MINUTES
BOARD WORKSHOP
February 10, 2022

Meeting location: Central Florida Expressway Authority
4974 ORL Tower Road
Orlando, FL 32807
Pelican Conference Room

A. CALL TO ORDER/PLEDGE OF ALLEGIANCE

The Workshop was called to order at approximately 10:22 a.m. by Chairman Parks.

Board Members Present:
Commissioner Sean Parks, Lake County (Chairman)
Mayor Jerry Demings, Orange County (Vice Chairman)
Commissioner Lee Constantine, Seminole County (Treasurer)
Commissioner Brandon Arrington, Osceola County
Mayor Buddy Dyer, City of Orlando
Jay Madara, Gubernatorial Appointment
Christopher "CJ" Maier, Gubernatorial Appointment
Rafael "Ralph" Martinez, Gubernatorial Appointment
Commissioner Victoria Siplin, Orange County
Commissioner Curt Smith, Brevard County

Staff Present:
Laura Kelley, Executive Director
Mimi Lamaute, Board Recording Secretary
Glenn Pressimone, Chief of Infrastructure

Non-Voting Advisor Not Present:
Nicola Liquori, Executive Director, Florida's Turnpike Enterprise

B. PUBLIC COMMENT

- There were no public comments from members of the audience.
- There were no written public comments received by the deadline.

Ms. Laura Kelley, Executive Director, explained the theme of the workshop. She introduced the workshop facilitator that will be guiding the board through each work session, Mr. Bob Kodzis of Flight of Ideas.

C. 2045 MASTER PLAN

Mr. Bob Kodzis, Board Workshop Facilitator, welcomed everyone, provided ground rules and an overview for the workshop. Mr. Kodzis provided a synopsis of the comments received during the planning interviews with Board Members.

At this time, there was Board member discussion and input.

Mr. Kodzis introduced Suzanne Murtha with AECOM. Ms. Murtha provided a presentation on Emergent Technologies. The PowerPoint Presentation is attached hereto as **Exhibit "A."**

There was further Board member discussion and input.

Mr. Kodzis introduced Mark de la Vergne with Cavnue. Mr. de la Vergne presented on The Future of Roads. The PowerPoint Presentation is attached hereto as **Exhibit "B."**

Mayor Demings left the workshop at this time 11:32 a.m.

Board member discussion and input continued.

D. BOARD MEMBER COMMENT

There were no additional Board member comments.

E. ADJOURNMENT

Chairman Parks adjourned the Workshop at 11:50 a.m.

Sean Parks
Chairman
Central Florida Expressway Authority

Mimi Lamaute
Recording Secretary
Central Florida Expressway Authority

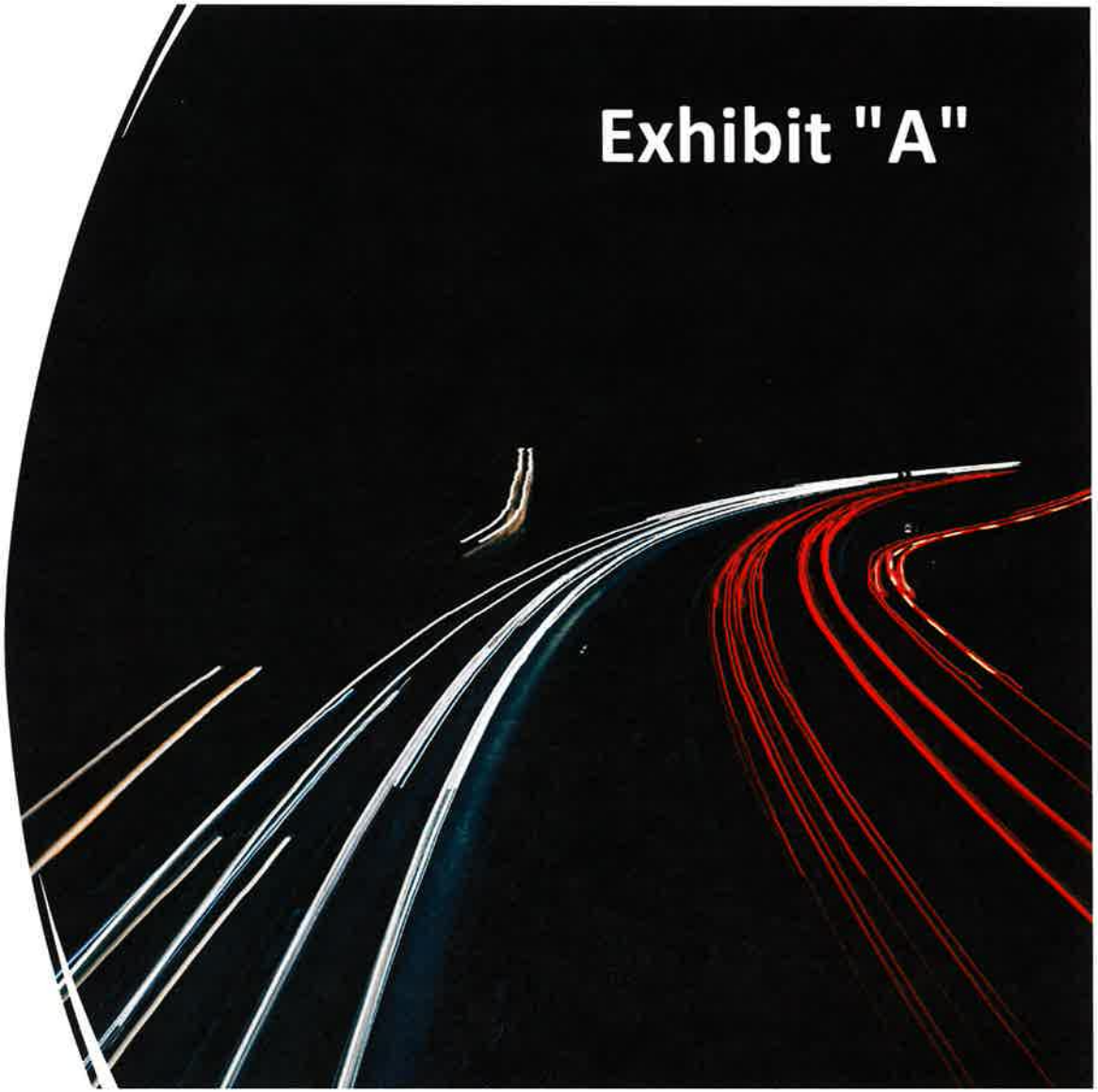
Minutes approved on March 10, 2022.

Pursuant to the Florida Public Records Law and the CFX Records & Information Management Program Policy, audiotapes of all Board and applicable Committee meetings are maintained and available upon request to the Custodian of Public Records at (407) 690-5326, PublicRecords@CFXway.com, or 4974 ORL Tower Road, Orlando, FL 32807. Additionally, videotapes of Board meetings are available at the CFX website, www.CFXway.com.

Framing the Future of Automotive Mobility in Tolling

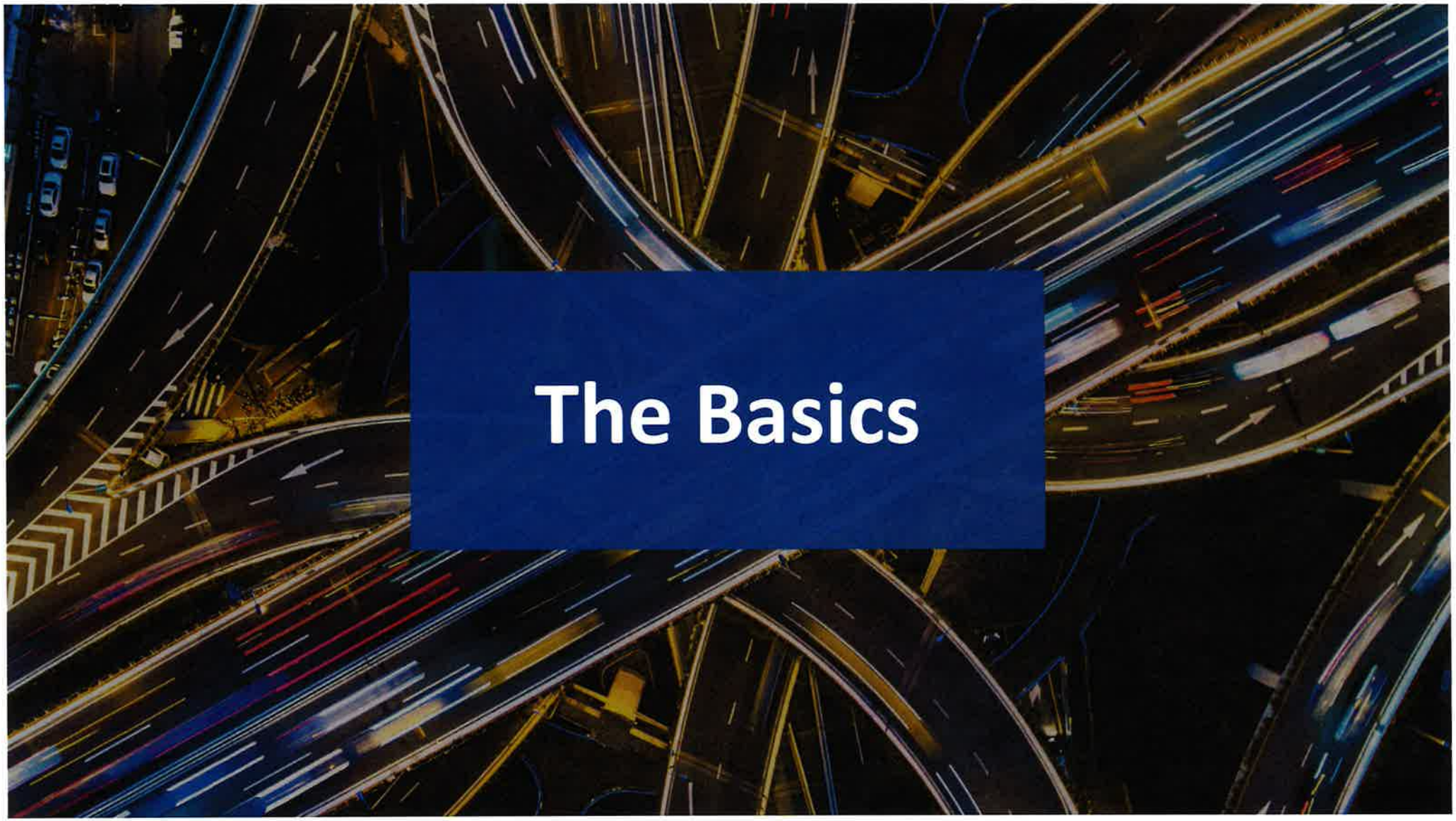
Suzanne Murtha
Global Connected and Automated Technology Lead, AECOM

CFX Board Workshop
2045 Master Plan
February 10, 2022

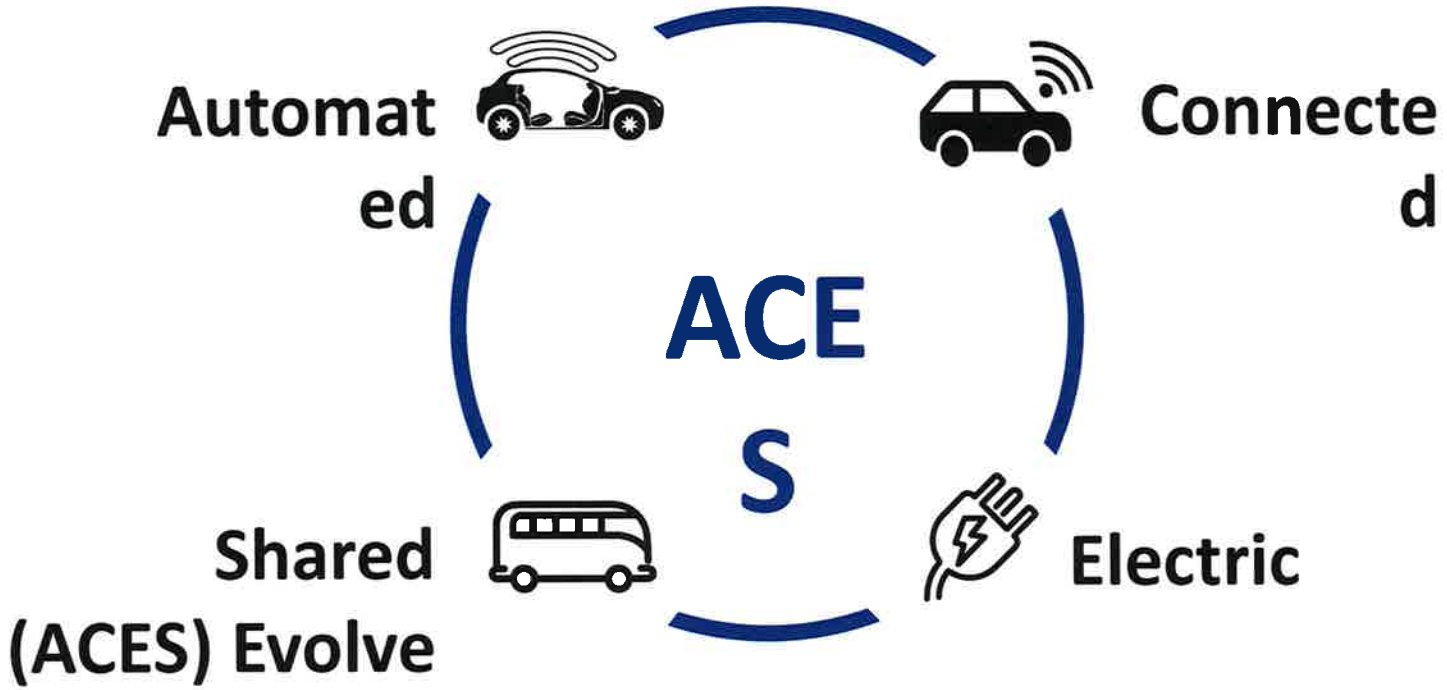


Agenda Framing the Future of Automotive Mobility in Tolling

1. The Basics
2. 2022 Current State
3. 2035 & 2045 Predictions
4. Arrival of eVTOLs


The Basics

What is ACES Technology



Levels of Driving Automation

SAE INTERNATIONAL

NHTSA

0

No Automation

Zero automation, the driver performs all driving tasks.

1

Driver Assistance

Vehicle is controlled by the driver - some driving assist features may be included in the vehicle design.

2

Partial Automation

Vehicle has combined automated functions, like acceleration & steering. The driver must remain engaged with the driving task & monitor the

3

Conditional Automation

Driver is a necessity but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.

4

High Automation

The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.

5

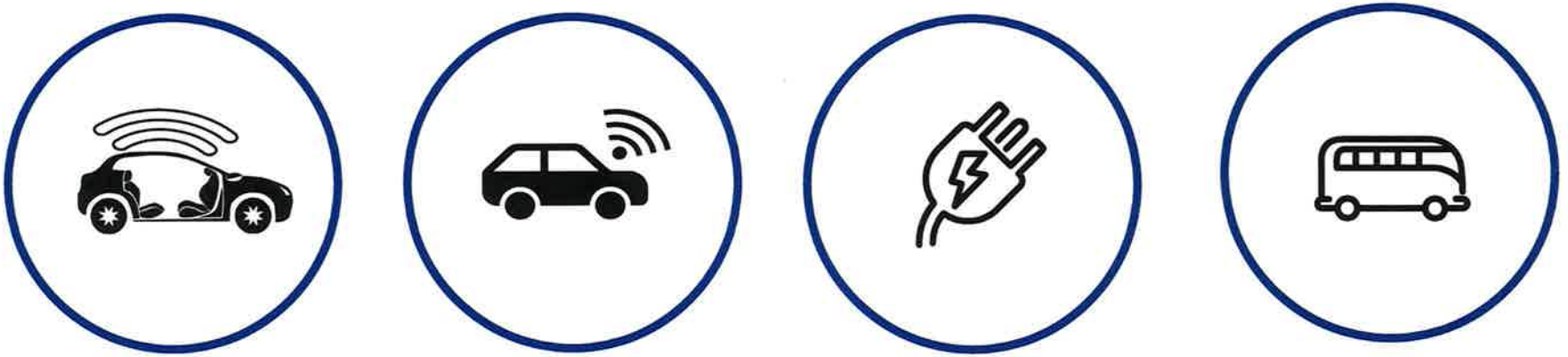
Full Automation

The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.

Connected

Electric

Shared



ACES Evolve

Automated, **C**onnected, **E**lectric, **S**hared

What does this mean for toll agencies?

2022 | Automated, Connected, Electric, Shared Vehicles

Automated

Early deployments L2

L4 Fleet deployments

- Trucks
- Buses

Connected

Shift from direct comms to telematics

5G

Toll payments – Road Use Charge (RUC)

Developing connected automation

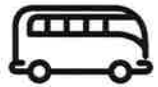
Electric

Focus on public fleets

All about the build out

Large commitments from car manuf / feds

Dynamic charging testing



Shared

Slower to roll out

Overtaken by AV/EV focus

Potential new models with transit systems

Industry developing multiple toll payment approaches

2035 | Automated, Connected, Electric, Shared Vehicles Accelerate


Automated + Connected

All fleets Level 4 automation

Most new vehicles with Level 3-4 automation

Vehicles begin using cooperative automation

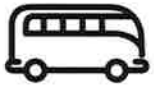
Challenges integrated with standard cars

Electric

Most new vehicles to be zero emissions

National interoperable electric vehicle charging network

Dynamic charging deployed



Shared

Automated electric fleets common

Tolls/RUC paid largely over cellular systems – fewer gantries and tags

2045 | Automated, Connected, Electric, Shared Vehicles Dominate

Automated + Connected + Electric

ADS L5 common, but not 100%

Cooperative automation & signage minimizing

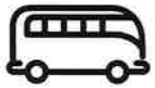
ACE lanes common for larger vehicles

Distributed Ledger Tech (DLT) enables payment

Crashes significantly reduced

Robust charging infrastructure options

RUC common, payments harmonized with toll facilities – (DLT)



Shared

eVTOLs alternative forms of transport

Tolls broadly paid without gantries, no tags, RUC widely deployed

eVTOLs Arrive

Global eVTOL Aircraft Market Projected to Grow at a CAGR of 31.1% and Surpass $4,222.4 Million from 2026 to 2033 – Exclusive Report By Research Dive

Bloomberg Businessweek

No, Really, Flying Taxis Are Getting Close to Takeoff

Billions of dollars have flowed into companies working to change "eVTOLs" from a gimmick to a standard mode of transportation.

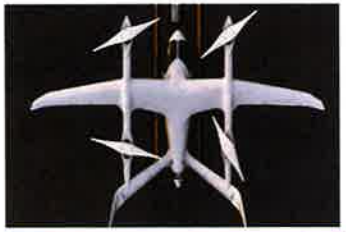
By Christopher Jasper
January 13, 2022, 6:00 AM EST

2022-2024 eVTOL Florida

Joby AVIATION

Toyota, JetBlue, REEF Technology Signature
1 Pilot, 4 Passengers
150 mile range

BETA



United Therapeutics, UPS, US Airforce
Amazon Climate Pledge Fund
1 Pilot, 4 Passengers
150 mile range

wisk

Boeing, Kitty Hawk Co.
Autonomous
2 passenger/ cargo
25 mile range

LILIUM

Honeywell, Ferrovial, Lufthansa
Future cargo
1 Pilot, 6 Passengers
200 mile range

United Airlines
1 Pilot, 4 Passengers
60 mile range

DG Fluyzeugbau
Heavy Lift Drones
1 Pilot, 4 Passengers
60 mile range

2022-2045 eVTOL Florida

2022-2045 eVTOL Florida

Florida launch network planned with Ferrovial and Tavistock

ferrovial

TAVISTOCK

Jets to be deployed	~125
Number of vertiports	14
Investment from partners	~$200M

Source: Lilium business plan.
Note: Planned network for Lilium in Florida, indicative. Lilium Network @2C routes).

Exhibit "B"

cavnue

The future of roads.

CFX Master Plan Board Workshop
February 10, 2022

Overseeing infrastructure is an evolving challenge

Safety

2021 saw near-doubling of traffic fatalities on Florida roads[1]

Congestion

Some areas of Florida have seen a 64% increase in traffic since 2020[2]

Freight

Worrying data has shown a steady increase in trucking accidents in Florida[3]

Equity

Climate

As a storm-prone state, DeSantis pledges $80 million for climate adaptation in South Florida[5]

1 - [illegible]
2 - [illegible]
3 - [illegible]
4 - xxx
5 - [illegible]

Level-4 autonomy has not arrived, but Level-2 features are reaching market scale

OEM	Intro year	Models[1], #	Examples	Est. sales volume, K		Headlines
				2020	2023	
General Motors *Super Cruise*	2020	22	• Cadillac Lyriq • Buick Encore	37.6	177.3	"GM's Super Cruise Self-Driving Tech Will Be on 22 Vehicles by 2023" CAR AND DRIVER Feb 2021
Ford *BlueCruise*	2020	11	• Mustang Mach-E • F-150 SuperCrew	3.7	52.7	
Tesla *Autopilot*	2020	5	• Model X • Model 3	153.5	302	"Tesla Full Self-Driving subscription model coming in Q2 2021" ROAD & SHOW Mar 2021
Volvo *Pilot Assist*	2023	2	• Volvo XC90 • Volvo XC100	0	7.6	
Volkswagen *Traffic Jam Assist*	2020	12	• Volkswagen Atlas • Audi A4	27.4	52.1	
Nissan *ProPilot Assist 2.0*	2021	2	• Infiniti QX50 • Infiniti QX55	0	5.5	
Toyota *SafetySense 2.5*	2021	46	• Toyota Camry • Lexus LX	0	421.6	"2021 Toyota Camry is first to get Safety Sense 2.5 Plus" ROAD & SHOW Jul 2020

Road infrastructure isn't keeping up with vehicle technology

The more test-miles OEMs accrue, the more they understand how much complexity they still can't account for

Initial problem formulation

- Simple problem: lateral (torque) + longitudinal (acceleration / deceleration)
- Underestimates the complexity of the road

+Unpredictable road actors

+Unpredictable infrastructure

+Unpredictable environment

Hundreds of thousands of intractable edge cases

Supportive infrastructure can radically simplify the complexity problem

- Simplify
- Sense + See
- Inform + Coordinate
- Permit + Penalize

The Future of Roads

CARS ARE GETTING SMARTER

Vehicles with increasing ADAS[1] capability are reaching scale

ROADS HAVE NOT KEPT UP

Road infrastructure is woefully inadequate to achieve these vehicles' full potential

SMART CARS NEED SMART ROADS

The future of roads will be safer and more efficient

cavnue

[1] Advanced Driver Assistance Systems

Infrastructure can add value to technology

Dedicated and / or mixed use lanes for autonomous trucks, autonomous transit, and passenger AVs			Digital twin to improve road operations and maintenance	
Trucking	**Transit**	**Passenger**	**Operations**	**Maintenance**
Improves safety Improves quality of driver experience to help address driver shortage Reduces shipping costs Additional savings via battery electric fleet integration	Improves safety, which reduces operating costs Enhances fleet management and planning Improves reliability Provides equitable access to autonomy	Improves safety Increases throughput and time savings Provides value of autonomy to passengers Creates opportunity for future integration with EV charging	Digitizes traffic monitoring and management Increases responsiveness to accidents Reduces operating expenses Minimizes revenue leakage	Increases responsiveness to maintenance needs Reduces maintenance expenses Transforms MoT capabilities

Bringing Vehicle/Tech to Infrastructure

Cavnue has assembled a first-of-its-kind partnership between OEMs / AV companies and a road operator, with the goal of supporting the flagship project in Michigan by defining a set of OEM-neutral standards and accelerating hands-off eyes-off deployment.

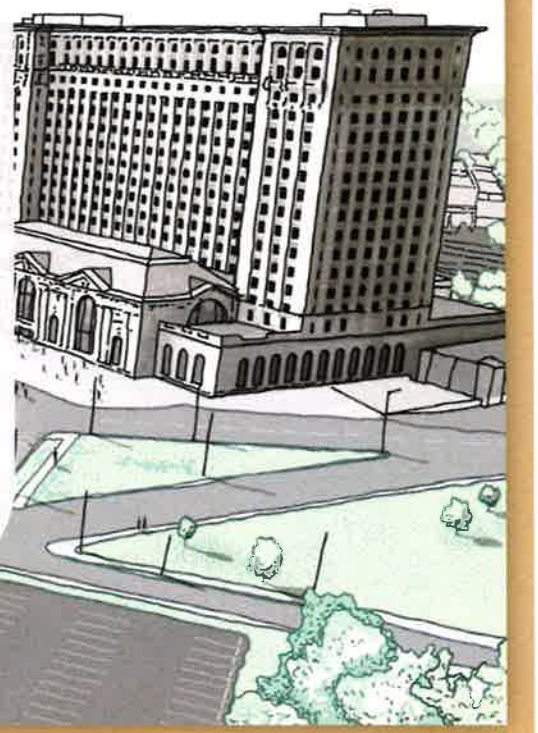
ADVISORY COMMITTEE MEMBERS

ARGO AI
ARRIVAL
Ford
gm
HONDA
may mobility
Motional
TOYOTA
tusimple
HYUNDAI

Michigan CAV Corridor Project

Ultimate vision is to build a **CAV-lane corridor between Detroit and Ann Arbor** that improves the safety, connectivity, accessibility and affordability of mobility in SE Michigan.

Phase I is a collaborative piloting, planning, and feasibility exercise with the objective is to test technology and infrastructure, conduct analysis and community outreach, and establish a viable vision for the project.




cavnue
1. Making it easier for vehicles and people to see the road ahead
2. Talking to vehicles and people to provide deeper insights about the complex roadway operating environment, including events happening ahead
3. Simplifying the road operating environment for vehicles and people
70
Clear
1


cavnue
1. Making it easier for vehicles and people to see the road ahead
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3. Simplifying the road operating environment for vehicles and people
2
70

cavnue

1. Making it easier for vehicles and people to see the road ahead
2. Talking to vehicles and people to provide deeper insights about the complex roadway operating environment, including events happening ahead

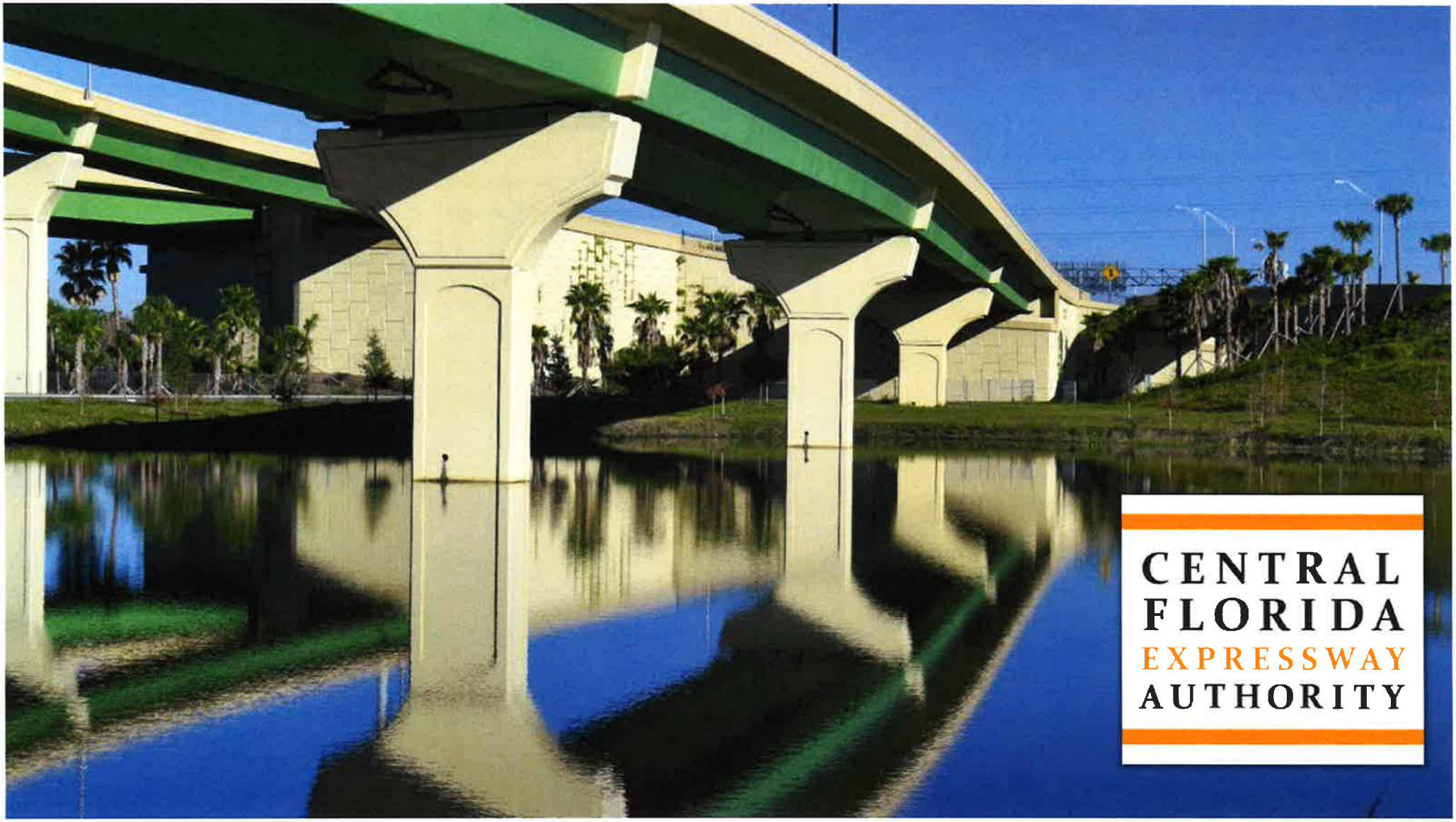
3. Simplifying the road operating environment for vehicles and people


cavnue
70
Dry
Clear
Incident

cavnue

The future of roads.

Mark de la Vergne
Vice President, Project Development
mark@cavnue.com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