



Exploring Emerging and Innovative Transportation Solutions for Tahoe

Tahoe Regional Planning Agency

December 4, 2019



Background and Session Purpose

■ Context

- Growing congestion
- Physical infrastructure constraints
- Rapidly evolving transportation technologies and business models

■ Approach

- Goal – improve ability to easily and reliably reach destinations in Tahoe using shared travel options
- Opportunities –exploring new modes and innovative practices; public-private partnerships
- Assumptions – forward-looking and unconstrained

■ Obtain your feedback

- Ideas
- Opinions
- Exchange



Agenda

▪ Emerging Transportation

- Micromobility
- Microtransit
- Automated Shuttles

▪ Innovative Approaches

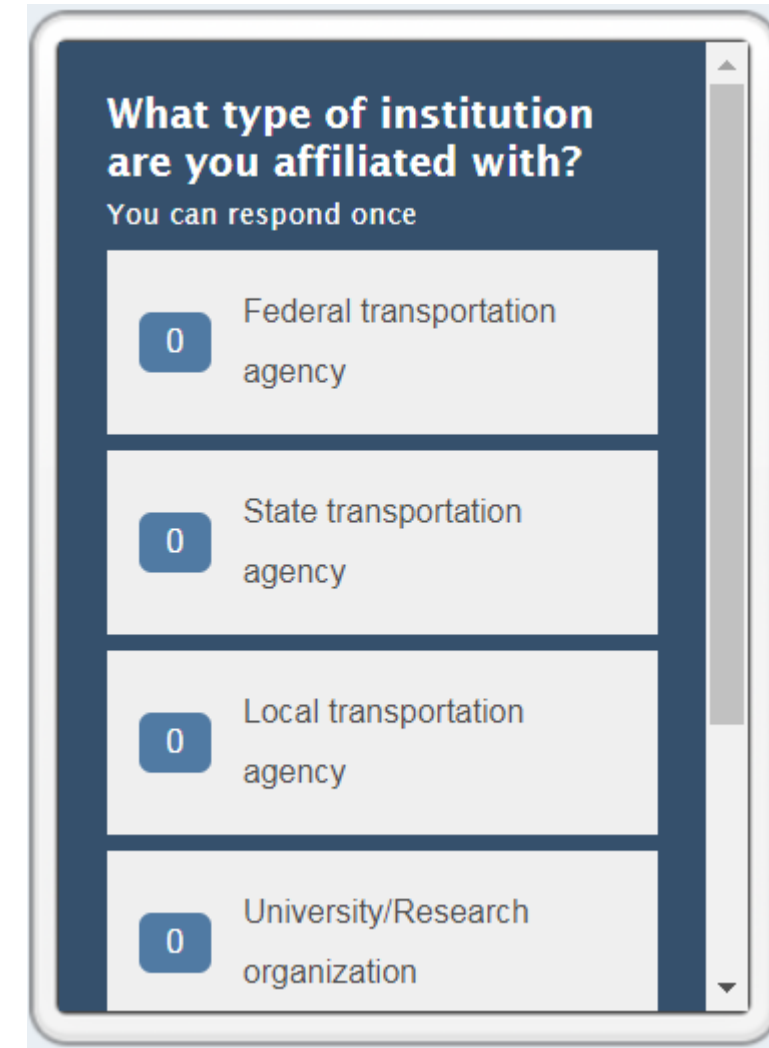
- Resort and Regional Shuttles
- Marketing and Incentives

▪ Breakout Groups

- Scenarios
- Reporting

Poll Everywhere

- Using Poll Everywhere Tool throughout the session
- Submit responses on your mobile device at www.PollEv.com/groovywild226



What type of institution are you affiliated with?
You can respond once

0	Federal transportation agency
0	State transportation agency
0	Local transportation agency
0	University/Research organization

Which sector best describes you?

Tourism/hospitality industry

Recreation providers

Other business community

Municipal or county government

Regional, state, or federal government

Other institutions (e.g., college or hospital)

Nonprofit or advocacy group

Not listed

Where in the Tahoe Region do you work?

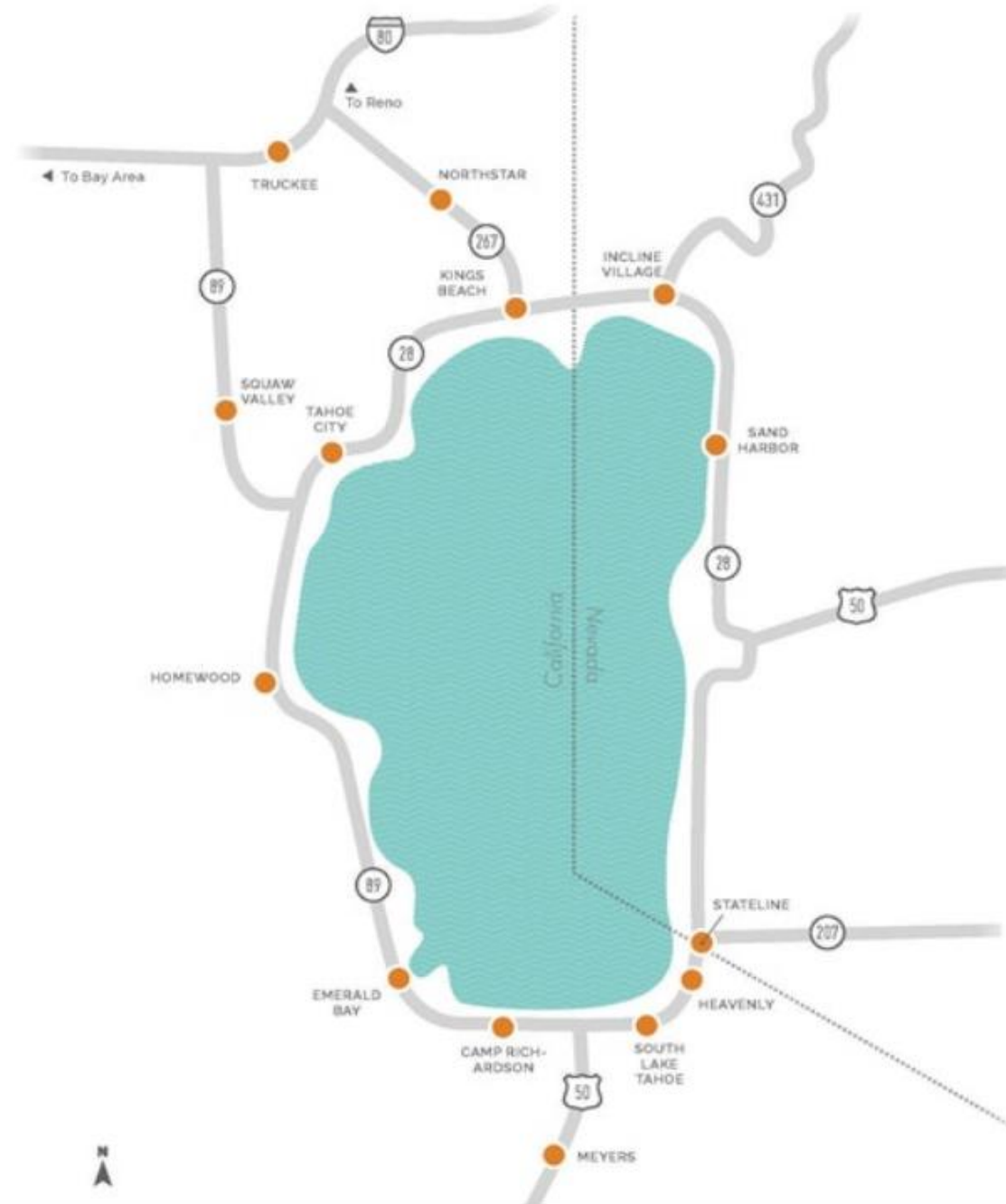
North
Shore

South
Shore

Truckee

Other

Tag the approximate location of your workplace.





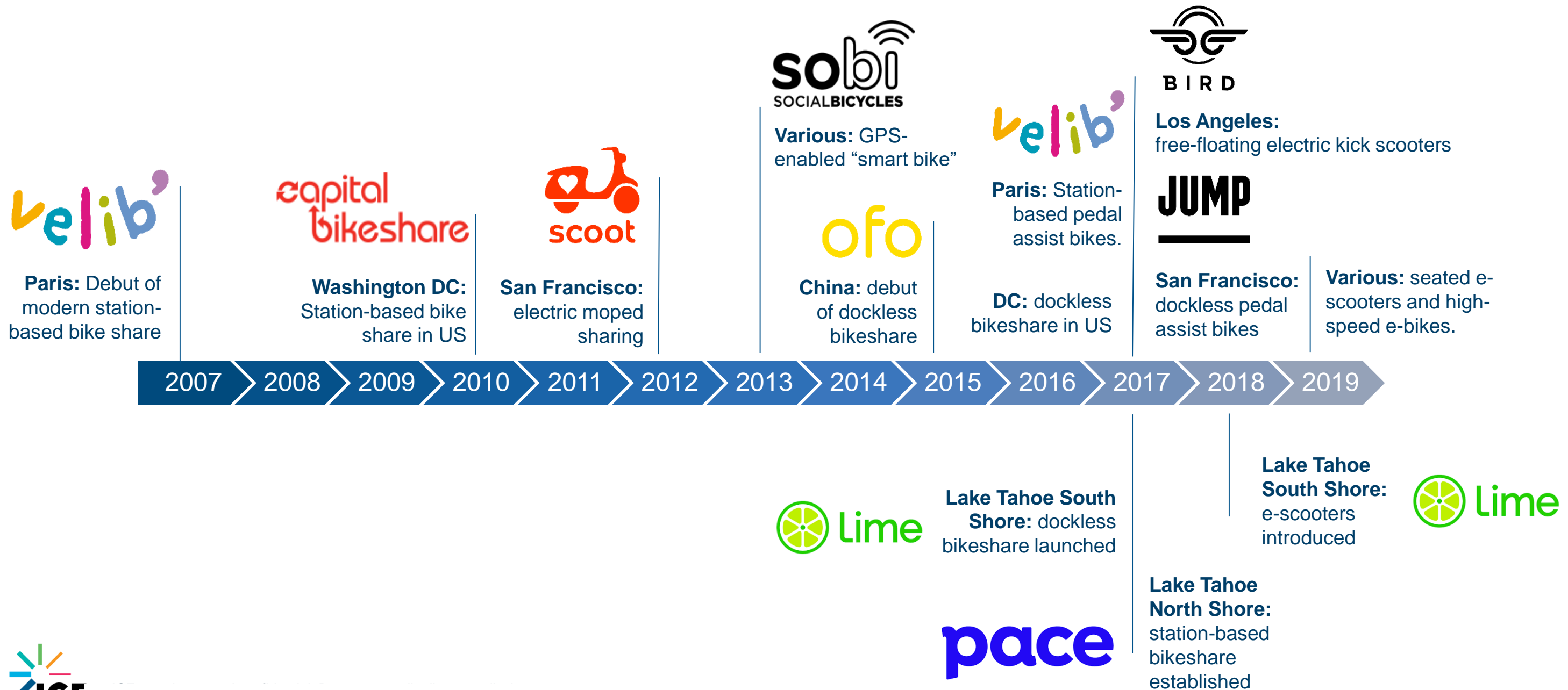
Emerging Transportation



Micromobility

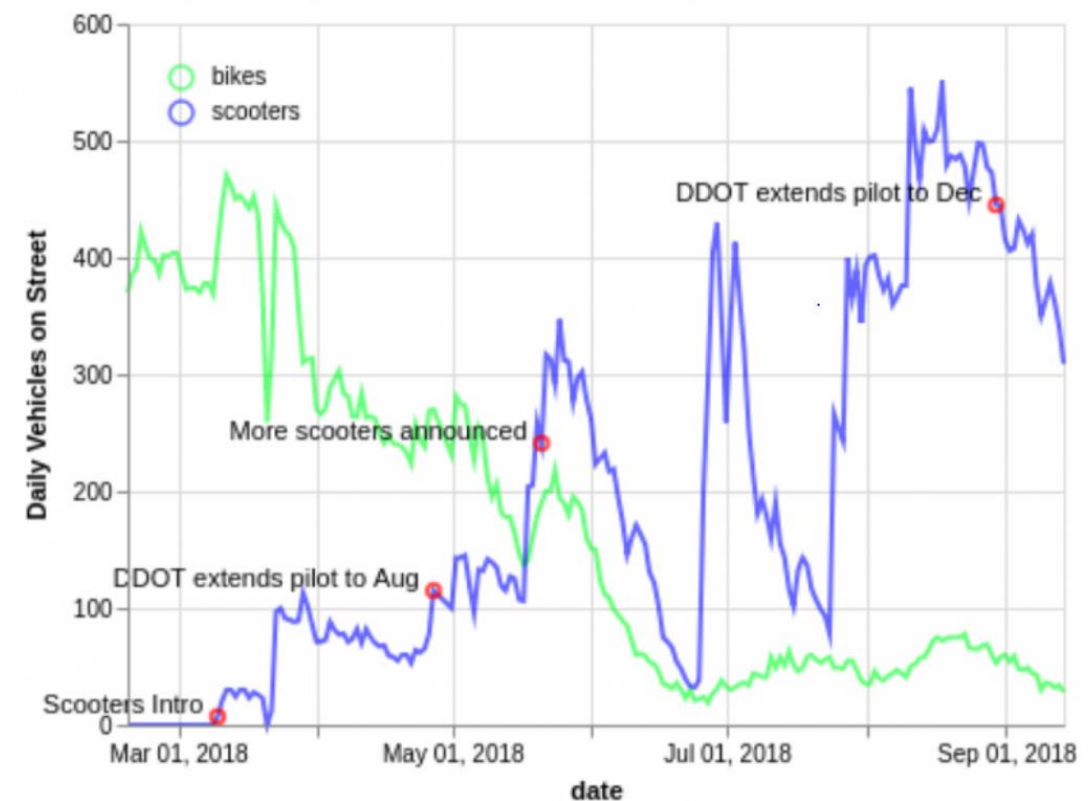
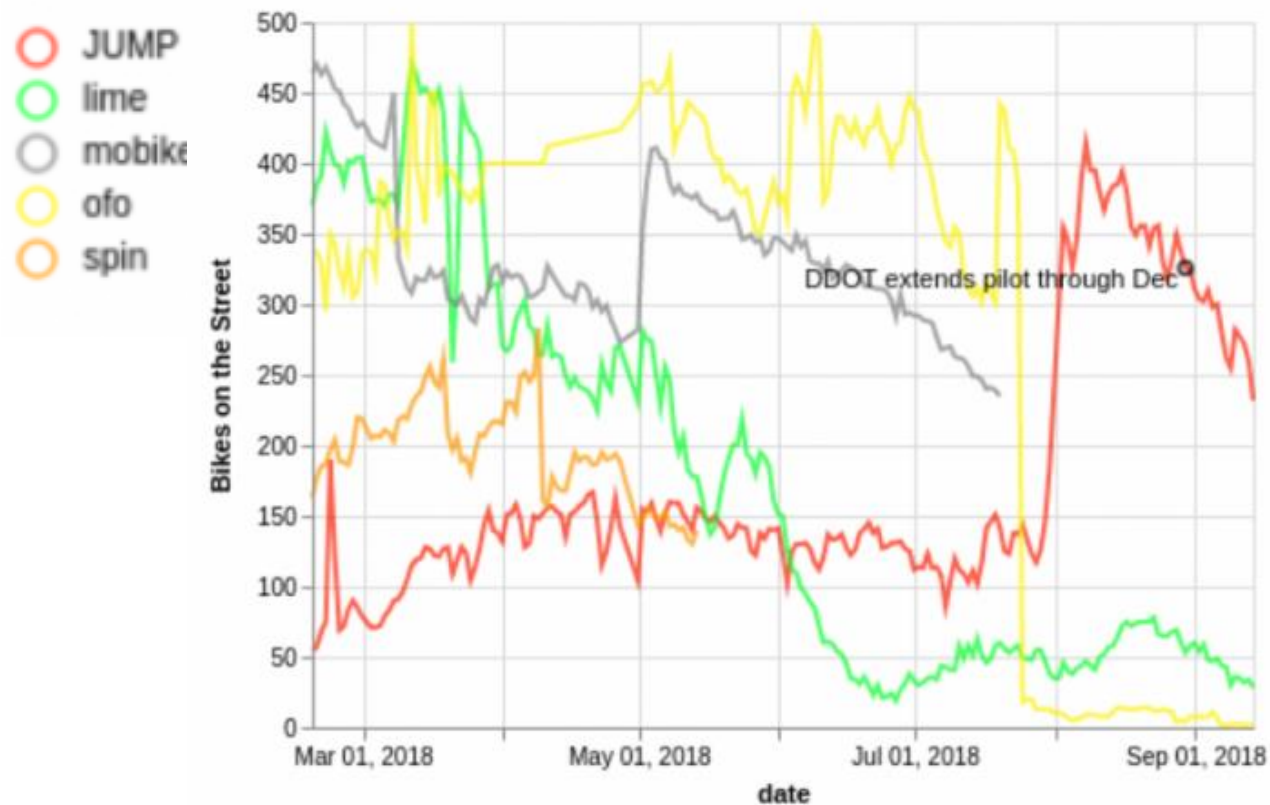
Lightweight low-speed vehicles (often shared and electric)

Evolution of Micromobility



Industry Trends

- Decline of dockless bikeshare, rise of e-scooters and e-bikes
- Rapid industry growth followed by recent contractions



Washington DC, 2018. Source: *Greater Greater Washington*.



Potential uses of micromobility include...

- Increasing access to opportunities, goods, and services for short-distance trips
- Transit connections
- Providing active and non-polluting alternatives to short driving trips
- Provide recreational options for residents and visitors

Trip Characteristics and Mode Shift



■ Trip Characteristics

- Trip types: 71% transportation / 29% recreation or exercise
- Average trip length: 1.5 miles

■ Mode shift

- 34% of tourists replaced ridesourcing trip
- 14% of tourists replaced personal vehicle trip
- 45% of tourists replaced walking or biking



■ Trip Characteristics

- All but 9.4% of e-bike trips were utilitarian
- Average trip length: 9.3 miles
- E-assist “generate[s] more trips, longer trips, and different types of bicycle trips.”

■ Mode shift

- 62% of e-bike trips replaced trips otherwise taken by car

Lifecycle and Unit Economics



- Lifecycle Emissions Assessment
 - Good for environment if replacing car trips
- Vehicle Lifespan & Usage
 - Louisville, KY: average 28.8 days
 - 163.2 miles/ 92 trips.
- Unit Economics
 - \$300 loss/scooter (lifetime)



- Lifecycle Emissions Assessment
 - Swappable batteries eliminates transportation to charging
 - Travel to charging was 40% of scooters' emissions
- Vehicle Lifespan & Usage
 - 10K miles a year per bike (10x personal bikes)
 - 3 – 5-year lifespan.

Affordability and Accessibility



- Discounts for Eligible Users
- Access to Vehicles for Low-Income Users
- Access for Users with Limited Mobility



- Discounts for Eligible Users
- Access to Vehicles for Low-Income Users
 - ½ of all Jump bike trips begin/end in low-income neighborhoods (Sacramento and Austin)
- Access for Users with Limited Mobility
 - E-bikes more accessible for older adults and individuals with physical limitations

Speed, Traffic Law Compliance, and Crashes



- 14.5-18.6 mph (average)
- Traffic Law Compliance
 - Depends on infrastructure
- Crash Likelihood / Injury Severity
 - CDC: 14 injuries per 100K trips
 - Among injured 48% sustained head injuries (15% TBI)



- 14 mph (average)
- Traffic Law Compliance
 - More likely to travel with traffic and on the correct side of the road than regular bicycle riders
- Crash Likelihood / Injury Severity
 - E-bikes and traditional bike crashes equally likely

Emerging Options

Seated E-Scooters



High Speed E-Bikes



E-Mopeds





How well do you feel micromobility is working in Tahoe?

Working well **A**

Neutral **B**

Not working well **C**

Unsure/No
opinion **D**



How supportive would you be of efforts to provide new micromobility options in Tahoe?

Very supportive

Somewhat supportive

Neither supportive or unsupportive

Somewhat unsupportive

Very unsupportive



Microtransit

On-demand, dynamically-routed transit systems.

Microtransit Operational Models

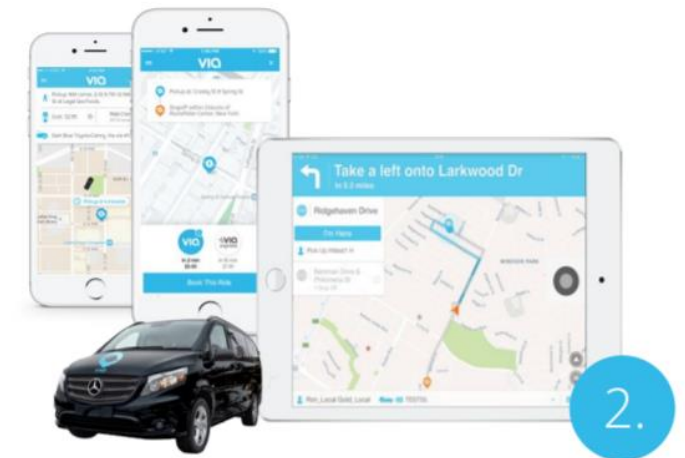
1. Technology provider

Software as a service
(SaaS) for agencies who want to use
their own vehicles and operators



2. Turnkey solution

Transit as a service
(TaaS) for agencies who want a
turnkey solution that includes
technology as well as drivers,
vehicles, and operations
management



- Technology provider
- Manages operations

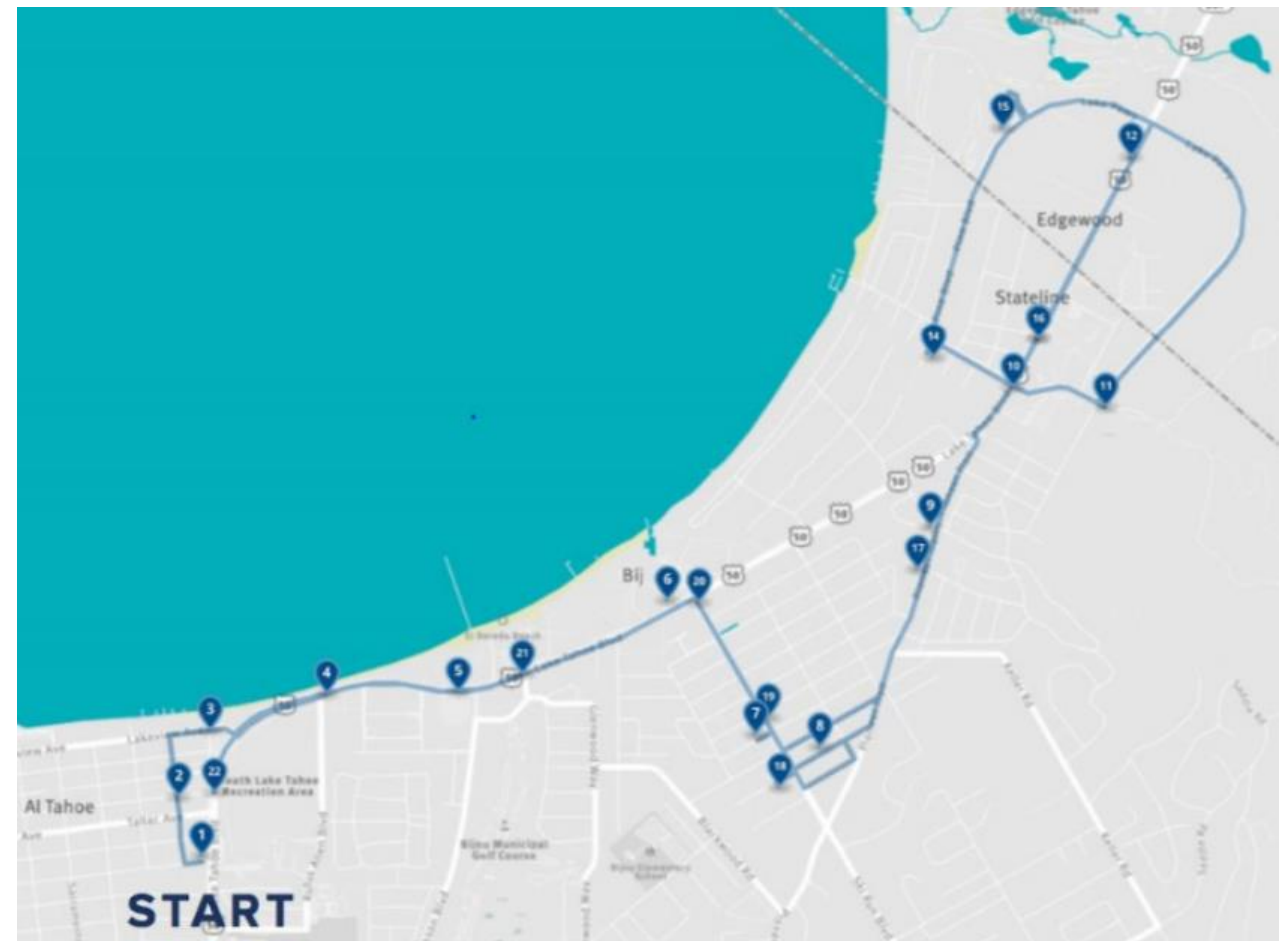
Early Adoption: Chariot in South Lake Tahoe

Successes

- Data collection
- Local agency and business partnerships
- Inter-state operation
- Hiring drivers

Lessons Learned

- Connectivity and lack of existing transit
- Operating speed and frequency
- Technology and app issues
- Marketing
- Sustainability of business model
- Seasonality



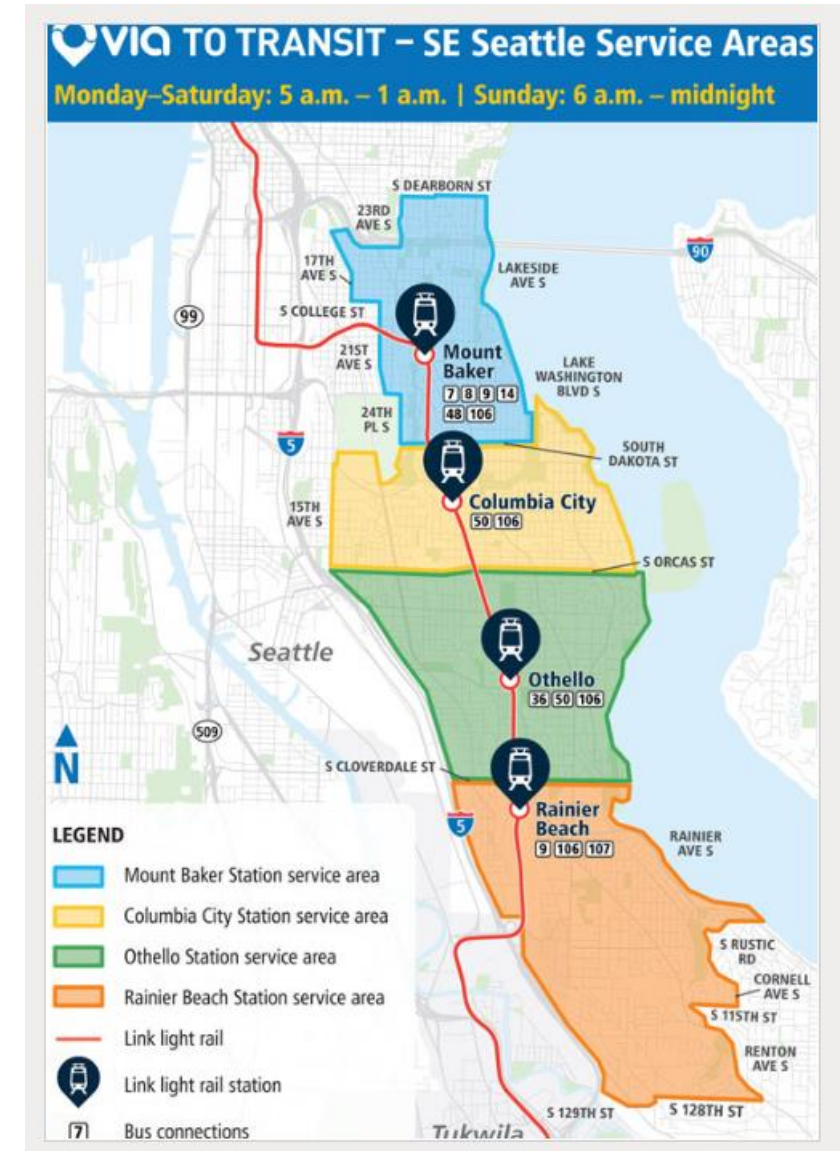
Microtransit has been used to...

- Improve congestion and parking conditions in dense areas
- Serve low-density areas
- Provide alternatives to ridesourcing trips (Uber and Lyft)
- Connect to or replace fixed bus or transit routes
- Serve popular destinations:
 - Airports
 - Downtown areas
 - Recreational destinations (e.g., casinos, beaches, trails, mountains)

Via to Transit – King County, Seattle

Connection to fixed-route transit

- Partnership between King County and Via
- Separate service areas for different transit stops
 - Clear connections to mainline transit
- Riders can pay with ORCA card (public transportation card), Transit GO Ticket, or credit/debit card through Via app or call center



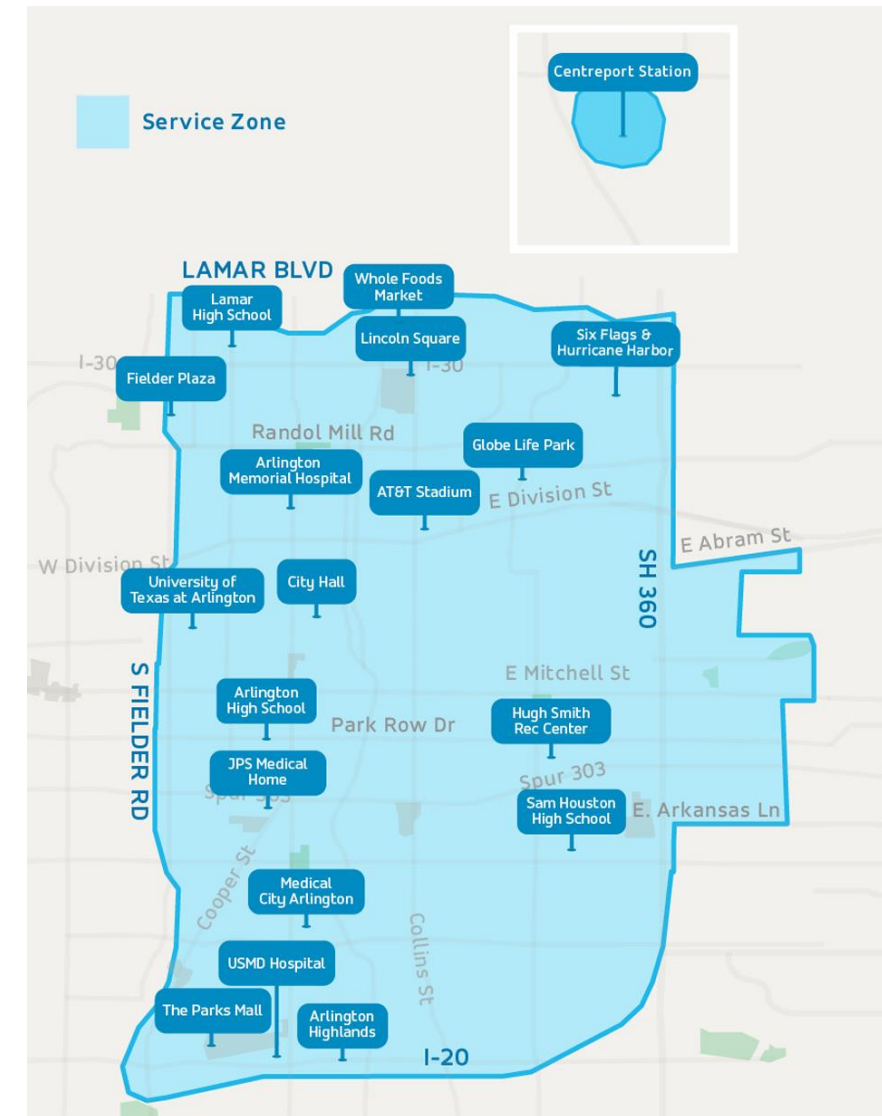
Via Rideshare – Arlington, Texas

Microtransit replaced fixed-route transit

- Partnership between City of Arlington and Via
- Replaced one bus line of transit
 - Largest city in the U.S. without fixed-route public transit
- Service zone has expanded three times since launching in 2017
 - Expansions built into contract with Via



Arlington, TX

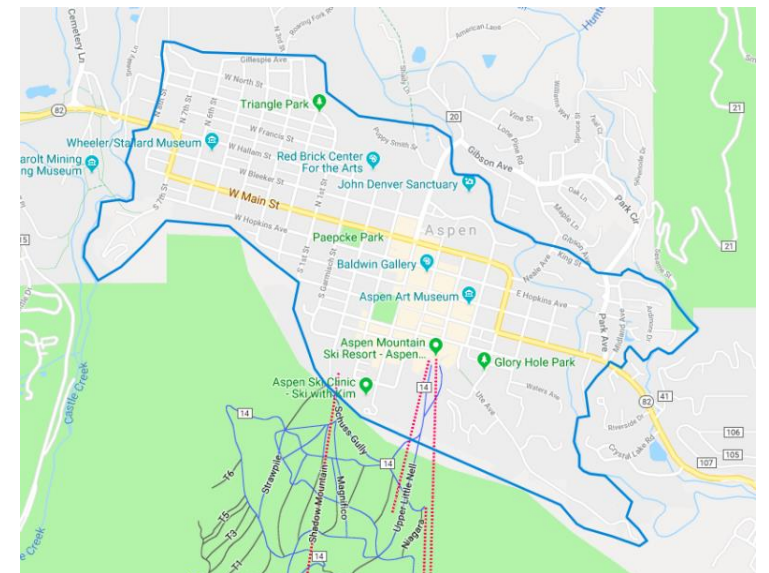


Arlington, TX



Downtowner- Aspen, Colorado

On-demand circulator connecting key destinations

- Partnership between City of Aspen and Downtowner
 - Same technology provider as Mountaineer (Squaw Valley)
- Electric vehicles equipped with heaters, ski racks
- Operating hours: 8am-11pm
- Working with local taxi companies
- Other efforts to improve travel downtown:
 - Increase parking costs
 - “Drive Less” marketing campaign
 - Expanded bike-share system



Aspen, CO



How supportive would you be of efforts to provide new microtransit options in Tahoe?

Very supportive

Somewhat supportive

Neither supportive or unsupportive

Somewhat unsupportive

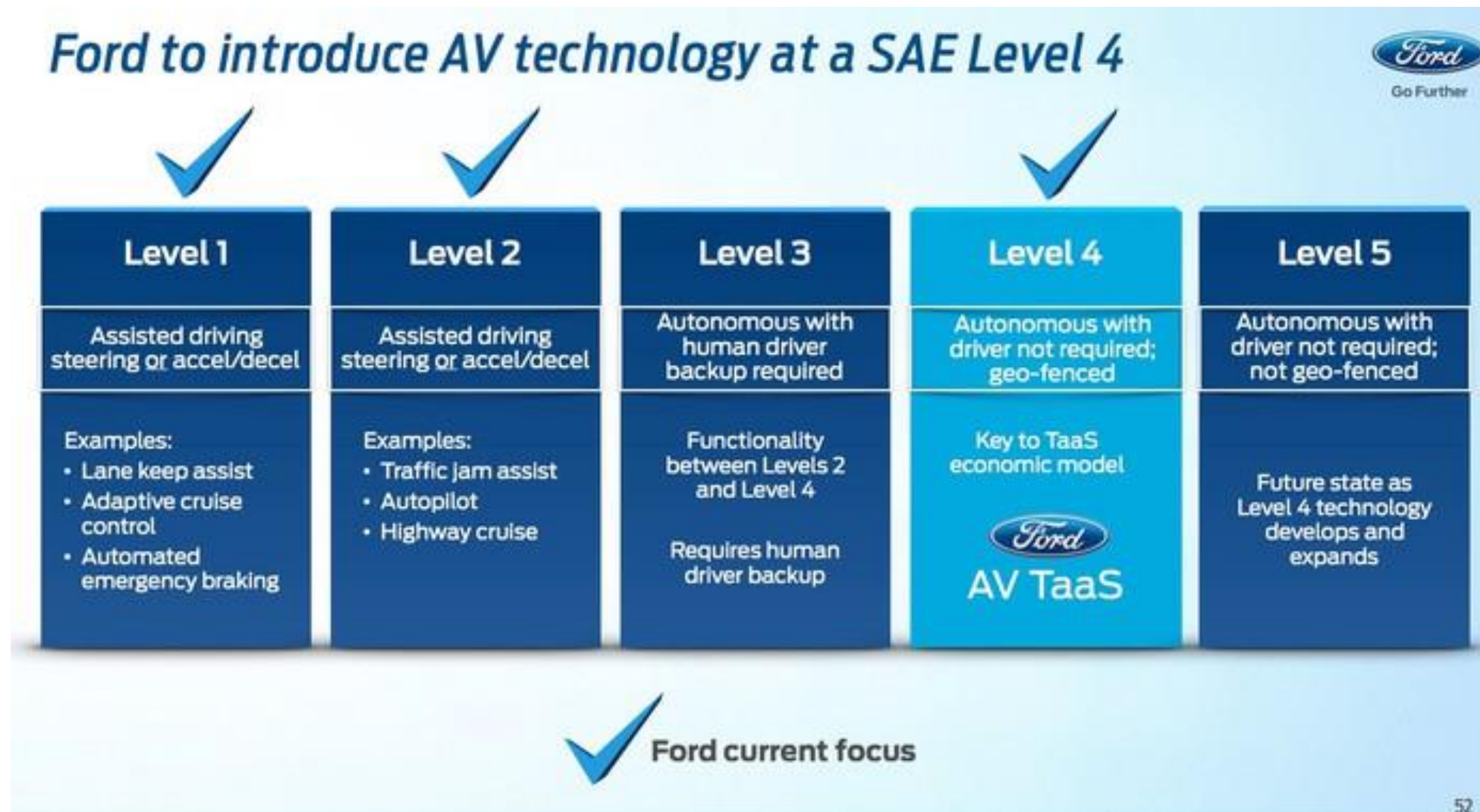
Very unsupportive



Automated Shuttles

Low-speed driverless vehicles operating on fixed or dynamic routes

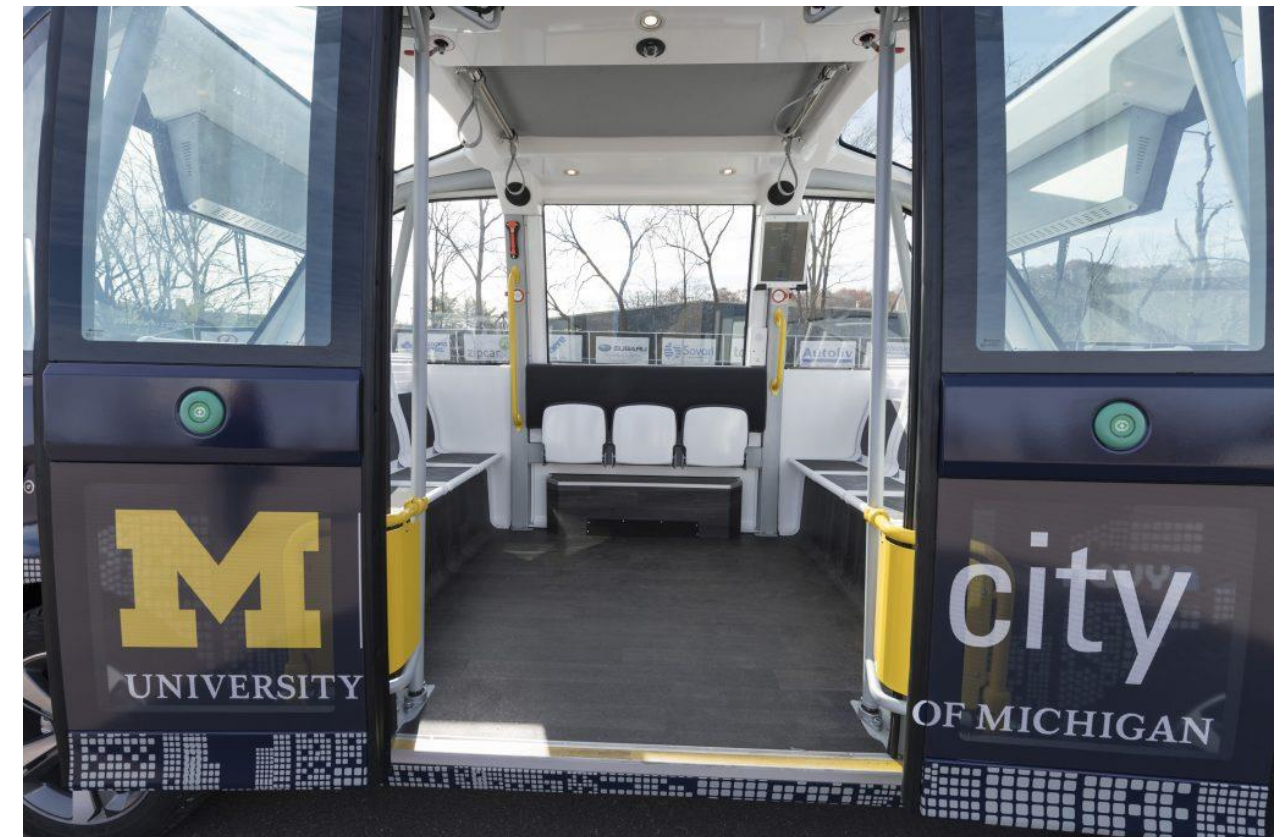
Vehicle Automation: State of the Industry



Source: Ford

Features

- Fully Automated (SAE Level 4)
- Constrained operating area (geo-fenced)
- Low speeds
 - Top speeds: 25 – 35mph
 - Cruising speeds: 10 – 12mph
- Passenger capacity
 - 4 – 8 seated
 - 10 – 15 total
- Range
 - 5 – 10 hours
 - 30 – 60 miles



Source: University of Michigan

Automated Shuttle Manufacturers

EASY
MILE



LOCAL MOTORS



NAVYO



AURO



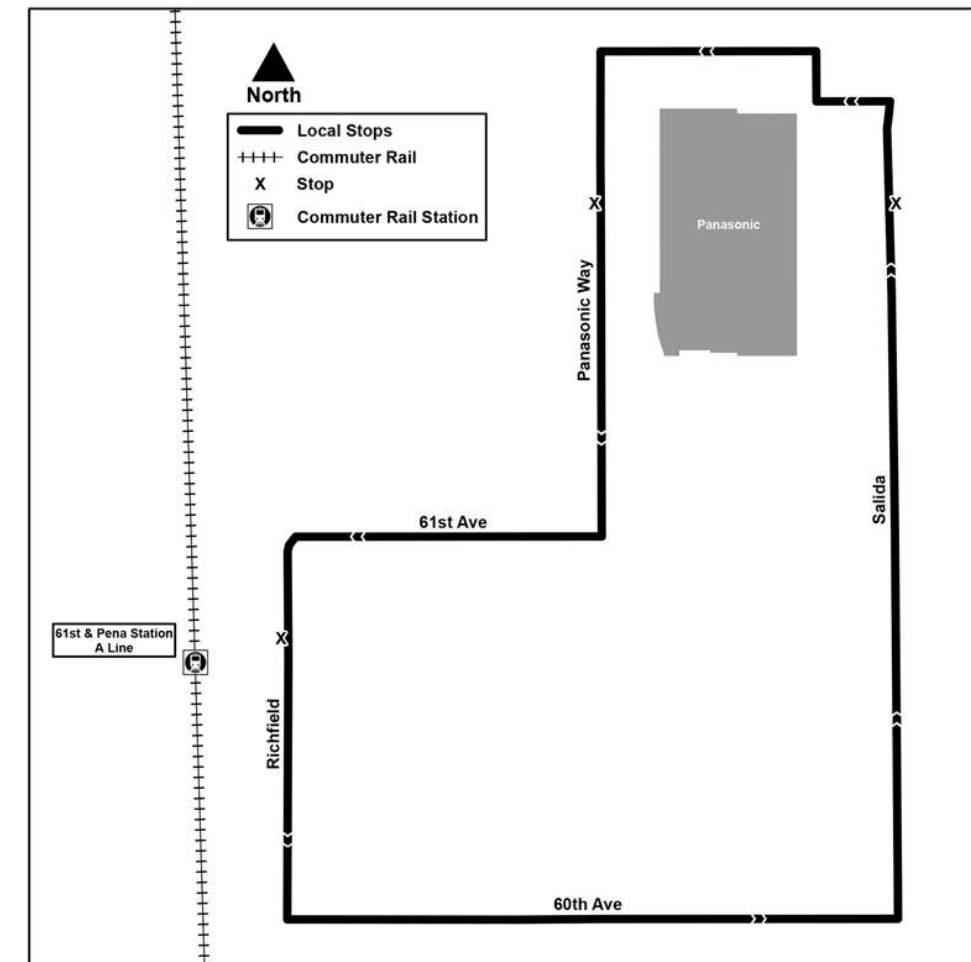
SB Drive



Source: CB Insights.

Uses for Automated Shuttles

- 155 projects and counting (July 2019)
- Public transit routes
- Connections to transit
- Circulators
- Business cases –
 - Universities
 - Health care services
 - Entertainment and retail areas



Source: Regional Transit District (Denver).

Other Considerations

- **Accessibility**

- New models include automated ramp and ADA wheelchair anchor points

- **Workforce issues**

- **Large scale deployment challenges**

- Costly vehicles
 - Vehicle attendees

- **Weather**

- Often deployed in temperate conditions
 - Inclement conditions R&D underway

- **Infrastructure**

- Quality and consistency



Finland's Muji/Sensible4 shuttle.
Image: Dezeen.

Houston Metro University District AV Project

Closed-circuit campus shuttle

- Launched June 2019
- Vehicle vendor: EasyMile
- 1-mile loop
- Serves university students and ADA eligible
- On-board operator
- University partnership for research and testing
- Planned transition to operating in mixed traffic/light-rail connection



Image: Houston Metro.

MnDOT AV Shuttle – Minnesota

Winter Conditions and Event Operations

- **Vendor: EasyMile**
- **Phases**
 - 1: Testing at private facility
 - 2: Operating during Super Bowl Week (1300 riders)
- **Results**
 - 1: vehicles cautious with winter weather hazards, but generally operated well on snow covered roads
 - 2: 80% of riders had positive interactions



AV Shuttle operation at MnROAD testing facility. Image: MnDOT.

How supportive would you be of efforts to bring an automated shuttle(s) to Tahoe?

Very supportive

Somewhat supportive

Neither supportive or unsupportive

Somewhat unsupportive

Very unsupportive



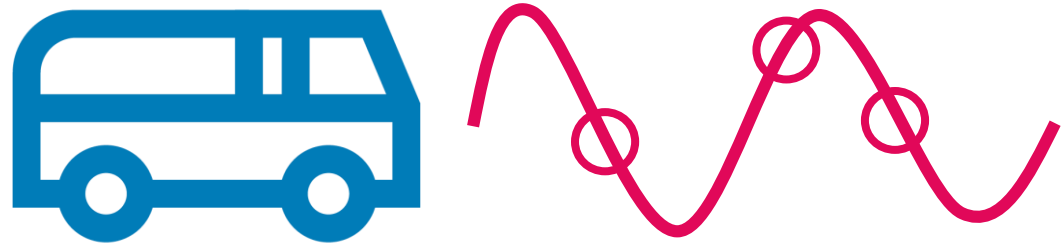
Innovative Approaches



Shuttles

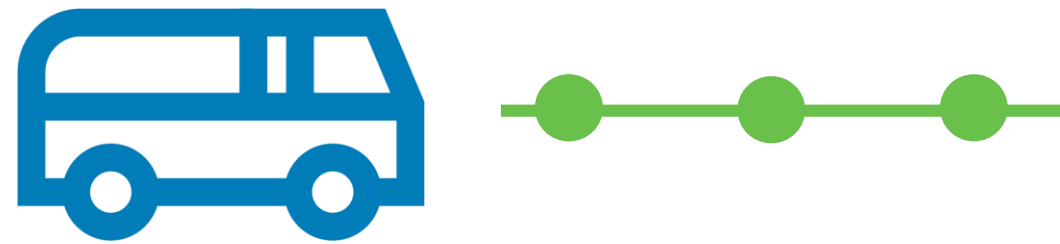
Notable examples from other regions and resort mountain towns

Shuttle Landscape



Microtransit

- On-demand, *dynamically-routed* transit system



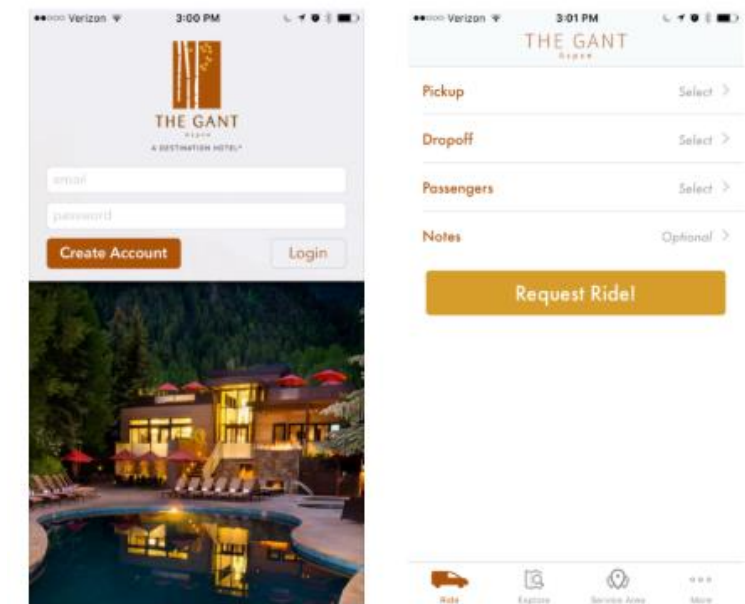
Shuttle

- Regular service between two locations or a service area
- May be on-demand or scheduled
- May be fixed or flexible route
- Might use technology

The Gant- Aspen, Colorado

On-demand resort shuttle

- Partnership with Downtowner to provide shuttle service through mobile app
 - Mountaineer (Squaw Valley) uses Downtowner technology
- Utilizes existing hotel shuttle fleet
- Service also available by calling phone number
- Operates 7am-11pm

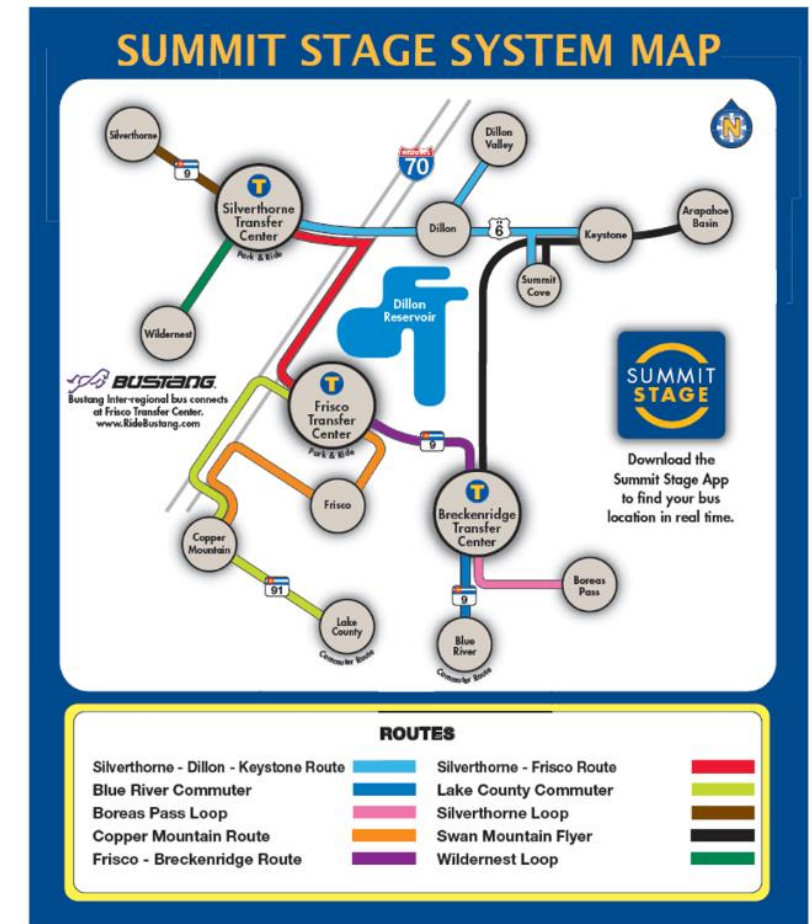


Source: [The Gant](#)

Summit Stage Free Bus- Summit County, CO

Free, fixed route shuttle to ski resorts

- Funded by resort partnership beginning 1977
- Operated by Summit County government since 1989
- Free service – paid by 0.5% sales tax
- Regional service to ski resorts
 - Breckenridge, Dillon, Frisco, Silverthorne, Blue River, Arapahoe Basin Ski Area, Breckenridge Ski Resort, Copper Mountain, and Keystone Resort
- 1.9 million annual ridership

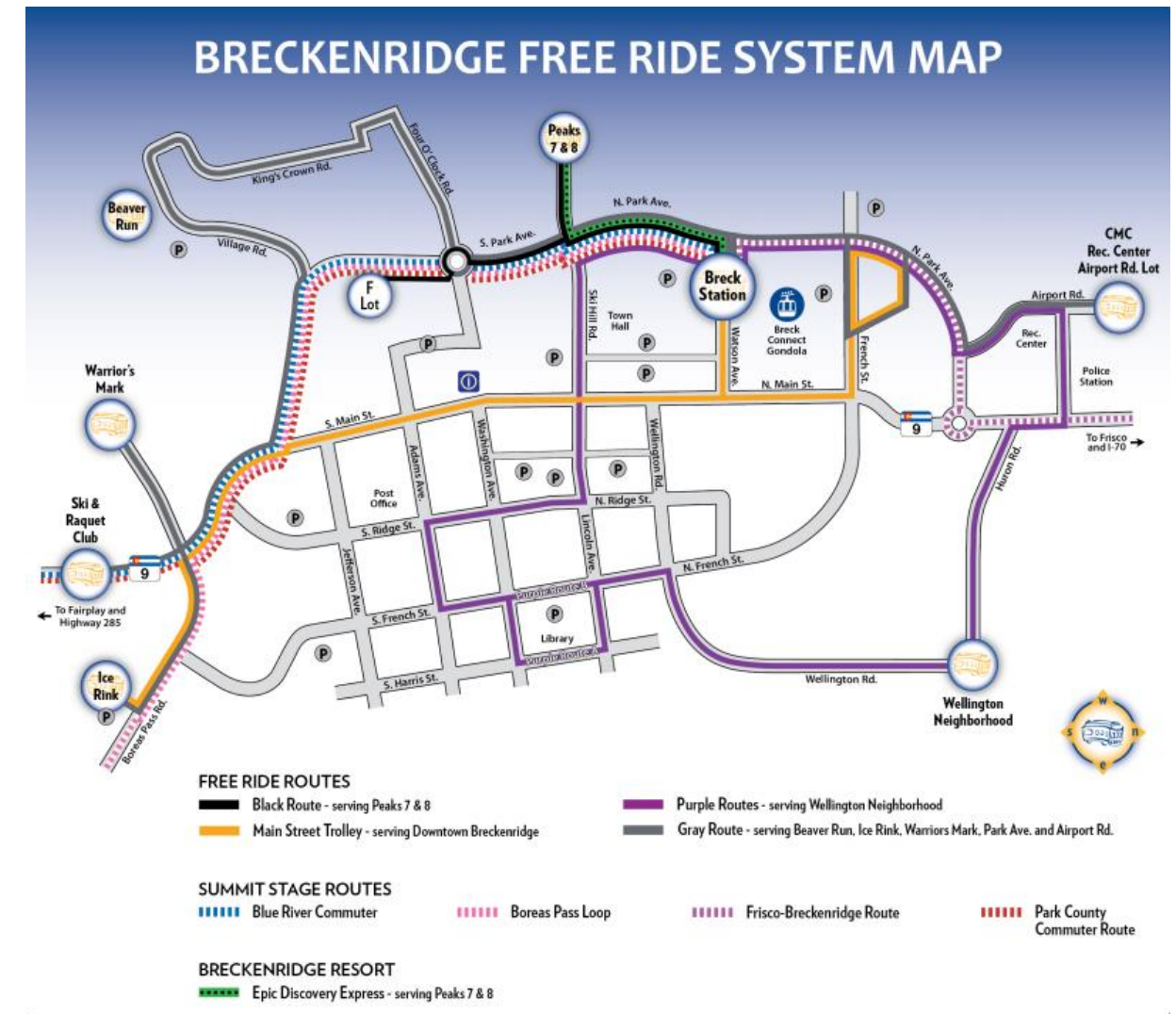


Columbia Gorge Express

Breck Free Ride- Breckenridge, CO

Free, fixed-route circulator

- Overlapping service area with Summit Stage free bus provides connections for riders



Source: [Columbia Gorge Express](#)


Trailhead Direct – King County Metro + Seattle

Longer-distance shuttles to recreation

- Public Private Partnership (P3) between King County Metro and King County Parks, with funding from Seattle DOT and REI Co-op to expand routes
- Weekend shuttle service between Seattle and hiking trails (April – October)
- 2018 inaugural season served 10,000+ hikers



Source: [Trail Head Direct](#)



How supportive would you be of efforts to increase shuttle options for travelers?

Very supportive

Somewhat supportive

Neither supportive or unsupportive

Somewhat unsupportive

Very unsupportive



Marketing and Incentives

Notable examples from other regions and resort mountain towns



Marketing and incentives have been used to...

- Improve congestion and parking conditions in dense areas
- Provide traveler information
 - Advertise new, expanded, rerouted systems
- Encourage travelers to choose sustainable transportation modes
- Support local businesses
 - Incentives toward products, services, discounts



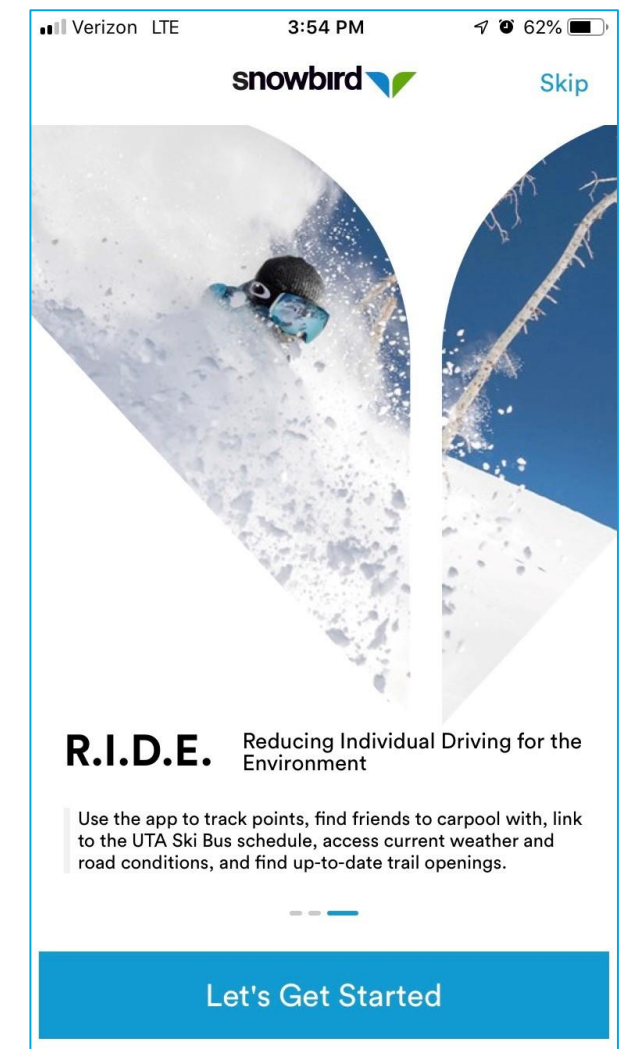
Strategies

- App-Based Incentives
- Marketing
- Traveler Information
- Parking Management

App-Based Incentives

R.I.D.E. App- Snowbird Resort, Utah

- Mobile app trip tracking
- UTA Ski Bus schedule incorporated into the app
- Carpool or transit option
- Points for checking in through app at Snowbird
 - Redeem points for prizes
- VIP parking for 3+ in carpool



Source: [Snowbird](#)

App-Based Incentives

Metropia App

- Everyday incentives for commuters
 - Austin Don't Rush mobility challenge
- Special events promotions for visitors
 - SXSW
 - Tucson Festival of Books



Source: [Mayor Adler](#)

Marketing

Trailhead Direct- King County Metro, Seattle



- Released Media Toolkit to crowdsource advertising for the 2019 service season:
 - Brochures, trail maps, social media campaign
 - Translated to Chinese, Nepali, Spanish, Swahili, Vietnamese
- Trail Head Direct Specific Parking Signs
- Holiday-specific promotional materials

Source: [Public Trailhead Direct Media Toolkit](#)

Marketing Trailhead Direct- King County Metro, Seattle



Source: [Trail Head Direct](#)



Source: [Trail Head Direct](#)

Traveler Information

Tree Hugger Challenge- Breckenridge, CO

- Online educational video series
- Participants complete lessons and receive certificate for a prize (sticker) at the Visitors Center



Source: [Tree-Hugger Challenge](#)

Traveler Information

goDCgo Initiative- Washington, D.C.



Capital Bikeshare Bulk Passes

24-Hour and 3-Day Capital Bikeshare passes that can be offered to guests as a complimentary amenity



Brochure Ordering

Complimentary ordering and delivery of maps and brochures for your concierge and front desk



Custom Marketing Materials

Custom Get Around Guide detailing transportation options near your hotel and messaging for your website and marketing materials



Education & Workshops

On-site training to educate concierge and guest services staff about transit options, including Capital Bikeshare



Transit Displays

Digital displays providing real-time transit details to keep visitors informed of all nearby transportation options



Event Travel Coordination

Consultation on event travel coordination from permitting to valet bike parking and Capital Bikeshare Corral Service.

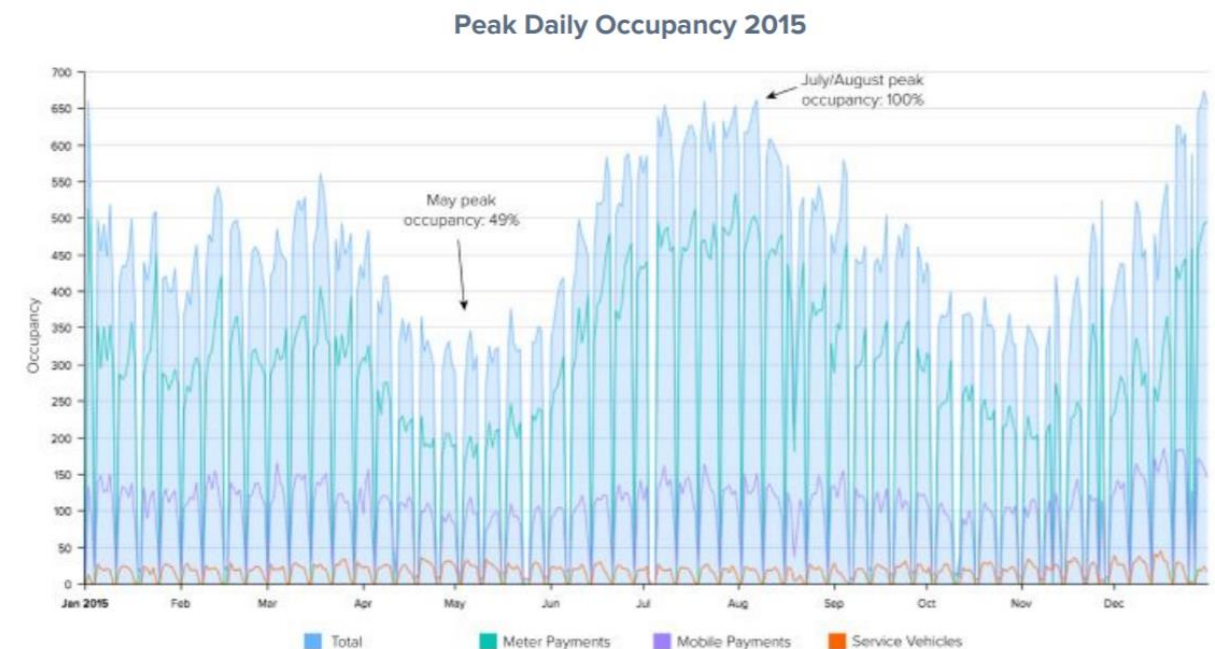
Parking Incentives Aspen, Colorado



- **Parking Management Program**

- Seasonal parking pricing, residential permit program, increased on-street prices, reduced off-street facility prices

- **City council allowed public vote *only* after all of programs' elements were in place for 3 months**

- Initial negative public reaction
- 75% voter approval to continue the program





How supportive would you be of efforts to increase marketing and incentives in Tahoe?

Very supportive

Somewhat supportive

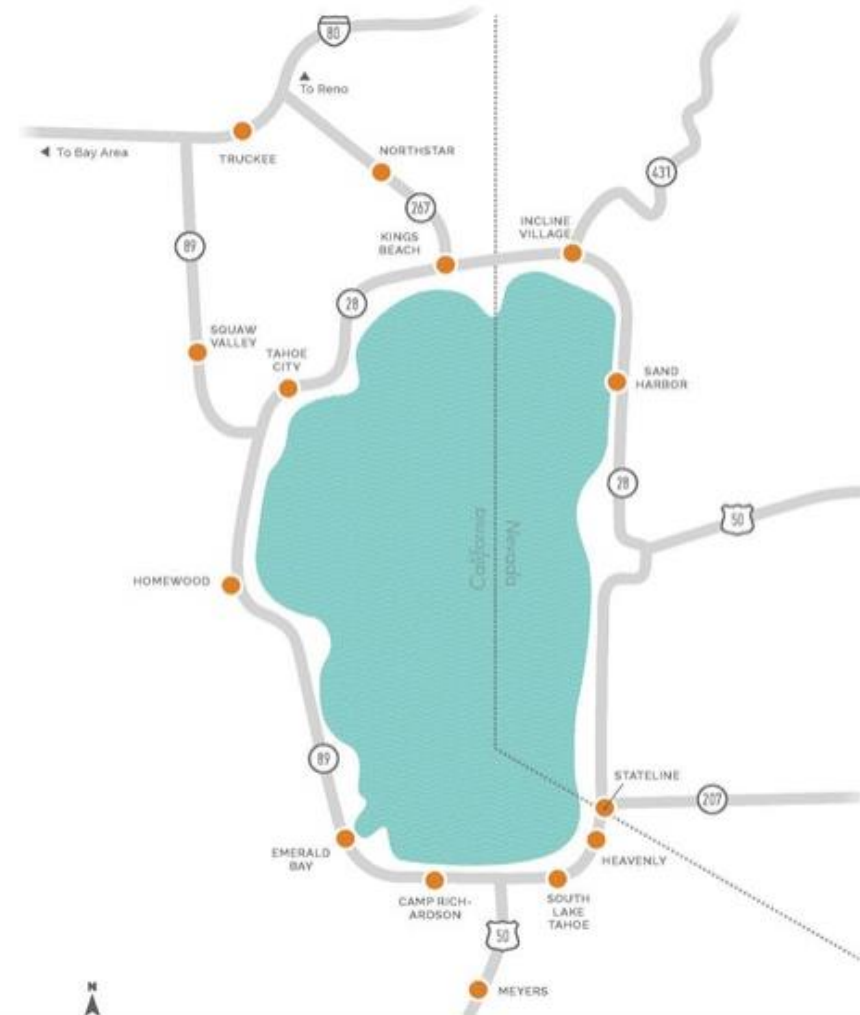
Neither supportive or unsupportive

Somewhat unsupportive

Very unsupportive

Breakout Groups


Tag the area that you believe has the greatest potential for applications of emerging or innovative transportation solutions.





Break

Five minutes



Scenario: Fourth of July traffic is expected to be record breaking this year. Visitors and residents have been expressing frustration with the traffic and lack of options to reach their desired destinations.

Prompt: Your team has been given a blank check to address this issue. How might you apply some of the shared travel options presented today or others you may be aware of to improve transportation in Tahoe?



Scenario: You work with a marketing firm hired by the Tahoe region to encourage sustainable transportation choices.

Prompt: How do you get the word out about the shared travel options your group selected in the previous exercise? How do you promote these options to residents and visitors?

Report Out by Group

