AC TRANSIT FLEX PILOT PROGRAM

JOHN URGO
TRANSPORTATION PLANNER
AC TRANSIT | OAKLAND, CA

WHAT IS AC TRANSIT FLEX?

- An **on-demand transit** service began operation in July 2016
- **Replaced** a fixed route in March 2017 for a **pilot period** of one year

WHAT IS AC TRANSIT FLEX?

1 BOOK YOUR TRIP AS LITTLE AS 30 MINUTES IN ADVANCE

CONFIRM YOUR 10-MINUTE PICKUP WINDOW

2 WE'LL SEND YOU A PICKUP ETA WHEN YOUR BUS IS ON THE WAY

THE BUS WON'T LEAVE BEFORE THIS TIME

3 TRAVEL TO BUS STOP

4 TRACK YOUR BUS WHILE WAITING AT INTERSECTION

BOARD BUS AND PAY WITH CASH, CLIPPER, OR PASS

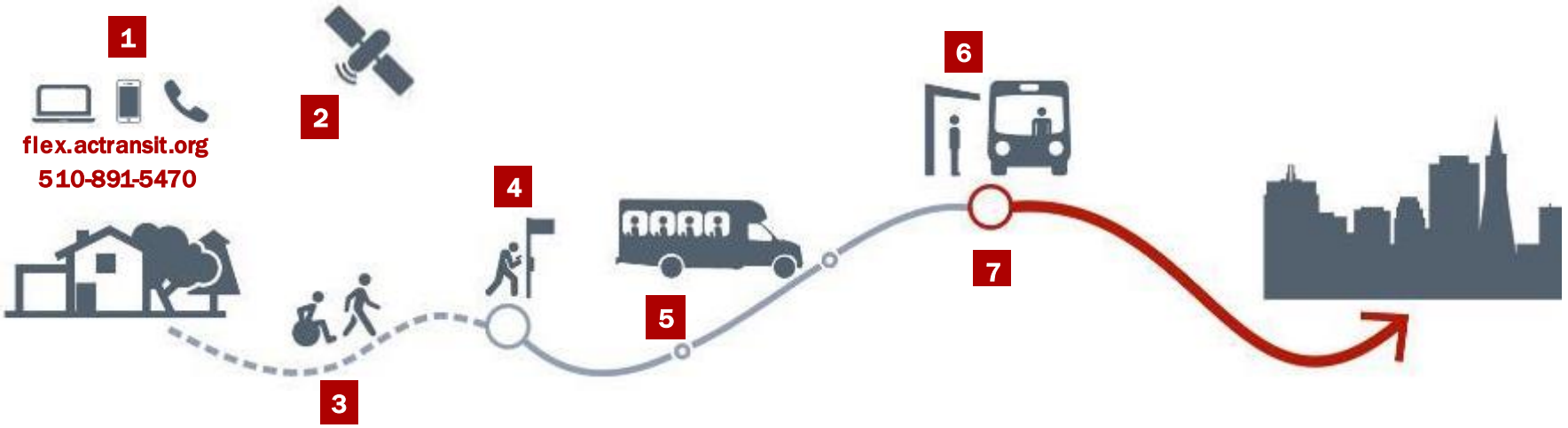
5 SHARE YOUR RIDE AS OTHER PASSENGERS GET PICKED UP AND DROPPED OFF

6 ARRIVE AT DROP-OFF POINT AND WALK TO DESTINATION

TRANSFER AT BART FOR DESTINATIONS IN THE EAST BAY AND SAN FRANCISCO

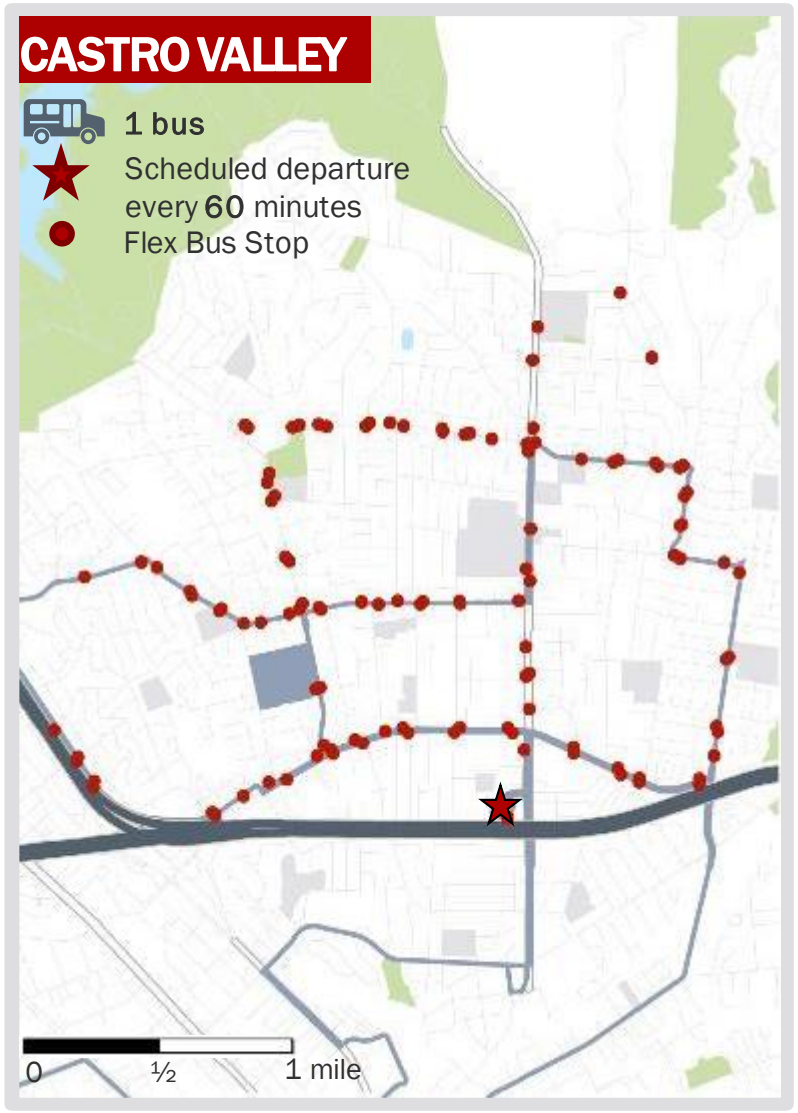
7 ON YOUR RETURN, BOARD FLEX AT BART EVERY 30 MINUTES WITHOUT RESERVATION

RESERVATIONS CAN ALSO BE MADE IN ADVANCE, OR ON A SUBSCRIPTION BASIS



Alameda-Contra Costa Transit
actransit.org

WHERE IS AC TRANSIT FLEX?



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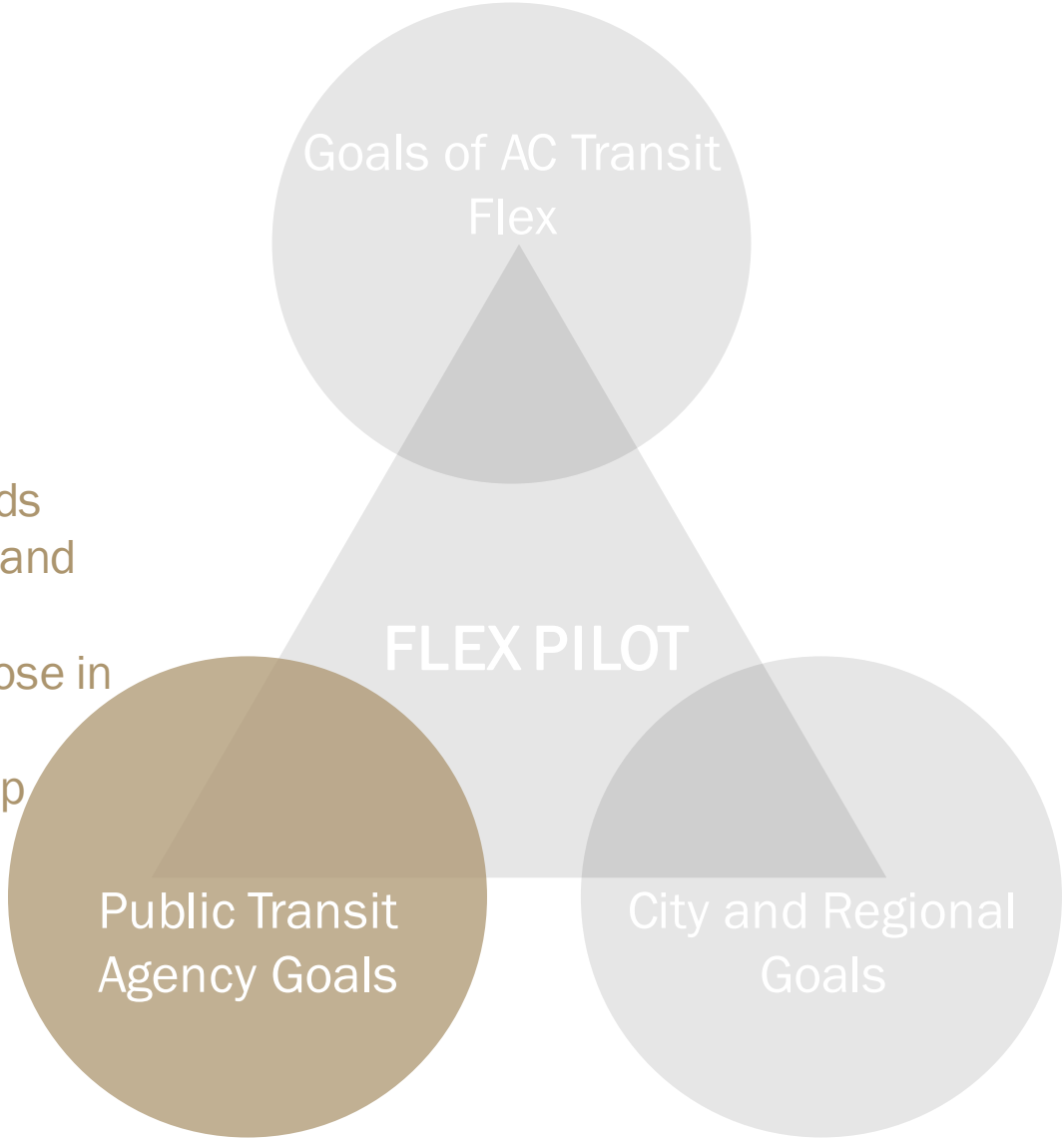
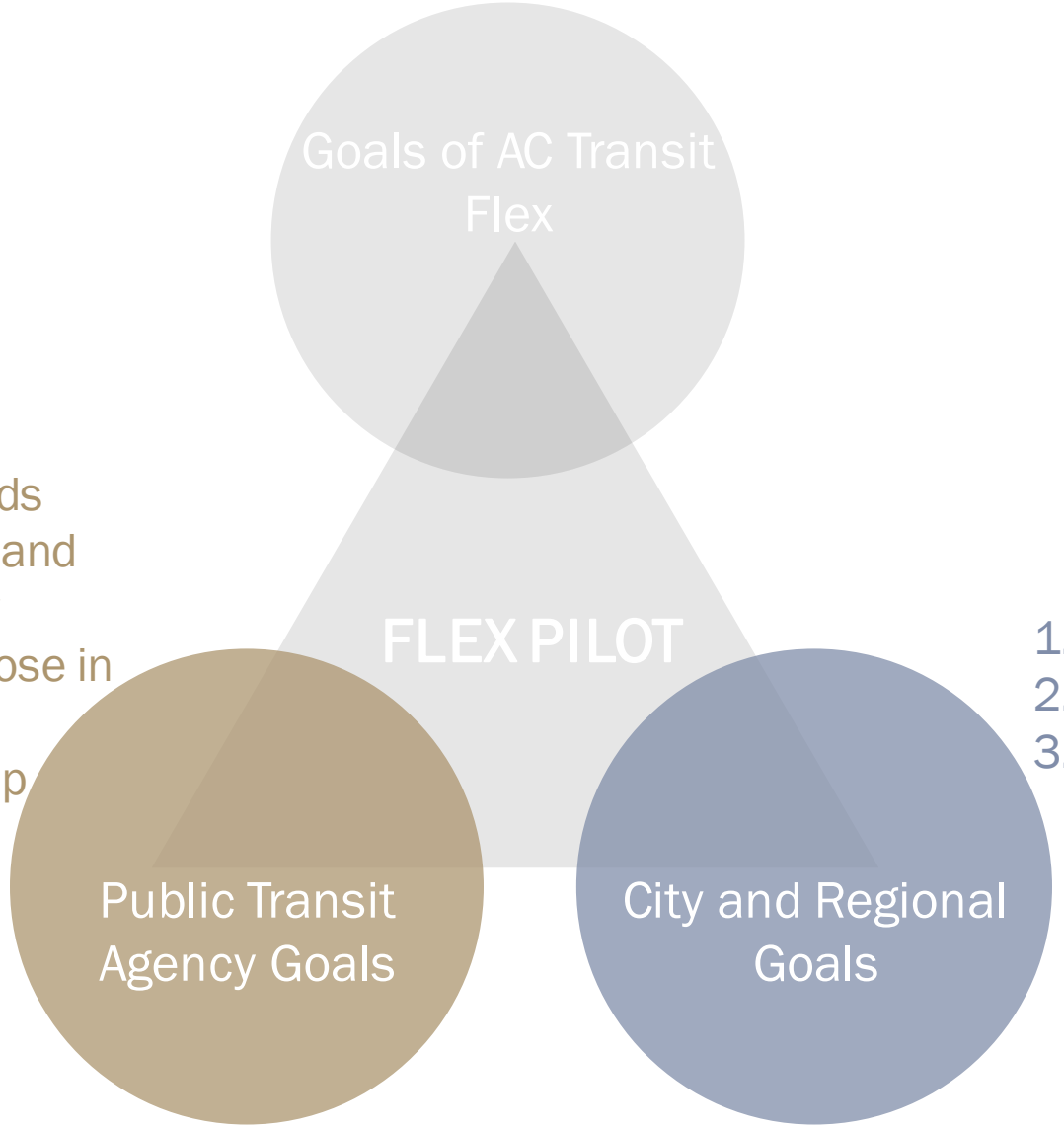
WHY AC TRANSIT FLEX?

1. Public Stewards
2. Transparency and Accountability
3. Mobility for those in need
4. Grow Ridership



WHY AC TRANSIT FLEX?



1. Public Stewards
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1. Reduce Emissions
2. Reduce Congestion
3. Social Equity

WHY AC TRANSIT FLEX?

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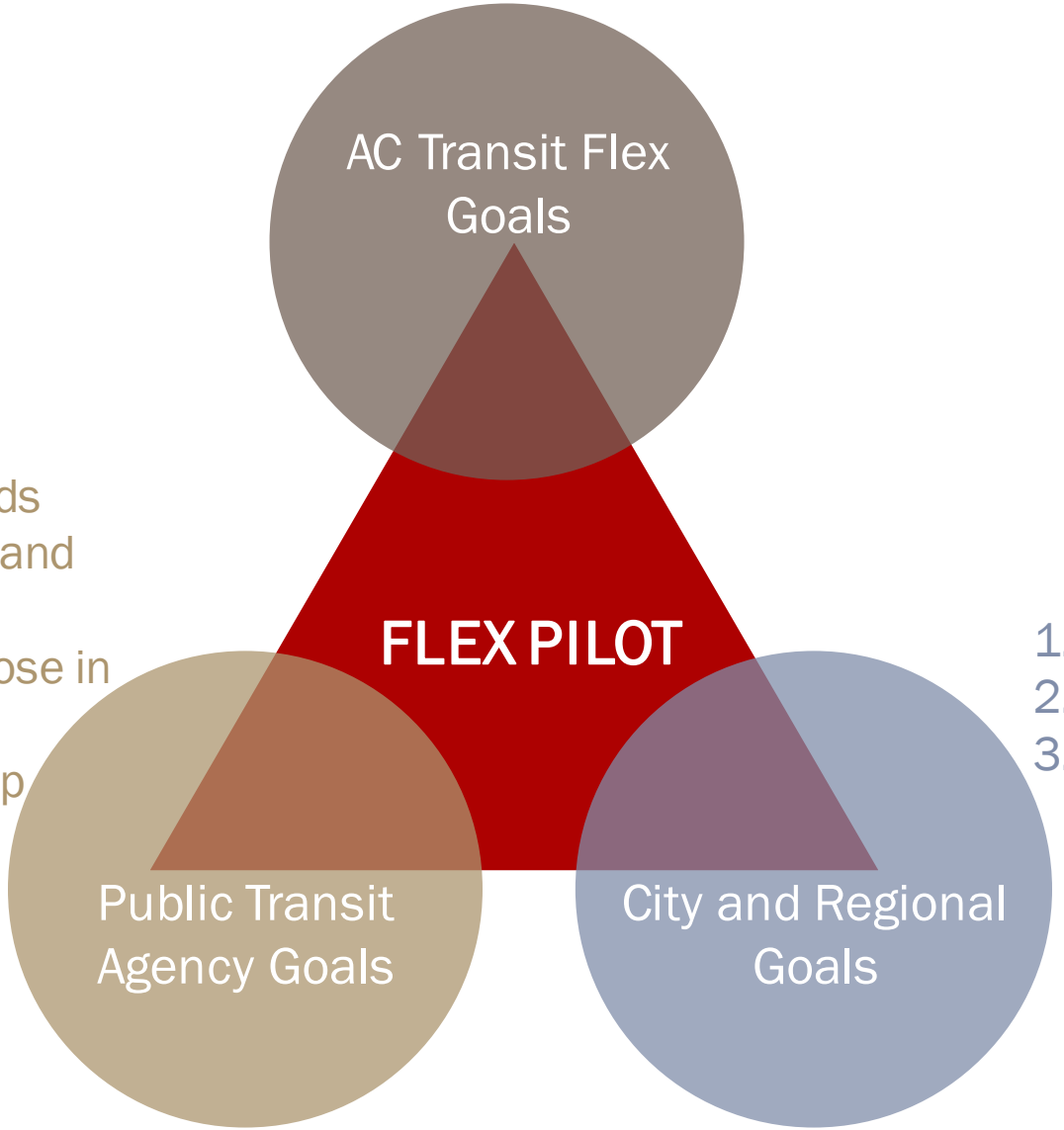


1. Reduce Emissions
2. Reduce Congestion
3. Social Equity

WHY AC TRANSIT FLEX?

Improve service in **low density** and **low demand** areas

Respond to a changing **marketplace**

Ensure **access** and **equity**

Costs and Funding

- General operating funds
- AC Transit Buses
- AC Transit Operators
- Contract for technology services

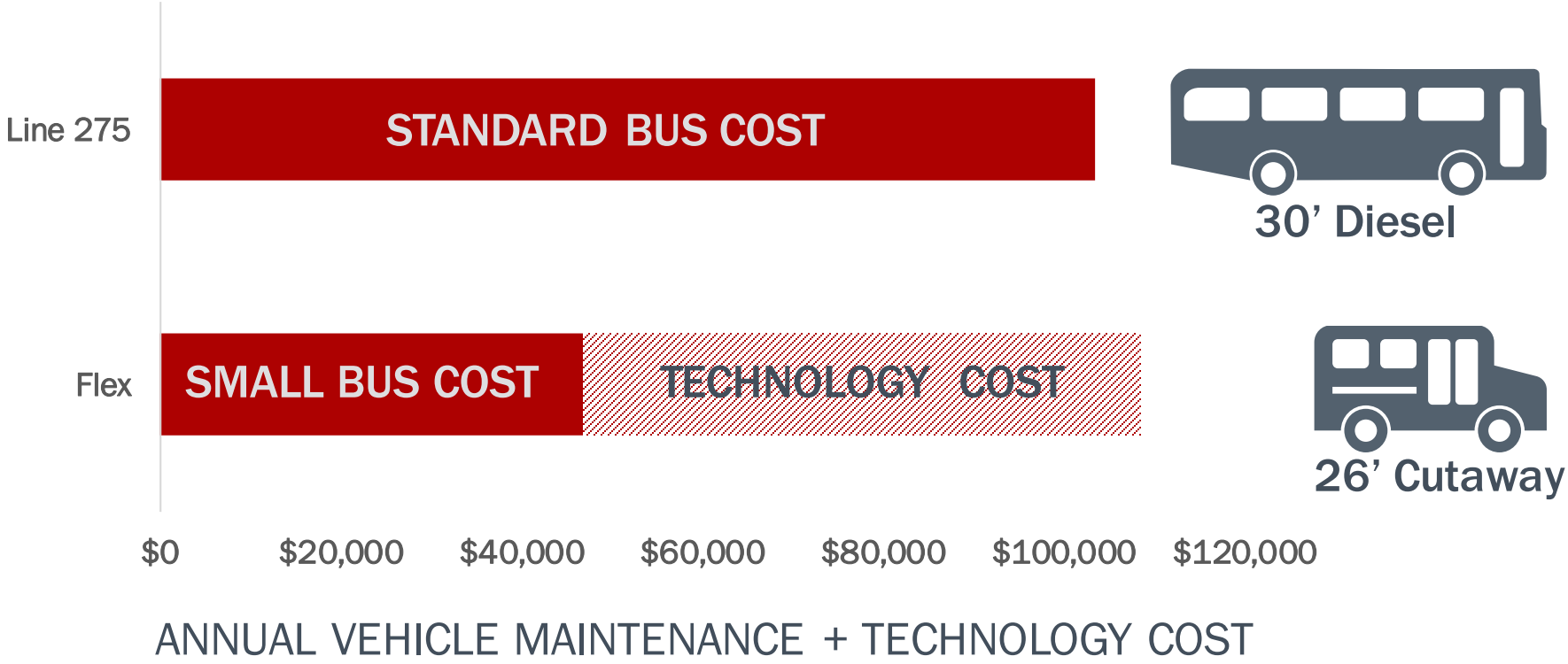
Revenue and operating
cost neutral

2 Buses

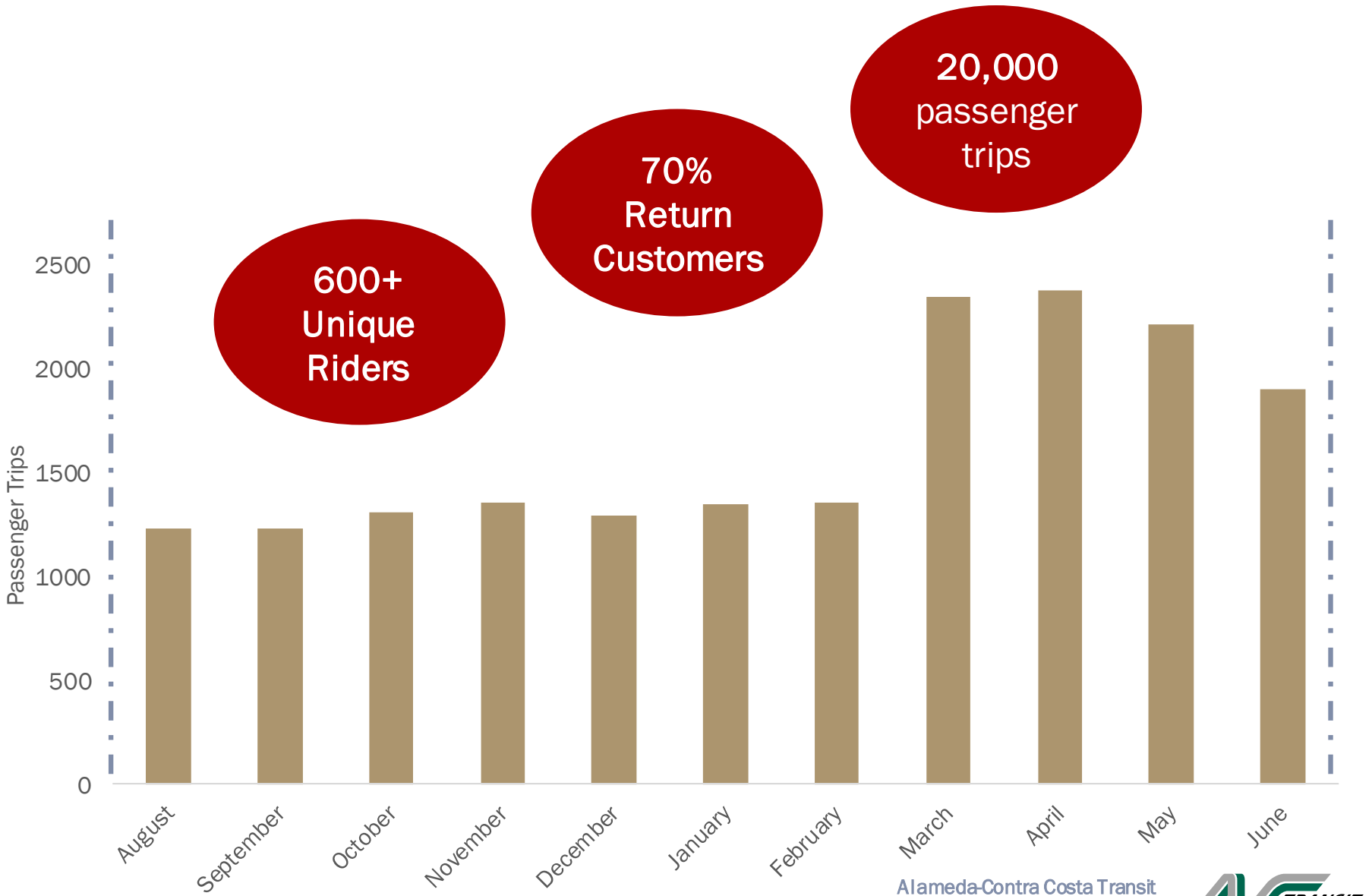
FLEX

COSTS AND FUNDING

Maintenance and Operating **Cost Neutral**



RIDERSHIP TO DATE



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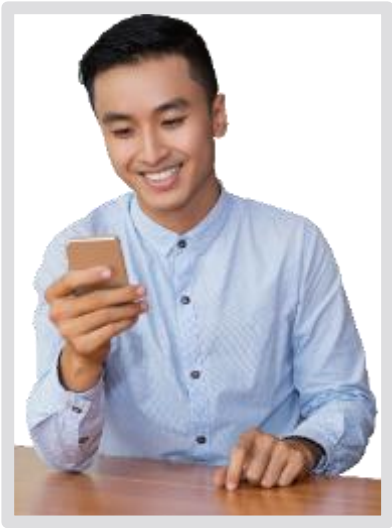
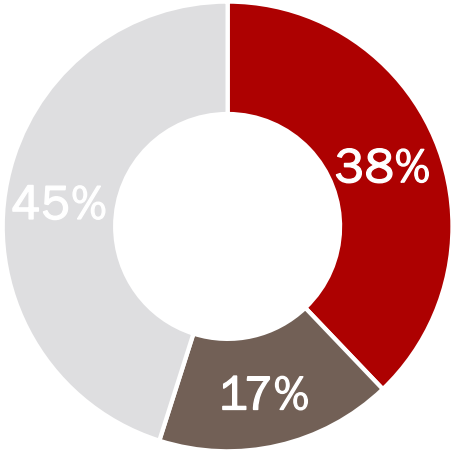
PASSENGERS MOSTLY BOOK TRIPS ON THEIR OWN

Online Booking

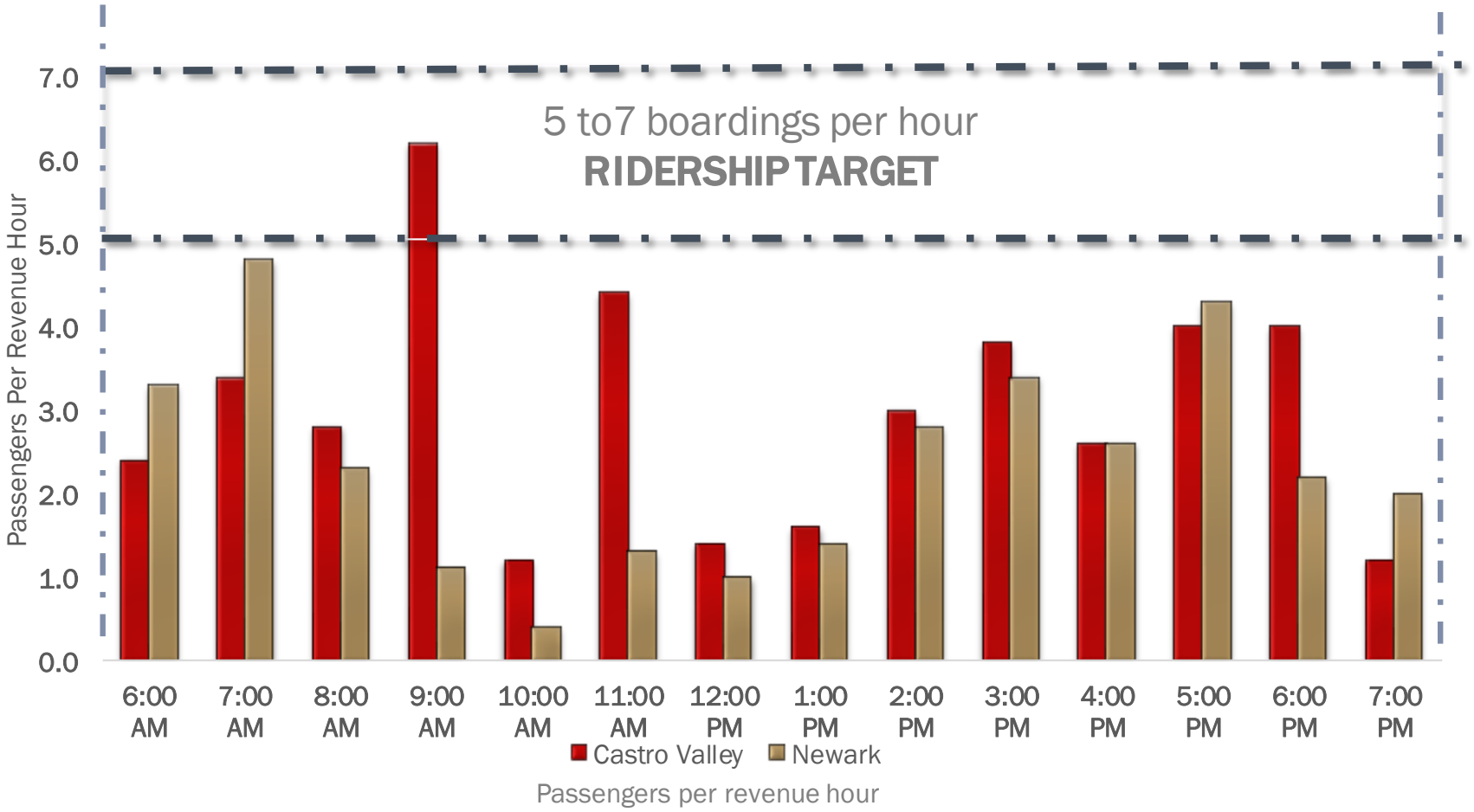




Walk On

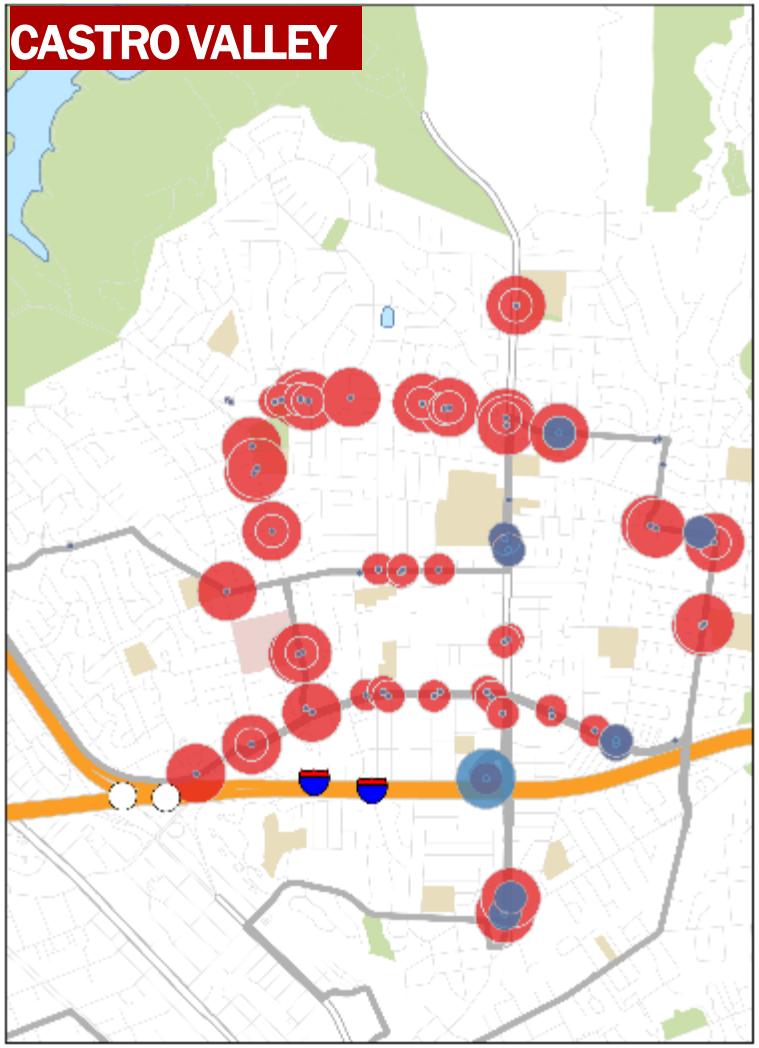
Call Agent Booking

SERVICE PRODUCTIVITY



RESERVATION BARRIER

- **40%** of passengers riding *from* BART are not taking the service *to* BART

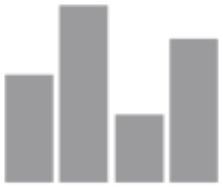


Blue = Boarding, Red = Alighting

LESSONS LEARNED

Set **realistic** goals for low demand areas

Reservationless **+** Scheduled Trips **boost** productivity but **lower** reliability



Upper limit **7** passengers/ revenue hour

Smaller buses **reduce** operating costs

Smallish 5-7 square mile service zones

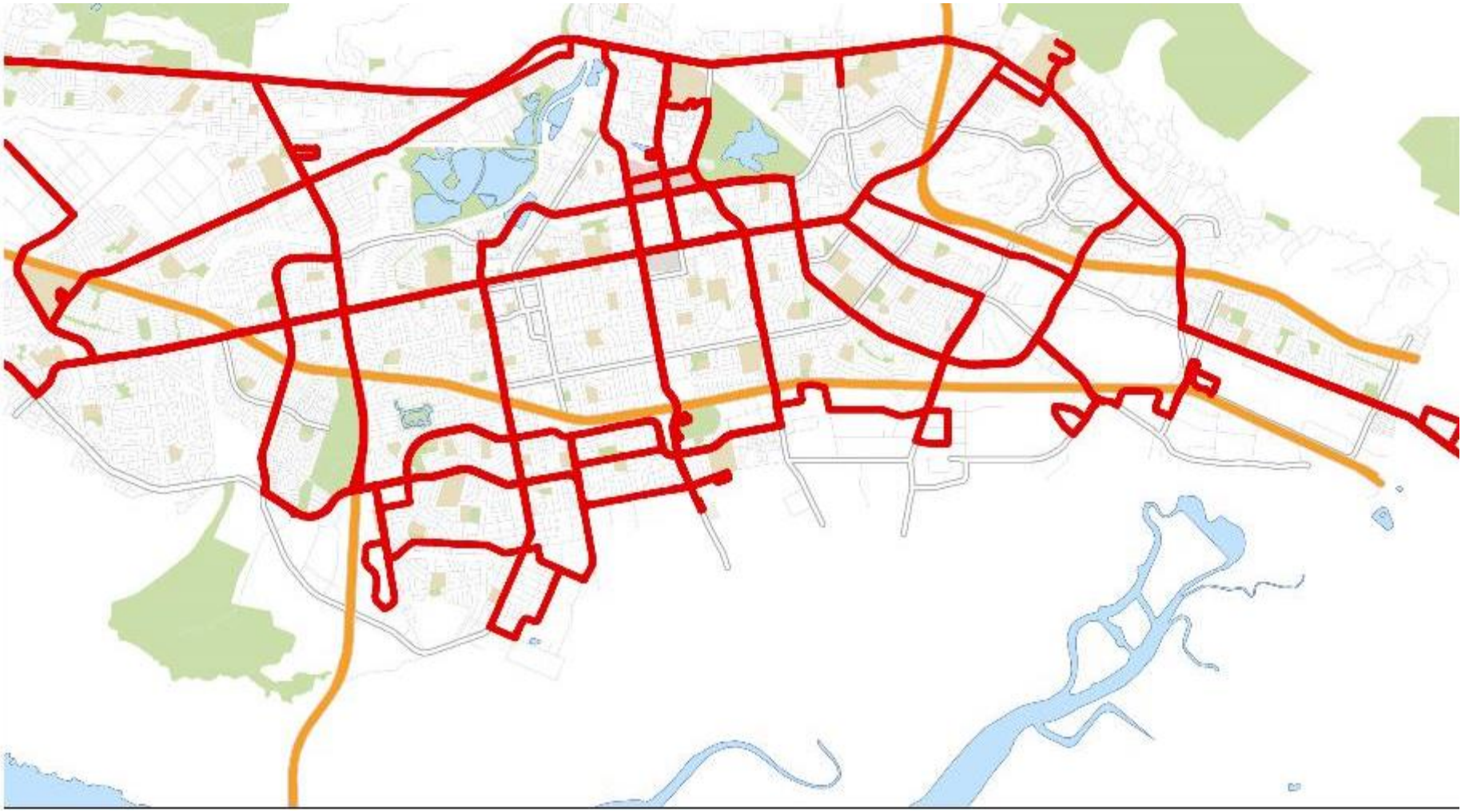
Technology leads to greater **efficiency** (as well as **headaches**)

Operate!

Replace is easier than repeal

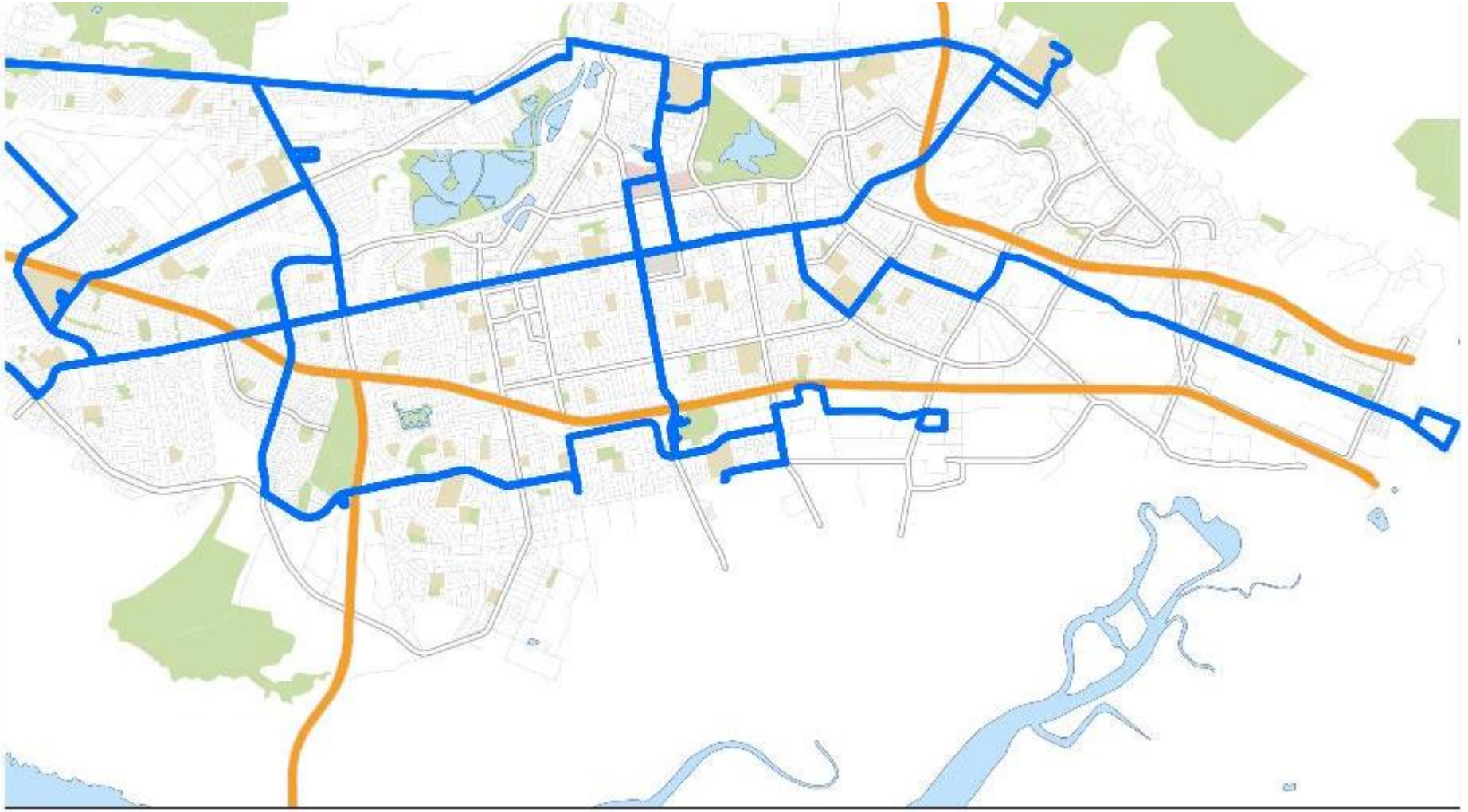
THE FUTURE OF FLEX: A NETWORK APPROACH

Existing **low frequency** network



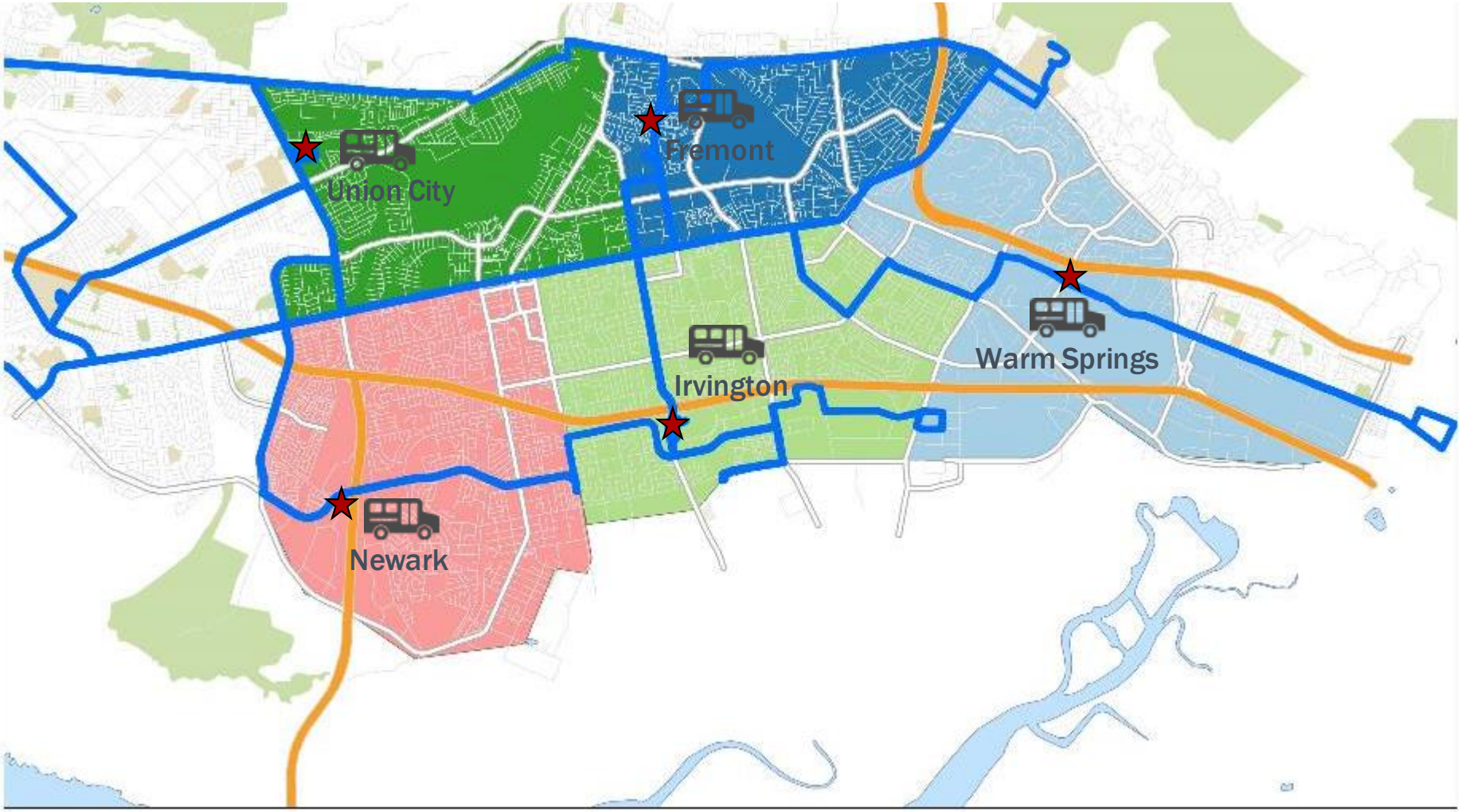
THE FUTURE OF FLEX: A NETWORK APPROACH

Proposed high frequency network



THE FUTURE OF FLEX: A NETWORK APPROACH

Proposed high frequency network + flex coverage zones = cost neutral



THE FUTURE OF FLEX?

- The future of public transit or an exit strategy?
- Will a high frequency + flex network sustain ridership?
- What role will ride-hailing and autonomous vehicles play in serving public transportation goals?

THANK YOU!

- Visit www.actransit.org/flex/ or call (510) 891-5470 more information

(510) 891-5470 / Free language assistance / Asistencia gratuita en el idioma / 免費語言協助 / Libreng tulong para sa wika / Hỗ trợ giúp thông dịch miễn phí
무료 언어 지원 / मुफ्त भाषा सहायता / زبان سے متعلق مفت اعانت / 無料の言語支援 / مساعدة لغوية مجانية / Assistência linguagem livre / បកប្រែភាសាមិនគិតថ្លៃ
Бесплатная помощь переводчиков / ภาษาช่วยเหลือฟรีสายบ่เสียค่า / મફત ભાષા કીય સહાયતા / Assistance linguistique gratuite

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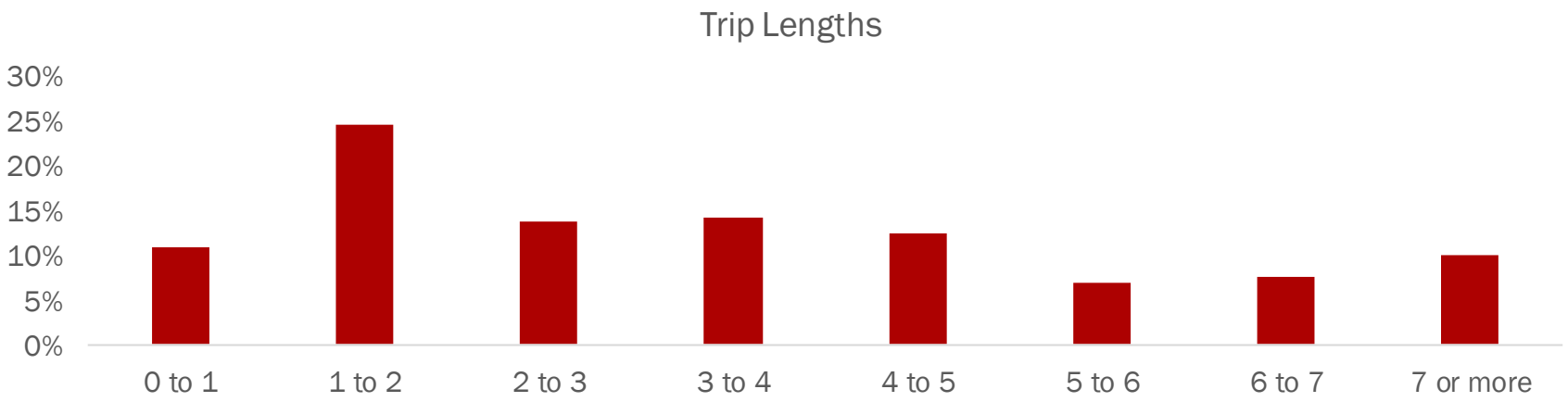
Passenger Trip Characteristics



Ensuring Access and Equity

Americans with Disabilities Act

Wheelchair Accessible vehicles

Professionally Trained Operators

Title VI/ Service Equity

Service Equity Analysis

Policies for Unbanked/digital divide

Limited English Proficiency

Translation Services

Customer Booking Call Center

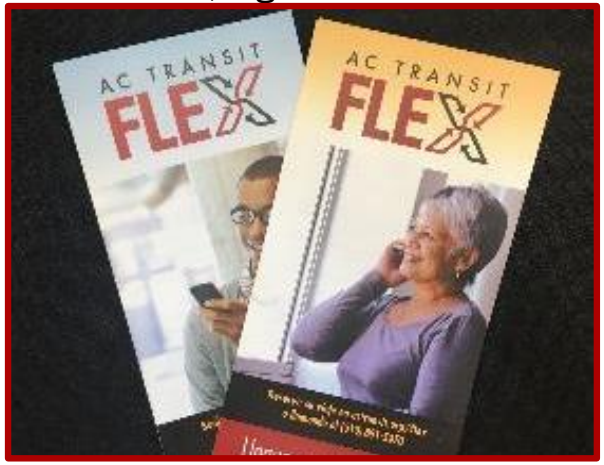
Marketing and Outreach

Billboards on bus shelters, exteriors, and BART stations

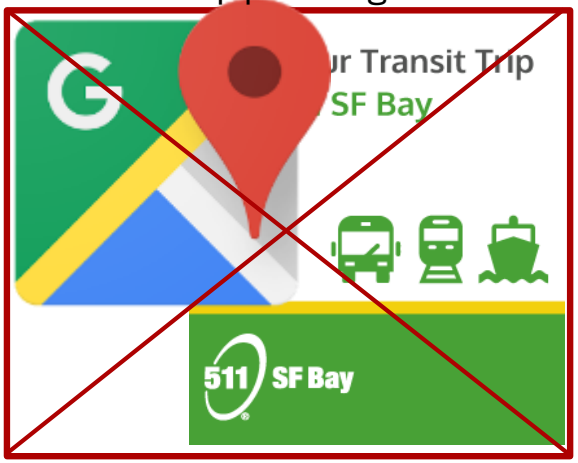
At-stop signage and inserts

Bi-lingual street teams

Direct mail; digital and social media

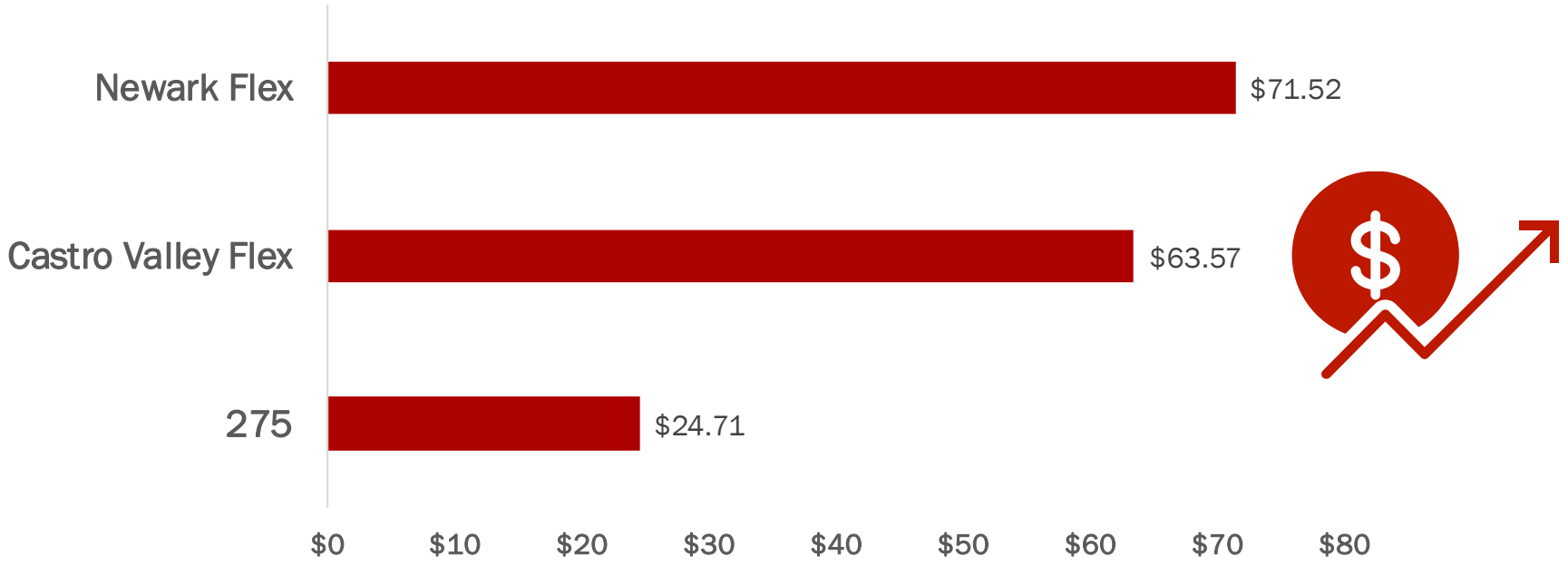


No online trip planning tools!



SERVICE PRODUCTIVITY

OPERATING EXPENSE PER PASSENGER TRIP



BESTMILE

THE MISSING LINK

Cloud platform enabling autonomous mobility services

Automated Vehicles Symposium
July 11th 2017

Leemor Chandally, Director of Strategic Partnerships, NA
leemor.chandally@bestmile.com

MASSIVE PARADIGM SHIFT

4th industrial revolution - Shared electric autonomous mobility

Digitalization and automation of transportation of people and goods

From ownership economy to shared economy

Mobility industry greater revenue generator than automotive

CHALLENGE

Industry focus is currently **vehicle-centric** – getting to Level 4/5 autonomy

Real economic driver of technology and transportation is in **fleets and mobility services** – usually an afterthought

Mobility providers need to offer **on-demand and fixed-route services** in addressing transportation challenges

Manage **hybrid fleets**
human-driven and autonomous vehicles

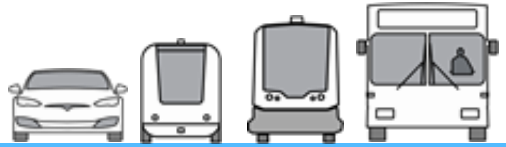
Manage **mixed fleets**
Different brands of autonomous vehicles








VALUE PROPOSITION



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BESTMILE
THE MISSING LINK

=

✓ **EFFICIENT, FLEXIBLE MOBILITY SERVICES!**

Fleet mixing autonomous and human-driven vehicles

Agnostic, real-time coordination and optimization platform

On-demand
Fixed-route

BestMile enables mobility providers to **deploy, operate and scale** innovative and efficient transportation services leveraging shared autonomous vehicles

BESTMILE CLOUD PLATFORM - CORE ENGINE

Sending the right missions to the right vehicles at the right time

supply & demand matching

automated dispatching

energy management

planning and scheduling

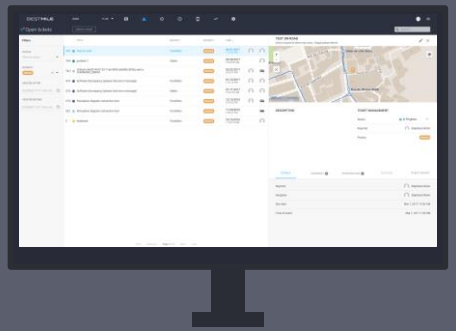
real-time dynamic routing

Additional key features

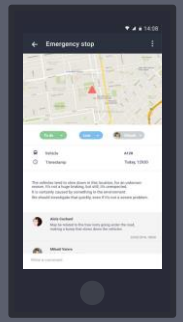
- Health and asset management
- Machine learning
- Data integration

APPLICATIONS AND INTERFACES

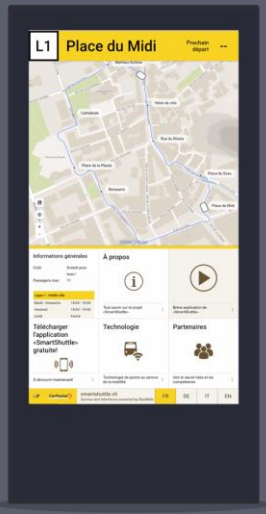
Operator Dashboard



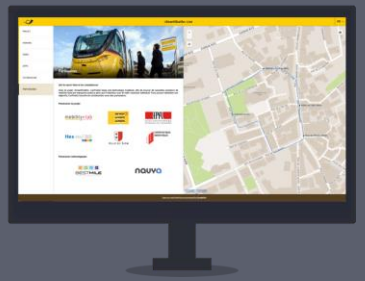
Field Agent Application



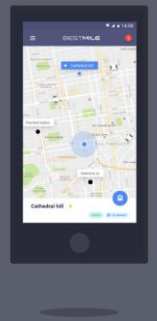
Interactive Kiosk



Web Portal



Traveler Application



PRO APPLICATIONS
for mobility providers

PUBLIC APPLICATIONS
for travelers

HOW IT WORKS


ON-DEMAND
1 Traveler books ride via the app and receives vehicle info
2 Platform receives data from vehicles (location, speed & battery level), performs optimization, and sends mission to the appropriate vehicle to go from point A to B
FIXED ROUTE
3 Platform receives data from vehicles (location, speed & battery level), performs optimization and sends mission to the vehicle to go from stop C to stop D
BESTMILE
1
2
3
mission
mission
vehicle position
booking
mobile app
position energy speed
position energy speed
A
B
C
D

UNIQUE SELLING PROPOSITIONS

Designed for autonomous vehicles

Unique optimization capabilities

Vehicle agnostic platform

Any brand
Any type
Driverless
Human-Driven

Enable all operating models

From fixed routes to on-demand services

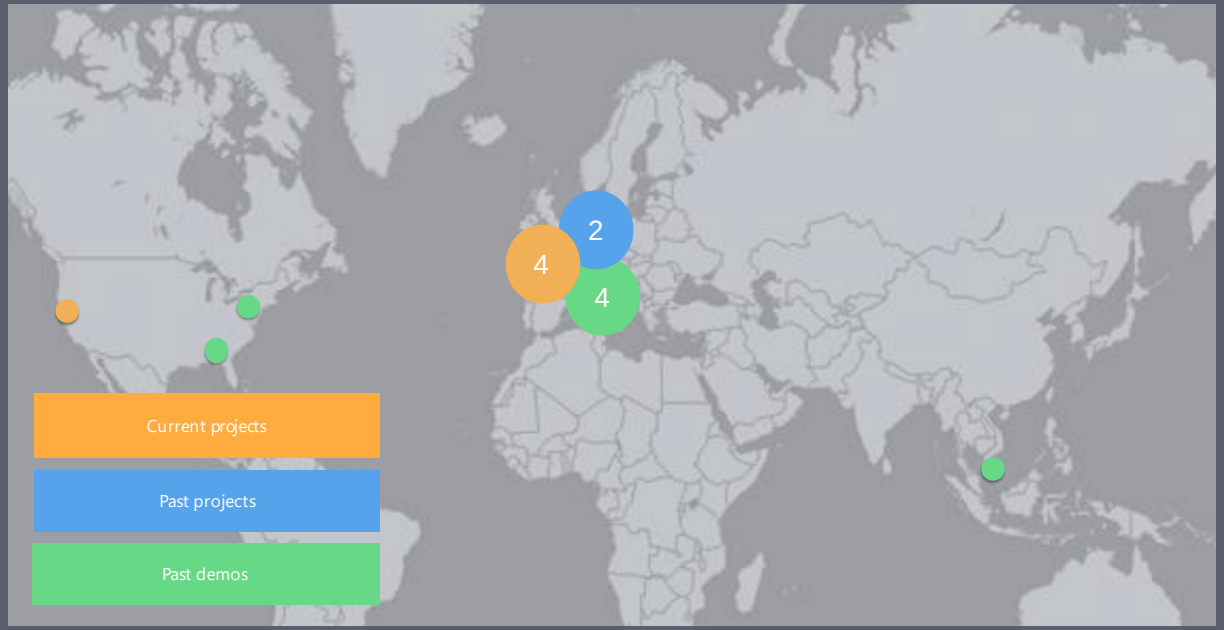
Open modular architecture

Turnkey or integrated solutions

"Frost & Sullivan firmly believes that BestMile will be instrumental in building a new mobility paradigm" – ***Frost & Sullivan, March 2017***

PREMIUM CUSTOMERS & PARTNERS

TRACTION



Track record

- 42,000 miles driven
- 120,000 passengers transported
- 13 fleets managed
- 6 fleets live: USA, Europe, Japan

‘SMARTSHUTTLE’ - SION, SWITZERLAND

CarPostal
Leading public transport operator in Switzerland

+

navya
Leading autonomous shuttle manufacturer

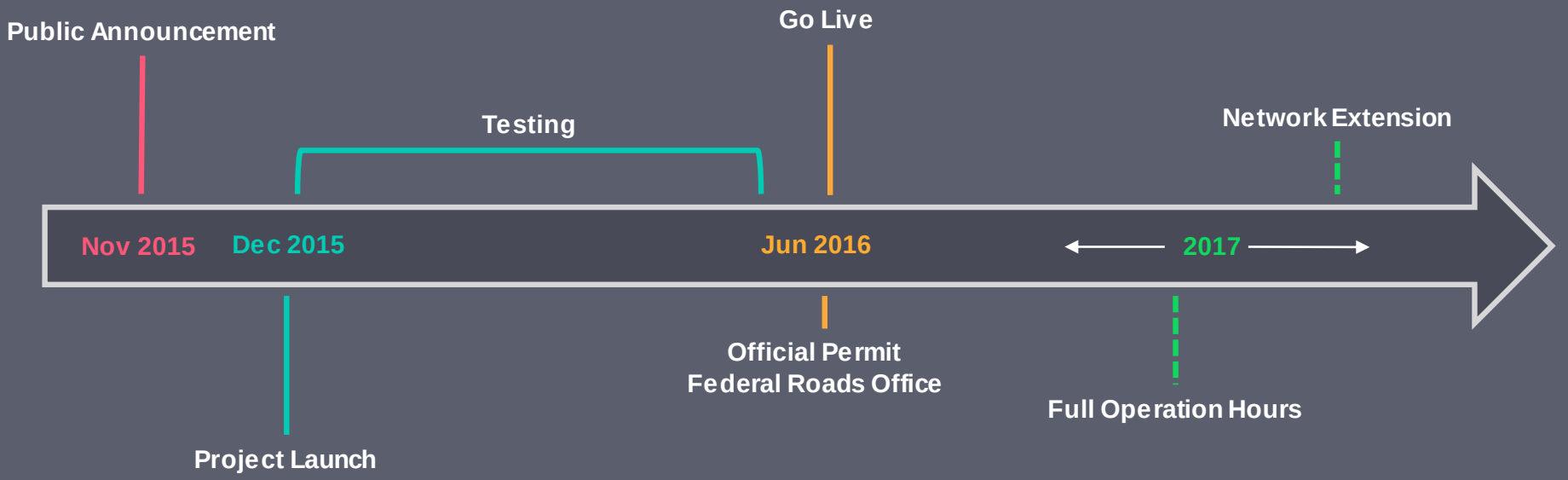
+

BESTMILE
THE MISSING LINK
Fleet optimization platform for autonomous vehicles

PostBus ‘SmartShuttle’

- Operating since June 2016
- 2 shuttles in a busy city downtown
- 2 km loop among cars and pedestrians
- Daily operation from 1 to 6pm
- Moved 21,500 pax; Traveled 4,500 kms
- Public acceptance

PROJECT MILESTONES



GOMENTUM STATION - CALIFORNIA

GOMENTUM STATION

- Partnership since Dec 2016
- Pilot with 2 EasyMile shuttles
- FM/LM project goal to deploy large scale of AV's on public road
- Developing requirements with input from local stakeholders
- How to implement FM/LM project?

LESSONS

Partnerships are critical to successful deployments

Pilot projects important as first step in iterative process. We're doing something new and innovative – break into phases and iterate.

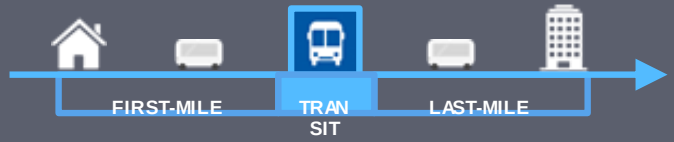
Tolerance for trialing and testing – we're all in R&D; spirit of exploration.

Understanding of local context; navigating cultural and corporate differences

ADDRESSING TRANSPORT CHALLENGES

Mobility-as-a-Service – citizens want more automated, connected, affordable, comfortable, sustainable and on-demand transportation services

Short-Distance Connectivity (FM/LM) – to enable seamless mobility and complement existing transportation systems



Mobility On Demand

"By 2030, over 60% of people will live in cities. Transportation is seen as the biggest infrastructure challenge and is a key factor in city competitiveness and development"

Megacity Challenges - Siemens

BESTMILE
THE MISSING LINK

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THE UNIVERSITY OF TEXAS AT AUSTIN
CENTER FOR TRANSPORTATION RESEARCH

Costs & Benefits of Automating U.S. Bus Fleets

Neil Quarles

Dr. Kara Kockelman

June 14, 2017

Background

Full Automation Technology

- Should be available in the next few years.
- Ongoing public testing of self-driving buses.
- Different expectations for public transit impacts.

Powertrain

- Self-driving electric buses

Austin's Transit Agency: CapMetro

- 82 Bus Routes + 438 Buses (+ 1 commuter rail line)
- 30.5 M/yr passenger boardings (FY2016)
- $264 M operating budget (FY2017)
  - **45% Driver costs** ($119 M/yr)
  - 6.4% Fuel costs ($17 M/yr)
- $158M capital budget (FY2017)

Fleet Conversion

Evaluated effects of converting Capital Metro's bus fleet:

- **Fully Automated** Buses
- **Electric** Buses
- **Both** Technologies Together

Criteria used:

- **Qualitative** impacts
- **Financial impacts**
- Possible **implementation schedules**

Qualitative Effects

- **Traveler comfort** at bus stops
- **Public perceptions**
- **Energy & Emissions Impacts**
  - Depend on electricity source
  - Austin generates power using 20%+ renewables (vs. Texas: 10%)/
  - Seeks 55% renewables by 2025.

Full Automation's **Costs & Benefits**

- **Bus drivers cost** Capital Metro $119M/year
  - $271K per bus-year, or **$3.3M over each bus's 12-year (avg.) life**
- Assuming **$80K per bus, full automation premium**…
  - $3.2M life-cycle savings per bus = **97% operating cost reduction!**
- **Crash cost & insurance savings** from safer driving
  - Possibly ~40%
- Smoother driving → **Fuel savings, emissions reductions**, & greater **rider comfort**
- **Public perceptions** (good & bad?)
- But **fewer jobs** for drivers.

Investment Scheduling

- Recognizing bus **fleet turnover & driver contracts**.
- Starting in 2017, **autonomous-only adoption delivers immediate savings** & year-zero payback.
- **Electrification should break even in 2024 to 2029** if battery costs fall at 14% per year (**or 2027 to 2035** if fall at 8%/yr).
- **Co-implementation** of these 2 technologies **will breakeven** after 6 **to 9 years** (assuming 14% to 8%/yr reductions in battery costs).

Conclusions

- **Full automation** can **drastically lower** transit **agency costs** → Funding for more service, better service, etc.
- **Electric buses** are not yet cost-competitive with diesel, but **offer other benefits**.
- Both technologies can **improve transit provision & lower environmental impacts.**

Any questions &/or suggestions?

Zendrive

Autonomous Vehicle Safety Standards

Autonomous Vehicle Symposium
JULY 2017

Jonathan Matus
CEO & Co-Founder
@matusjon

DRIVING BEHAVIOR DIFFERS AROUND THE WORLD
- MAKING SENSE OF IT IS DIFFICULT, NECESSARY FOR AUTOMATED VEHICLES -

SAFETY AND TRUST ARE BIG HURDLES LIMITING ACCEPTANCE WITH REGULATORS, INSURERS, CONSUMERS

San Francisco Chronicle | SFGATE

Self-driving cars: Consumer groups want government to hit brakes

"When you're talking about potentially life-threatening technologies, you need real standards that can be enforced."

As automakers race to create cars that can drive themselves, a growing chorus of consumer advocates is demanding that the companies — and their federal regulators — slow down.

The fatal crash of a Tesla Motors Model S operating in its self-steering Autopilot mode has thrown the issue into sharp relief.

CBR Computer Business Review

Verticals | Internet of Things | Big Data | Mobility | Cloud | Nev

MOBILITY/SECURITY

Data breaches, blackmail & of the driverless car future

BUSINESS INSID

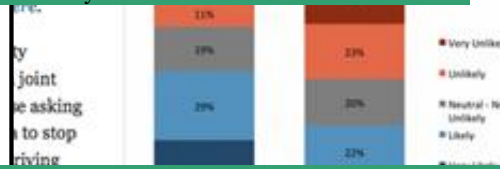
Consumer advocacy groups want US government t pump the brakes on self-driving cars after Tesla cra

BI Intelligence

Jul. 15, 2016, 10:38 AM 267 3

FACEBOOK LINKEDIN TWITTER EMAIL

"The software vulnerabilities found in vehicles' network connections pose a significant risk to the security of driverless cars."



The Center for Auto Safety

"Consumer Reports also published a column calling on Tesla to deactivate the Autopilot system because of safety concerns after the accidents."

Consumer Watchdog

President Barack Obama
The White House
1600 Pennsylvania Ave. NW
Washington, DC, 20500

July 13, 2016

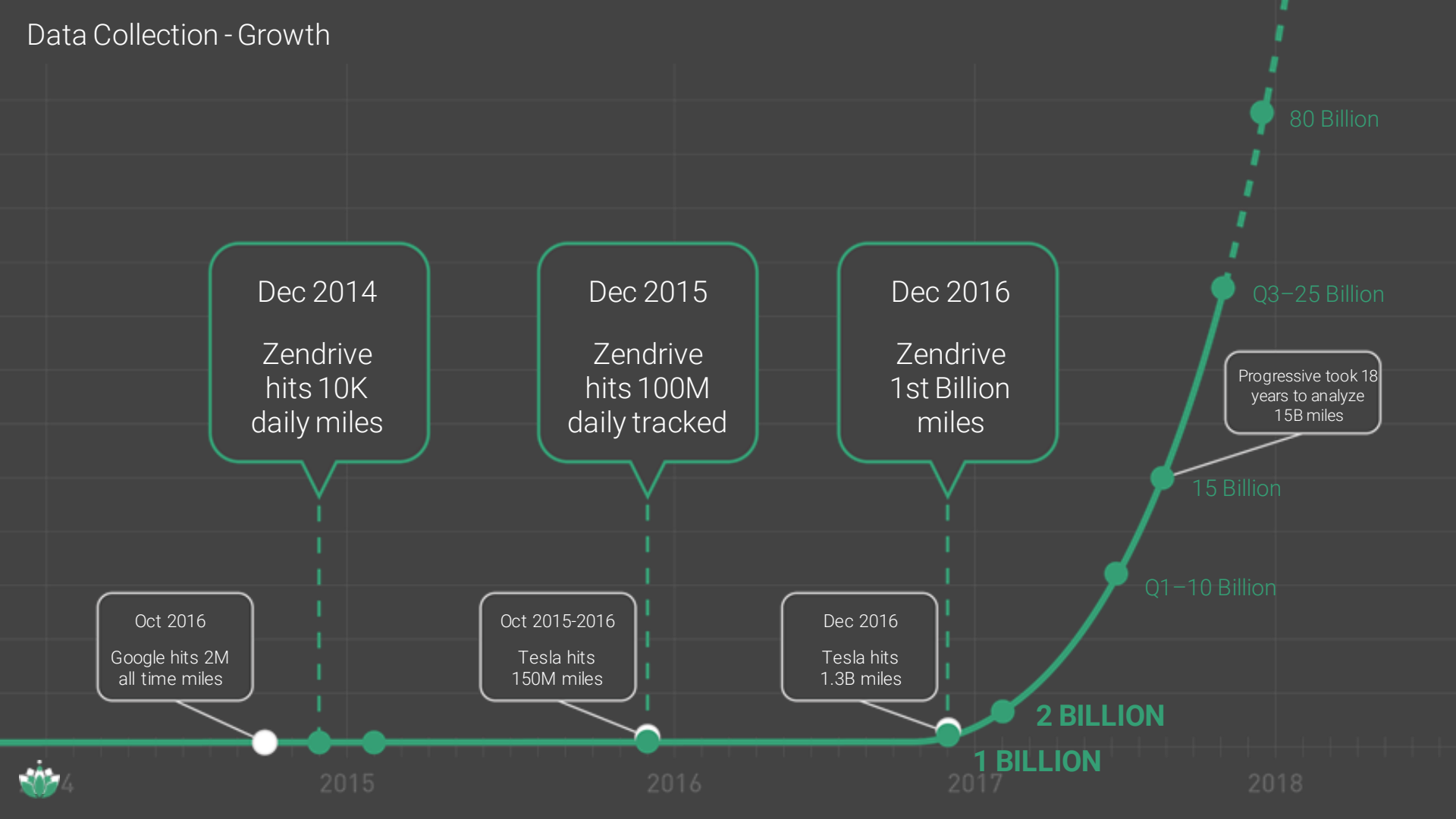
Dear Mr. President:

"It is time to stop your administration's undue haste to get autonomous vehicle technology on the road."

REUTERS

Tesla crash raises concerns about a

Data Collection - Growth



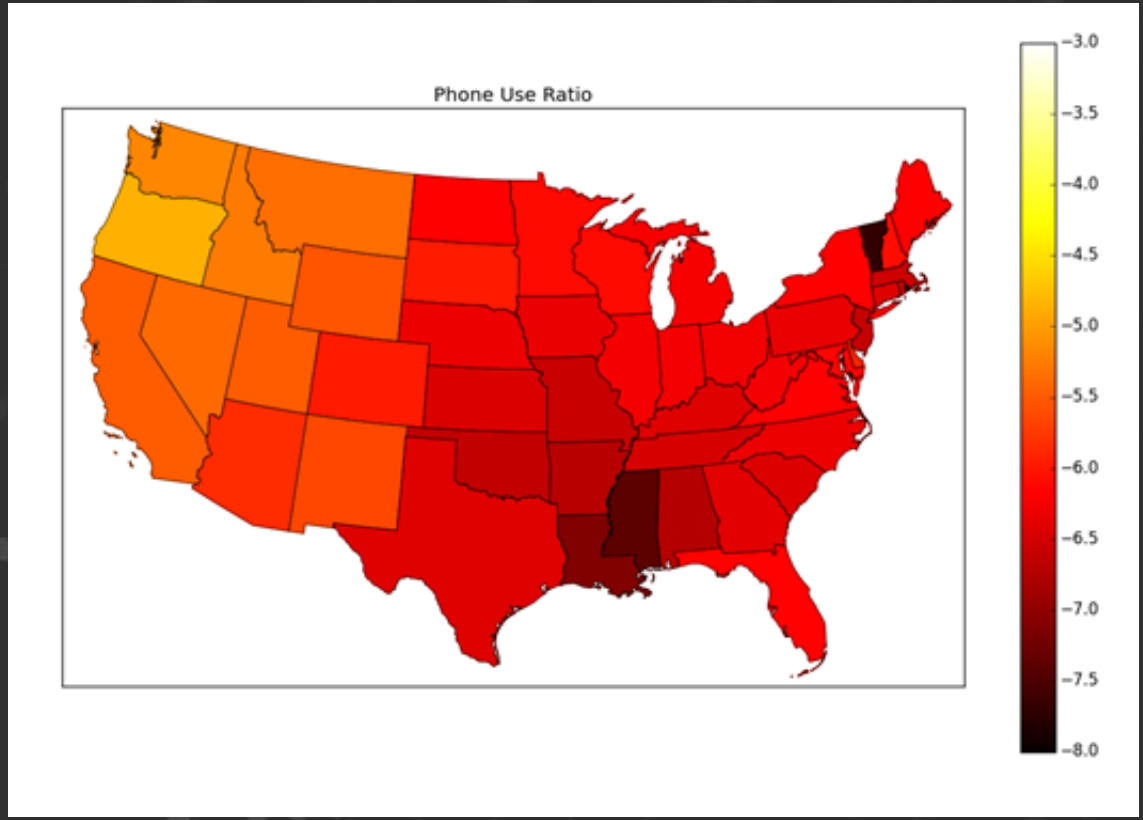
What did we learn?

#1
Zendrive's massive dataset delivers robust coverage across the country

#2
In different parts of the country, people drive differently

(#3
We all use our phones a lot behind the wheel:
In 88% of trips we analyzed, a driver was on their smartphone for an average of 3.5-minutes per hour)

December 2016 - February 2017
5.6-Billion Miles, 570-Million Trips, 3-Million Drivers

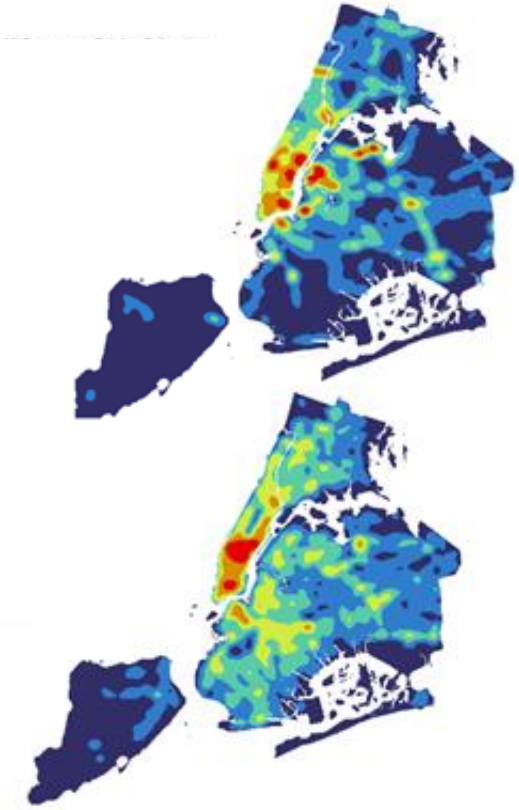


What did we learn?

#1
Zendrive accurately measures driver behavior

#2
Driver behavior is a predictor of collisions

NYU: **71%** Correlation
Between Zendrive Risky Driving Events & NYPD Crash Data



Risky Driver Events - Zendrive

July to December 2015:
33,450 Zendrive risky driver events

Now, Zendrive collects 70M+ events/month

Crashes - NYPD

July 2012 and March 2017:
127,423 NYPD collisions reports

JOIN US IN BUILDING THE INDUSTRY'S AUTONOMOUS VEHICLE SAFETY STANDARD

Three ways we could start working together...

Data Partnership

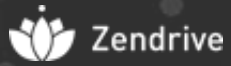
Adding Zendrive data to your autonomous vehicle will bring human driver behavior to bear for the first time.

Evaluation Partnership

Zendrive provides an independent system to measure autonomous vehicle safety and compare it to human driver safety.

PR Partnership

Zendrive's unique behavior data tells a compelling story for a broad array of audiences.



Thank you.

Jonathan Matus
Co-Founder, CEO
jonathan@zendrive.com

Zendrive

Zendrive

Appendix

TRAFFIC COLLISIONS CAUSE 1.3 MILLION PREVENTABLE DEATHS WORLDWIDE

AUTOMATED VEHICLES HAVE THE POTENTIAL TO PREVENT CASUALTIES

Zendrive has analyzed billions of driving events

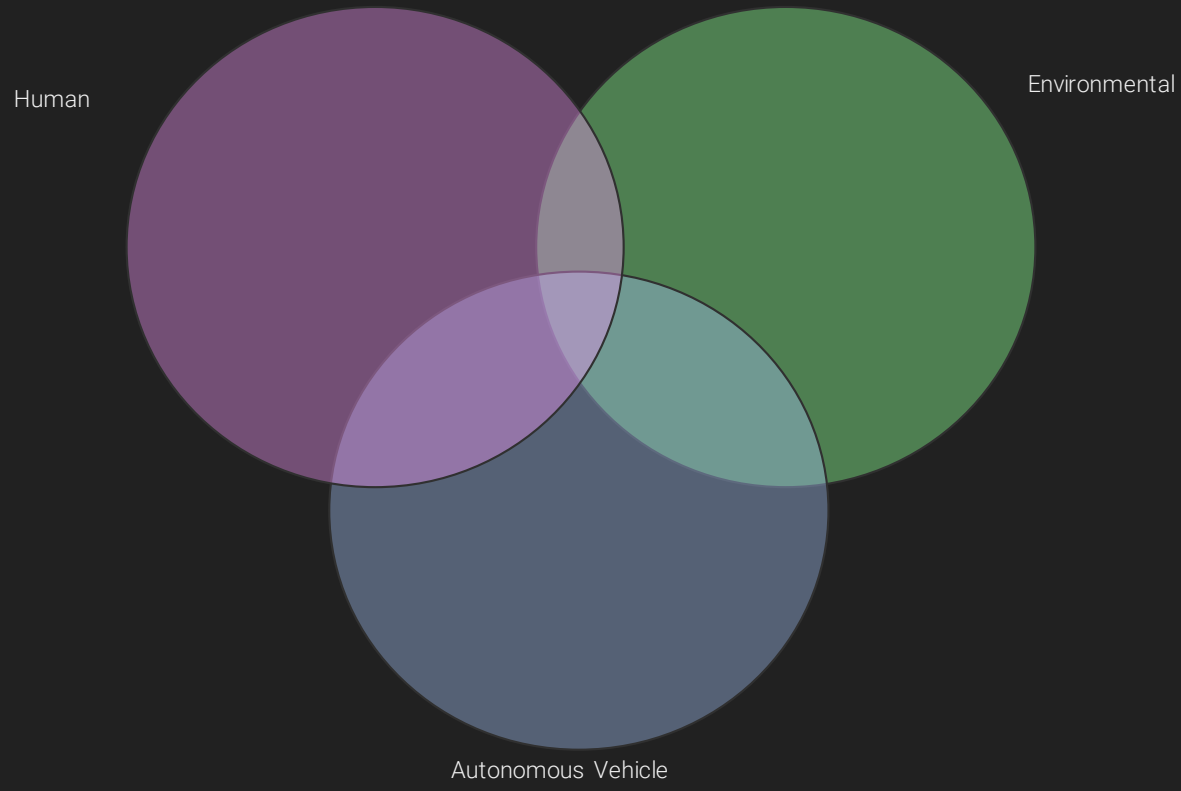
4.5B
Monthly miles analyzed by Zendrive

5M+
Active drivers using Zendrive

Billions
Driving events detected by Zendrive

NYU · Life360 · edriving · NYC Taxi & Limousine Commission · Mcity · ILLINOIS

WITHOUT A STANDARD ASSESSING SAFETY OF AUTONOMOUS VEHICLES: TOUGH, COMPLEX, TIME & DATA INTENSIVE



Zendrive's Definitive Distracted Driving Analysis

In **88% of trips** we analyzed, a driver was on their smartphone

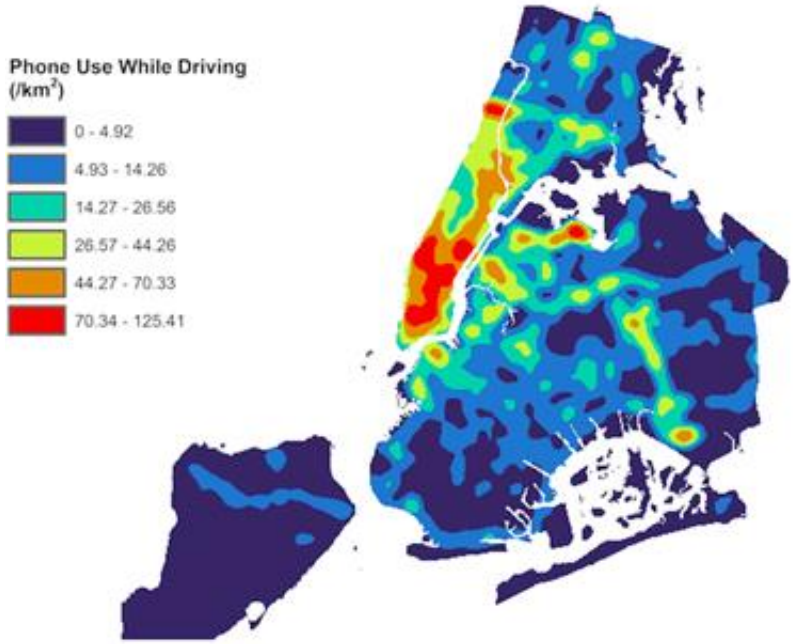
Of these trips, the average phone use was **3.5-minutes per hour of driving**

Taking your eyes off the road for **2-seconds** increases your chances of collision by over 20x

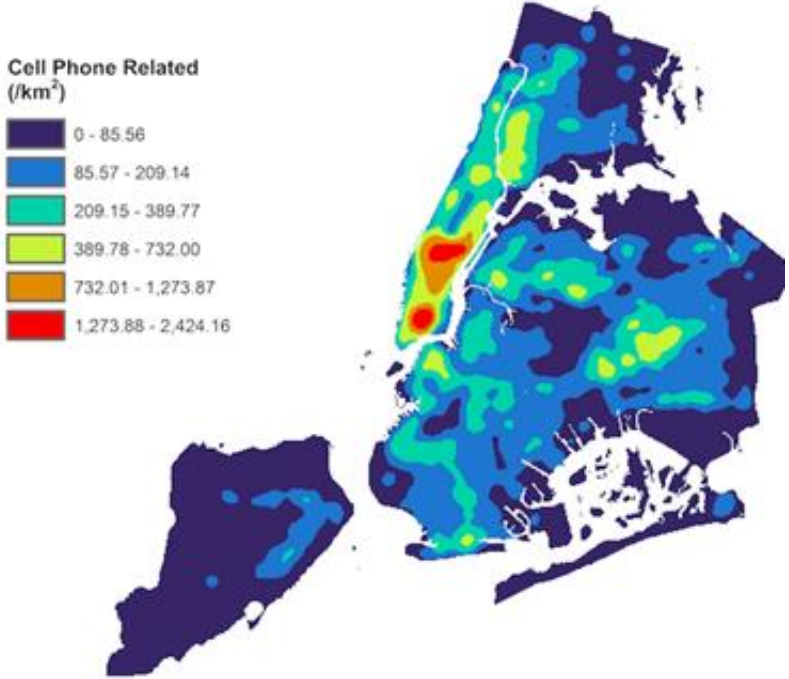
At 55mph, **2-seconds** is enough time to travel the length of two basketball courts

NYU **75%** Correlation Between Zendrive Phone Use & NYPD Phone-related Crashes

Driver Phone Use - Zendrive



Cell Phone Crashes - NYPD



ASSESSING SAFETY OF AUTONOMOUS VEHICLES: TOO COMPLEX FOR ANY SINGLE REGULATOR, INSURER OR AV VENDOR

ZENDRIVE UNDERSTANDS HUMAN BEHAVIOR & ENVIRONMENTAL RISKS AT MASSIVE SCALE, GLOBALLY

Rapid Acceleration

Turn Speeds

Hard Braking

Speeding Behavior

Phone Use

Time of Day

Traffic Patterns

Road Sign Compliance

Road Rage

Weather

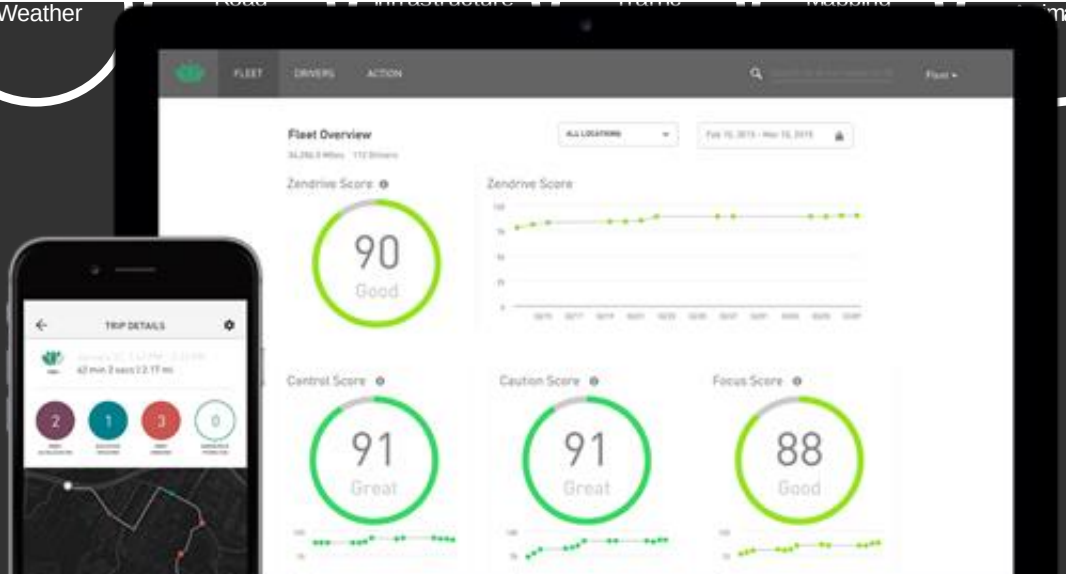
Road

Infrastructure

Traffic

Mapping

mals

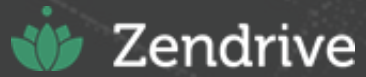


REQUIRED: AUTONOMOUS VEHICLE SAFETY STANDARD (AVSS)

HOW DO PEOPLE DRIVE IN DIFFERENT PLACES?
HOW SAFE ARE AV VENDORS IN RELATION TO AGREED BENCHMARK?
HOW SHOULD RISK BE PRICED FOR INSURERS?
WHICH AV IS SAFE ENOUGH FOR MY NEEDS / MY CITY?

Quantitative, algorithmic approach to understanding and quantifying AV safety:

Gives regulators **consistency**
Provides **benchmarks** across industry & improve safety overall
Gives consumers **confidence**
Reduces time-to-market for AV vendors
Decreases insurance costs across industry



QUESTIONS?

Jonathan Matus
@matusjon

CEO/founder

@zendrive

Zendrive

THANK YOU

NCHRP 20-102 (02) Laws, regulations, and the future of AV transit

TRB/AUVSI 2017

Kimley»Horn

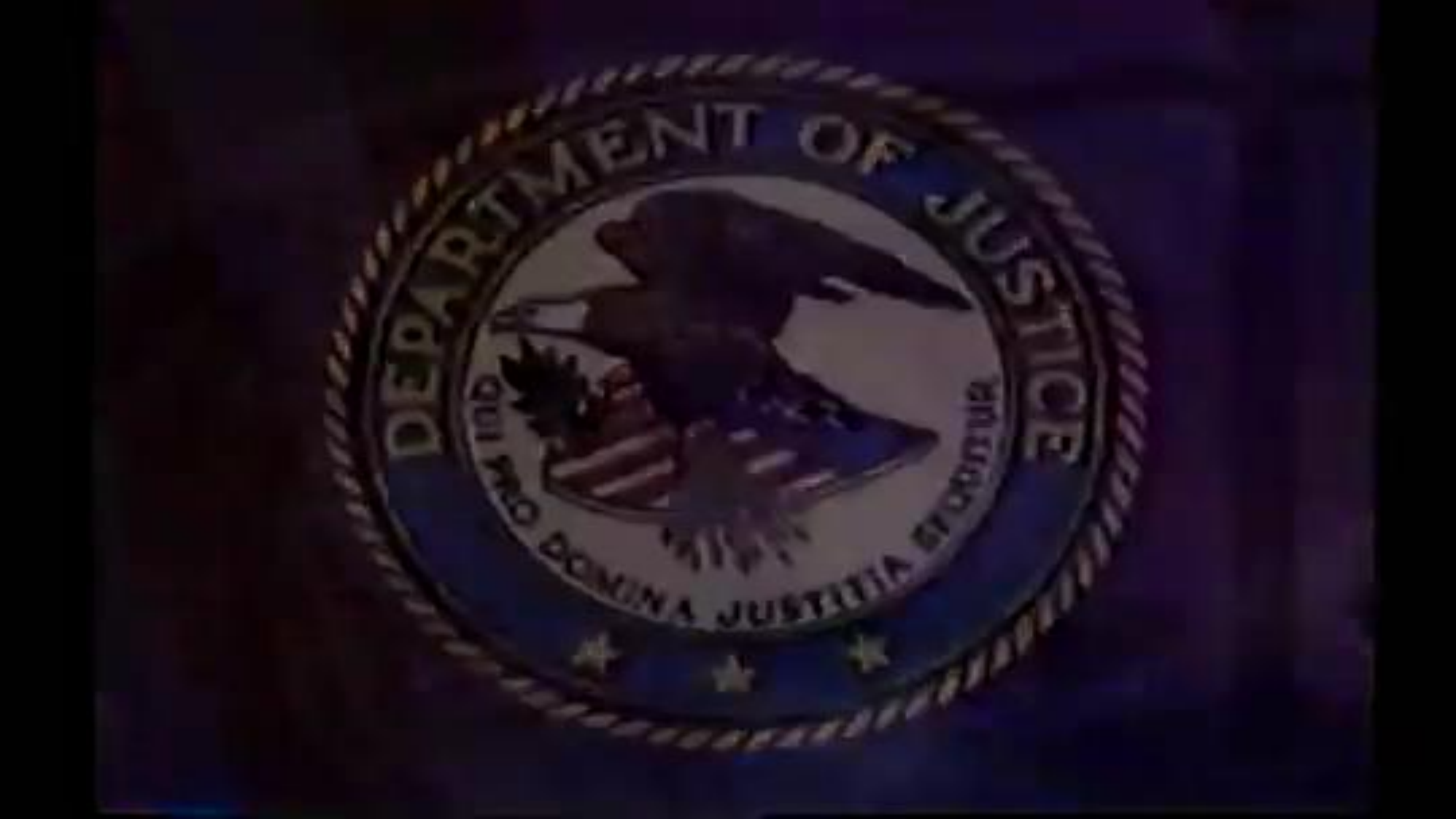
Expect More. Experience Better.

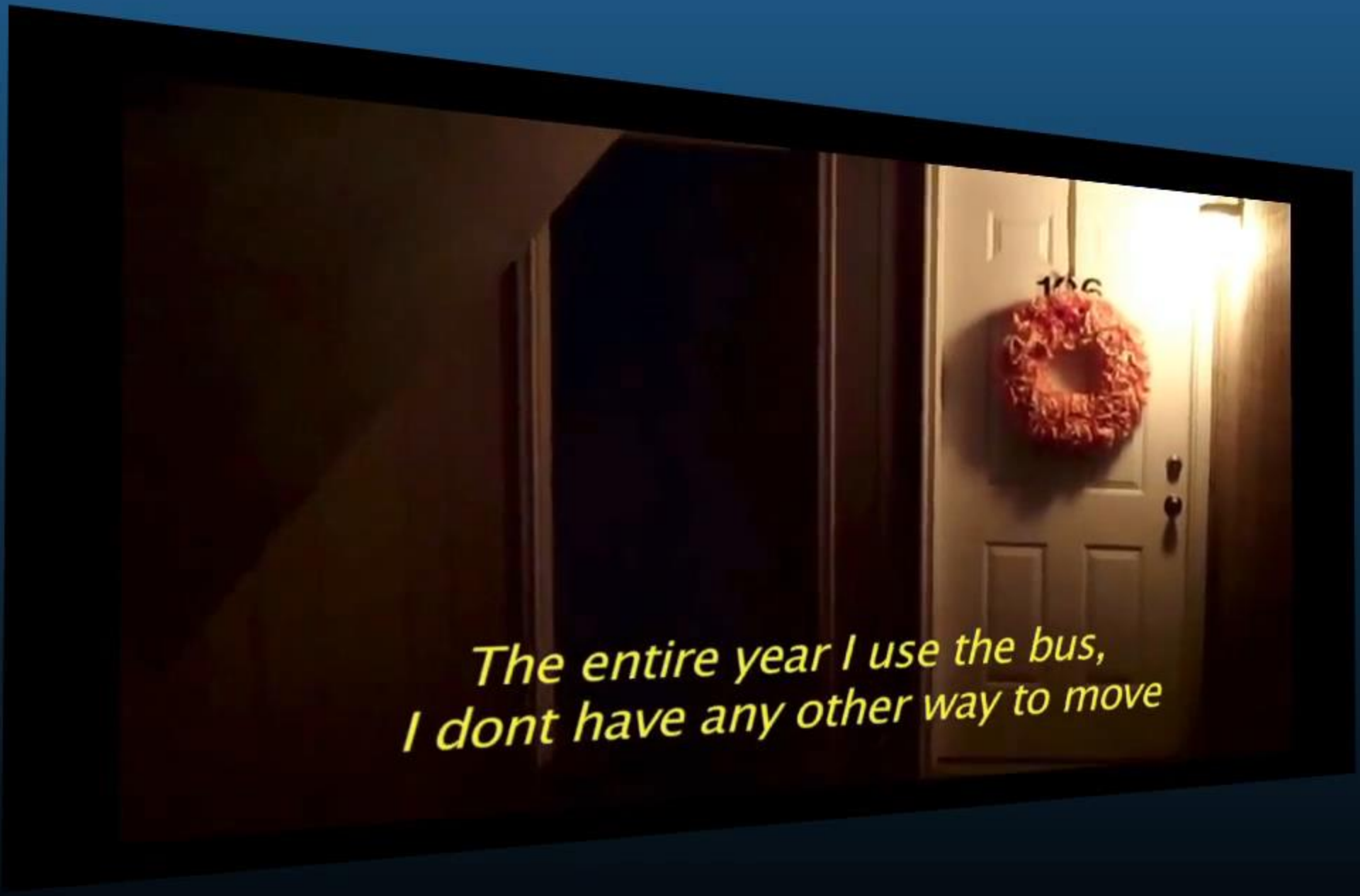
PROJECT TASKS


REP. ROBERT W. NEY
(R) Ohio


REP. RON PAUL
(R) California


East Carolina U


DEPARTMENT OF JUSTICE
QUI IUD DOMINA JUSTITIA ET ORDO


The entire year I use the bus,
I dont have any other way to move

Activity	Budget	Schedule (months)	Timeframe
Assessment of restrictions on transit platooning strategies	$150K	9	2018-2020
Research identifying possible changes to transit facilities and stations	$1M	18	2020-2022
Research on transit vehicle sizing, dynamic “entrainment”, and other innovations enabled by automation	$1M	24	2022-2025
Research on design of platform edge protection and automated entry for vehicle berths	$5M-$20M	24	2020-2022
Categories of hazards and risks for L3 and L4 AV transit	$250K	12	2018-2019
Hazards analysis methodology for L3 and L4 AV transit implementation	$500K	18	2018-2019
New consensus safety standard(s) for AV transit systems	$1.5M	24	2021-2023
Transit operational design domain definitions	$150K	9	2018-2020
Hazards assessment and mitigations for L3 operations	$350K	15	2020-2023
Definition of AV transit employee roles and responsibilities	$350K	18	2020-2022
Employee involvement guidelines	$200K	12	2021-2023

Activity	Budget	Schedule (months)	Timeframe
Union Contracting Guidelines	$500K	18	2021-2023
Automation of employee actions in compliance with ADA	$250K	15	2019-2020
Long range planning AV transit benefit/cost analysis guidelines	$1M	24	2020-2022
Integration of AV transit scenarios in regional transit master planning	$750K	24	2019
AV transit service types and operational planning parameters	$1M	24	2019-2021
Benefit/cost analysis of conversion from L3 to L4 operations	$250K	12	2021-2022
AV Cybersecurity issues affecting transit agencies	$750K	18	2019-2020
Management of “big data” in AV transit systems	$350K	18	2019-2020
AV Operations Control Center Concept of Operations	$350K	18	2020-2021
Investigation of risk, liability, and insurance for AV transit operations	$150K	12	2018-2019
Scenario analysis of AV transit operations without federal funding	$150K	12	2019-2020

Activity	Budget	Schedule (months)	Timeframe
Possible changes to Section 13c of Federal Transit Act	$350K	12	2018
Evaluation of Applicability of transit-related laws and regulations to private contractors (e.g. “TNCs”)	$150K	12	2020-2021
Evaluation of OSHA regulations for robotic vehicles in the workplace	$150K	12	2020-2021
Evaluation of Minority population involvement and environmental justice in AV transit	$150K	12	2020-2021
Evaluation of Title VI adjustments and incentives	$150K	12	2020-2021
Evaluation of boarding requirements and exceptions to ADA compliance	$500K	18	2019-2020
Evaluation of Buy America requirements	$150K	12	2021-2023
Evaluation of Implications of FMVSS for low-speed L4 AV transit vehicles	$150K	12	2019-2021
Safety management system development guidance	$350K	18	2019-2021

Kimley»Horn

Expect More. Experience Better.

Douglas Gettman, Ph.D.

TRB/AUVSI Symposium 2017

Minnesota User Based Fee Demonstration: Pre-Implementation Plan

Frank Douma, U of MN

Ken Buckeye, MnDOT

Chris Berrens, MnDOT

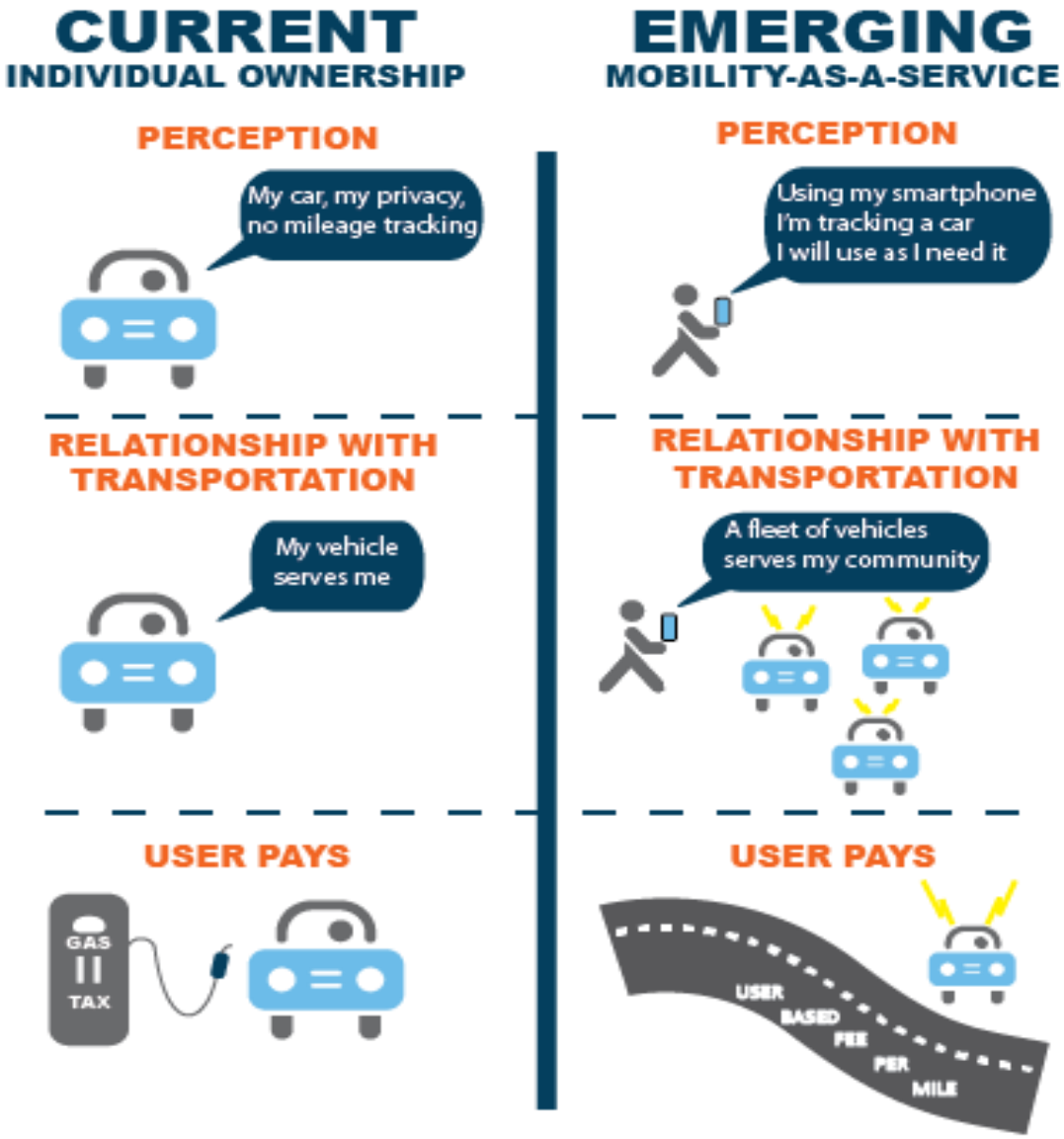
DEPARTMENT OF TRANSPORTATION

U.S. Department of Transportation

Federal Highway Administration

Summary

- Propose an efficient, scalable, acceptable user based fee that anticipates where personal mobility will be
- Develop a partnership Shared Mobility providers
- Understand the “value proposition”
  - Transparent -Robust
  - Clear goals -Reliable
  - Public acceptance -Ease of collections
- Societal, technological and economic trends are driving change to the transportation model - Shared Mobility is the change agent


CURRENT
INDIVIDUAL OWNERSHIP
EMERGING
MOBILITY-AS-A-SERVICE
PERCEPTION
My car, my privacy, no mileage tracking
PERCEPTION
Using my smartphone I'm tracking a car I will use as I need it
RELATIONSHIP WITH TRANSPORTATION
My vehicle serves me
RELATIONSHIP WITH TRANSPORTATION
A fleet of vehicles serves my community
USER PAYS
GAS
TAX
USER PAYS
USER BASED FEE PER MILE

Basis for Project

- AV and EV Technologies are rapidly maturing
- Shared Mobility models are maturing, and fit well with AV's and EV's
- Long term transition shared AV's fits with need for long term transition away from motor fuel tax

Goals and Objectives

- Partner with shared mobility provider to propose a distance-based fee demonstration that is **efficient**:
  - Easily paid
  - Easily collected
  - Easily understood (transparent)

Goals and Objectives

- Partner with shared mobility provider to propose a distance-based fee demonstration that is **sustainable**:
  - Long term revenue source (compared to current tools)
  - Evolves with advances in technology
  - Scalable

Goals and Objectives

- Partner with shared mobility provider to propose a distance-based fee demonstration that is **acceptable**:
  - Safeguards data (privacy)
  - Accounts for Equity
    - Payment (electric vs. gasoline)
    - Ability to pay
    - Demographics

AUTOMATED TO AUTONOMOUS, LESSONS LEARNED

Wessel van der Pol

[we deliver]

2getthere

2getthere has realized automated vehicle applications in various demanding environments since 1984

- Industrial applications
- Cargo handling
- Entertainment
- People movers







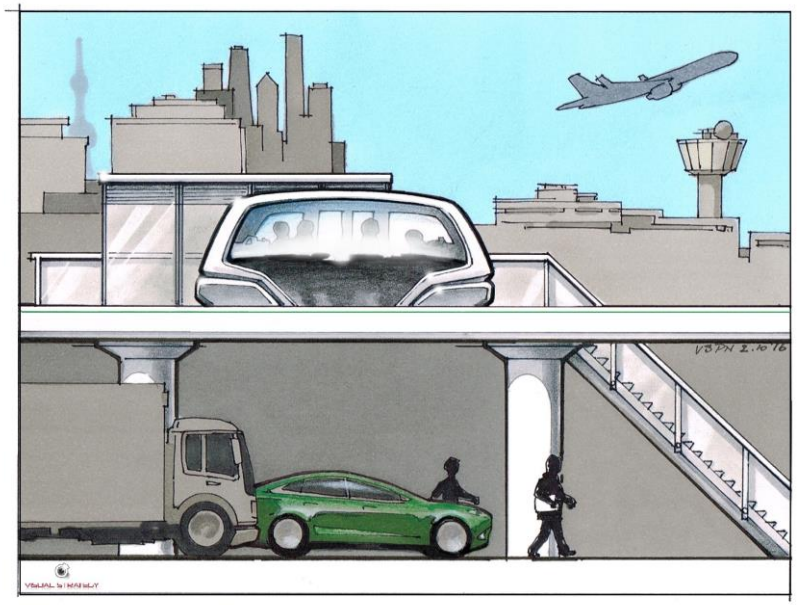



MASDAR CITY PRT

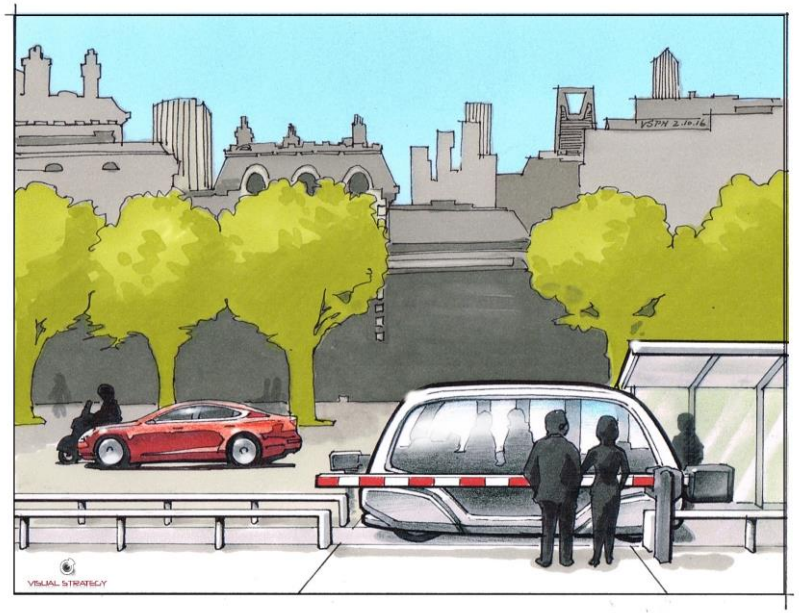
ABU DHABI, UNITED ARAB EMIRATES

DIFFERENT AUTOMATED APPLICATIONS

IN RELATION TO THE ENVIRONMENT AND THE CAPACITY TO BE ACHIEVED



Automated People Movers (APM)

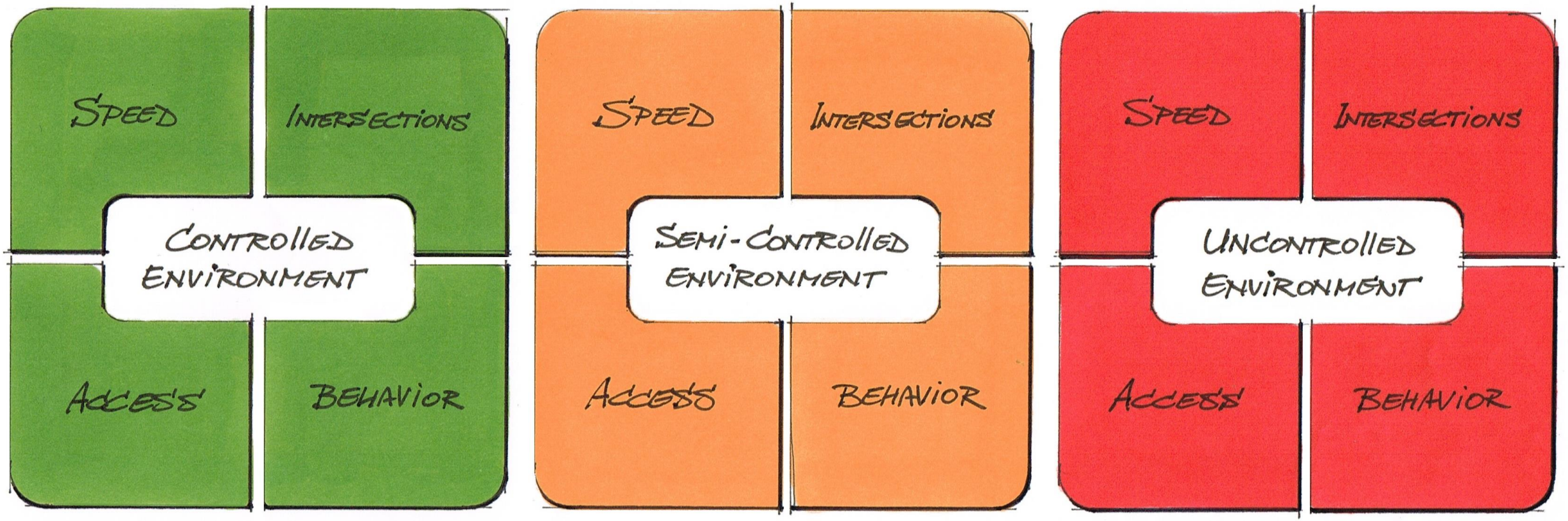


Automated Transit Networks (ATN)

Shared Autonomous Vehicles (SAV)

THE COMPLEXITY OF AUTOMATION

TO CONTROL THE APPLICATION ENVIRONMENT, OR NOT? THAT'S THE QUESTION



2get there

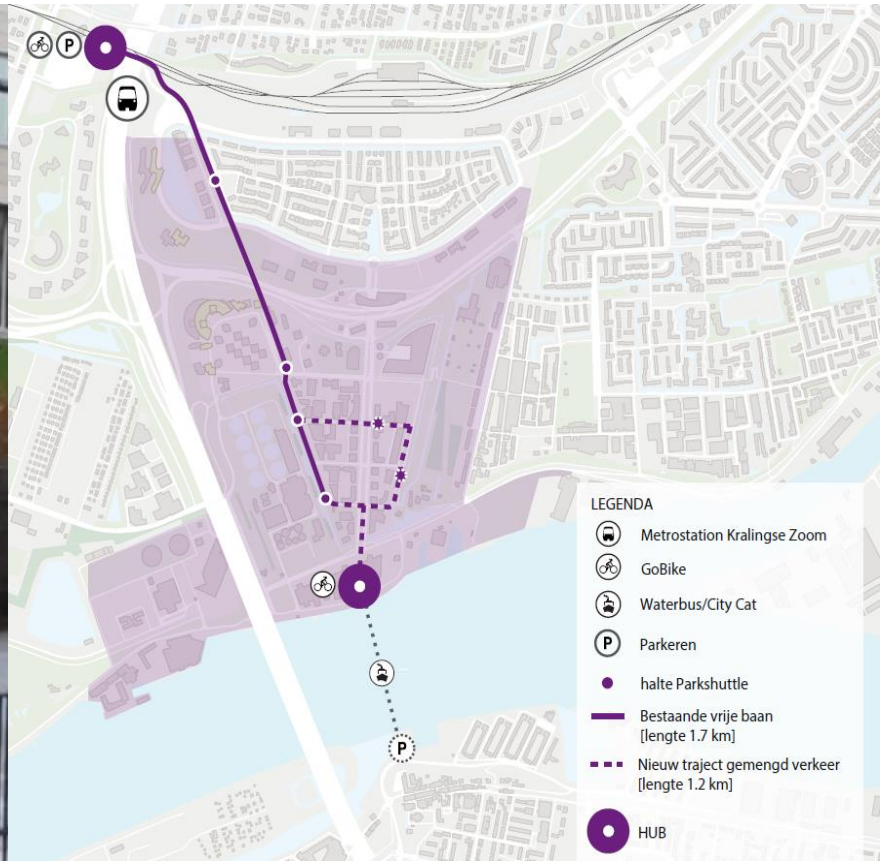
BLUEWATERS: AUTOMATED PEOPLE MOVER

HIGH CAPACITY: UP TO 5,000 PPHPD

2getthere

RIVIUM 3.0: SHARED AUTONOMOUS VEHICLES

TRULY AUTONOMOUS: NO STEWARD OR SAFETY DRIVER!



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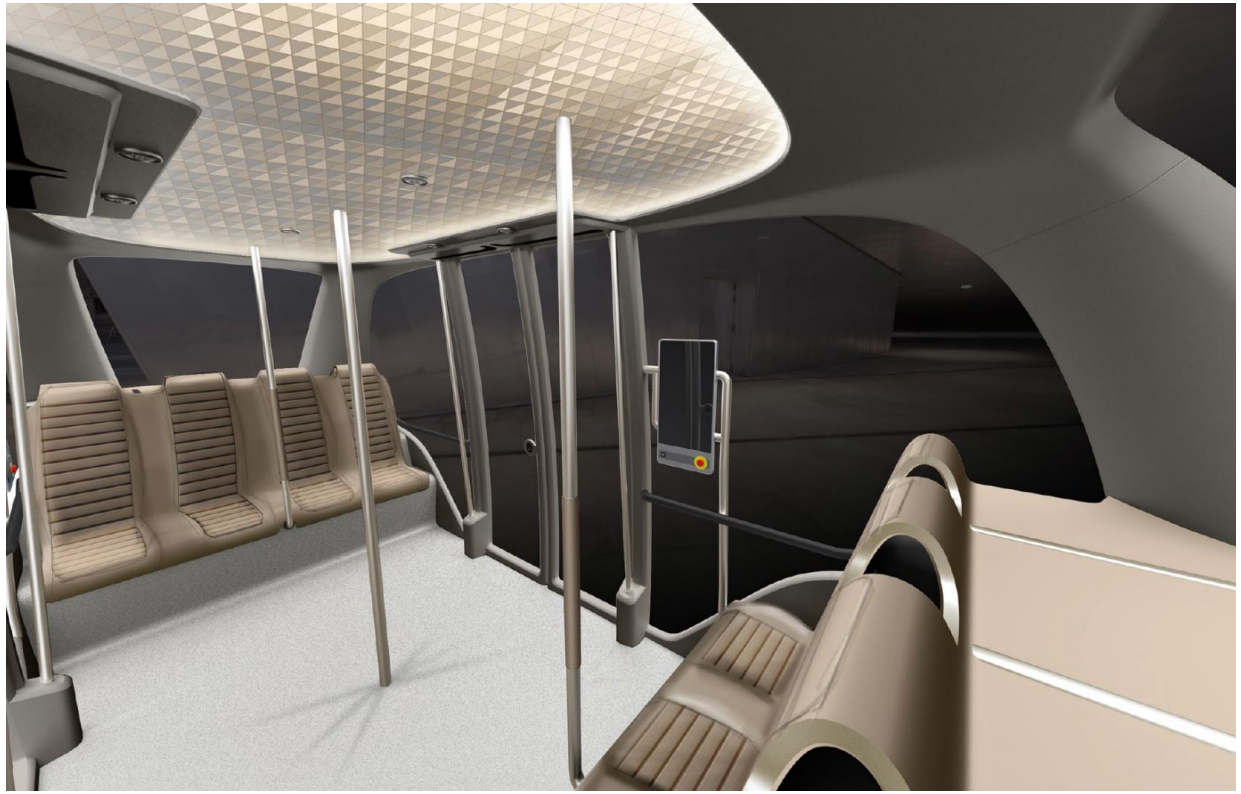
VEHICLE DESIGN

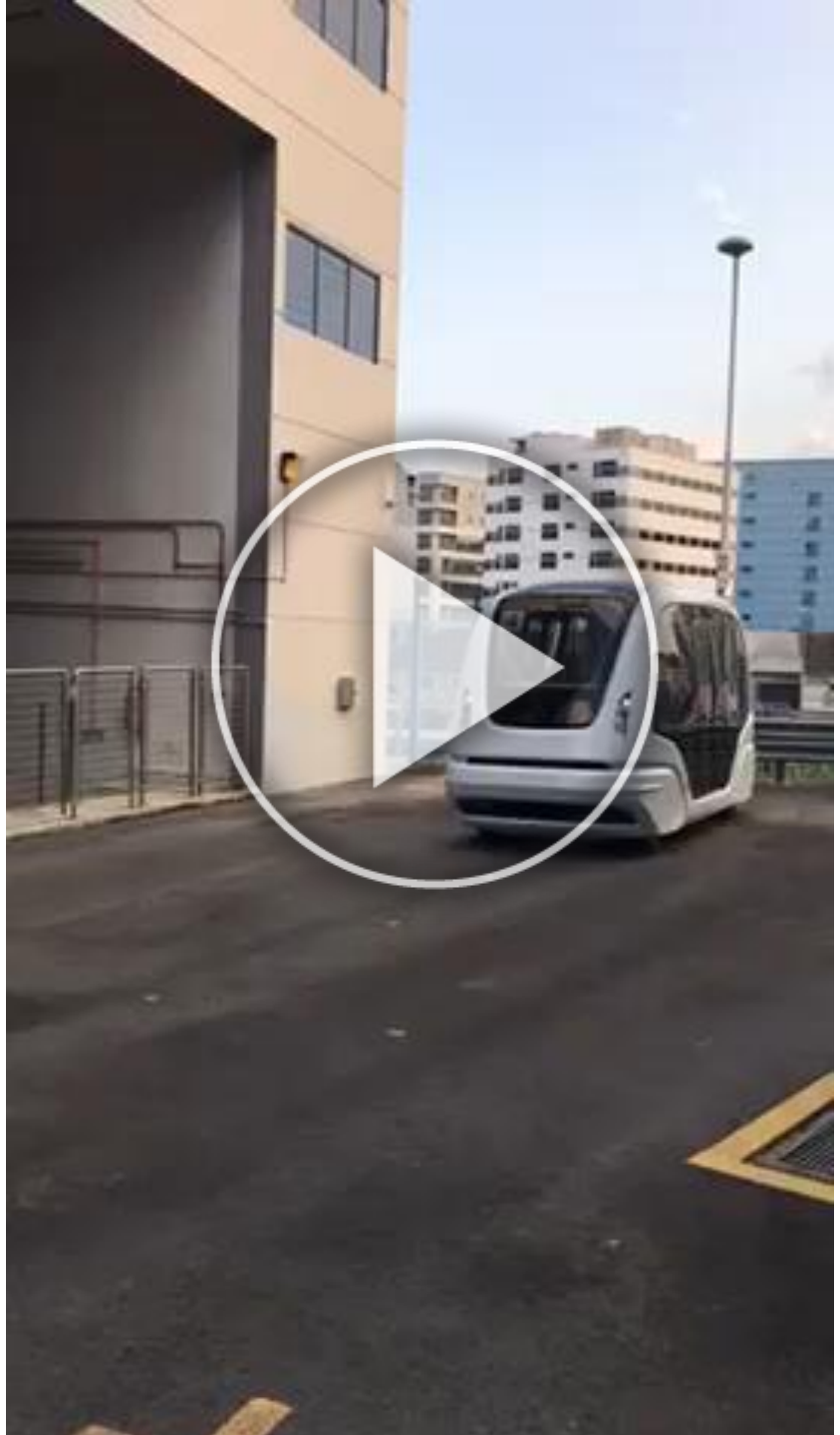
NEW GRT

VEHICLE DESIGN: INTERIOR

LUXURIOUS AND SPACIOUS



VEHICLE DESIGN




THANK YOU.
[we deliver]
2getthere

Test Beds: Lessons Learned

- Have a vision, mission, strategic, business and marketing plan
- Commitment of Key Partners
- Keep it simple to attract private sector
- Understand the needs of private sector
- Do not underestimate permitting requirements
- Funding Coalition is Key

Stantec