

Transit and Underserved Communities

Stanley E. Young
NREL Mobility Workshop
2023 May 10

Lessons from Scanning Tour

- The term ‘Scanning Tour’ comes from a practice by the Federal Highway Administration of rounding up a dozen or so state engineering experts and take them on sight to the latest technology – perhaps a new bridge, pavement, or traffic operations technology – to see and experience firsthand.

Arlington, TX

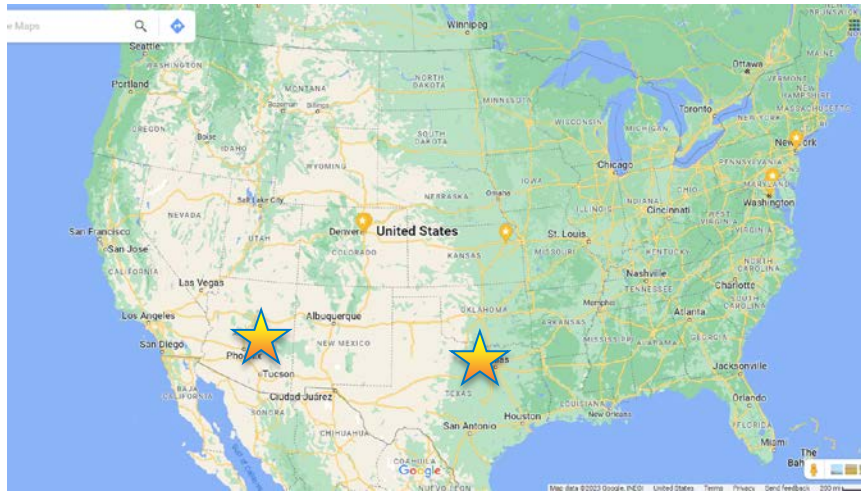
Via On-Demand Transit

DART – Dallas, TX

GoLink/GoPass

Waymo

Waymo One



Arlington Statistics:

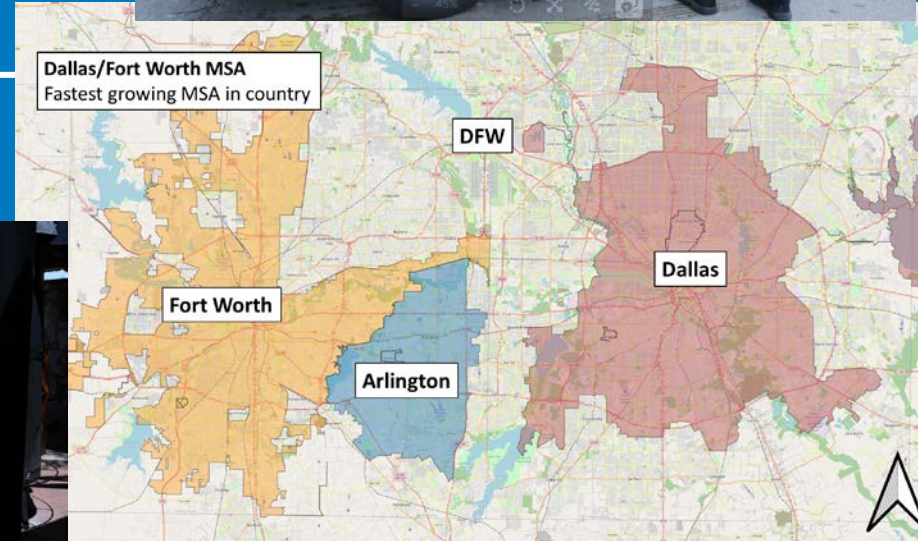
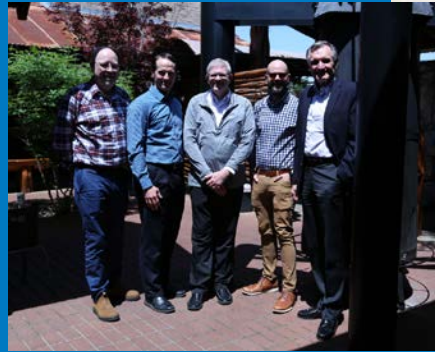
- 400,000 residents (48th largest city in USA)
- Land area = 100 mi²
- Pop density = 4,000ppl/mi² (Denver = 4,800ppl/mi²)
- 3.7% zero car households (national average = 8.7%)
- Rejected public transit ballot measures in '80, '85, '02, '17
- Referred to as - *“Largest city without a public transit system”*



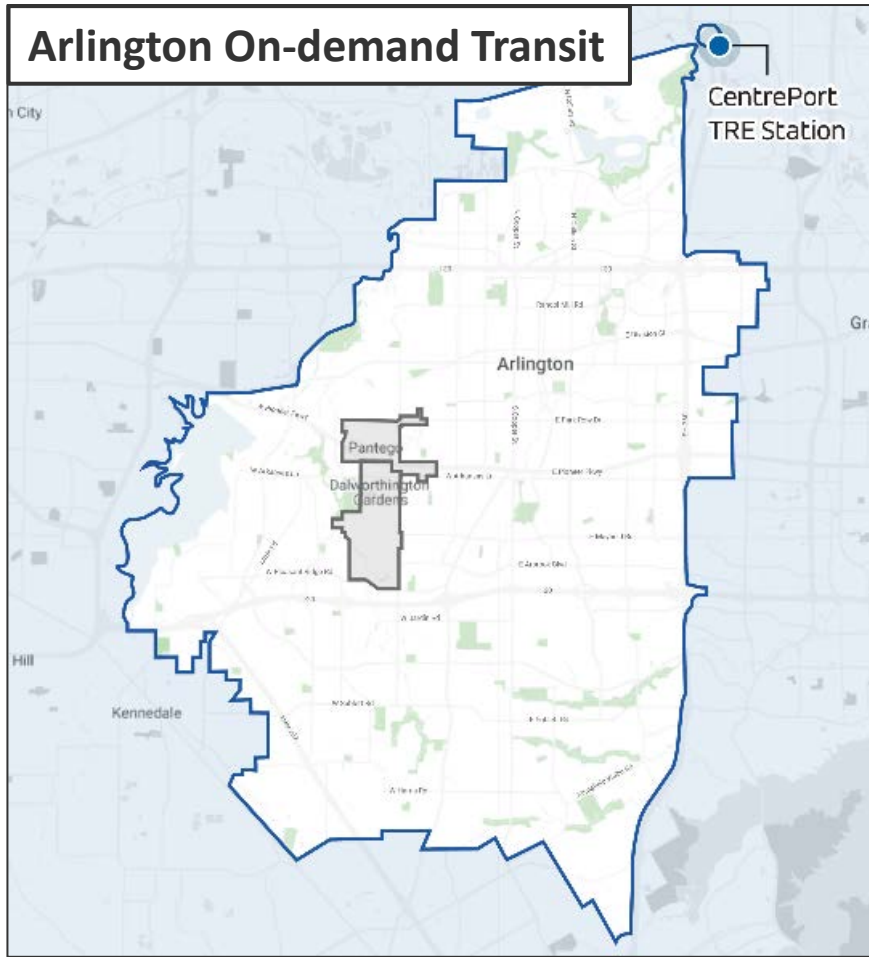
Arlington, TX

Arlington On-Demand and RAPID systems
“Green-Field ODT”

Thanks to Ann Foss & Alicia Winkelblech



Arlington On-demand Transit



Service Area – All of Arlington

Fares

Trips from 0-1.5 miles:	\$3.00
Trips from >1.5-3 miles:	\$3.50
Trips from >3-4.5 miles:	\$4.00
Trips from >4.5-6 miles:	\$4.50
Trips over >6 miles:	\$5.00

Trips between CentrePort and any point in Arlington are a \$3.00 per trip flat rate.

Characteristics:

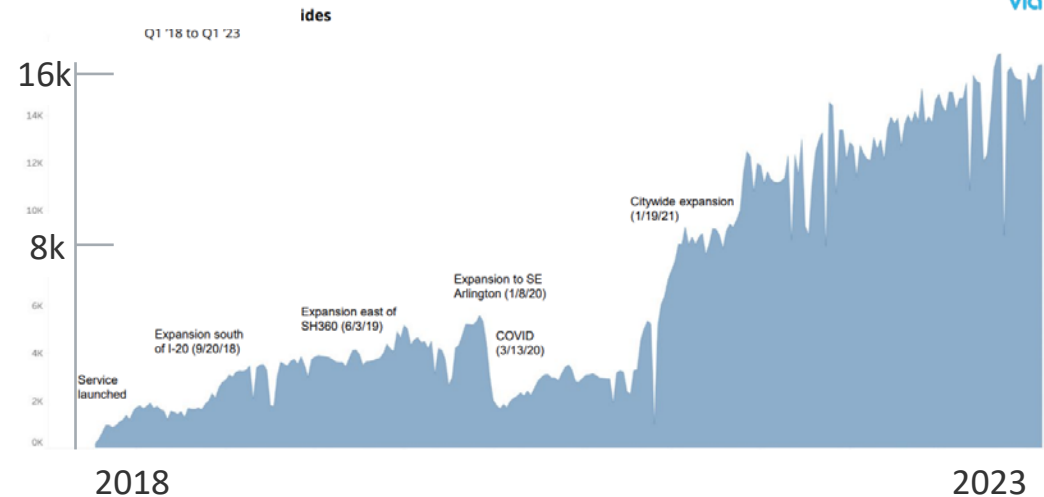
- Pilot Began service in 2017
- Fleet: ~70 shared, 6-passenger vans
- Annual costs: ~ \$11 million/yr (next 2 yrs)
- Expanded service region to all of Arlington in Jan 2021
- Service region: 99 square miles
- Require short walks to waypoints
Corner – to - Corner
- M-F (6am-9pm) & Sat (9am-9pm)

Service Performance:

- Served ~1.8 million trips through Apr 23
- 60,000 rides in June 2022 alone (record)
 - Now >15,000 rides per week
- More resilient during COVID downturn
 - Flexibility in supply
- Ridership stats
 - 88% riders make < \$50k/year [Via]
 - 66% non-white [Via]
 - Average wait times: 15 min [Via]
 - 77% no car ownership
- Fully accessible for all residents
 - Credit, debit, or prepaid cards
 - Handicap accessible vans available
- Branded black mini-vans
 - Easily rented to cover peaks



Via On-Demand Rideshare: Weekly Ridership



Dallas Area Rapid Transit

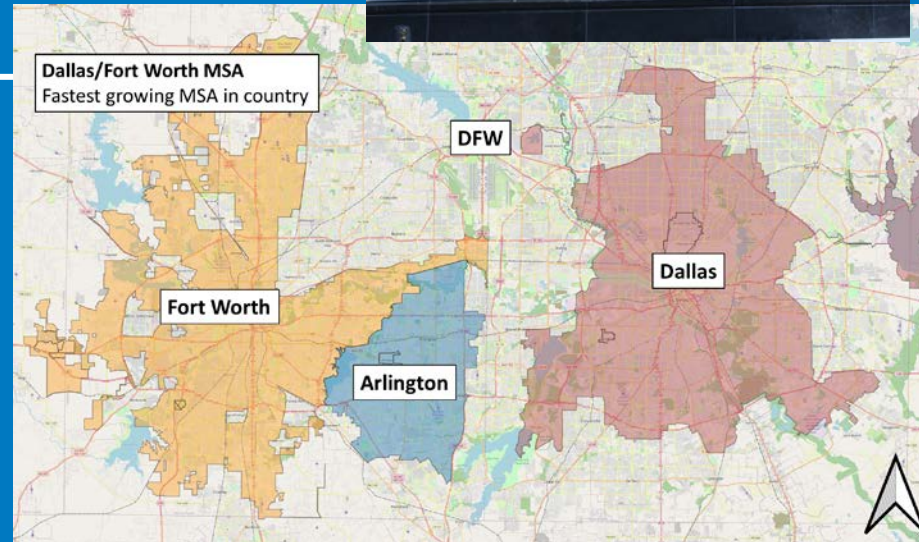
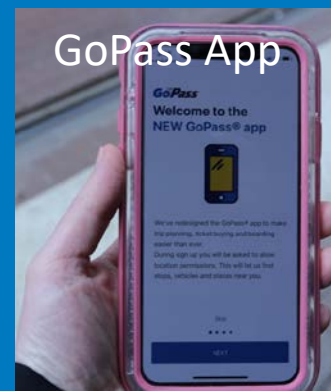
GoLink/GoPass system

GoPass – Smart Phone app

GoLink – link to on-demand transit

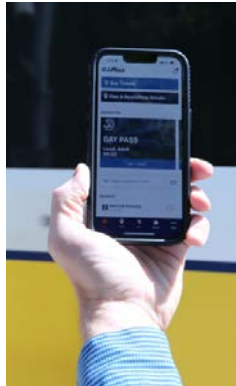
90,000 rides per week

Thanks to: Gregory Elsborg
VP, Chief Innovation Officer



DART GoPass Characteristics

- Branded ticketing, routing, planning, and wayfinding app
- A decade in the making
- Provides patron specific management
Licensed to other transit agencies



GoPass

The app gives you the power to:

- Purchase transit passes
- Plan your trip in real-time
- Personalize your experience
- Receive rider alerts and trip notifications



**GoPass
TAP**

Makes it easy to:

- Tap and board
- Reload with cash or credit
- Register your card to protect balance



Contactless Payment

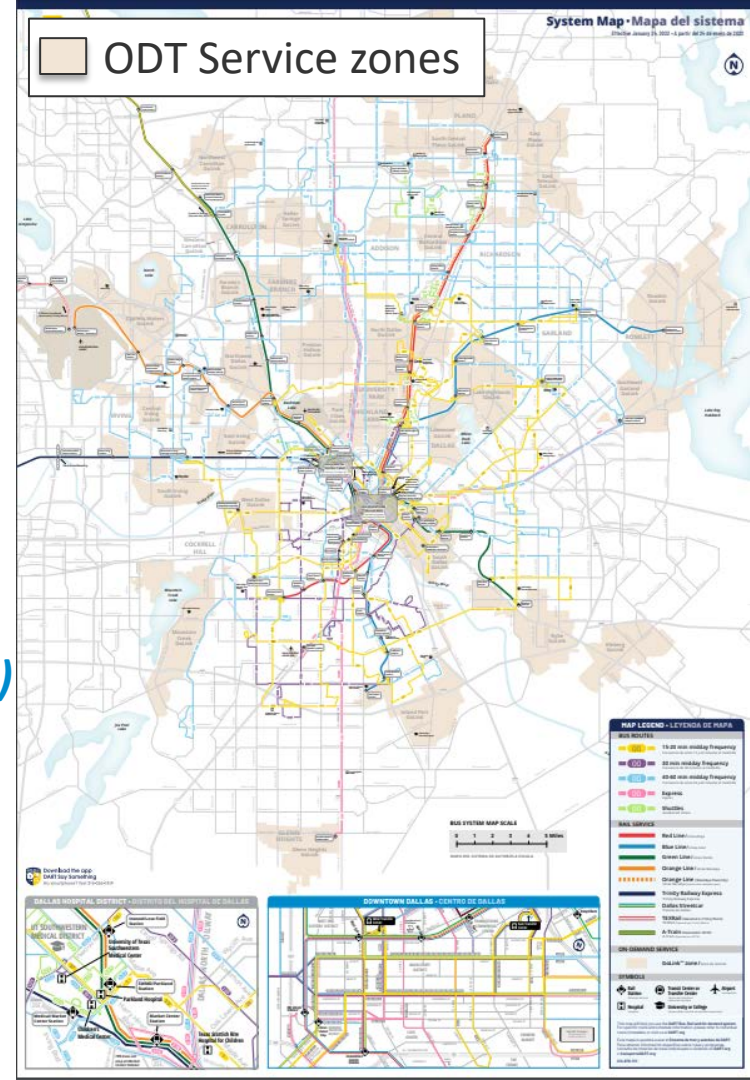
The simple and secure way to:

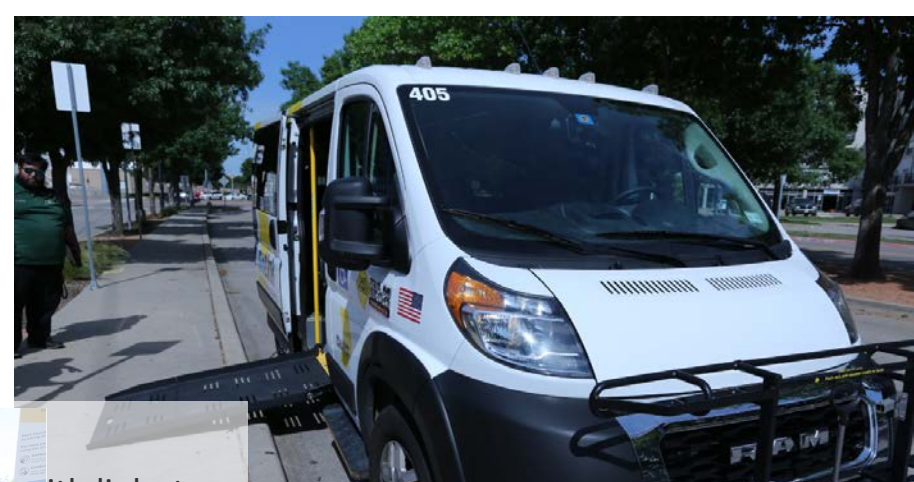
- Purchase your DART fare with your contactless credit or debit card
- Or use your payment-enabled mobile device to tap and pay

DART & On-Demand Transit

- 700 *Square Mile Service Area*
- 13 *Service Area Cities*
- 97 *Miles Light Rail*
- 34 *Miles Commuter Rail*
- 45% *Rider usage of GoPass® Mobile App*
- 96 *Fixed Route Bus Routes (Previously 130+)*
- 232/360 *Square Miles of on-demand (Previously 110)*
- 30/32 *On-Demand Zones (Previously 15)*

DART was awarded the 2019 APTA Innovation Award in recognition of the industry impact that the GoPass platform has created.





Go Link:

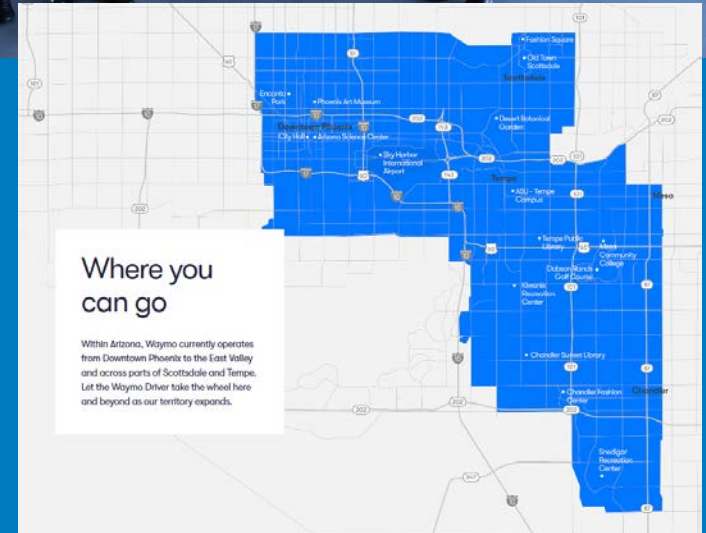
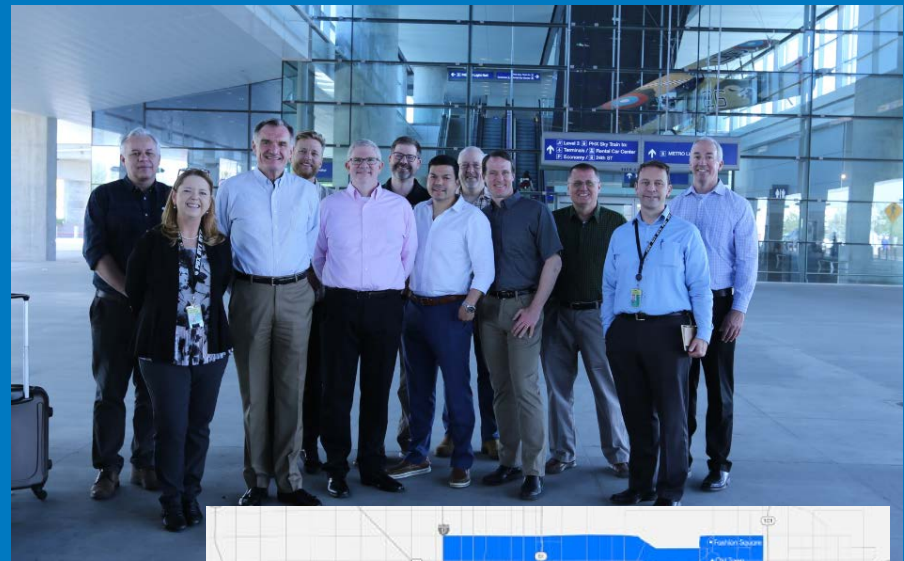
- Serves zones with links to inter-regional transit
- First-mile/last-mile with circulation
- Bus stops reduced from 10,000 to 7,000 when implemented
- 90k trips per week.
- DART Multi-passenger vans, Uber and other services





Waymo - Phoenix

Download Waymo One and go!!!
Attendees used for local ride to/from
airport and hotel
Met with Waymo Adam Lentz –
sustainability
Eclipsed one million rides in early 2023



Video



February 28, 2023

In January 2023,
Waymo reached **1 million rider-only miles**

Waymo And Cruise have Both
Hit 1M Miles With No Driver,
But Waymo Publishes
Detailed Safety Data

Since April 25th Interaction

Waymo doubles down in Phoenix area, expands San Francisco efforts

Waymo's expansion of service in metro Phoenix and San Francisco serves as a prelude to a massive expected expansion over the next year.

GM's Cruise Surpasses 1.5 Million Driverless Miles
Traveled

BY TREY HAWKINS — MAY 5, 2023

GM's automated robotaxi service, Cruise, recently hit the 1 MILLION miles on February 2023. Now, the all-electric ride-sharing platform announced having already reached 1.5 million driverless miles – JUST 90 DAYS LATER. (FLEET OF 240 UNITS)

- 50% growth in 90 day, represents ~5x growth per year
- Current yearly VMT is ~ 3.2 trillion vehicle miles
- If growth is sustained – driverless taxi VMT will eclipse current VMT in 11 years

Is this the future of sustainable mobility?

Additional Automation - Buses



About the Automated Bus Consortium

An association of transit and transportation agencies has formed the Automated Bus Consortium, a collaboration designed to investigate the feasibility of implementing automated bus projects across the United States. The Consortium is a first-of-its-kind approach to accelerate the development of automated transit technologies and will combine the purchasing power and collaborative decision-making of these founding transit agencies nationwide. If implemented, the pilot projects will use full-sized, full-speed, accessible buses and enable Consortium members to collectively demonstrate and deploy automated technologies in live service environments.



MetroLINK (Moline)



Metropolitan Transit Authority of Harris County (Houston)



RATP Dev USA



Metropolitan Atlanta Rapid Transit Authority (MARTA)



New Jersey Transit



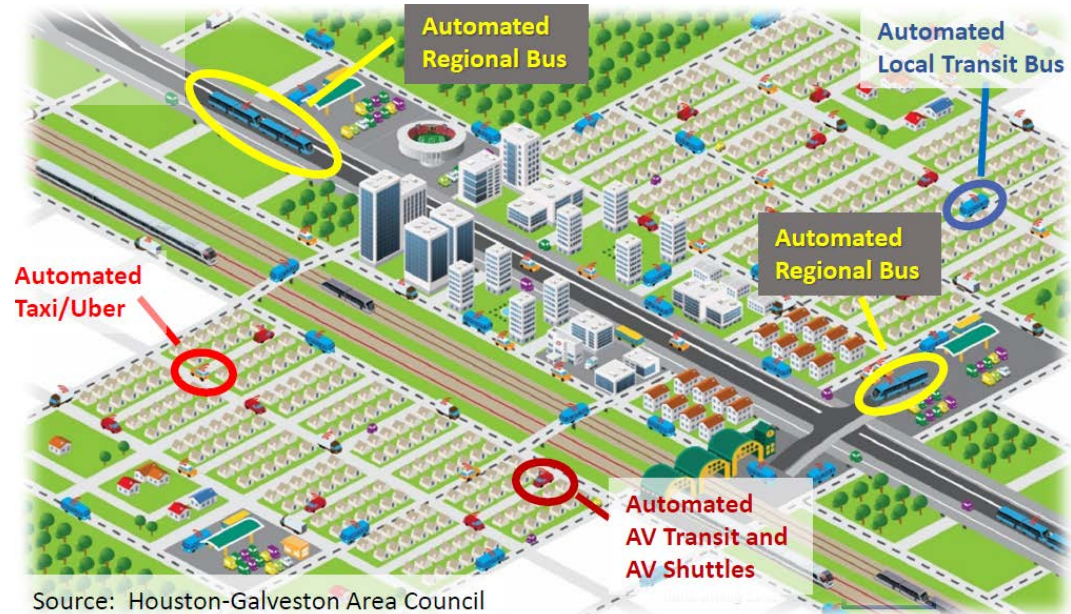
Dallas Area Rapid Transit (DART)

Automated Mobility Districts – Automated Shuttles

AMD Concept is Applicable to Districts such as:

- Dense urban environments with geographic boundaries
- Large mixed-use employment, residential, and retail centers
- Major activity centers, such as airports or entertainment districts
- University and medical complex campuses

- *Intelligent roadway Infrastructure*
- *Safety affirmative control*
- *Jurisdiction having authority*
- *Next generation traffic control*
- *Curb management*



Source: Houston-Galveston Area Council

Electrification of Buses, Shuttles and Vans

Lightning ZEV3 Transit Passenger Van



In RTD's case, the demand charge it pays is based on the mall fleet's monthly peak electrical usage. In 2018, RTD paid \$328,150 in "16th Street Mall-specific electricity bills." More than \$269,000 of that total — or 82 percent — is attributable to **demand charges**, the agency said. May 14, 2019 Denver Post

Kansas City Airport installs wireless electric bus charging system



Challenges & Opportunities

- **Automation of payment, routing, customer experience**
 - ‘DART GoPass’ – getting to native digital interface
 - Toward management of patrons –
 - Tailor experience to the traveler/customer
- **Integration of on-demand micro transit**
 - ‘Cat is out of the bag’ with respect to on-demand services
 - Strong and swift customer acceptance
 - Application from Urban (Houston-Dallas-StL), Suburban (Arlington), Ex-urban (Innisfil, CA), to rural (Fort Erie, CA, Bastrop)
- **Vehicle Automation and Electrification**
 - Automated bus consortium
 - Shuttles, automated mobility districts, TNCs (Waymo)
 - Electrification of vehicle, management of charging & inductive

Thank You

www.nrel.gov

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