# AUTONOMOUS FUTURE, TODAY

*EasyMile brings driverless vehicle solutions for people and goods to life with leading technology to provide a real service*

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# Lauren Isaac

*Director of Business Initiatives, EasyMile*

- Denver, CO based
- 15 years of transportation experience including public transportation, bike share, rideshare, and driverless vehicles
- 8+ years in transportation consulting and working with public agencies
- Passionate about reducing single-occupancy vehicles on the road and leveraging the growing sharing economy

# About us

# EasyMile

Since
2014

30+ PhDs

220+

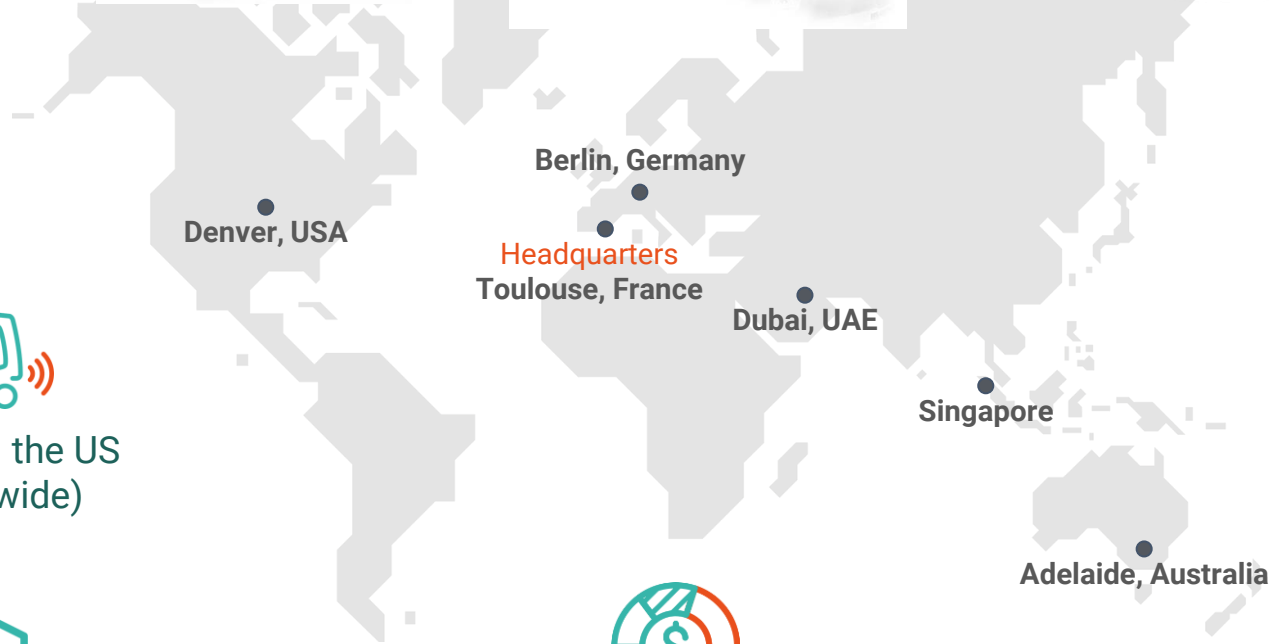
Leader
in R&D

32 vehicles in the US
(150 worldwide)

7
locations

22
nationalities

60+ projects in the US
(350+ worldwide)




## Shareholders

Founders, Continental, Alstom, and Bpifrance

# EZ10 autonomous shuttle

Driverless and electric shuttle

6 (seated Passengers)

16h autonomy, 8h with Heat/Air

Built-in automatic access ramp - ADA compliant

Pre-mapped network of roads

Connected

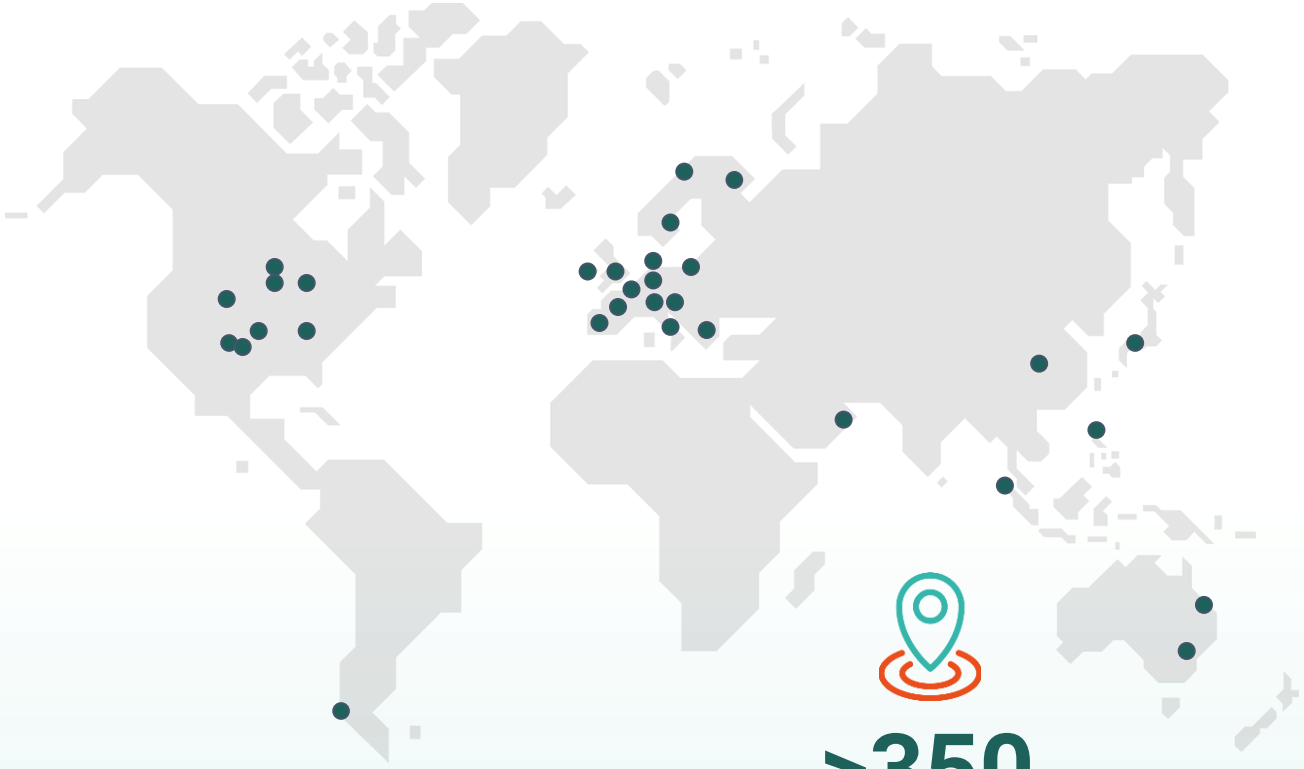
12 EZ10 maximum speed

30 Other vehicles' maximum speed

Sunny,Cloudy, light Rain, light snow


ez10

# EasyMile’s vehicles in the world



**150+**
Shuttles worldwide

**10**
Tractors worldwide

**>350**
Deployments
**In 30+ countries**

**> 400,000 miles**
Autonomous driving

# Phoenix Motorcars and the EZ Zeus

—

- EasyMile is working with Phoenix Motorcars to develop the EZ Zeus
- This is an FMVSS, Buy America, and ADA compliant vehicle
- Commercially available in the next two years with the first vehicle available by 2021
- Press release here

# EZ10 Deployments

# Teaching vehicles how to behave

## Localization

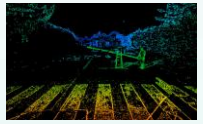
Using all the available data from the different sensors in a fusion algorithm, the vehicle knows its position and the accuracy of it at all times. Any potential deviation will safely slow down or stop the vehicle.

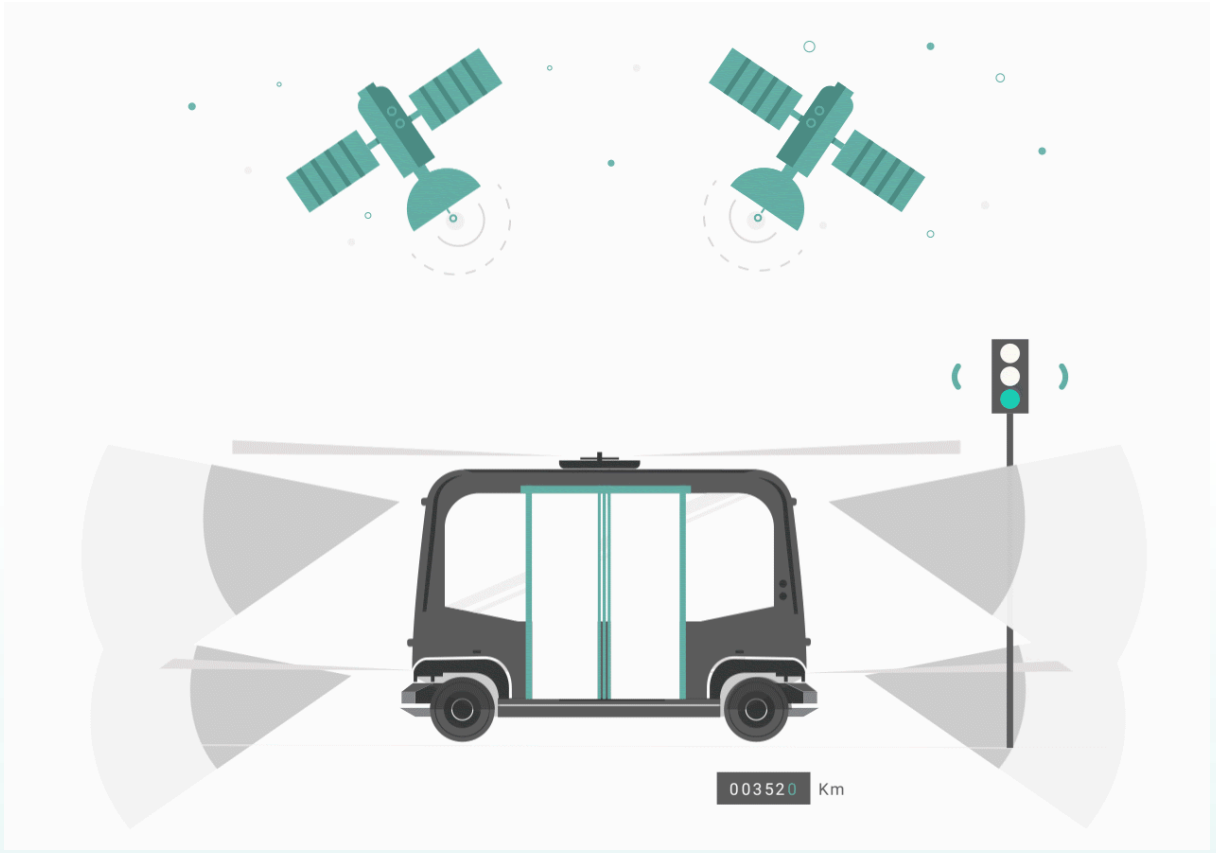
## Navigation

The vehicle can be programmed to a site map, even with a network of potential trajectories, with all elements triggering specific behavior (e.g speed areas, pedestrian crossings etc.). The vehicle follows the path smoothly with pre-defined behavior.

## Perception

If an obstacle appears, the vehicle's sensors detect it and trigger appropriate behavior, slowing down, overtaking or stopping. When the obstacle is avoided, the vehicle proceeds.





# EZ10 ODD Considerations

- Pre-mapped environment
- Well paved and maintained roads
- Lower speed vehicle traffic (<30 mph)
- Day or night operations
- Good 3g/4g coverage
- Traffic signals require CV technology

# EZ10 Use Cases

## Private sites

- Large industrial sites
- Universities and hospital campuses
- Business parks, theme parks especially to commute with parking areas

## Public roads

- 1st and last mile in complement to mass transportation means
- Pedestrian / controlled speed districts
- Touristic areas

# Sharing best practice

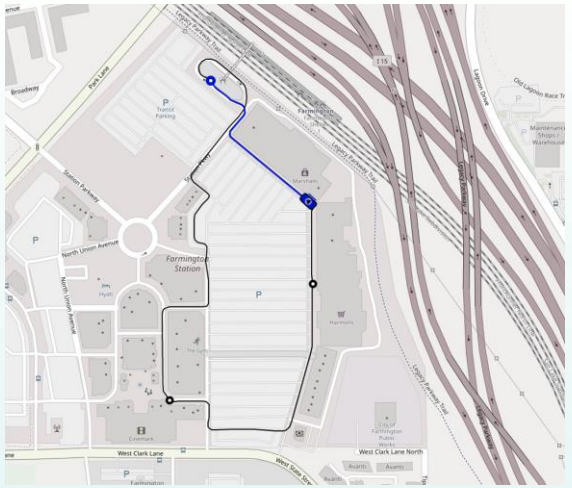
*Various use cases including, Department of Transportations, Airports, Fortune 500 firms and University Campuses*

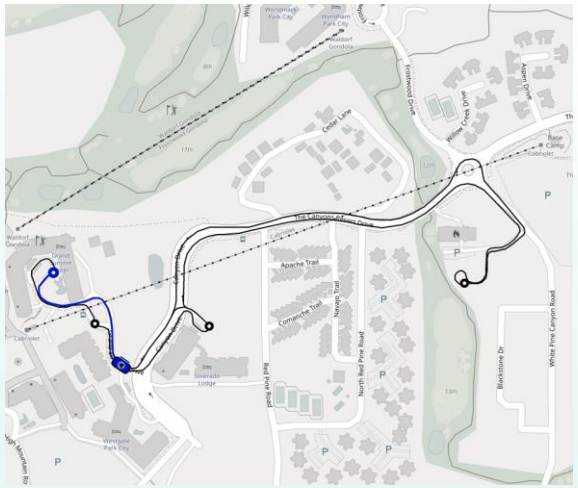

*EasyMile has unmatched deployment experience; having operated hundreds of thousands of miles in our driverless shuttles globally. EasyMile is happy to provide references, upon request.*

# Utah Department Of Transportation

10 venues over 12 months around Salt Lake City with different use cases and customer types: skiing resorts, business parks, university campus, hospital, malls.

| | |
|---|---|
| *Place* | *Various Locations Around the State of Utah, USA* |
| *Customer and Client URL* | *Utah Department of Transportation.* [http://www.avshuttleutah.com/](http://www.avshuttleutah.com/) |
| *Environment* | *Private and Public Roads* |
| *Description of the project scope* | *Mixed Traffic  with Pedestrians, Bikes and Motorized Vehicles* |
| *Route length* | *Average 1 mile* |
| *Make, Model and Number of shuttles used* | *One EasyMile EZ10 Gen-2* |
| *Project Duration - including passengers carried,* | *18 months project, has been ongoing since March 2019. 750 riders per month.* |
| *Average temperatures and weather encountered* | *The highest average temperature is 89.4° and the lowest average temperature is 17.1°F. Weather includes snow, rain, wind, fog, hail* |

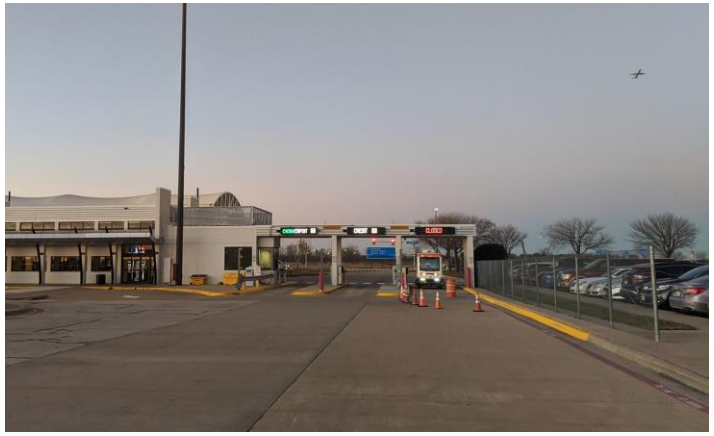


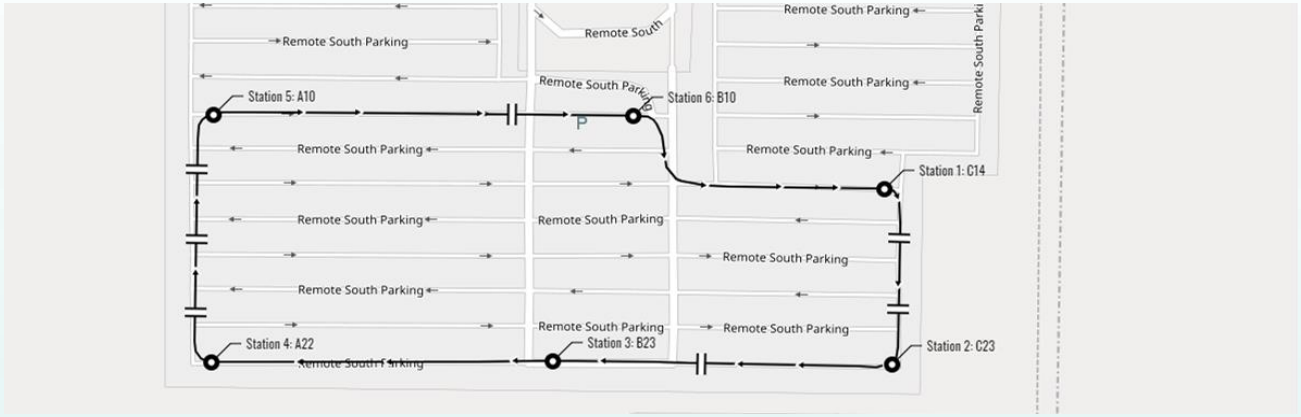


# Dallas Fort Worth Airport, Texas

Dallas Fort Worth International Airport (DFW) has contracted EasyMile to provide a driverless shuttle service transporting passengers in the Remote South Parking lot in order to provide a seamless connection with a shuttle service to the airport terminal. The service is being provided from December 2019 to June of 2020 and is operating from 7am to 3pm on weekdays. DFW is using this first pilot as an opportunity to learn about the driverless technology and understand potential additional applications throughout the airport. Future opportunities at DFW include additional passenger transport locations in addition to baggage transport airside or landside.

| | |
|---|---|
| *Customers and Client URL* | *DFW - [www.dfwairport.com](http://www.dfwairport.com)* |
| *Environment* | *Private parking lot - landside* |
| *Description of the project scope* | *Mixed Traffic with Pedestrians and Motorized Vehicles* |
| *Route length / Number of stops* | *0.75 mile with 6 stops* |
| *Make, Model and Number of shuttles used* | *One EasyMile EZ10 Gen-2* |
| *Project Duration, hours of service - including passengers carried* | *6 month first phase completed*<br>*7am to 3pm.*<br>*Approx. 50-100 passengers per week* |
| *Average temperatures and weather encountered* | *The highest average temperature is 96° and the lowest average temperature is 30°F. Weather includes rain, wind, fog, hail.* |



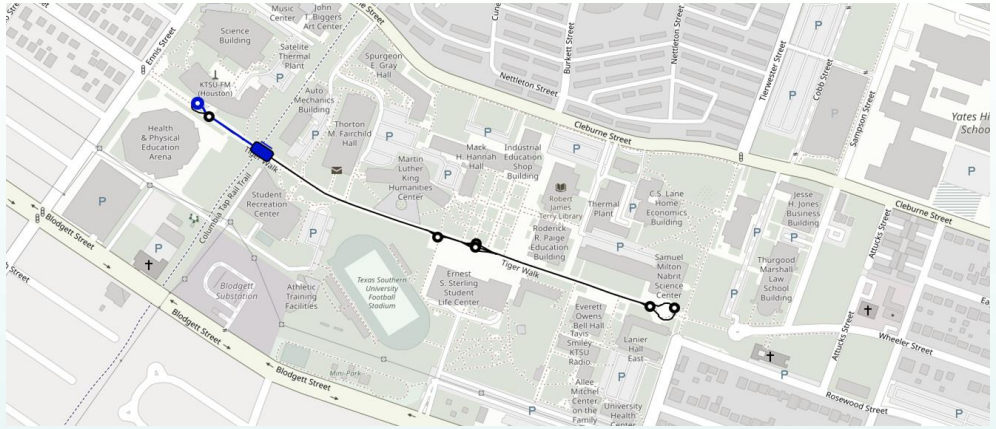



# Houston Metro, TSU, Texas

Texas Southern University, METRO, First Transit, Houston-Galveston Area Council and EasyMile started the region's first Shared Autonomous Shuttle in June 2019.

The University District Circulator in which a driverless EasyMile SAV shuttle travels on the Tiger Walk is a one-mile pedestrian walking loop, providing connections to multiple points and buildings on campus for students and faculty.

| | |
|---|---|
| *Customers and Client URL* | *Houston METRO - https://www.ridemetro.org/* |
| *Environment* | *University campus* |
| *Description of the project scope* | *Mixed Traffic with Pedestrians, Bikes and Motorized Vehicles* |
| *Route length / Number of stops* | *1 mile with 6 stops* |
| *Make, Model and Number of shuttles used* | *One EasyMile EZ10 Gen-2* |
| *Project Duration, hours of service, ridership* | *Phase 1 - 1 year completed*<br>*Phase 2 is in preparation*<br>*1,000 Passengers per month* |
| *Average temperatures and weather encountered* | *The highest average temperature is 93° and the lowest average temperature is 44°F. Weather includes rain, wind, fog, hail.* |

# Reflections on AV Shuttle Deployments

- AV shuttles are not just sexy toys! Projects should solve a mobility challenge.
- Route complexity needs to match the state of the automated technology…. And can scale from there
- Stakeholders should each identify their goals upfront
- We will share data, but we need to know what is useful to you!
- Key factors for a successful AV project:
  - Aligned stakeholders
  - Feasible route
  - Funding

# Introducing EZ Street...

# What is required to prepare for commercial autonomous deployments?

What type of Infrastructure changes will be required?

Determine the advantages/disadvantages in public transit

What level of stakeholder engagement will be required?

How real is the threat from cybersecurity?

What outreach will be needed to gain acceptance from the community?

What type of weather conditions can the AV operate in? How many overall days will they not operate?

What is the job transition plan?

Who owns the data? How will it be shared?

Are all AV companies the same? What type of safety testing is available?

Will there really be a cost benefit provided by autonomous vehicles?

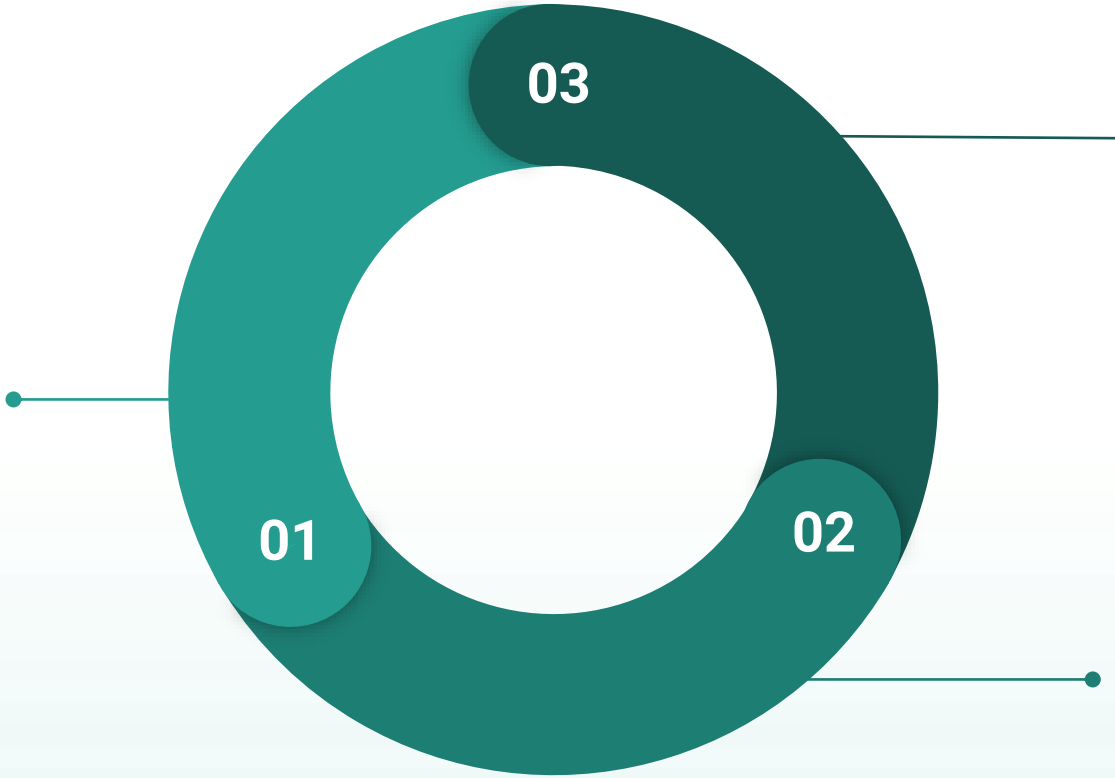
Who is liable in an accident? City, AV technology, operator, infrastructure?

Are state and local laws ready to allow for autonomous vehicles on the roads? Licensing and permitting?

# PROJECT VISION

## Deploy Meaningful, Autonomous Service

Provide the nation's largest autonomous micro transit first-and last-mile/circulator service today




## Educate the Industry

Capture and communicate all of the lessons learned in order to to create the world's first roadmap to prepare the city, and the industry, for robust autonomous transit in the next few years

## Create a Living Lab

Incorporate a range of novel technologies that can leverage the autonomous vehicle micro transit service

# PROJECT SITE(S)

The Colorado Smart Cities Alliance is in discussions with multiple Colorado cities about deployments of up to 10 autonomous shuttles at each site. The shuttles will provide first/last mile connections to transit stops and/or circulation around a downtown. Estimated deployment timeline is Q2 2021. Commitments are expected by the end of Q4 2020.

# PROJECT ECOSYSTEM

FUNDING

**Partner Contribution** | **University Data Sharing** | **EZ Street Playbook** | **Private Sector Sponsorship** | **Grants**

**Colorado Smart Cities Alliance**
**(Partner and Funding Coordination)**

PARTNERS

**EasyMile**
(Vehicles/Maint/ Deployment)

**Panasonic**
(Connected Infrastructure)

**Transdev**
(Operations)

**RTD**
(Transit Partner)

**NHTSA**
(Federal approval)

**Telecom**
(4G/5G)

**Host City**
(Site owner, Storage/Charging)

**Insurance Partner**
(Risk Analysis)

**CO AV Mobility Taskforce**
(State approval)

**Consulting Firm**
(Sponsorship Generation/Playbook)

**Sponsors**

**Local Employers**

**MaaS Platform**

**University/ Research Centers**
(Grant Applications/Data Analysis)

**AV Vendors**
(Supporting Technology)

# Thank you!

*Lauren Isaac, Director of Business Initiatives*
*lauren.isaac@easymile.com*

Connect with us:

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