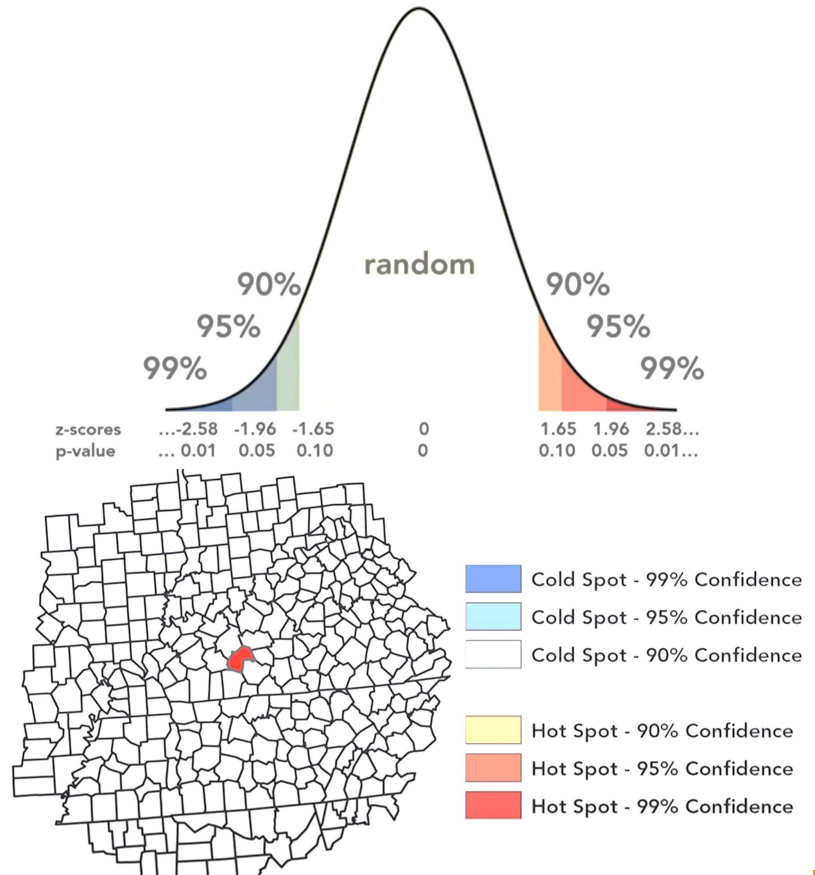


# Condition Three:

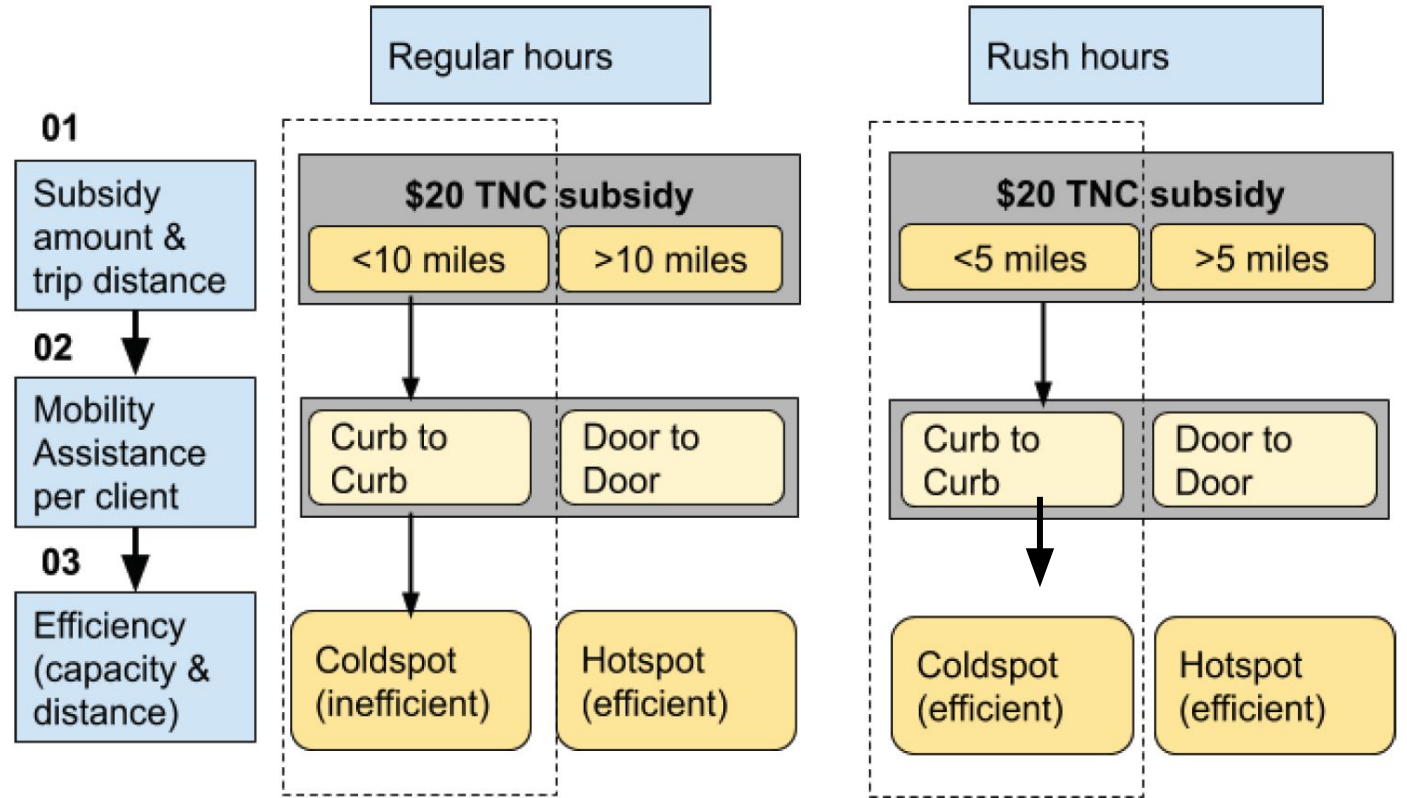
## Trip efficiency & service area

### Trips diversion based on service areas:

- Operational efficiency: Mile/pax.
- Using Access 2019 trips, we define areas that form statistically significant clusters of high efficiency and low efficiency.
- We compare the results before and after trip diversion;
- Find areas where **ADA paratransit can be impacted by same day service.**



# Generating scenarios





# Research Data

## KCM Access Paratransit Trips data (2019)

- Trip origin & destination;
- Trip distance;
- Number of passengers;

## Access Paratransit Clients data (2019):

- Age;
- Home location;
- Required Mobility assistance.

# Scenario Planning

	Condition (1)	Condition (1-B)	Condition (2)	Condition (3)	Scenario (1)	Scenario (2)
	Trip distance (\$40 subsidy)	Dynamic subsidy	Mobility assistance	Operational-efficiency	Condition (1+2+3)	Condition (3+2+1B)
Regular hours	\$40 subsidy (up to 10 miles) for TNC trips	Adopt a dynamic subsidy amount up to \$80 (up to 20 miles) to cover most TNC-divertible trips.	Curb-to-curb assistance only for TNC divertible trips.	(Passengers/Mile) for each Access trip.  Differentiate areas with high efficiency and low efficiency.	All three conditions intersected (1,2,3): trips covered by \$40, curb-to-curb, and inefficient for Access	Conditions (2) and (3) are intersected.  Condition (1-B) is applied to maximize TNC trips.
Rush hours	\$40 subsidy (up to 5 miles) for TNC trips					

# 05

## **Results and Conclusions**

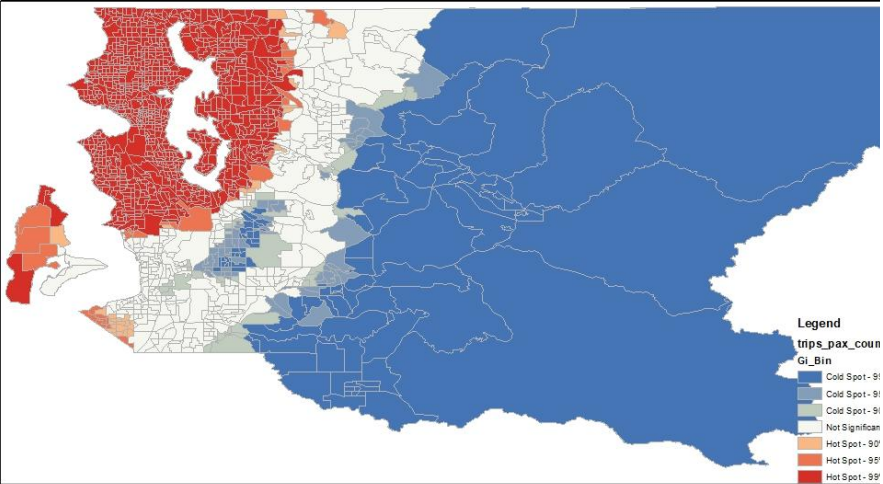
- Trip Diversion Conditions
- Trip Diversion Scenarios
- Conclusions
- Relevance of Results to Access
- Q&A

# Results

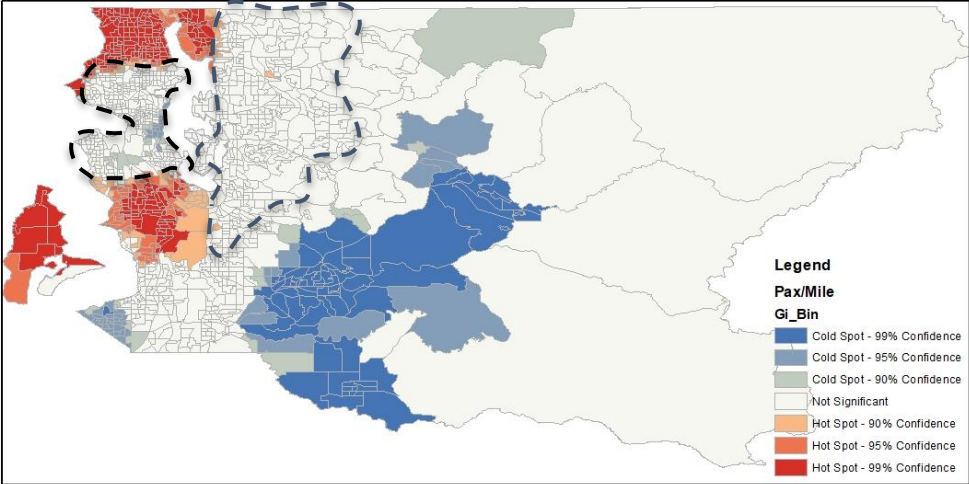
- By applying the first condition (mobility assistance) results show that **29%** of Access trips can be diverted to TNCs.
- By applying the second condition (trip distance) a total of **63.3%** of Access trips can be diverted (**70.8%** during off-peak and **32.7%** during peak)
- Intersecting the two conditions result in a maximum of **17.7%** of total Access trips that can be diverted to TNCs.
- The percentage can go up to **21%** if the dynamic subsidy is applied.

# Operational Efficiency

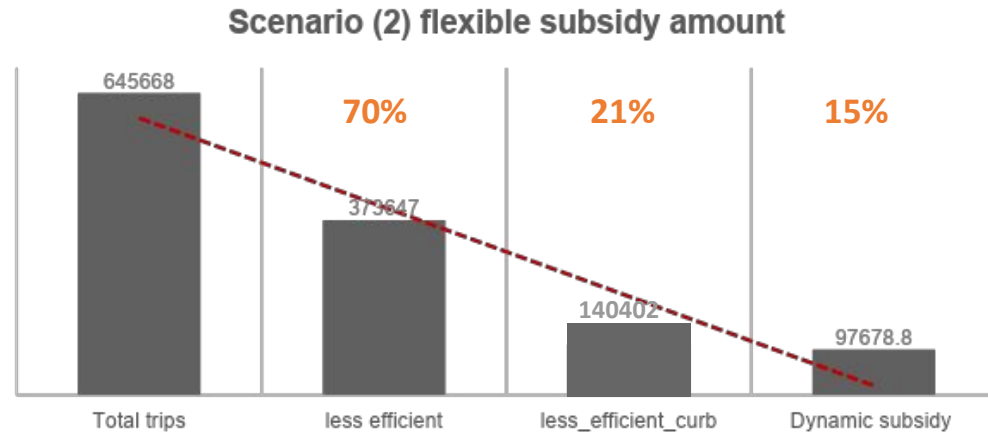
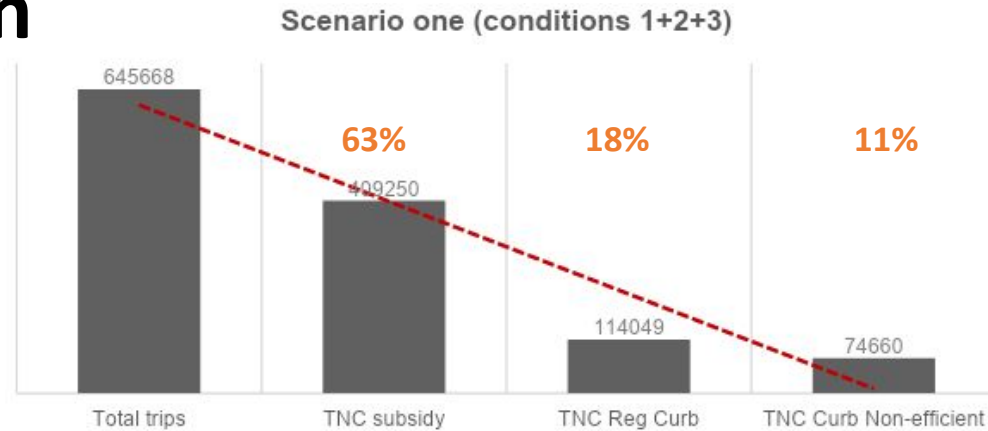
Hot Spot Analysis - Pax/Mile  
Before Trip Diversion



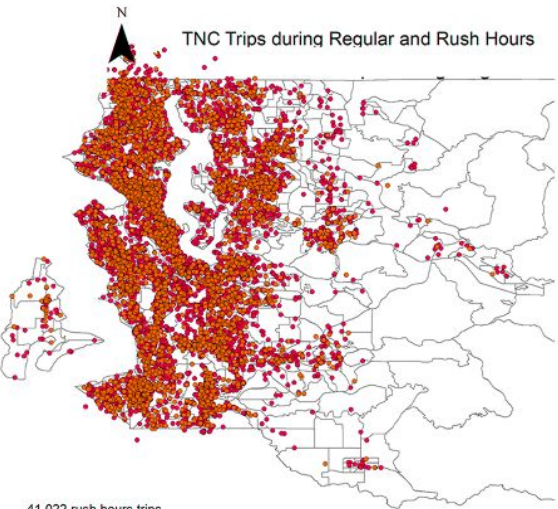
Hot Spot Analysis - Pax/Mile  
After Trip Diversion



# Tri diversion

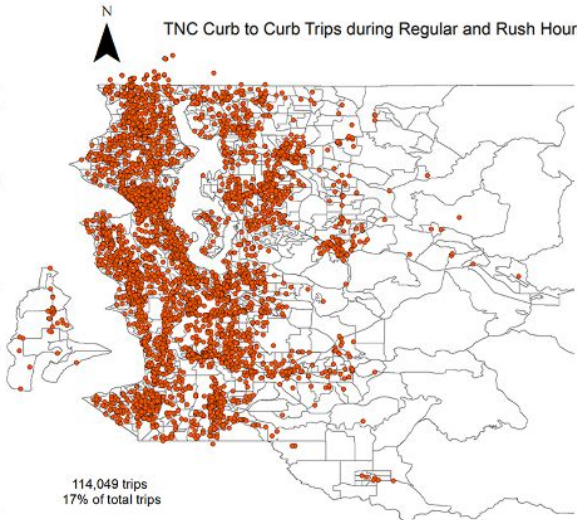


# Scenario (1): Fixed subsidy



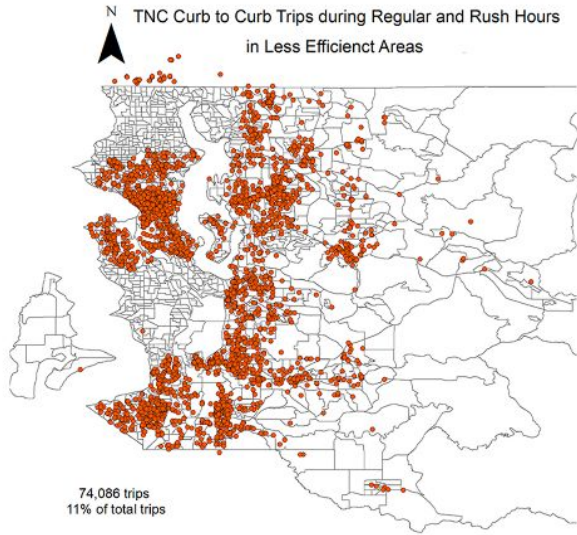
41,022 rush hours trips  
32% of rush hours trips  
409,250 total TNC trips  
63% of total trips

- TNC\_rush\_trips
- TNC\_normal\_trips
- Census Blockgroups



114,049 trips  
17% of total trips

- TNC\_total\_curb
- Census Blockgroups



74,086 trips  
11% of total trips

- TNC\_N\_R\_C\_Non-efficient
- Census Blockgroups

- Understanding the implications of the different barriers to providing alternative paratransit service using TNCs, specially

- Trip length and scheduled time;
- TNC dynamic pricing;
- Type of accommodations;
- Operational efficiency;

- Trip diversion to TNCs depend on the **subsidy amount**, but mainly on the availability of **trained drives** and **WAV**

- Higher subsidy amount can divert more trips but **induce higher demand** (demand-shift pricing)

- ADA paratransit efficiency and availability can be impacted by the rate of diversion

## Conclusions



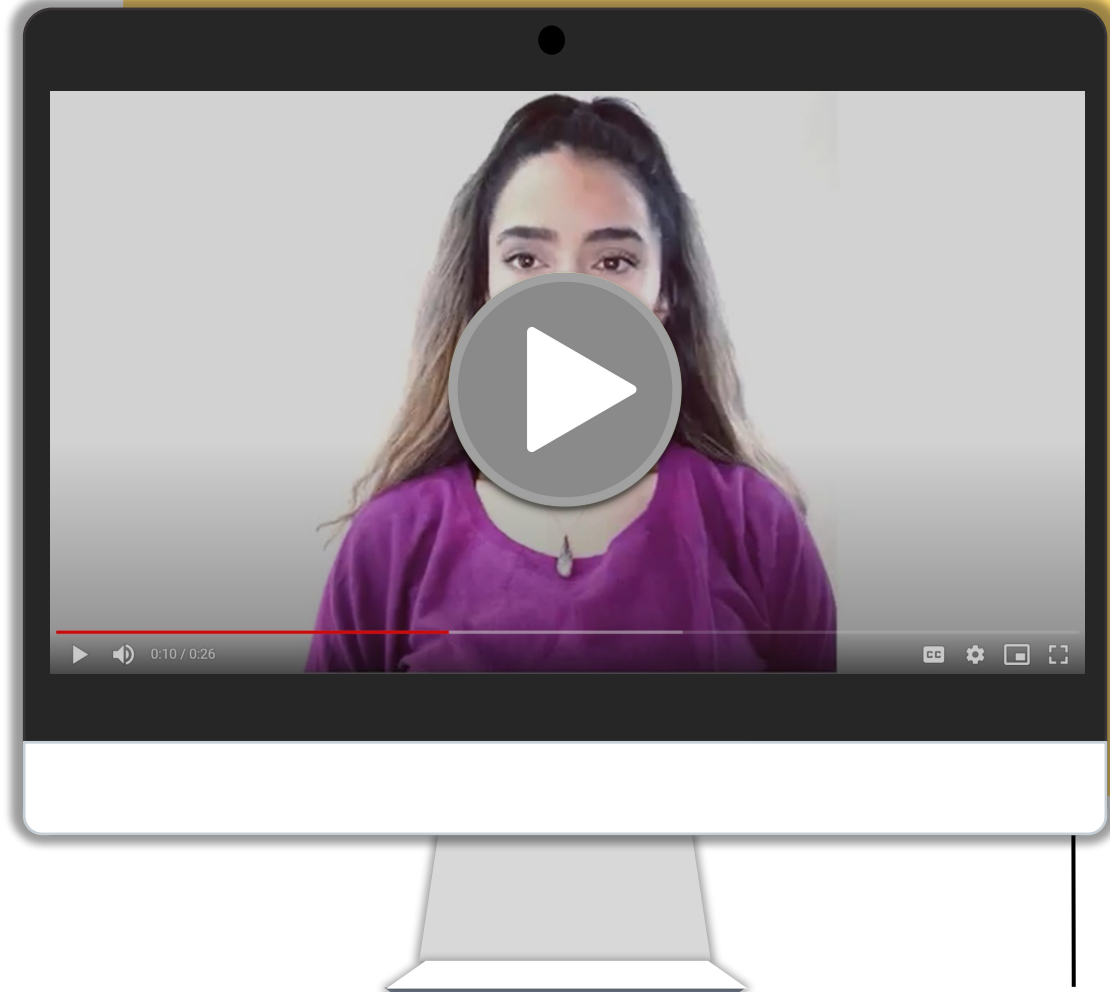
1. **Long trips** could be better served by Access (to mitigate high costs for clients);
2. There should be a balance (break even point) when diverting trips from ADA and TNCs trips;
3. This can be achieved through nuanced same day service **trips cap** considering ridership and home location;
4. We recommend a **dynamic subsidy** that takes into account trip distance and time of the day.
5. Subsidy amount should maximize the number of TNC trips, while minimizing demand shift (breakeven);

## Conclusions

# Introduction

## Welcome to this course!

Watch this short video to learn more about the course purpose, instructor, software, tools and analyses!





Thank you

Q&A

# Webinar questions (optional)

- Tell us more about Access Transportation (clients, trips, service area, unique issues – such as 40% WC users)
- What is the status of the SDS Pilot?
- Based on the Ride Sourcing Research, how was the data most helpful?
  - Could you elaborate on the operational efficiency measure? Future improvement?
  - How can trip diversion be increased? Which of these barriers is removable?

# Q&A (anticipated)

- Could you elaborate on the operational efficiency measure? Future improvement?
- How can trip diversion be increased? Which of these barriers is removable?

1. Investigate break even points for subsidy;
2. Understanding the long term implications of TNCs change in prices;
3. Explore different pilot regulations and guidelines to address the barriers to same day service;
4. Explore the implications of Autonomous vehicles?

**Future  
research**

# Results

- **In the first scenario** which intersects the three condition (trip distance, mobility assistance and operational efficiency), the percentage drops down to only **11.5%** of Access trip that can be diverted to TNCs.
- **In the second scenario** the percentage of trips diversion is shown to increase to **15%** when KCM applies a dynamic subsidy amount.