



Intelligent Transportation Systems  
Joint Program Office

**Mobility on Demand Program  
Webinar 2:**

**Integrating Ridesharing With Transit Operations**

November 9, 2017

# Today's Agenda

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- Purpose of this Webinar
  - To present Mobility on Demand and examples of innovative approaches and technologies
  
- Webinar Content
  - Integration of ride-sharing services into transit operations
  
- Webinar Protocol
  - Please mute your phone during the entire webinar
  - You are welcome to ask questions via chatbox at the Q&A Section
  - Questions will be answered in the order in which they were received



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# Mobility on Demand Overview

Robert Sheehan  
USDOT Joint Programs Office



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# Trends/Setting the Stage



# Societal Trends Driving MOD

## •Redefining Longevity

- By 2045, the number of Americans over age 65 will increase by 77%

## •Population Growth & Urbanization

- In 30 years, our population is expected to grow by about 70 million



# Technological Trends Driving MOD

- **Big Data & Analytics**

- Transportation increasingly relying on data to drive decisions and to enable innovative travel options

- **Real-Time Travelers**

- 72% of Americans own a smartphone, with access to up-to-the minute traveler information



# Mobility & Environmental Trends Driving MOD

## •Increasing Congestion

- On average, Americans spend over 40 hours stuck in traffic each year, costing \$121 billion

## •Mobility Choices

- There is growing popularity of shared mobility and shared modes, such as bikesharing, carsharing, and ridesourcing



# Public or Private?

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# Public or Private?

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# USDOT MOD Program



# USDOT MOD Program Goals

- **Explore emerging technology solutions and new business approaches** that have the potential to transform mobility services.
- **Prepare the transportation industry to deliver innovative mobility solutions** that will enhance transportation efficiency and effectiveness, improve customer service, and foster personal mobility and access to goods and services.
- **Enable the widespread deployment of integrated mobility solutions** that are connected, equitable, and effective to enhance the personal mobility of everyone and provide access to all users.



# What is Mobility on Demand (MOD)?

An **integrated and connected multi-modal** network of **safe, affordable,** and **reliable** transportation options that are **available to all**



- User-focused options to improve personal mobility and access to more destinations
- Promotes choice in personal mobility & optimizes the transportation system through Intelligent Transportation Systems
- Advances connected vehicles & automation applications
- Utilizes emerging technologies & data exchange to enable personal mobility
- Encourages multimodal connectivity & system interoperability



# Who Benefits from MOD?



## Travelers

- Access to more transportation options
- Builds a more efficient, effective, and customer-centered transportation network



## Public Transit Providers

- Connects ALL regional transportation services and assets into a seamless public transit network
- Extends service quality and coverage



## Shared-Use Transportation Providers

- Connects travelers to provider services
- Provides an easy to use, common technology platform for mobility options

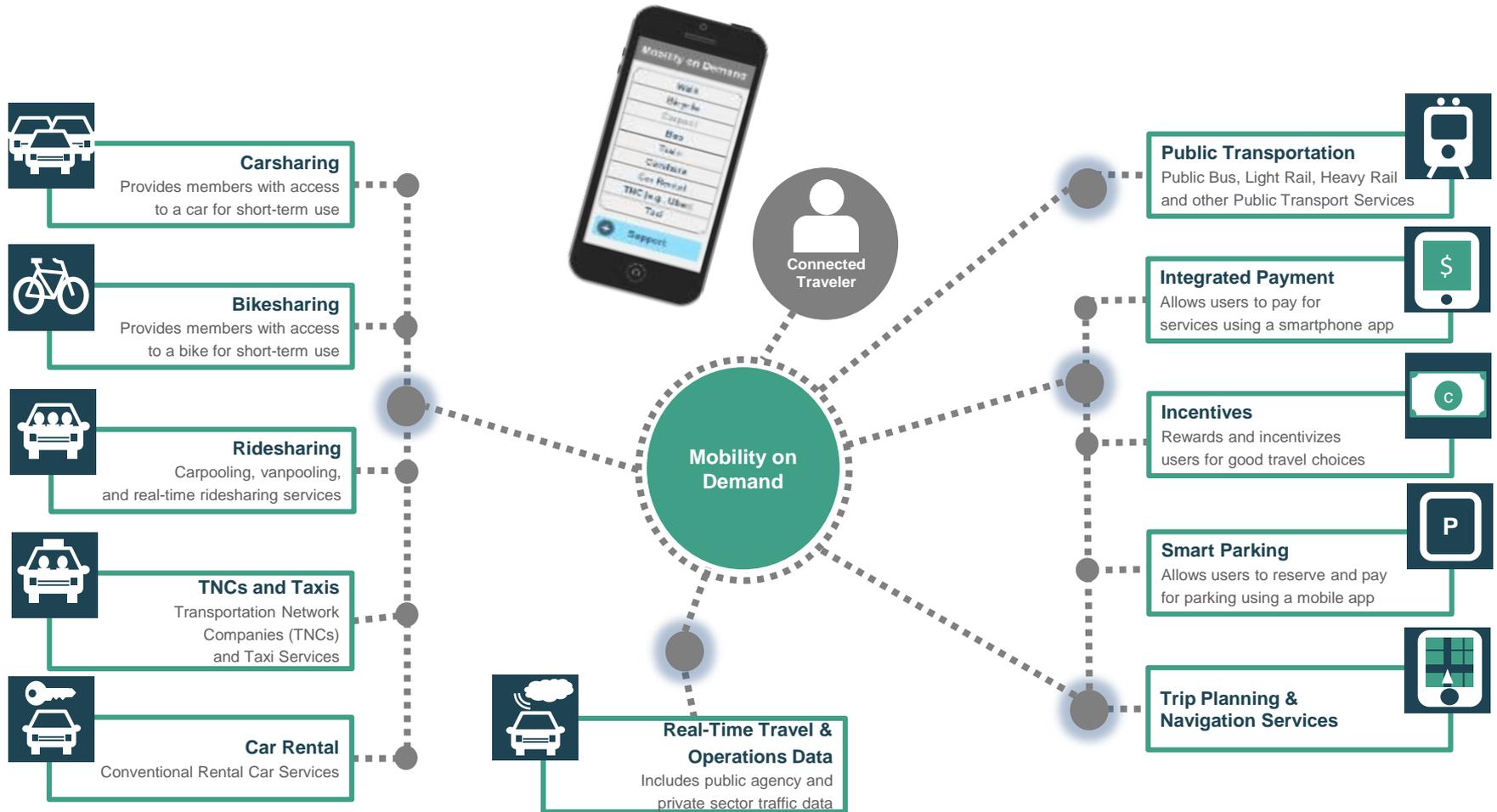


## Mobility Managers

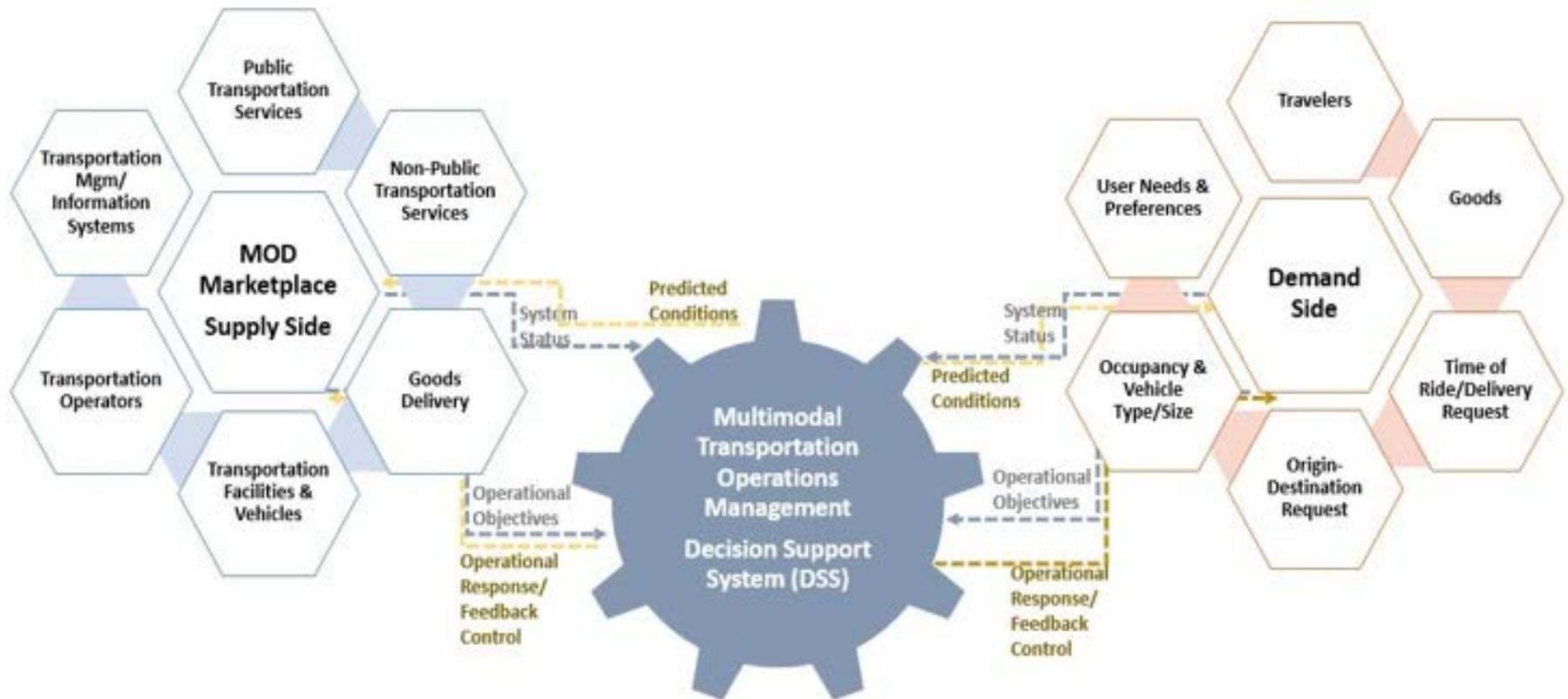
- Streamlines information for transportation options
- Growing employment and transportation partnerships



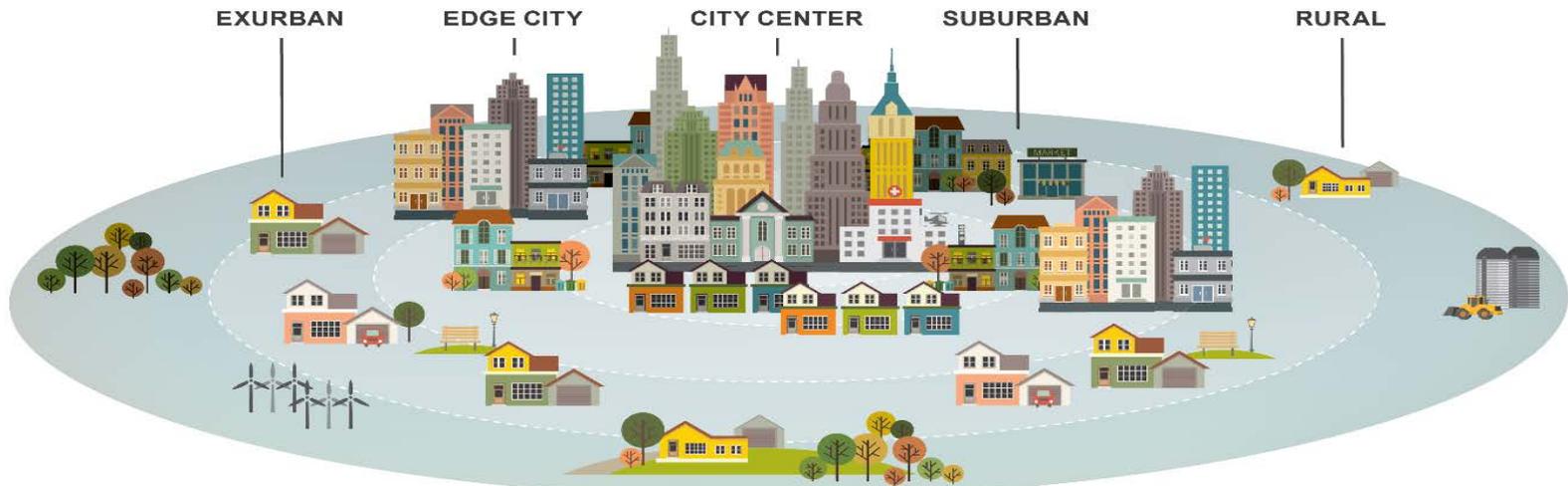
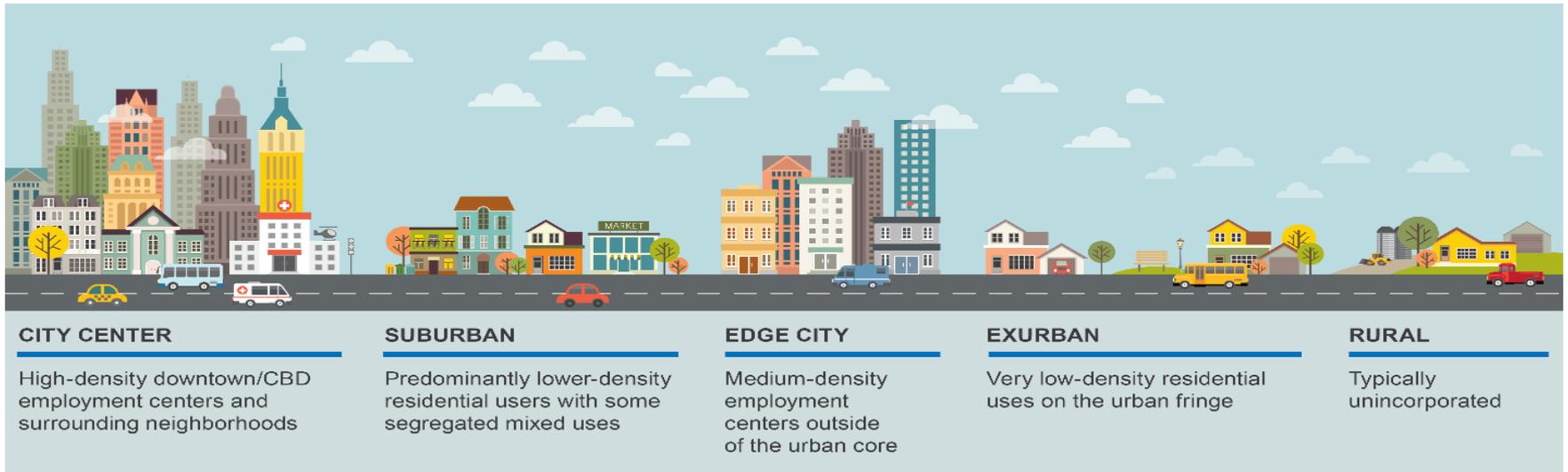
# MOD - User-centric Travel Options



# MOD - Supply and Demand



# Not just city center

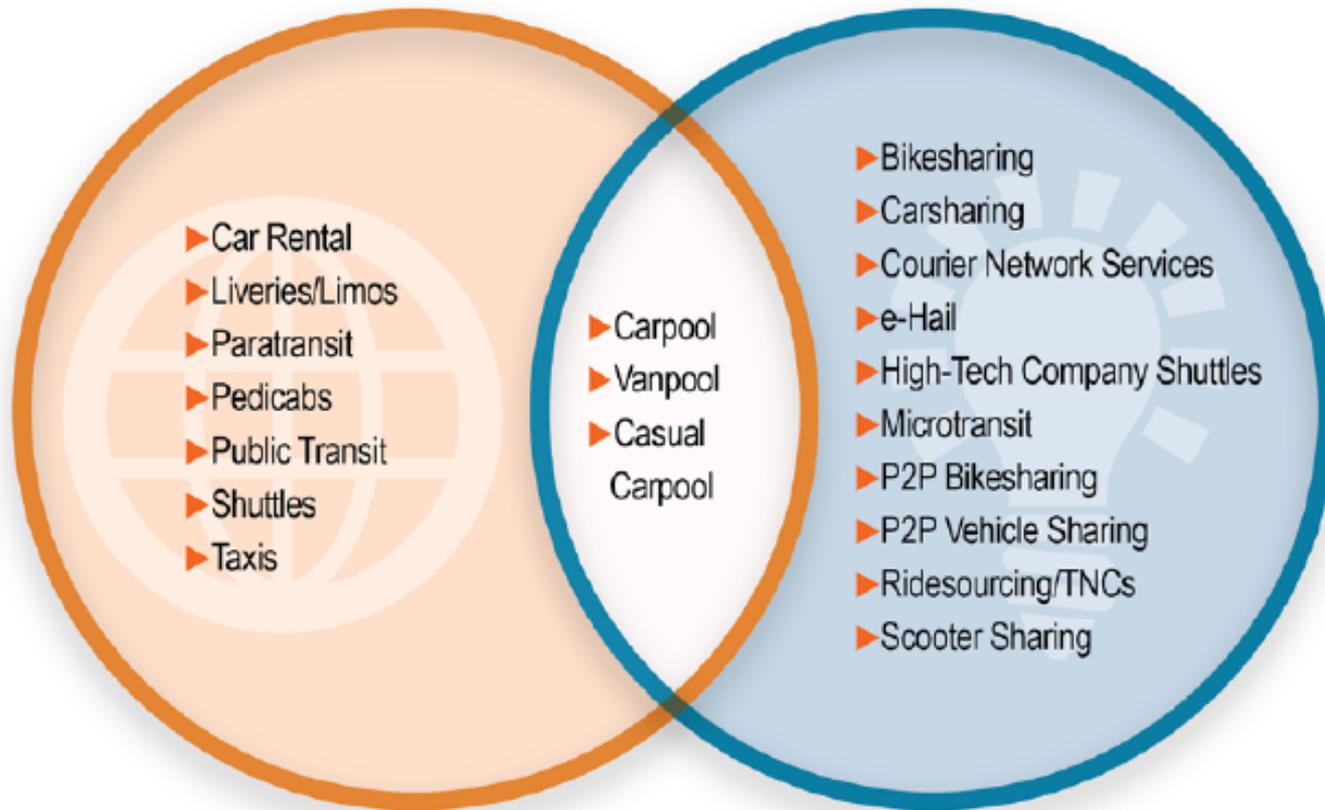


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# MOD Enablers



# MOD and Shared Mobility Sector



Core & Incumbent  
Services



Innovative  
Services



# State of Industry and Business Models: Digital Matching Firms

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Increasingly, consumers and transportation providers are engaging in transactions facilitated by Internet-based platforms—commonly referred to as digital matching firms.

According to the Department of Commerce, digital matching firms typically comprise of four key characteristics:

1. T-based systems, typically available via web-based platforms such as mobile apps on Internet-enabled devices, to facilitate P2P transactions.
2. Rely on user-based rating systems for quality control, ensuring a level of trust, virtually, between consumers and service providers.
3. Service providers/operators often have flexibility in deciding their typical working hours.
4. To the extent that tools and assets are necessary to provide a service, digital matching firms rely on the workers using their own.



# State of Industry and Business Models: Automotive Sector

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Interest in MOD by the automotive sector has taken a variety of forms including acquisitions, investments, partnerships, and internal development of technologies and services that were previously not on the radar of automotive OEM's

Automotive Company	Activity
<b>Ford</b>	Acquisitions: Chariot (microtransit) Investments: Lyft (ridesourcing) Internal Developments: Ford Smart Mobility LLC; a Ford subsidiary working to design and invest in emerging mobility services
<b>General Motors</b>	Acquisitions: Sidecar (ridesourcing) Investments: Lyft (ridesourcing) Partnerships: Lyft; leases electric Bolt cars to Lyft drivers Internal Developments: Maven (carsharing)
<b>Fiat Chrysler</b>	Partnerships: Google/Waymo (shared automated vehicles); provides Chrysler vans to Waymo as test vehicles
<b>Daimler</b>	Acquisitions: car2Go (one-way carsharing), Moovel (multimodal trip aggregator), Hailo (e-Hail taxi app) Partnerships: Matternet (drones)
<b>Volvo</b>	Partnerships: Uber (ridesourcing); joint venture to develop fully autonomous vehicles Partnership: Volvo with its new digital key app paired with Urb-it, a shopping and delivery startup, to deliver goods.
<b>Toyota</b>	Investments: Uber (ridesourcing) Partnerships: Uber; lease vehicles to Uber drivers

# State of Industry and Business Models: Shared Mobility Sector

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In North America, the first shared mobility passenger services launched in 1994. Since then, shared mobility passenger and courier services have grown rapidly. Although shared mobility traces its origins to city centers, numerous shared modes continue to expand to markets outside of the city center.

## Benchmarking Data

- As of January 2017, there were 21 active carsharing programs in the United States with over 1.4 million members
- In April 2011, Zipcar, a carsharing company providing short-term (e.g., hourly) vehicle rentals, raised \$174 million in its initial public offering, giving it a valuation of \$1.2 billion. The Avis Budget Group acquired Zipcar for \$500 million in January 2013
- As of April 2016, there were 32,200 bikes at 3,400 stations across 99 cities in the US
- In January 2016, various ridesourcing services were available in 175 metropolitan areas
- As of July 2011, there were an estimated 638 ridematching services in North America.
- Advancements in courier services (both technologies and service models) are transforming how consumers access goods and services. One app-based courier service, Postmates, was making more than one million deliveries per month, as of April 2016

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# MOD Constraints and Issues



# MOD – Travel Constraint Types

Constraint Type	MOD Opportunities	MOD Challenges
<b>Spatial</b>	<ul style="list-style-type: none"> <li>Public transit operators and ridesourcing/TNC first- and last-mile partnerships</li> <li>Microtransit for lower-density areas</li> <li>First-and-last mile goods and digital delivery to areas lacking community resources (e.g., goods delivery, remote healthcare, online learning)</li> <li>Fixed route, flexible route</li> </ul>	<ul style="list-style-type: none"> <li>Higher operating costs (passenger movement and goods delivery) in lower-density exurban and rural settings</li> <li>Limited curb space for increasing variety of mobility services</li> <li>Bandwidth limitations that may limit or inhibit MOD passenger and goods ordering capabilities.</li> </ul>
<b>Temporal</b>	<ul style="list-style-type: none"> <li>Dynamic microtransit</li> <li>Late-night ridesourcing/TNC and shuttle services</li> <li>Commuter carpooling services</li> </ul>	<ul style="list-style-type: none"> <li>Wait-time and travel-time volatility on congested roadways</li> <li>Unpredictable wait times due to supply fluctuations</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>MOD subsidies for low-income users</li> <li>Multiple payment options for shared mobility services</li> <li>Multimodal hubs with Wi-Fi access</li> <li>Free delivery and low-cost flat-rate subscription delivery services (e.g., Amazon Prime, ShopRunner etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Credit/Debit Card payment</li> <li>High cost for longer distance and peak-demand trips</li> <li>Maintaining affordability, while providing livable wages</li> <li>High one-time annual costs of delivery subscription services.</li> </ul>
<b>Physiological</b>	<ul style="list-style-type: none"> <li>Older adult-focused MOD services</li> <li>Voice activated mobility app features</li> <li>Goods delivery and digital delivery services that eliminate the need for a trip (e.g., substituting goods delivery for people movement).</li> </ul>	<ul style="list-style-type: none"> <li>Maintaining legacy technology access</li> <li>Ensuring adequate driver training</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>Ridesourcing/TNC app interface that minimizes sociodemographic profiling</li> <li>Targeted outreach to low-income and minorities</li> <li>Website and app information in user's native language</li> </ul>	<ul style="list-style-type: none"> <li>Attracting marginalized groups</li> <li>Driver prejudice against riders</li> <li>Providing security at un-manned vehicle stations</li> </ul>

# MOD – Issues to consider

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- Economics
  - Economic impacts of MOD
  - Economic costs of MOD on Public Infrastructure
  - Commodification of Transportation
  - Economic impacts of reduced vehicle ownership
  - Cost savings for public agencies
  - Economic impacts of MOD on households/individuals
  - Economic impacts of changing consumer preferences
- Travel Behaviors
  - Impacts on public transportation
  - Incidental trips
  - Regional variations
  - Goods movement
- Productivity, macro and micro
- Impact of cultural norms on pricing and modal choice
- Energy and environmental impacts
- Social Equity and Environmental justice
  - Disabilities
  - Unbanked/underbanked
  - Digital divide
  - Other populations
  - User demographics
- Policy and regulations
- Physical infrastructure needs
- Data management, sharing, and standardization
- Transportation planning
- Analysis and modeling

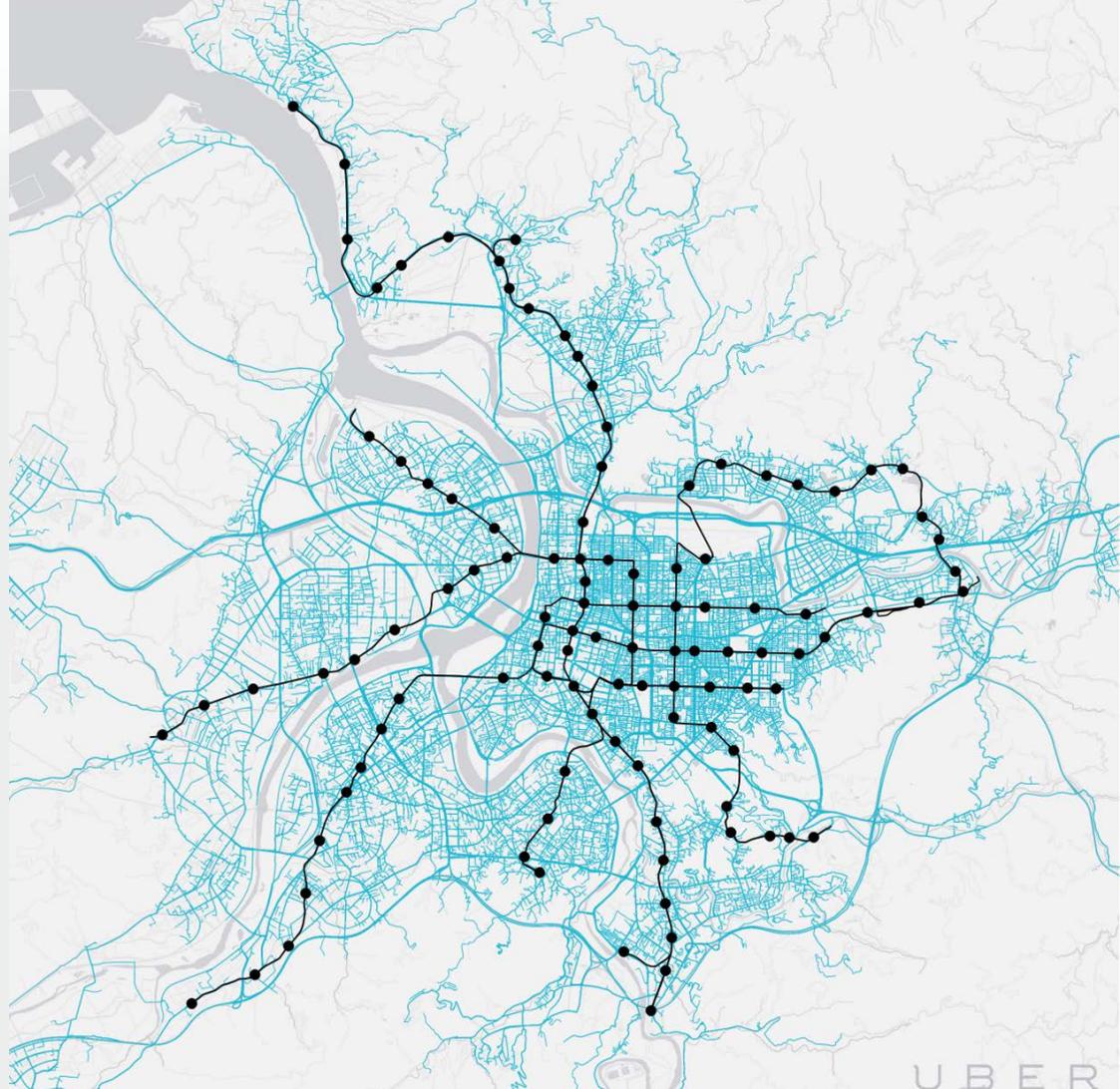


UBER

# UBER'S IMPACT ON CITIES

Paige Tsai, Transportation Policy & Research Senior Associate

NOVEMBER 2017



# Agenda

1. Uber overview
2. How Uber impacts cities
3. Working with public transit
4. Trip Planning Apps



UBER

Uber overview

A dark-themed world map with numerous small, glowing cyan dots scattered across the continents, representing Uber's service locations. The dots are most densely packed in North America and Europe, with more sparse distributions in South America, Africa, Asia, and Australia.

70+  
Countries

UBER

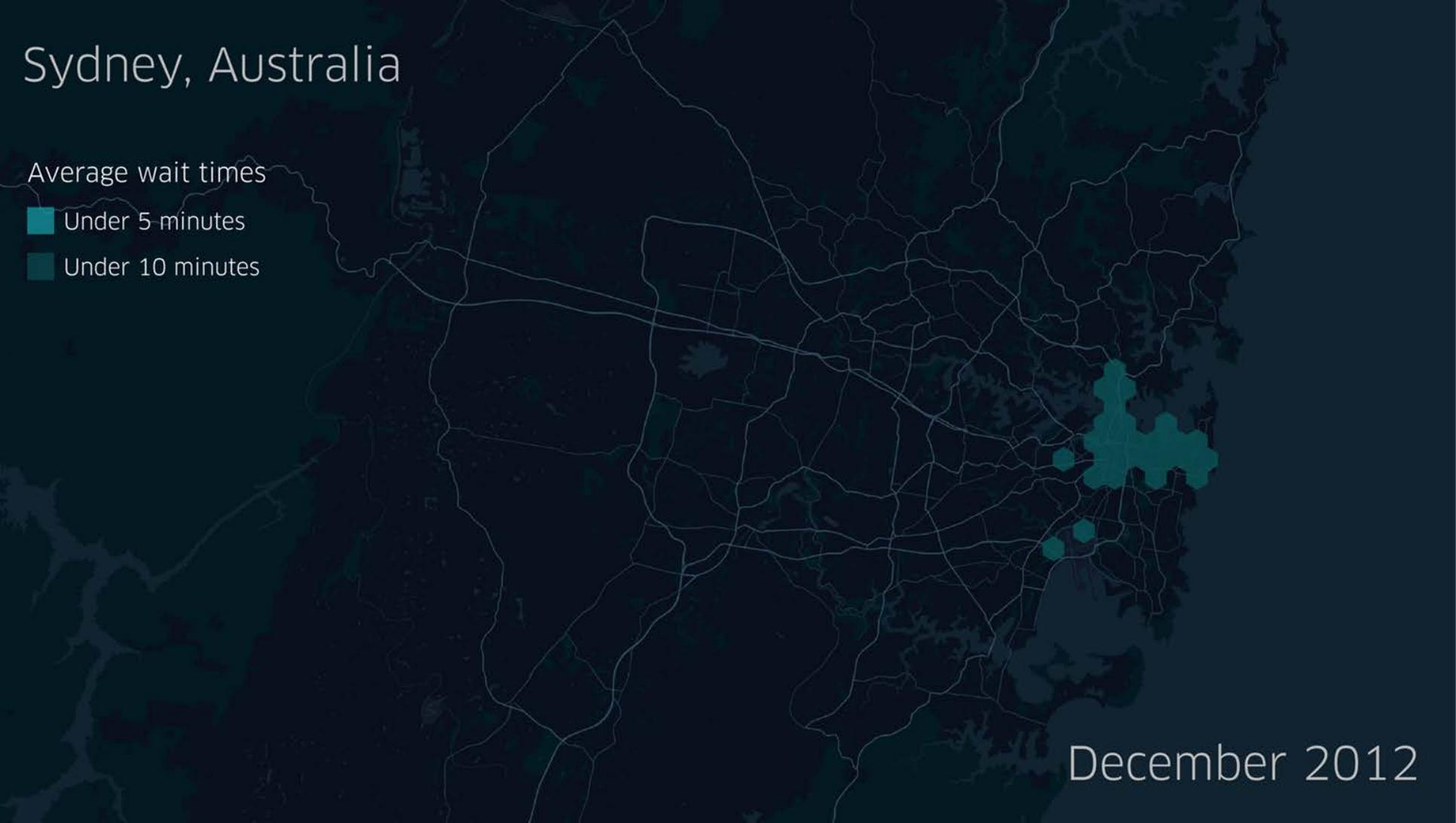
Uber's impact on cities

# Sydney, Australia

Average wait times

Under 5 minutes

Under 10 minutes

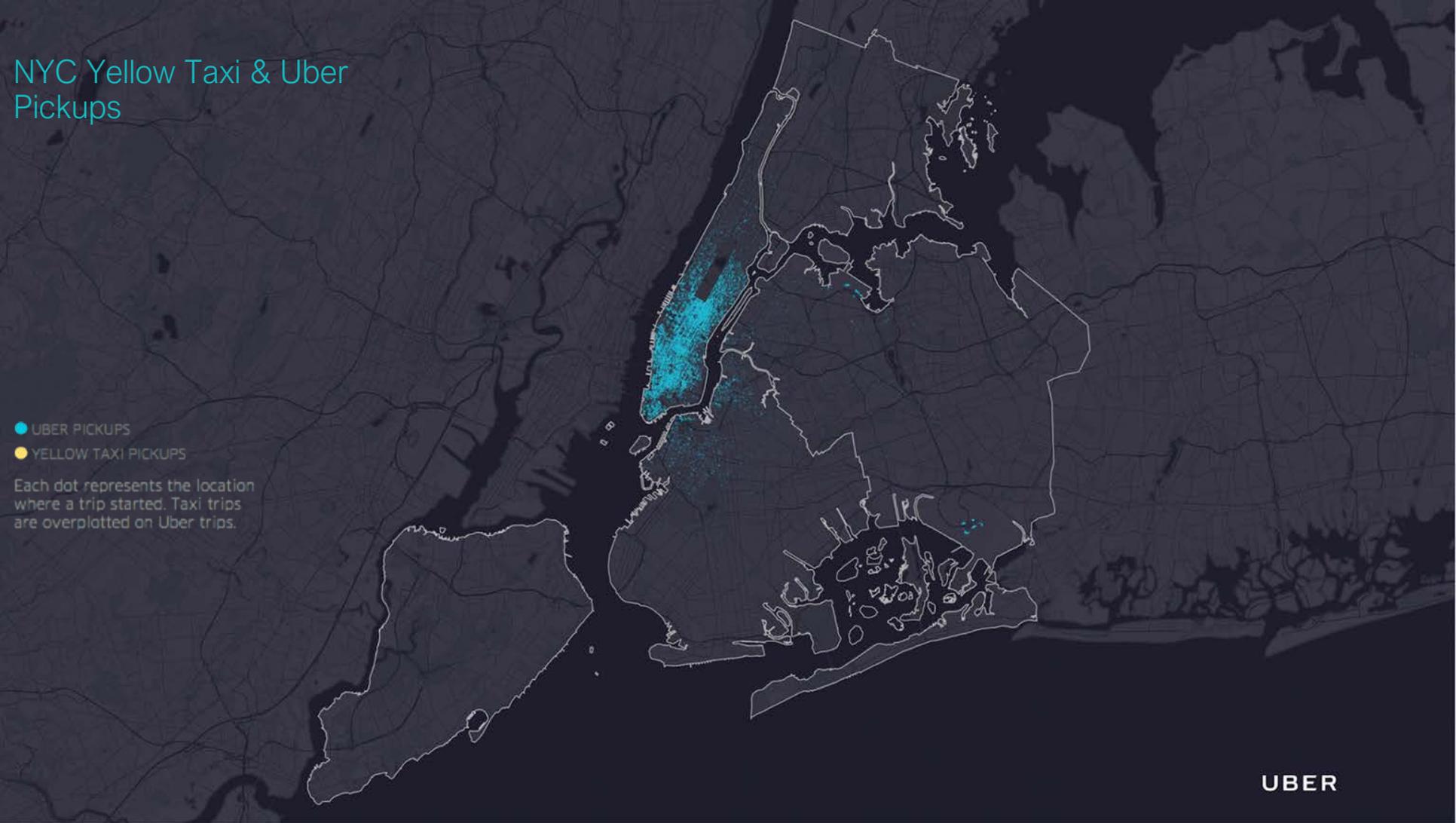


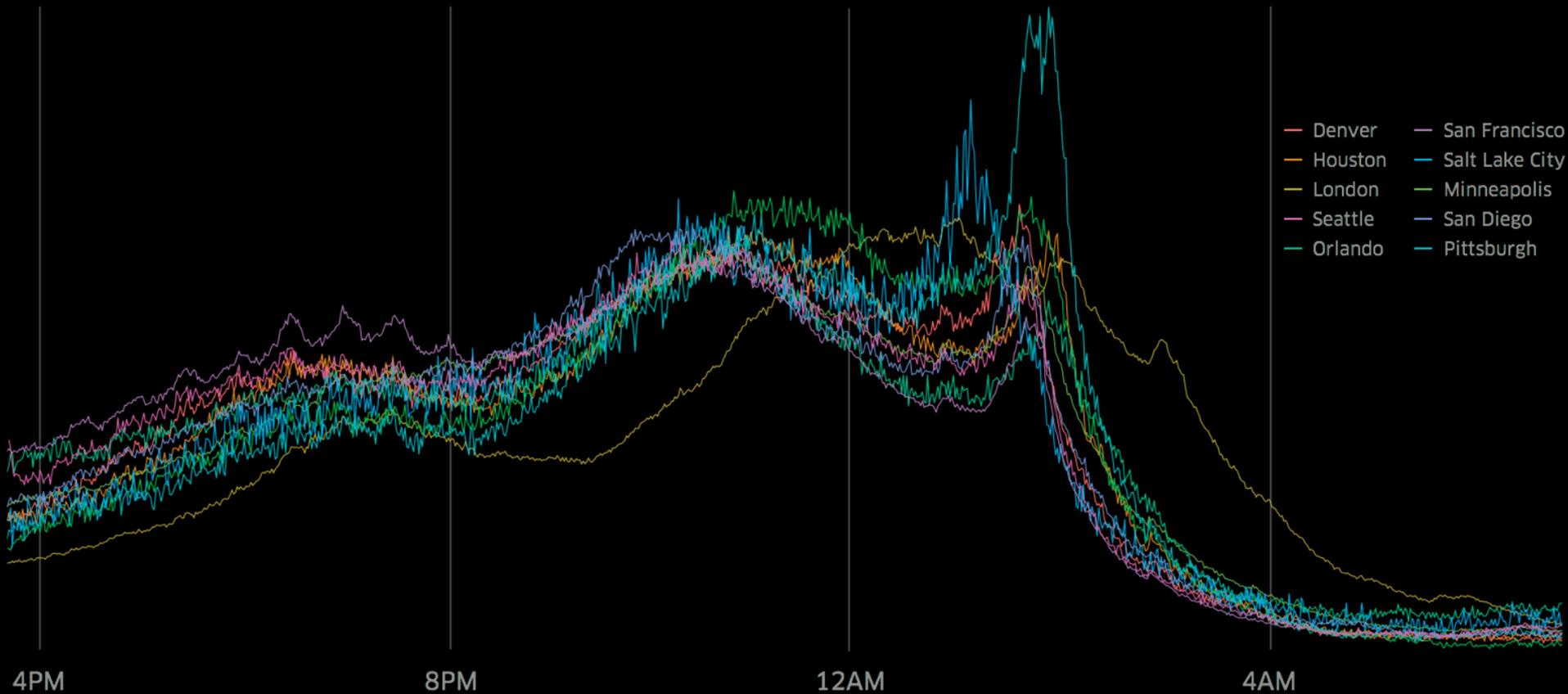
December 2012

# NYC Yellow Taxi & Uber Pickups

- UBER PICKUPS
- YELLOW TAXI PICKUPS

Each dot represents the location where a trip started. Taxi trips are overplotted on Uber trips.





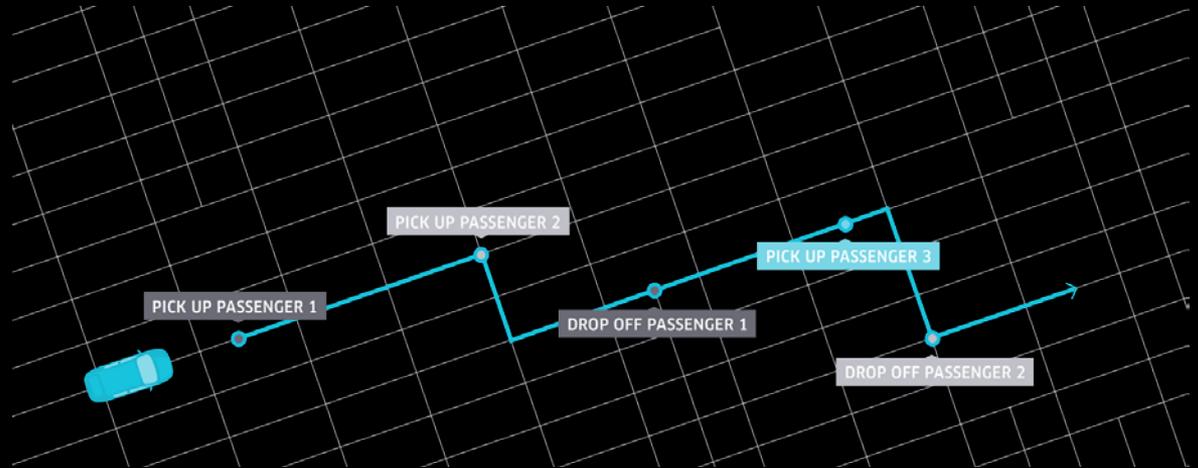
## Reducing congestion with uberPOOL

More efficient.

Drivers spend more time per hour earning money on longer trips—without the downtime between passengers

More cost-effective.

Riders share the cost between them, while adding only a few minutes of time per trip.





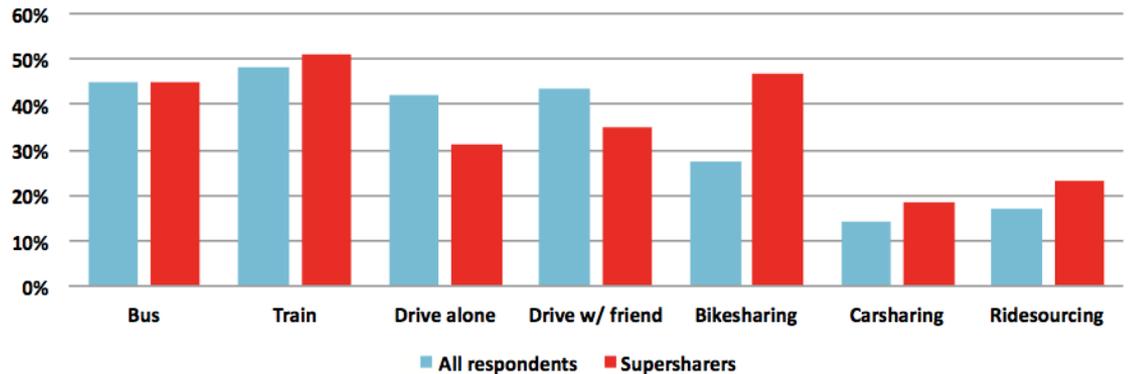
UBER

uberPOOL makes up 20% of our trips globally today, in cities where it's available

## The rise in shared modes

The more people use shared modes, the more likely they are to use public transit, own fewer cars, and spend less on transportation overall.

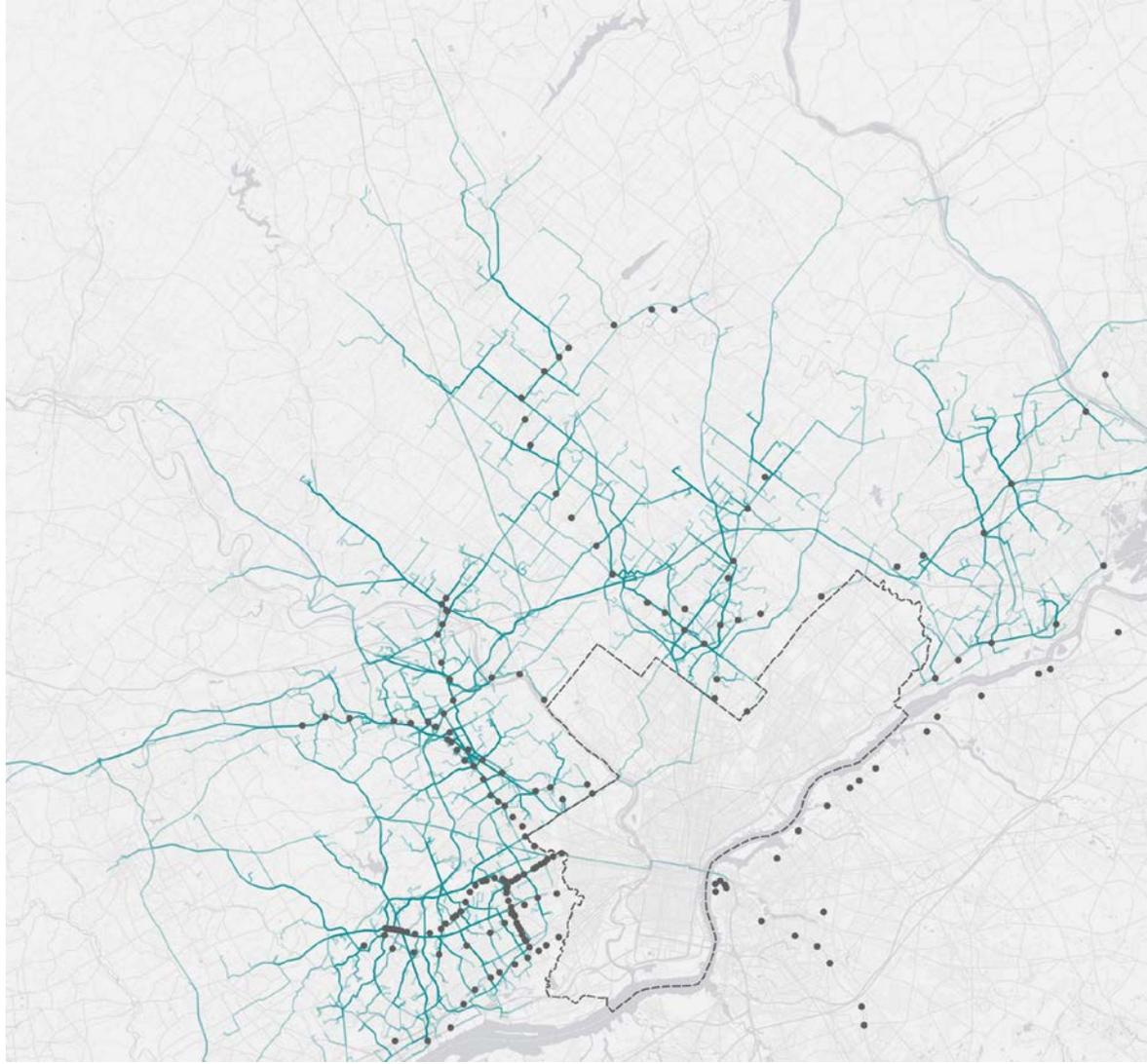
**Figure 2:**  
Frequent use (once or more per week) by mode—supersharers v. all respondents<sup>2</sup>



# UBER EXTENDS BEYOND EXISTING TRANSPORTATION

PHILADELPHIA, PENNSYLVANIA

- RAIL/SUBWAY STOPS
- UBER TRIPS
- ▭ PHILADELPHIA COUNTY BOUNDARY

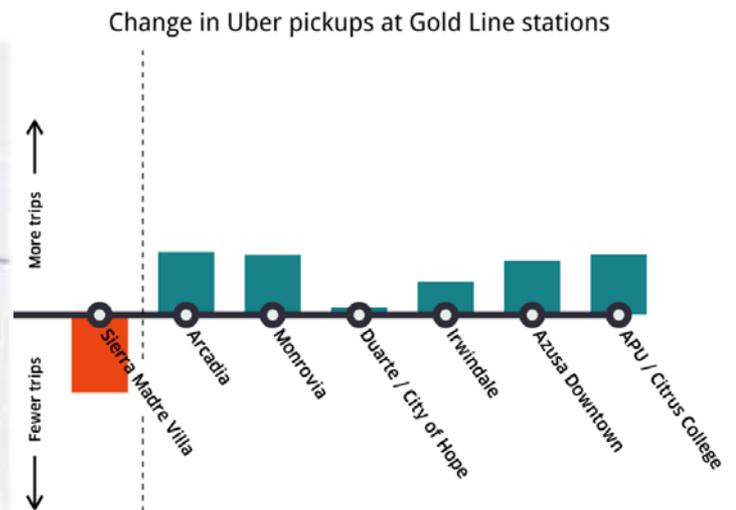
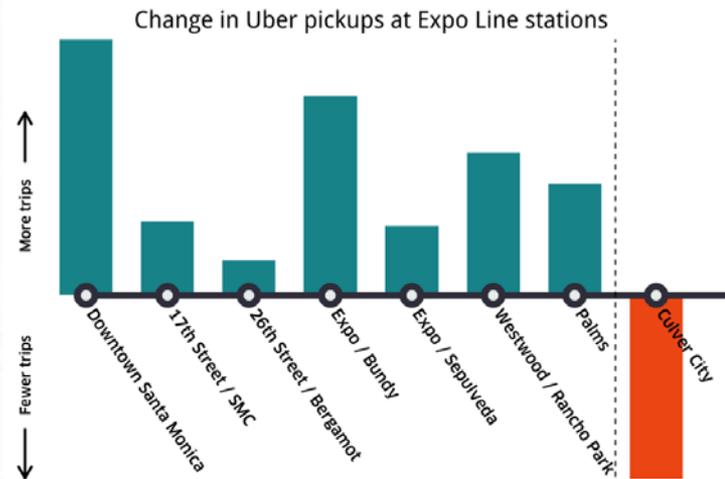


06:30:00 AM





Los Angeles Metro Rail 2016 extension stations (green) and previous end-of-line stations (orange)



UBER

Partnering with transit agencies

# How Uber can help transit agencies

1. Help fill the gaps in transit
1. Providing access to underserved communities
1. Alleviate the demand for parking
1. Reduce costs of underutilized routes or services



# Global Transit Partnerships Snapshot



SEATTLE, WA: SDOT



SAN FRANCISCO, CA: CALTRAIN

SACRAMENTO, CA: SAC RTD

LIVERMORE, CA: LAVTA

LOS ANGELES, CA: METRO

SAN DIEGO, CA: MTS



LONE TREE, COLORADO



DENVER, COLORADO: RTD



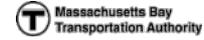
DALLAS, TX: DART



DENTON, TX: DCTA



MINNEAPOLIS, MN: METRO TRANSIT



BOSTON, MA: MBTA TRANSIT

SOUTHEAST PENNSYLVANIA: SEPTA



SUMMIT, NJ

ATLANTA, GA: MARTA



CENTRAL FL: CITY PLANNING

TAMPA BAY, FL: PINELLAS SUNCOAST TRANSIT

MIAMI, FL: DTPW



## Alleviating the demand for parking: Summit, NJ

During commuting hours, residents enrolled in the existing parking program, can ride Uber to an NJ Transit hub for free. Residents who aren't enrolled, are charged a flat \$2.



## Increasing access to transportation & reducing costs: MBTA

- In September 2016, Massachusetts Governor Baker and leaders in the disability community announced the pilot partnership with MBTA
- Uber to subsidize on-demand transportation option to better serve customers of the RIDE and reduce paratransit costs for the MBTA



## Pilot program details: MBTA

- The RIDE: door-to-door service to people with disabilities who are unable to access or use the MBTA's fixed-route system, which services a 712 square mile area that includes 60 cities and towns.
- Passengers will pay just \$2 per ride, the MBTA will cover the rest of the Uber (or Lyft) trip, up to \$13.
- Before the pilot launched, the average paratransit ride cost the MBTA \$31. Under the new program, Uber rides will cost the agency an average of \$13 per trip

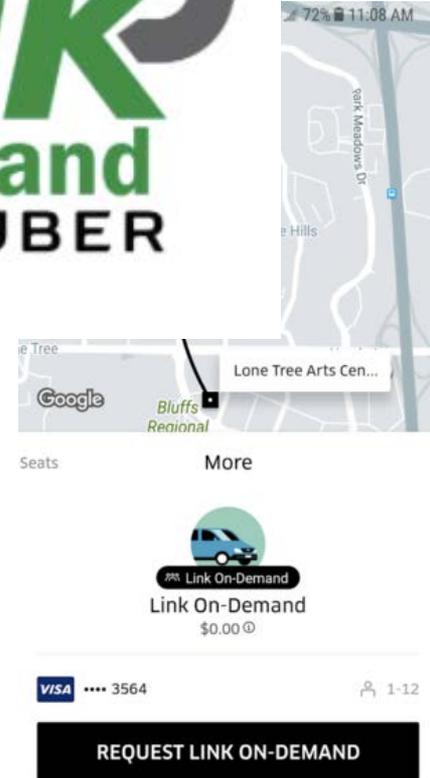
### RESULTS

- In just over 5 months, Uber and Lyft have helped connect RIDE customers and drivers to a convenient and safe on-demand transportation option 10,000 times.
- In February 2017, Governor Baker announced the MBTA is opening up the program to everyone who has signed up, including the 200+ people on the waitlist.

*“This is 70 percent cheaper than our existing service. If it works, we certainly hope that we would expand it while dramatically reducing our total cost per trip.”*  
– MBTA GM Brian Shortsleeve

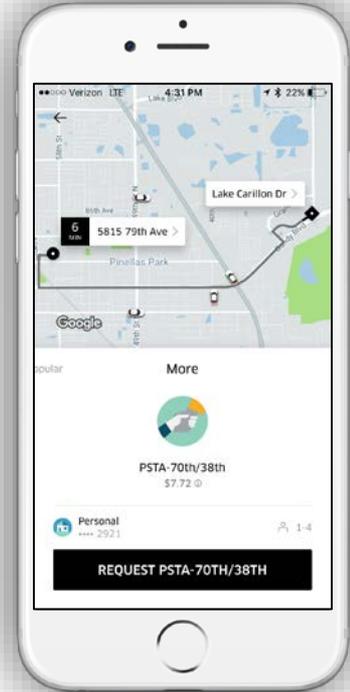
## Connecting to existing vehicles: Lone Tree, CO

- Link on Demand offers FREE door-to-door on-demand rides within the Lone Tree city limits
- Residents can request the shuttle on-demand through the Uber app.
- Shuttles are wheelchair accessible
- Operates 7 days a week



## Uber's technology makes partnering easy

- In-app messaging to showcase partnership and encourage local utilization
- Transit 'view' incorporated within the Uber app for maximum visibility, if desired
- Geo-fence technology to target transit stops and other important areas directly within the Uber app
- Custom subsidy structure to allow agencies to pay all or part of the fare



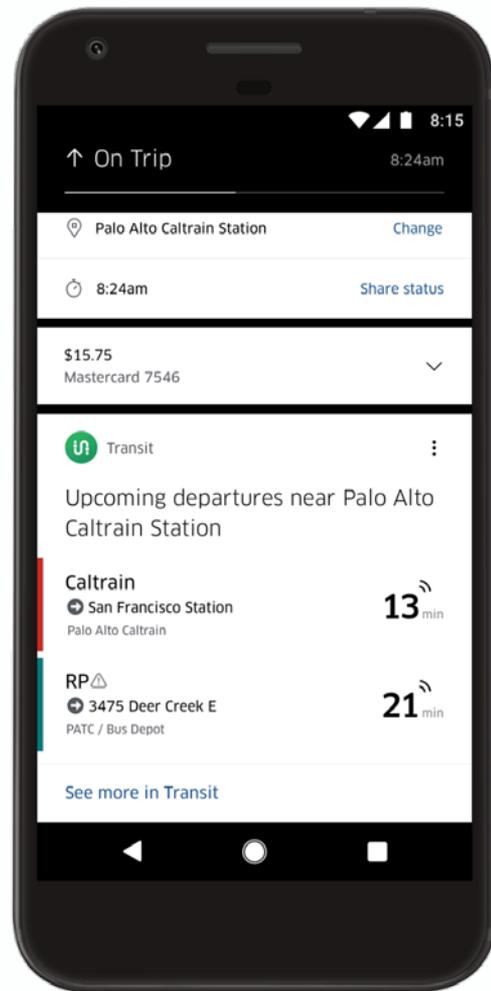
UBER

Transit API Integrations

## Uber + Transit Makes it Easy to be Multimodal

“Our integration with Uber is a perfect match, as we both envision a future in which every journey is shared using a combination of transit options.”

Jake Sion, Chief Operating Officer, Transit



## Integration with CityMapper

### A better connected city.

Access more parts of the city that might not be well supported by public transportation.

### Reduced costs.

More affordable options than taking an Uber all the way, especially for long distances.

### Reduced travel times.

Sometimes trains are faster. Sometimes cars are faster. Sometimes combining them is faster.

### Reduced traffic and parking.

Public transit + Uber can mean fewer cars on the road and less congestion.



Public Transit Only



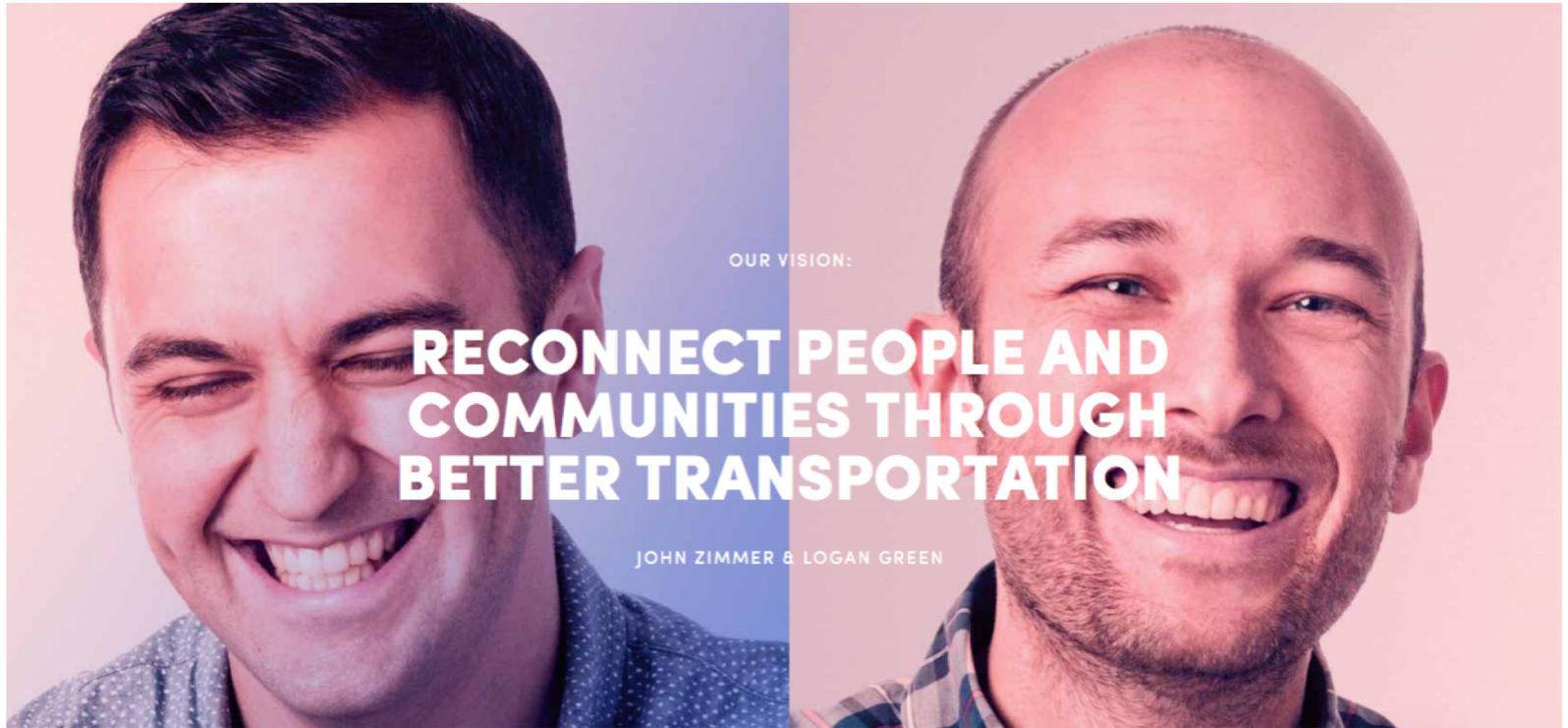
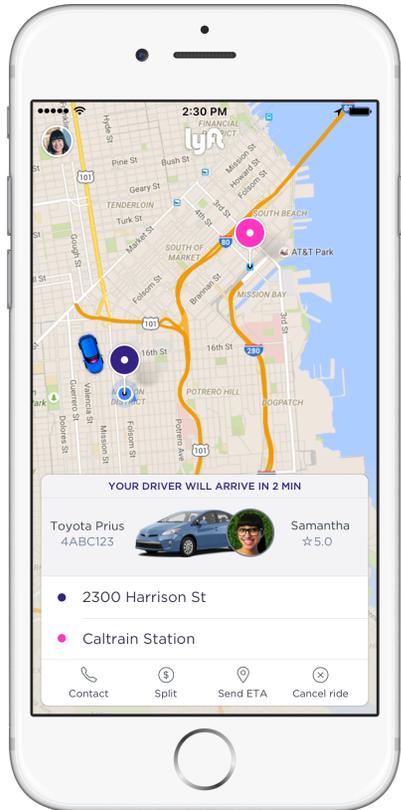
Public Transit + Uber

UBER

# Connecting Communities

Partnering to improve regional mobility



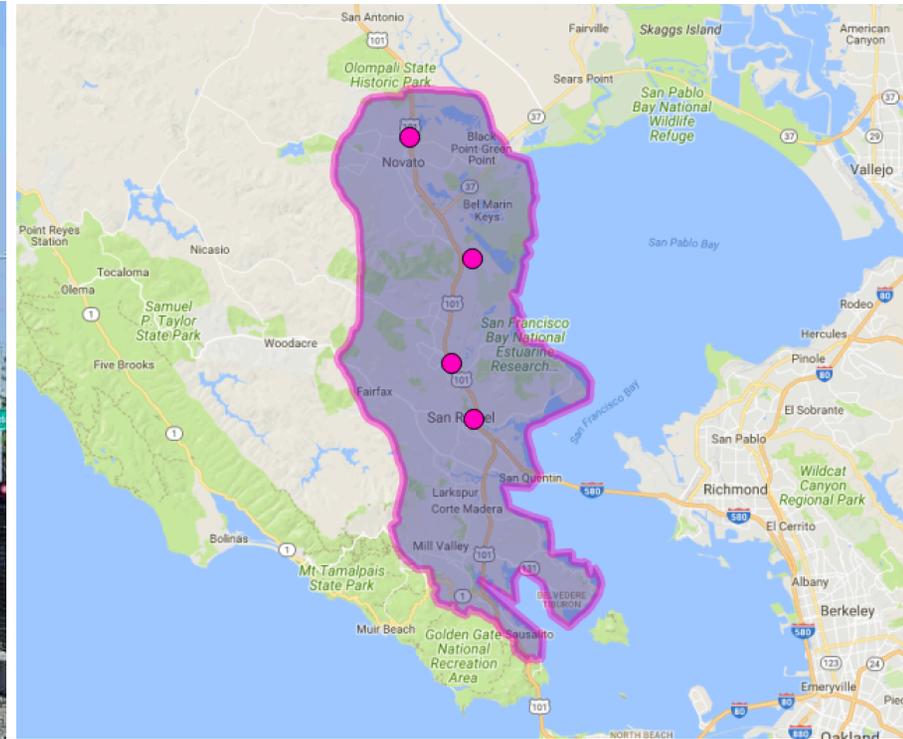
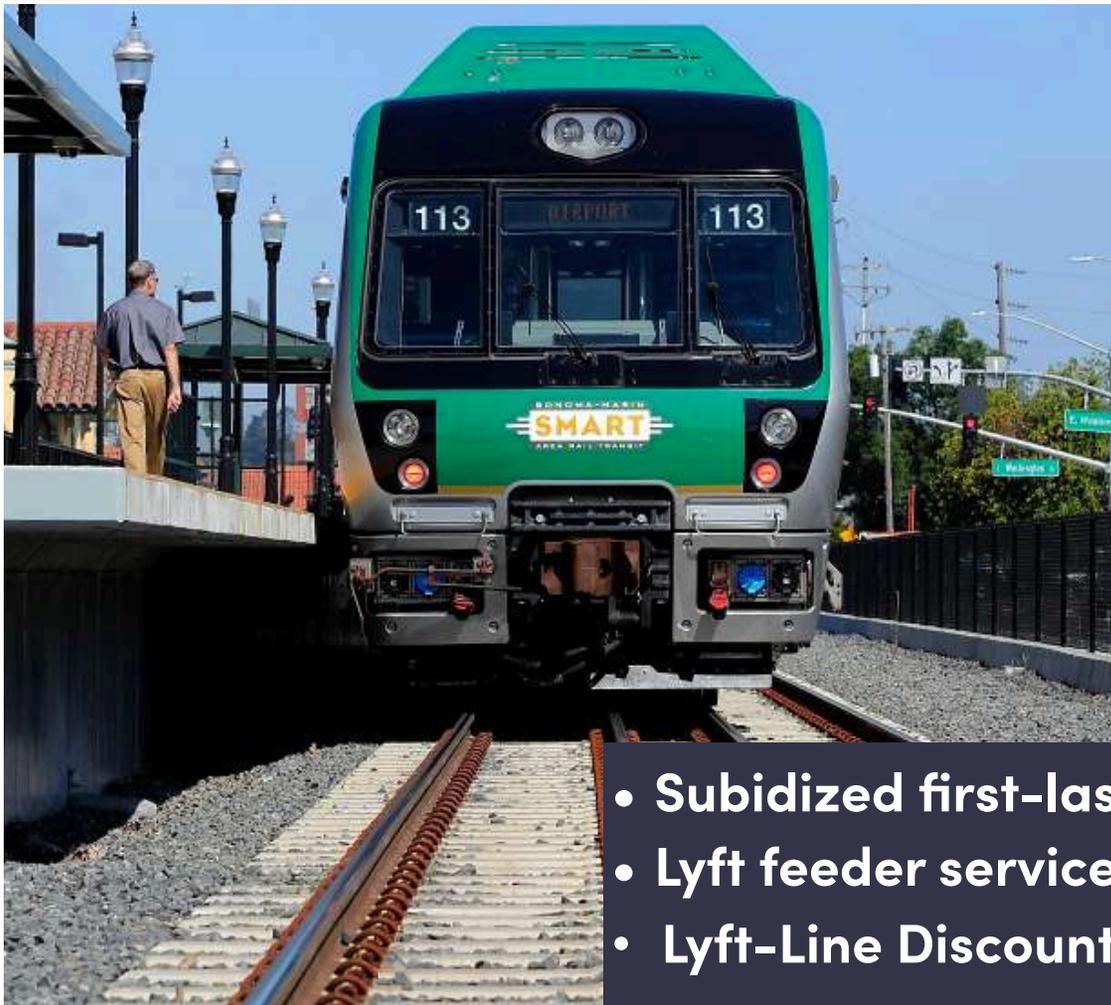


# Pilots and Types

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# First-Last Mile Services

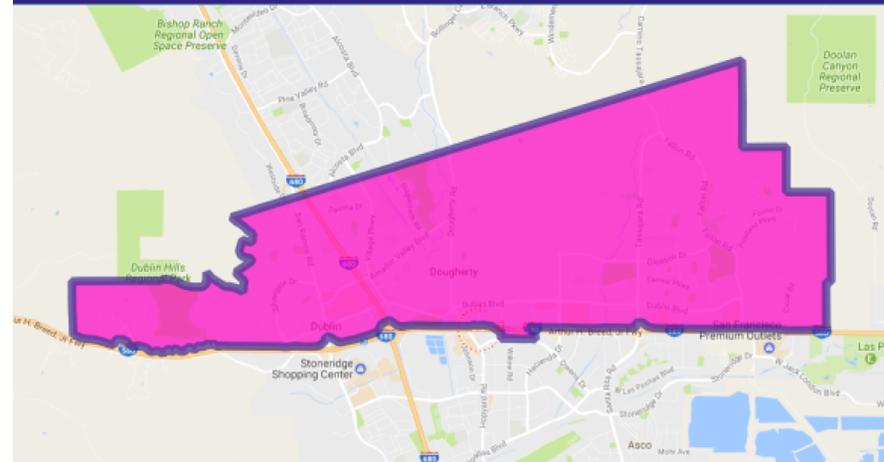


- Subsidized first-last mile rides into new stations
- Lyft feeder services encouraging behavior change.
- Lyft-Line Discounts: Encouraging Shared commuting.

# Alternative Dial-a-Ride Services

## GODUBLIN

50% off up to \$5 for any of your Lyft Line rides in the City of Dublin, CA  
Get discounted rides until June 30<sup>th</sup> or while budget lasts



- Increase convenience of suburban feeder/circulator services.
- Encourage ridesharing to BART stations to alleviate parking congestion.
- Suburban Services study being conducted.



## Paratransit Programs

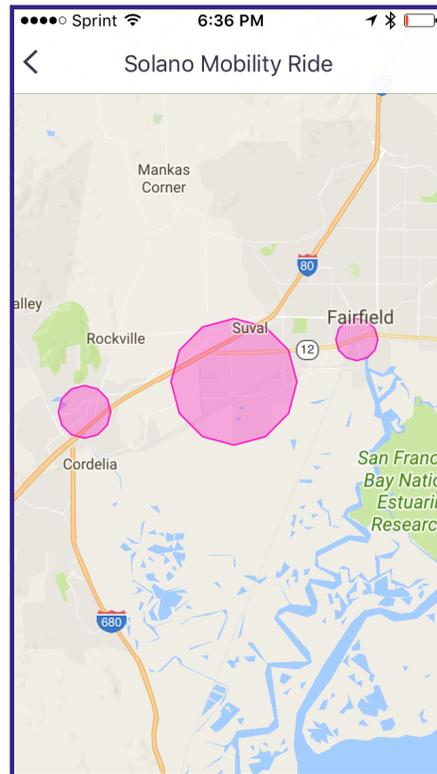
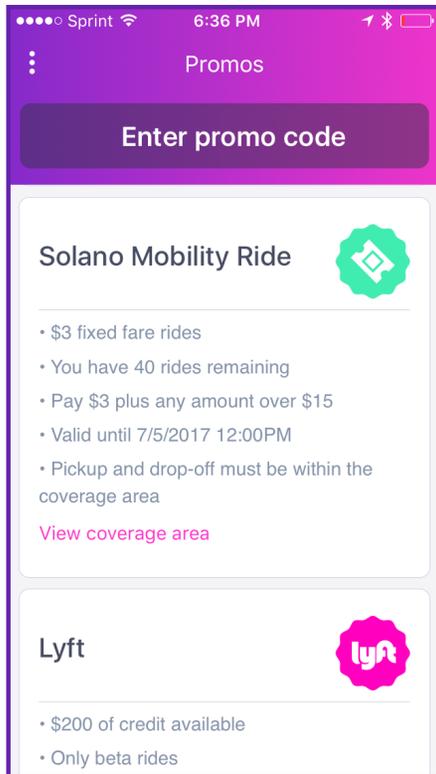
- **MBTA:** Creation of On-Demand Paratransit Program alternative.
- **Rabbit Transit:** Overflow provider to improve program performance.
- **Lyft integrating** with Paratransit platforms to ease program tracking.

***Programs have improved customer mobility & reduced program costs***

*“The success of this partnership . . . is changing lives and improving reliability for the MBTA’s paratransit customers who rely on THE RIDE for their daily travels.*”

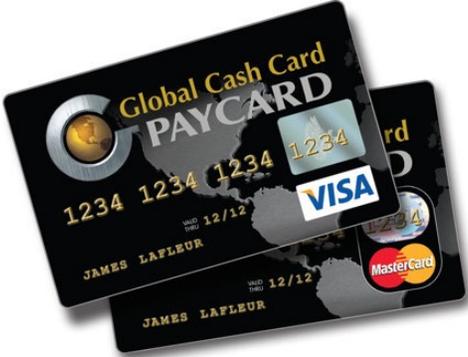
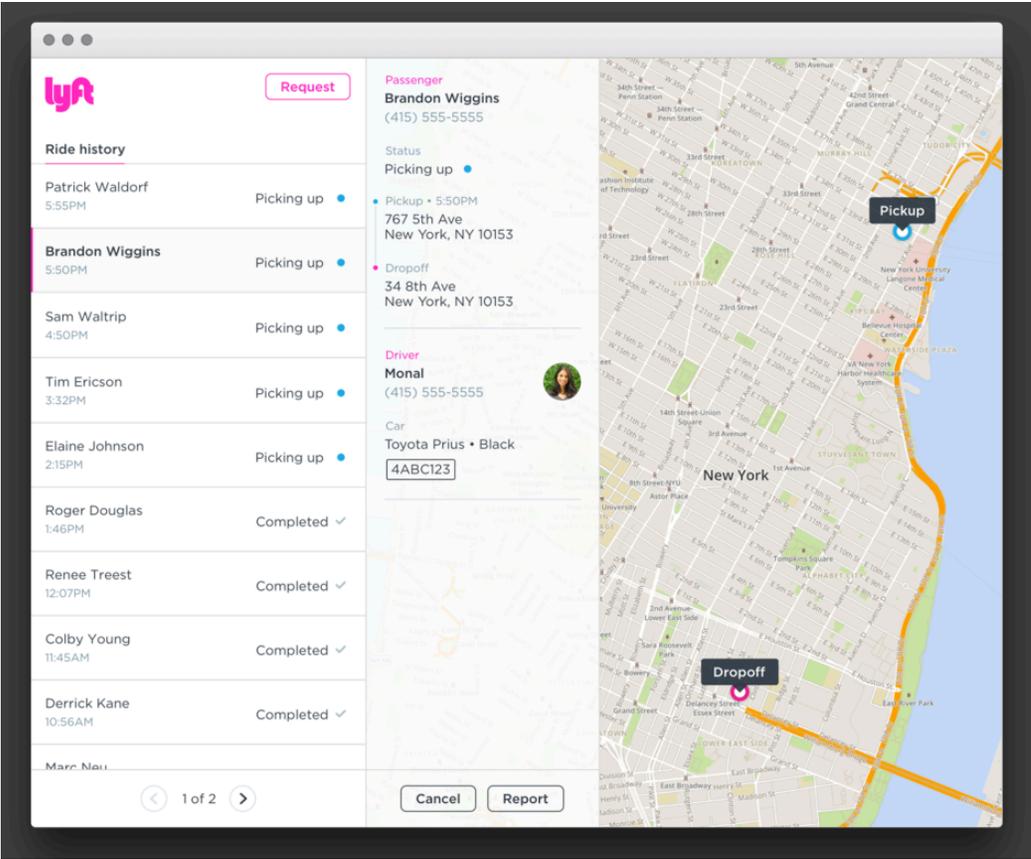
*- Massachusetts Governor Charlie Baker, February 2017*

# Features to Support Transit Partnerships

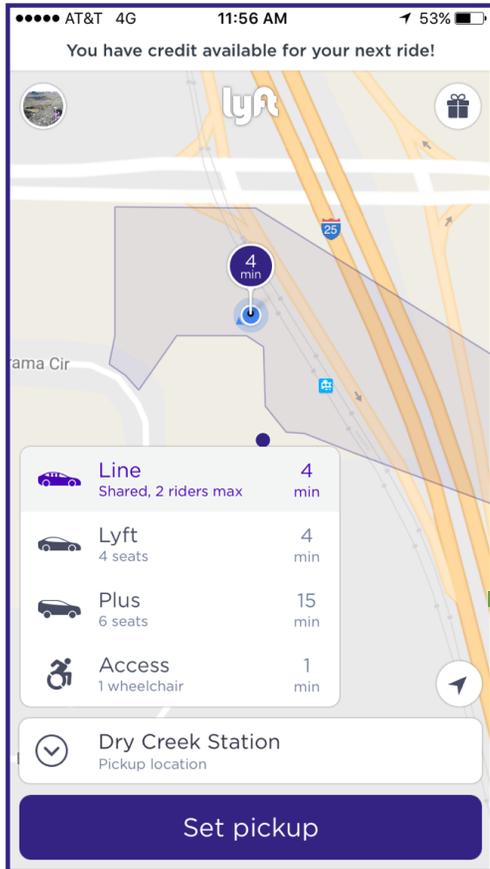


- **Geofencing Parameters**  
Restrict subsidized rides to specific areas
- **Timeboxing Parameters**  
Restrict subsidized rides to specific times
- **Support Eligibility Based Programs**  
Direct distribution of programs to eligible users
- **Flexible Fare Structures**
  - Fixed Fare of \$X;
  - % Discount up to \$Y; or
  - Split Fare Offerings

# No Smartphone. No Bank. No problem.



# WAV Mode and Service



- **Lyft Access Mode**

- Additional Mode to view/book lift-equipped vehicles

- **Vehicle Supply through partnerships.**

- **Collaborate with trusted local partners:** NEMT, NGOs

e.g.  **Whistlestop**

- **Additional Subsidies for WAV rides**

- Trip premium offered to cover the additional costs associated with WAV trips.

# Keys to Success

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- **Service Planning Sessions.** Planning/Operation meetings to develop service design and technology implementation plans.
- **Cross-functional Launch Meetings.** Marketing, Operations, Planning, and Customer Service Team sessions allow for seamless and coordinated program launch.
- **Engaging Local Partners** in program implementation and outreach.

# Partnership Goals

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- Partner with communities to improve regional mobility.
- Drive more users onto regional transit systems.
- Reduce single occupancy vehicle travel and car ownership.
- Reclaim parking spaces for more productive uses



**Paul Davis**  
**Transit Partnerships Manager**  
[pdavis@lyft.com](mailto:pdavis@lyft.com)



# Powering the world's most efficient shared rides

**Louis Pappas** | Business Development Principal, Via  
[louis@ridewithvia.com](mailto:louis@ridewithvia.com)

INTRODUCING VIA

# Powerful passenger aggregation and dynamic vehicle routing software

Efficiency and automation



## On-demand

Book a seat on your phone



## Convenient

Get picked up at a corner nearby: 'Virtual Bus Stop'



## Shared

Seamlessly share the ride with others with no fixed routes



Via is the world's first on-demand transit system operating at global scale

# 1. NYC/CHI/DC/+

Consumer microtransit business

22M+

Shared rides since launch (2013)

# 2. Mobility Platform

Partner to transportation providers

1.5M

Rides per month

\$350M

Venture funding





**The more people use shared modes, the more likely they are to use public transit, own fewer cars, and spend less on transportation overall...Shared modes complement public transit, enhancing urban mobility.**

“Shared Mobility and the Transformation of Public Transit”, American Public Transportation Association (APTA) and Shared-Use Mobility Center (SUMC) - March 2016





# Reinventing dial-a-ride (and more) with



**METRO**

CASE STUDY



# METRO Problem

**Deviated dial-a-ride service** in NE Austin, a rapidly redeveloping area

**Low ridership** due to:

**Advanced**  
booking requirement

**2** Hours  
in advance

**Limited**  
deviation ability

**.5 mi**

**Limited**  
service hours

**3** Days  
Per week

Thus, **expensive** to  
provide service,  
and **low user satisfaction**



# METRO Solution

Capital Metro partnered with Via to **reimagine** the bus route as an entirely **flexible, on-demand shuttle**.

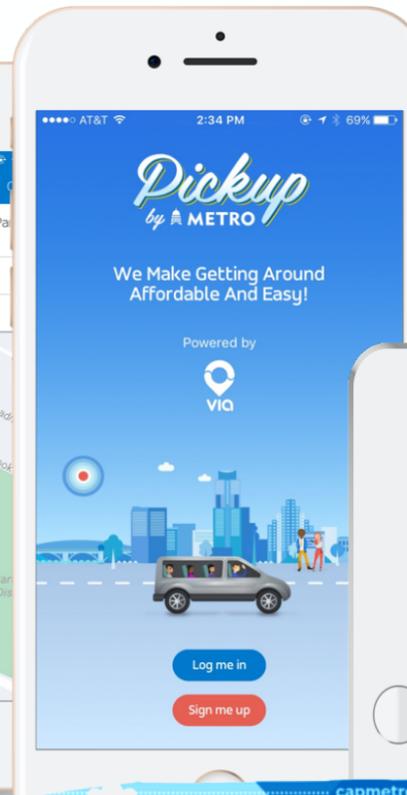
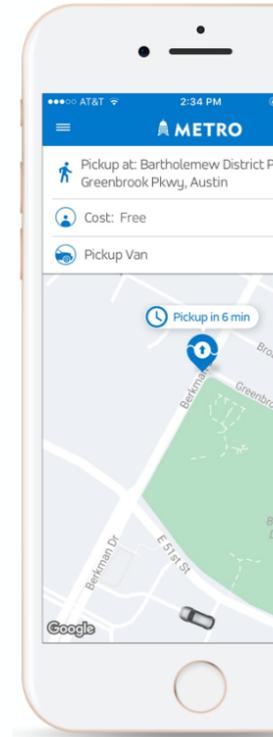
Customers can request rides **from anywhere, to anywhere** within the zone



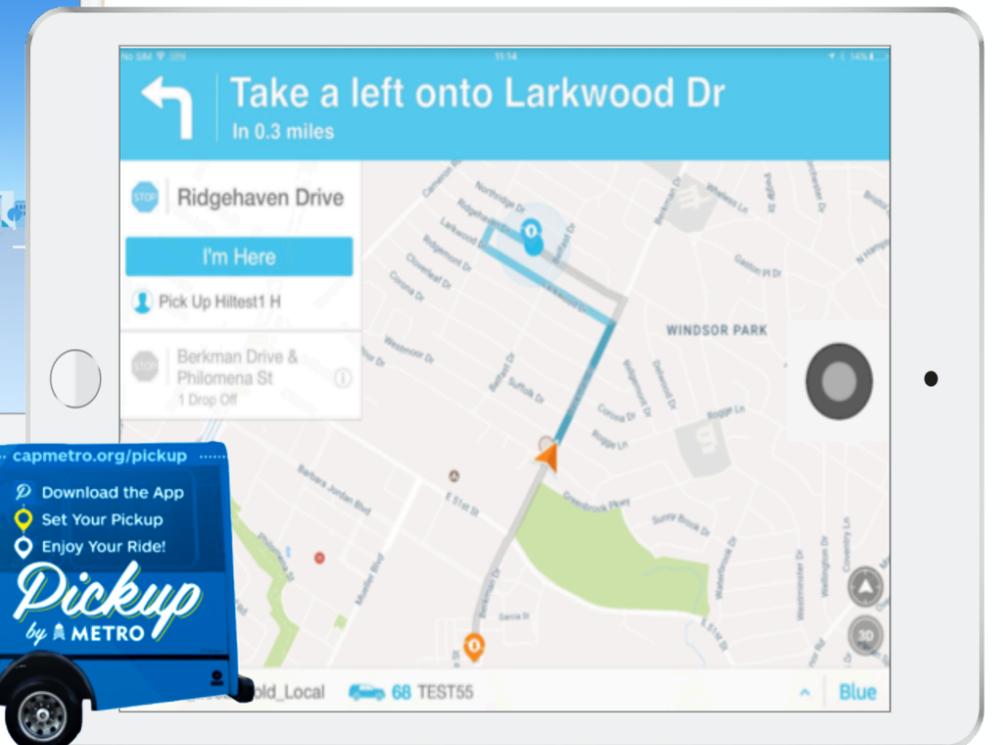
# **METRO** Solution

- ‘Pickup’ brand
- Existing agency vehicles, operators, and dispatchers
- Customized rider app and localized driver app
- No fixed routes

Rider app



Driver app





# METRO Solution

Fully accessible



Phone booking



Cash payment



WAV-enabled fleet



VIA

# METRO Results

## Pre-booked wait time

**2** → **11**  
Hours      Minutes

## Utilization

**2** → **3.5**  
Rides/hour      Rides/hour

## App bookings

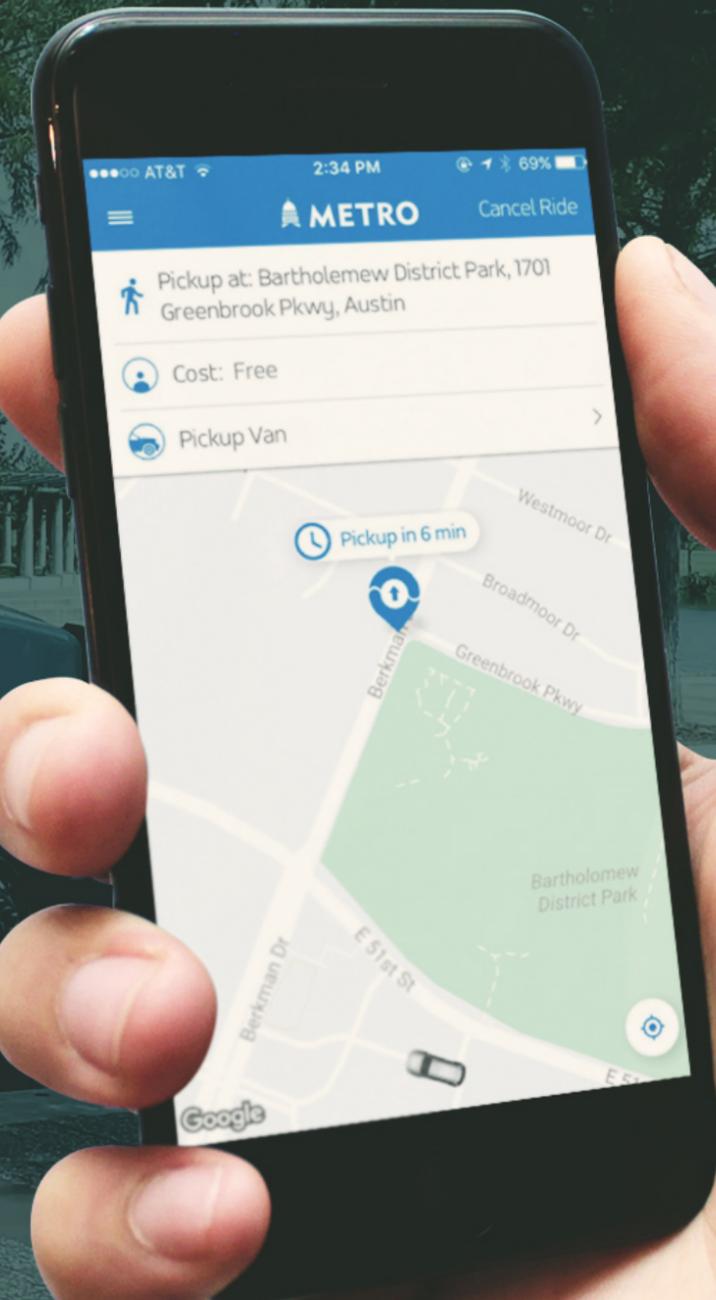
**0%** → **50%**  
Rides booked      Rides booked

## Ridership

**60%** ↑  
Increase

## Cost per ride

**30%** ↓  
Reduction





# METRO Picking Up

October 2017: major service expansion

Expanded Hours

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3 → 6 Days/  
week

Expanded Zone

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community  
circulator →

First and last mile service

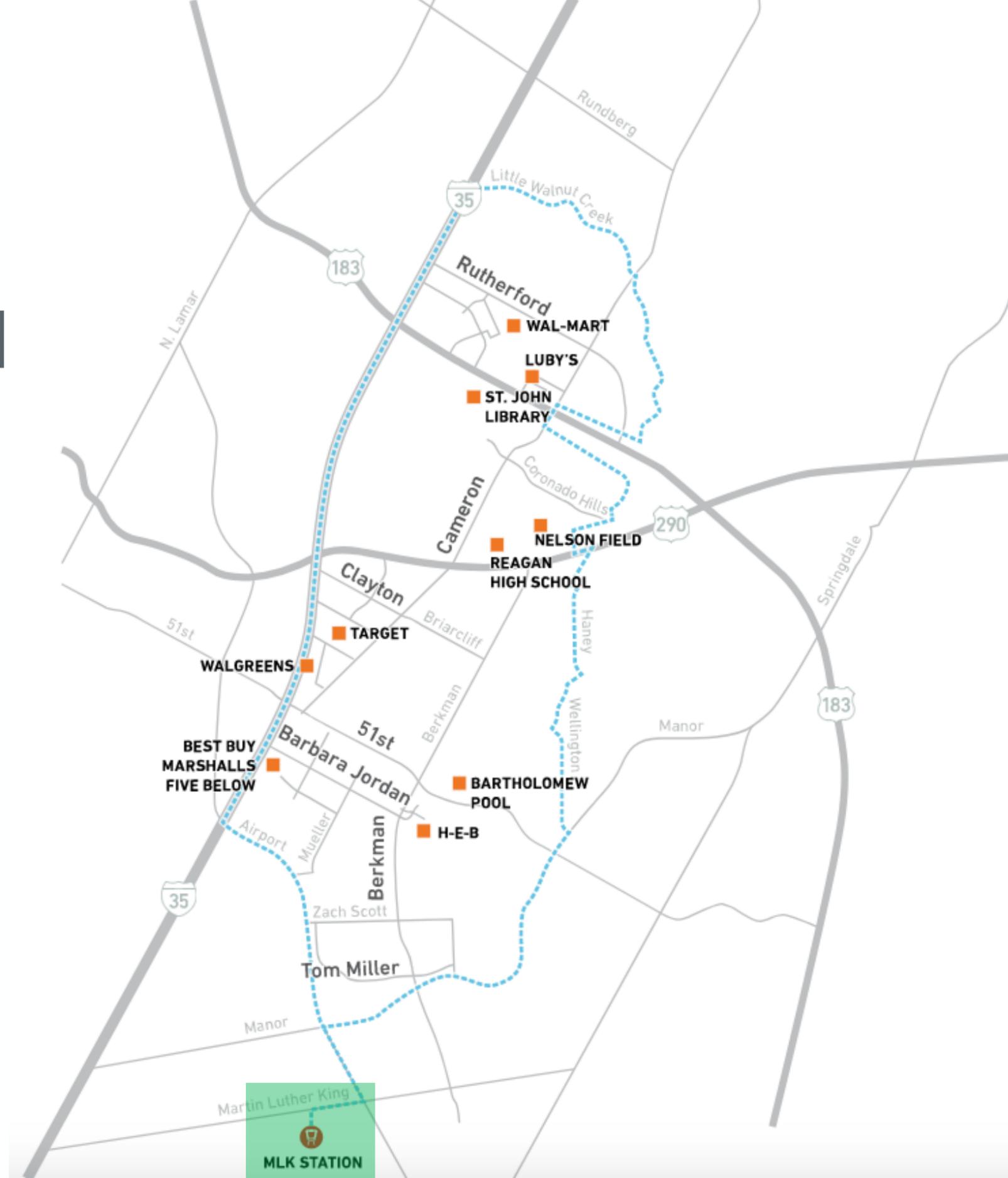
- JFK MetroRail station
- Connection to downtown Austin





# METRO Looking ahead

- Continued ridership growth
- New users and use-cases
- More learning opportunities for Cap Metro





# Creating Virtual Infrastructure



CASE STUDY



## Problem

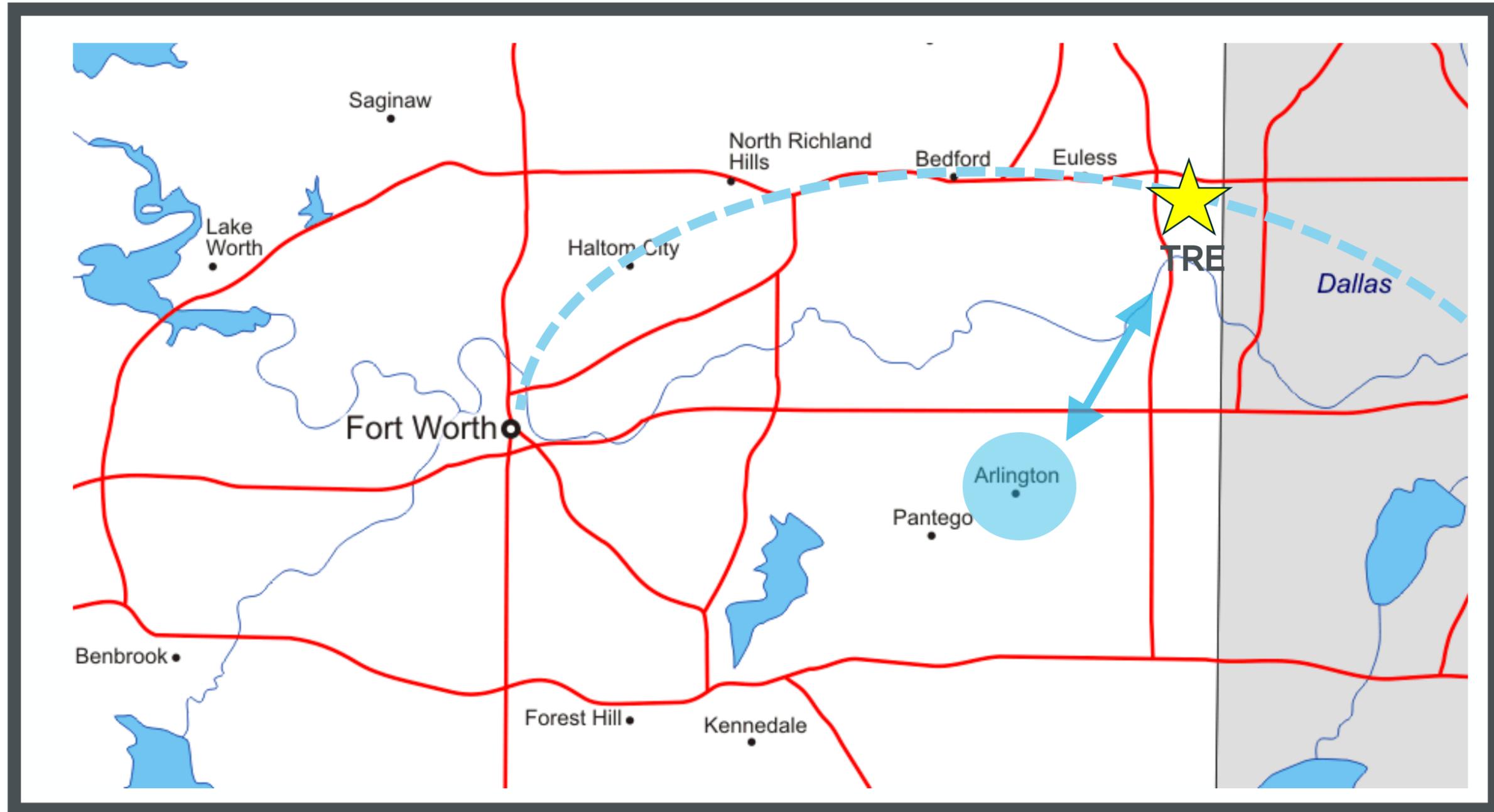
Long the nation's largest city **without a dedicated transit system**

**Limited connectivity** to regional commuter rail (Trinity Railway Express – TRE)





# Problem





## Solution

Assemble use-case-optimized Mercedes-Benz **van fleet**,  
deploy **localized Via app**

Create **virtual corridor** between  
Arlington and TRE Station and  
**deliver shared journeys** within  
Arlington



Launching December 2017  
Stay tuned!





# Powering the world's most efficient shared rides

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