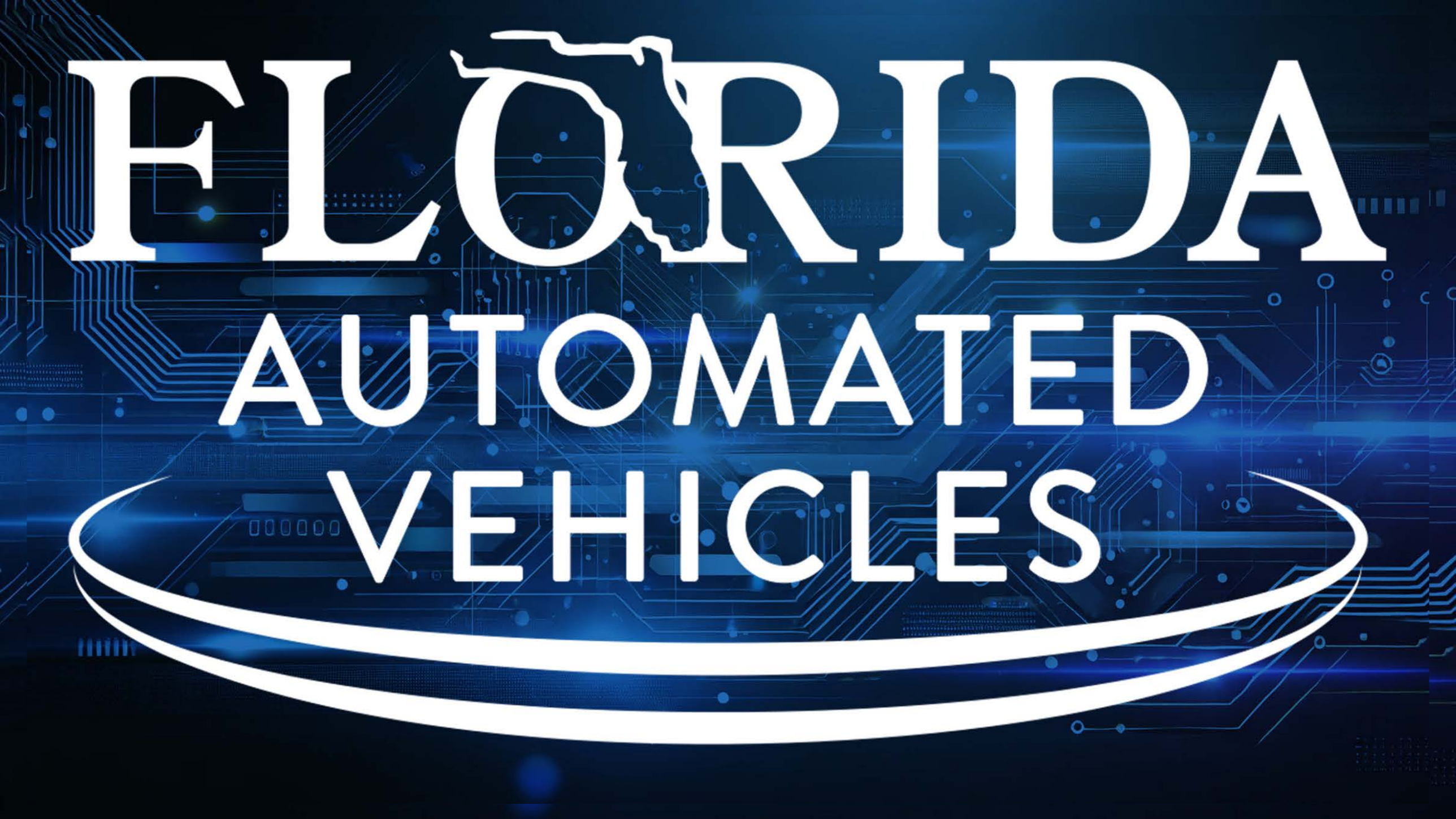
FLORIDA
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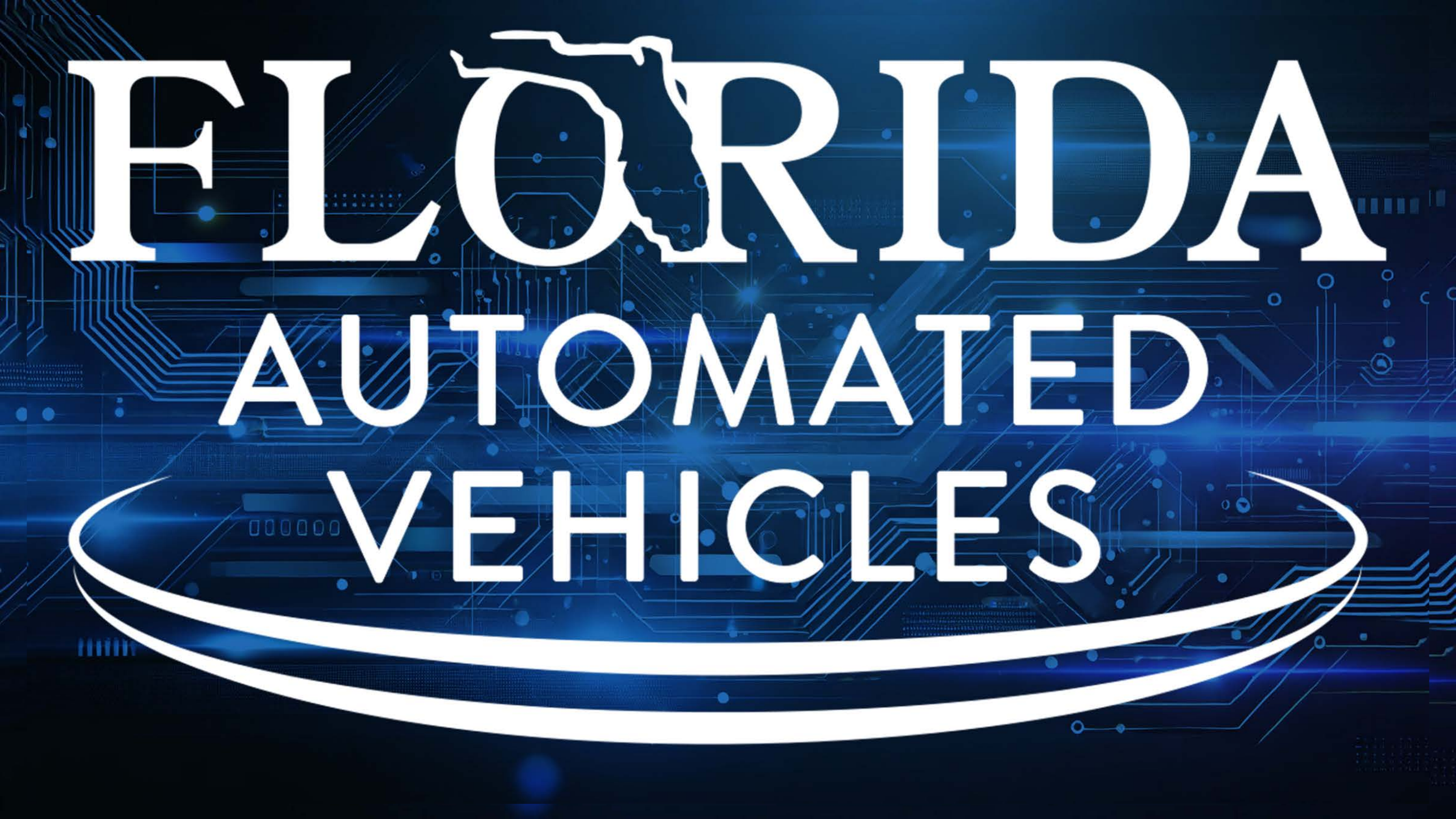
VEHICLES

SCAN HERE FOR OUR ONLINE BROCHURE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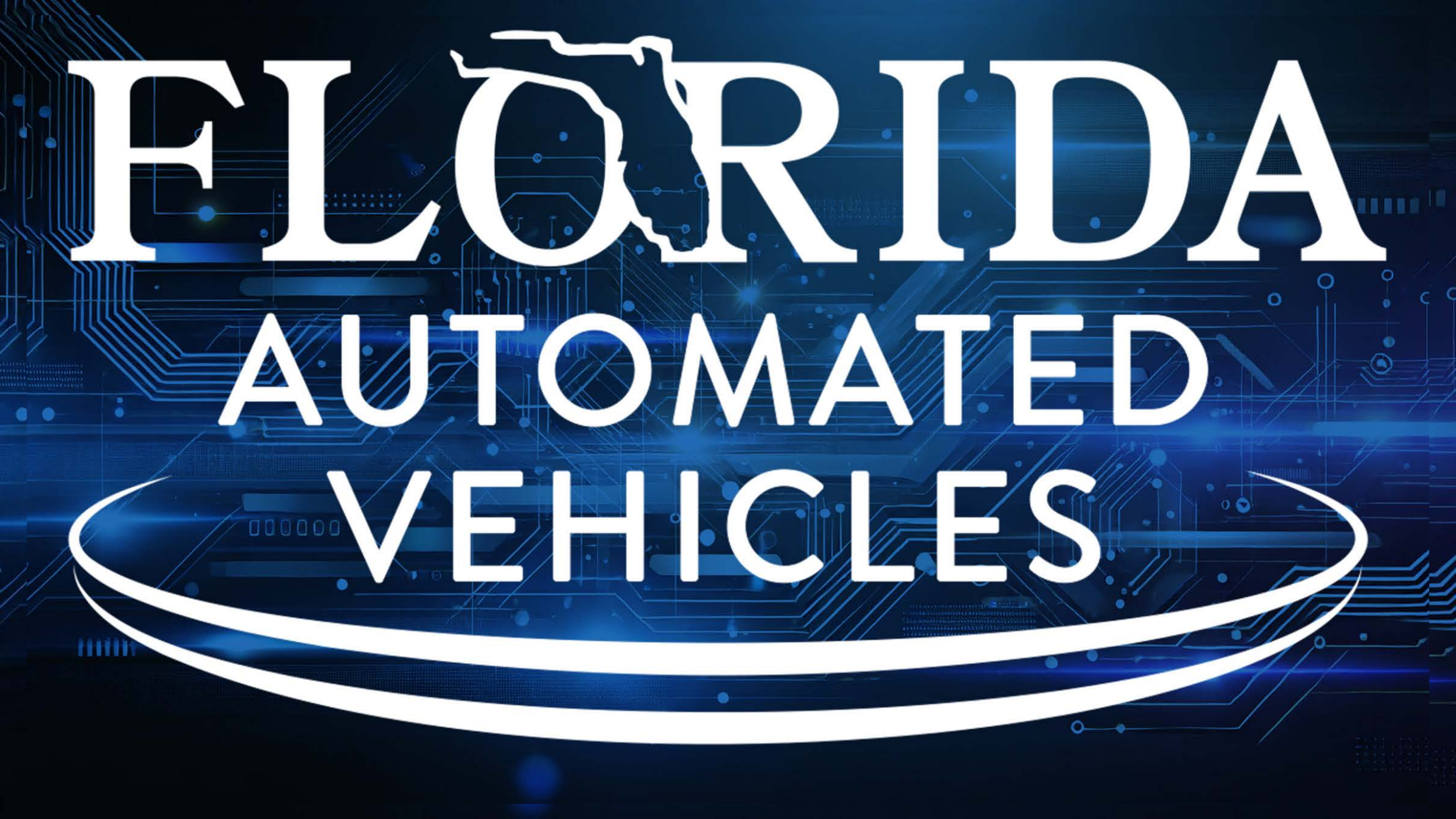
VEHICLES

Welcome to the 2024 Florida Automated Vehicles Summit

Jeffrey Brandes
CEO/Founder
Florida Policy Project

Greg Slater
Executive Director & CEO, Tampa Hillsborough Expressway Authority

FLORIDA AUTOMATED VEHICLES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Florida Department of Transportation

Jared W. Perdue

Secretary, Florida Department of Transportation

FLORIDA AUTOMATED VEHICLES

FLORIDA AUTOMATED VEHICLES SUMMIT

FLORIDA DEPARTMENT OF TRANSPORTATION

SECRETARY JARED W. PERDUE, P.E.

SEPTEMBER 5, 2024

PRESENTATION OVERVIEW

- Setting the Stage
- Historic Budget
- Federal Policies & Funding
- Transportation in Florida
- FDOT Vision for the Future
- Partnerships

FLORIDA LEADS THE NATION

3 LARGEST CRUISE PORTS IN THE WORLD

ONLY STATE WITH 4 LARGE-HUB COMMERCIAL AIRPORTS

BASED ON BUDGET, FDOT WOULD PLACE ON THE Top half of Fortune 500 BUSINESSES GLOBALLY

23 MILLION RESIDENTS

140 MILLION ANNUAL VISITORS

FLORIDA: 14TH LARGEST ECONOMY IN THE WORLD

HISTORIC BUDGET

Five-Year Work Program $65.8 Billion

Most Mega Projects ($500M+) in Work Program History

FY 24-25 Annual Budget

Total Budget $15.5 Billion

Work Program $14.5 Billion

FY 24-25 Budget Highlights

- Aviation: $334.2 M
- Highway Maintenance/ Construction: $5.2 B
- Safety Initiatives: $210.1 M
- Bridge Repairs and Replacement: $382.5 M
- Public Transit and Rail: $960.6 M
- Local Transportation Projects: $241.5 M

FEDERAL POLICIES & FUNDING

CURRENT AUTHORIZATION UNDER IIJA

TRADITIONAL FORMULA-BASED
Florida Allocation: $12.6 B

NEW FORMULA PROGRAMS
Florida Allocation: $1.2 B

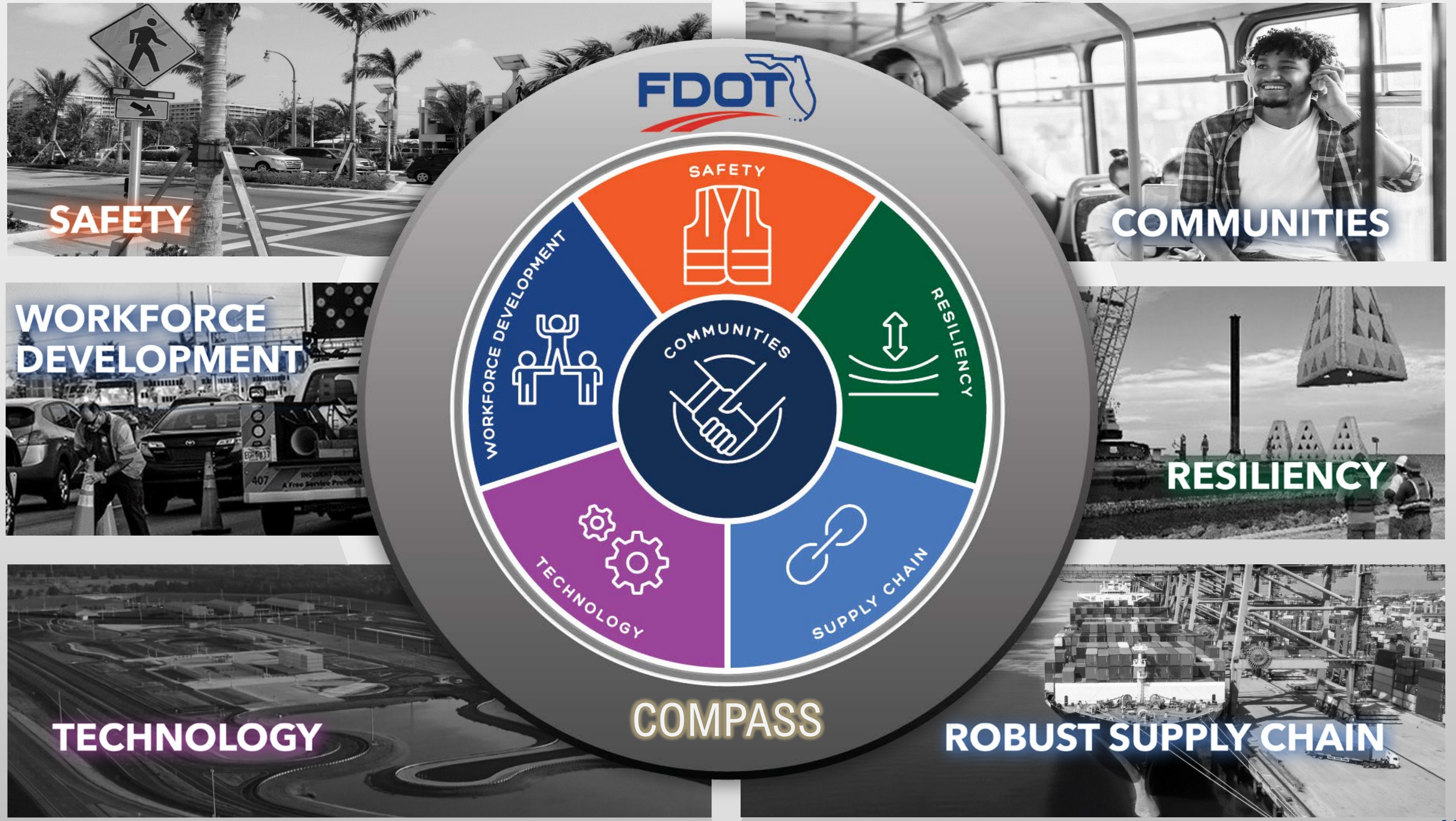
DISCRETIONARY GRANTS
IIJA Allocation: $165 B

NEXT REAUTHORIZATION OCCURS IN 2026

TRANSPORTATION REAUTHORIZATION

Florida's Strategic Approach:

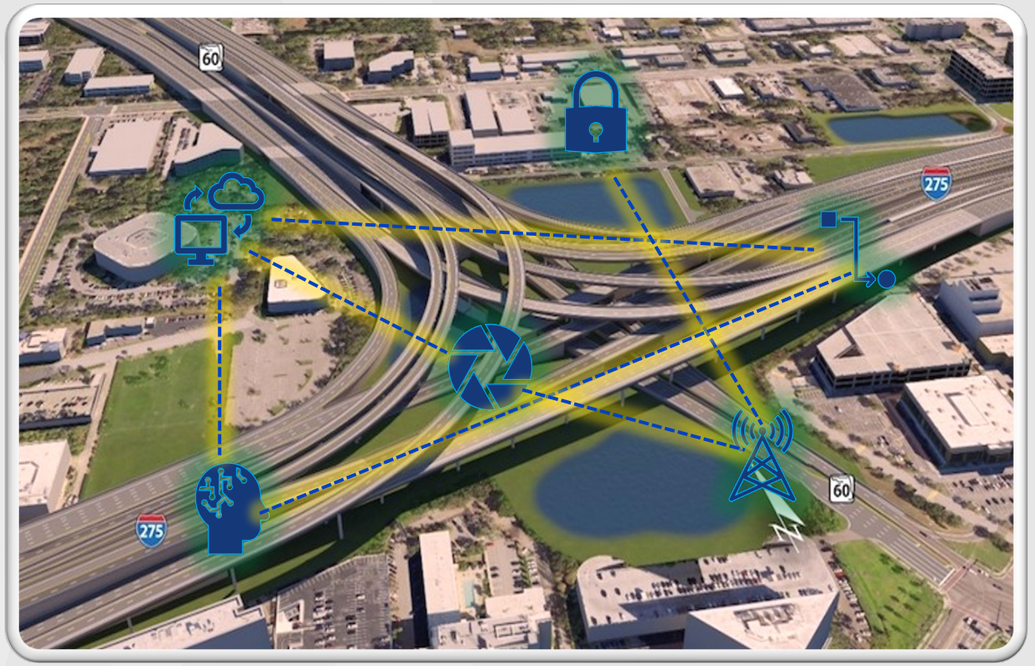
- Focus on formula-based transportation programs
- Reduce number of discretionary grant programs
- Consider program consolidation or elimination
- Increase flexibility for states
- Reduce administrative burdens
- Improve execution of Buy America
- Recommend policies based on transportation system performance
- Emphasis on technology and digital infrastructure
  - Build Public Confidence in the Privacy, Security & Safety of New Transportation Technologies


SAFETY
COMMUNITIES
WORKFORCE DEVELOPMENT
RESILIENCY
TECHNOLOGY
ROBUST SUPPLY CHAIN
FDOT
SAFETY
COMMUNITIES
RESILIENCY
SUPPLY CHAIN
TECHNOLOGY
WORKFORCE DEVELOPMENT
COMPASS

DRIVING INNOVATION & EFFICIENCIES TO PREPARE FOR TOMORROW

FOCUS FOR FLORIDA

- Research Partnerships
- Broaden & Modernize the Focus on Transportation Technology



PARTNERSHIPS

STRONG PARTNERSHIPS = STRONGER COMMUNITIES

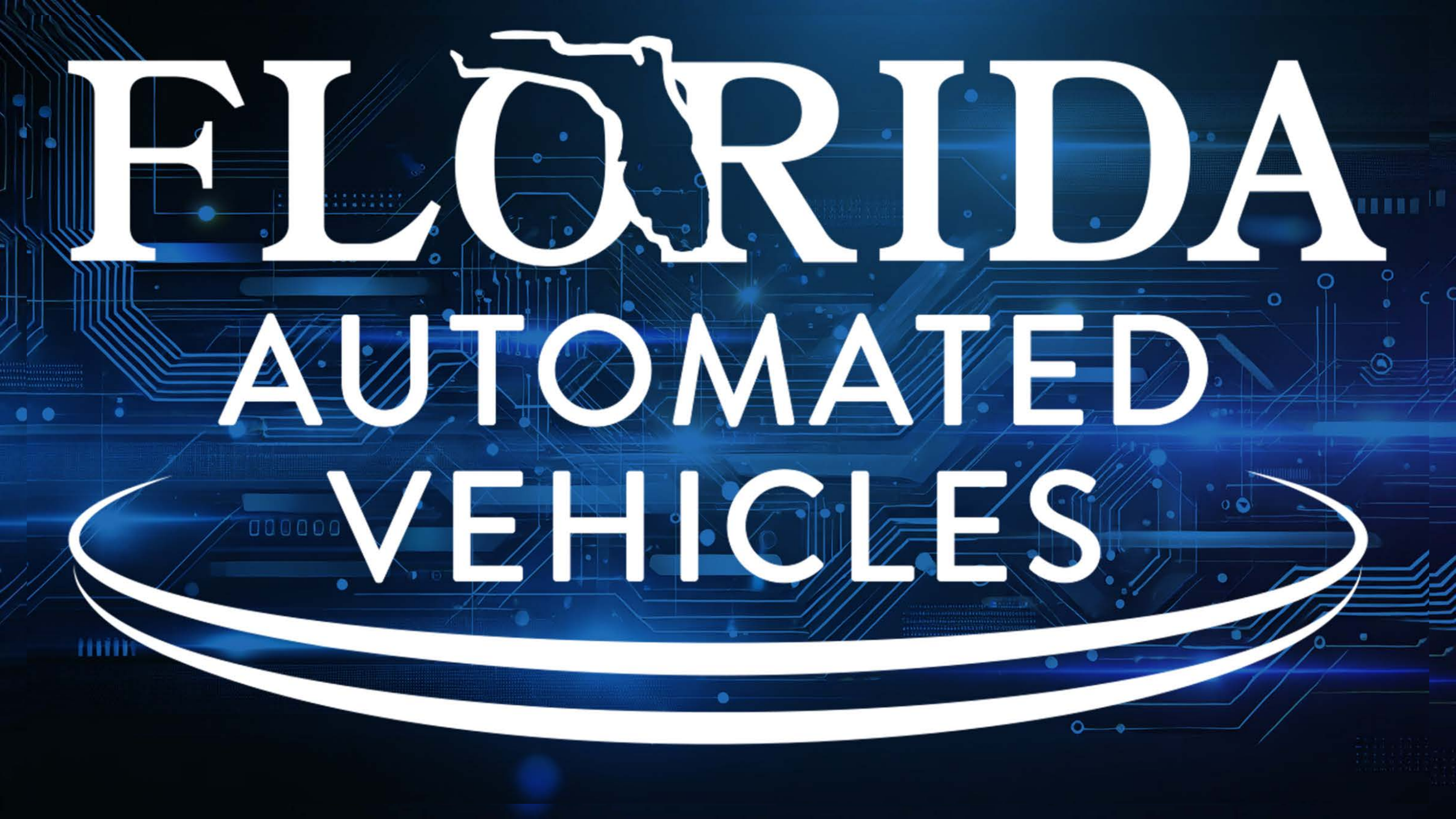
FDOT STUDIOS

FLORIDA IN MOTION

with

SECRETARY JARED W. PERDUE, P.E.

Scan Me!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U.S. Department of Transportation

Taylor W.P. Lochrane

Ph.D., P.E. Director, Highly Automated Systems Safety COE,
USDOT Office of the Assistant Secretary of Research and Technology (OST-R)

FLORIDA AUTOMATED VEHICLES

Advancing the Safe and Responsible Integration of Automation Across the Transportation Ecosystem

Taylor Lochrane, Ph.D., P.E.
Director, Highly Automated Systems Safety COE

Office of the Assistant Secretary for Research and Technology
U.S. Department of Transportation

Florida Automated Vehicles Summit | September 5, 2024

U.S. Department of Transportation

HASS
Highly Automated Systems Safety
Center of Excellence

U.S. DOT Research Updates

Saving Lives with Connectivity: A Plan to Accelerate V2X Deployment

- Guiding the implementation of vehicle-to-everything technologies for road safety, mobility, and efficiency to reduce roadway fatalities

SMART* Grants Program

- $500M in funding to support demonstration projects across our transportation system ($148M in Stage 1 grants)

Intersection Safety Challenge

- Incentivizing new and emerging technologies that identify and address unsafe conditions involving vehicles, and vulnerable road users at intersections (15 awards in Stage 1A)

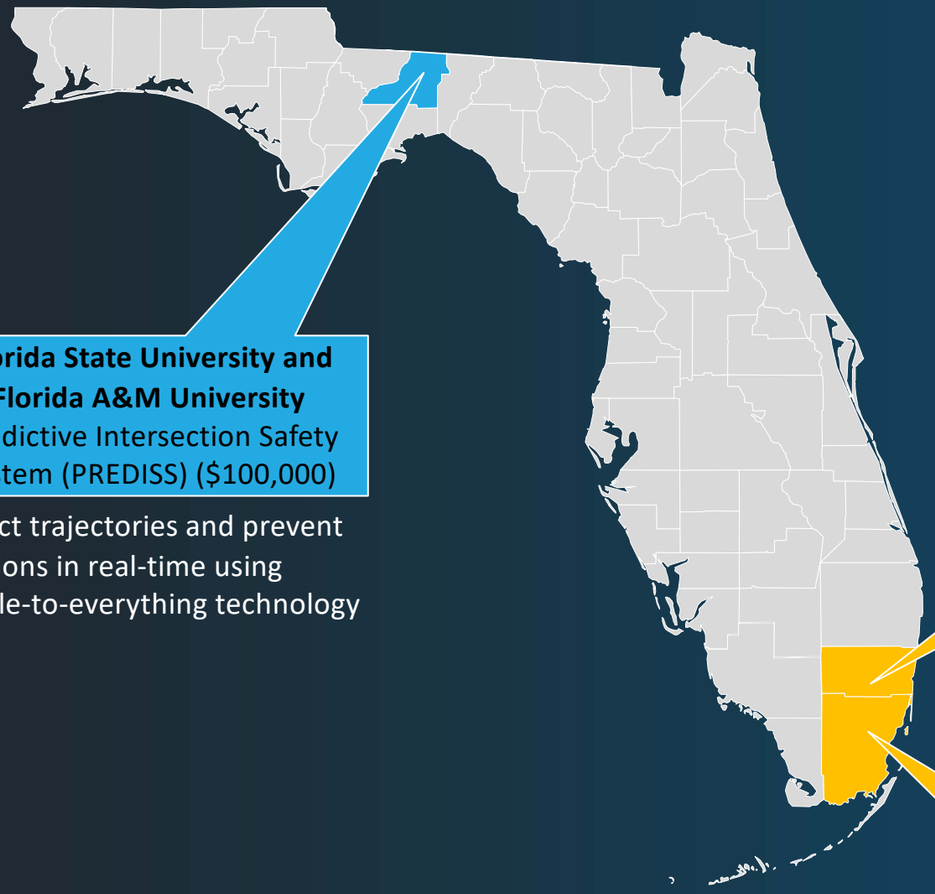
ATTAIN† Program

- Funding to deploy, install, and operate advanced transportation technologies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure ROI
- 2023-24 applications are under review and awards will be posted to ops.fhwa.dot.gov/bipartisan-infrastructure-law

U.S. Department of Transportation

* Strengthening Mobility and Revolutionizing Transportation
† Advanced Transportation Technologies and Innovative Mobility Deployment

Recent Awards in Florida



SMART Grants

Intersection Safety Challenge Stage 1A

Florida State University and Florida A&M University
Predictive Intersection Safety System (PREDISS) ($100,000)

Predict trajectories and prevent collisions in real-time using vehicle-to-everything technology

Broward Metropolitan Planning Organization
SMART METRO ($2,000,000)

Develop a digital twin of transportation, land use, and infrastructure data to support scenario modeling and infrastructure planning

Miami-Dade County
A MicroFreight Approach for Safer Streets ($1,985,000)

Introduce a platform of integrated data, networked sensors, and digital infrastructure to enable and scale safe, zero-emission last mile freight and goods deliveries

HASS Highlights

AI Assurance Program

- Developing an AI assurance framework will support the development, assessment, and integration of AI verification and validation, runtime monitoring, risk assessment, and risk mitigation techniques used to improve system and operational safety of ADS and unmanned aircraft systems

Distributed Testing Strategy

- Building a community of practice around Distributed Testing (DT) systems that enable connection and systematic testing of live and/or simulated, geographically dispersed actors

Quantum Community of Interest

- Partnering with ARPA-I to engage quantum experts and explore the opportunities of quantum-based technologies in the transportation sector

State and Local Engagement

- Supporting coordination and relationships across the Department on state and local considerations and strengthen and improve state DOT and local relationships

HASS Supporting the Future of Air Mobility

Three HASS team members selected for **Advanced Air Mobility (AAM) Interagency Working Group (IWG)**:

- Comprised of 19 Federal departments and agencies
- Fostering leadership and interagency collaboration in the adoption and deployment of AAM
- Planning and coordinating efforts related to safety, operations, infrastructure, physical and cyber security, and Federal investment necessary for maturing national AAM ecosystem, particularly passenger carrying aircraft, to:
  1) **GROW** new transportation options;
  2) **AMPLIFY** economic activity and jobs;
  3) **ADVANCE** environmental sustainability and new technologies; and
  4) **SUPPORT** emergency preparedness and competitiveness.

U.S. Department of Transportation

Advanced Air Mobility
Interagency Working Group

Looking Ahead

Collaborating across government, academia, and industry and different modes of transportation.

Automated Testing and Evaluation Program

- New test program launching Fall 2024
  - AI Assurance to assure Safety
  - Distributed Testing to support Verification and Validation
  - State and Local Outreach and Engagement – Automation

HASS EDU

- New test program launching Fall 2024
  - Let's learn more about this technology

HASS Fellowship Program

- Launching next year
  - Rotational assignments to enhance knowledge exchange and development across Federal/state/local government and academia
  - Come work with us!

Contact

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Director, HASS COE
taylor.lochrane@dot.gov

transportation.gov/hasscoe

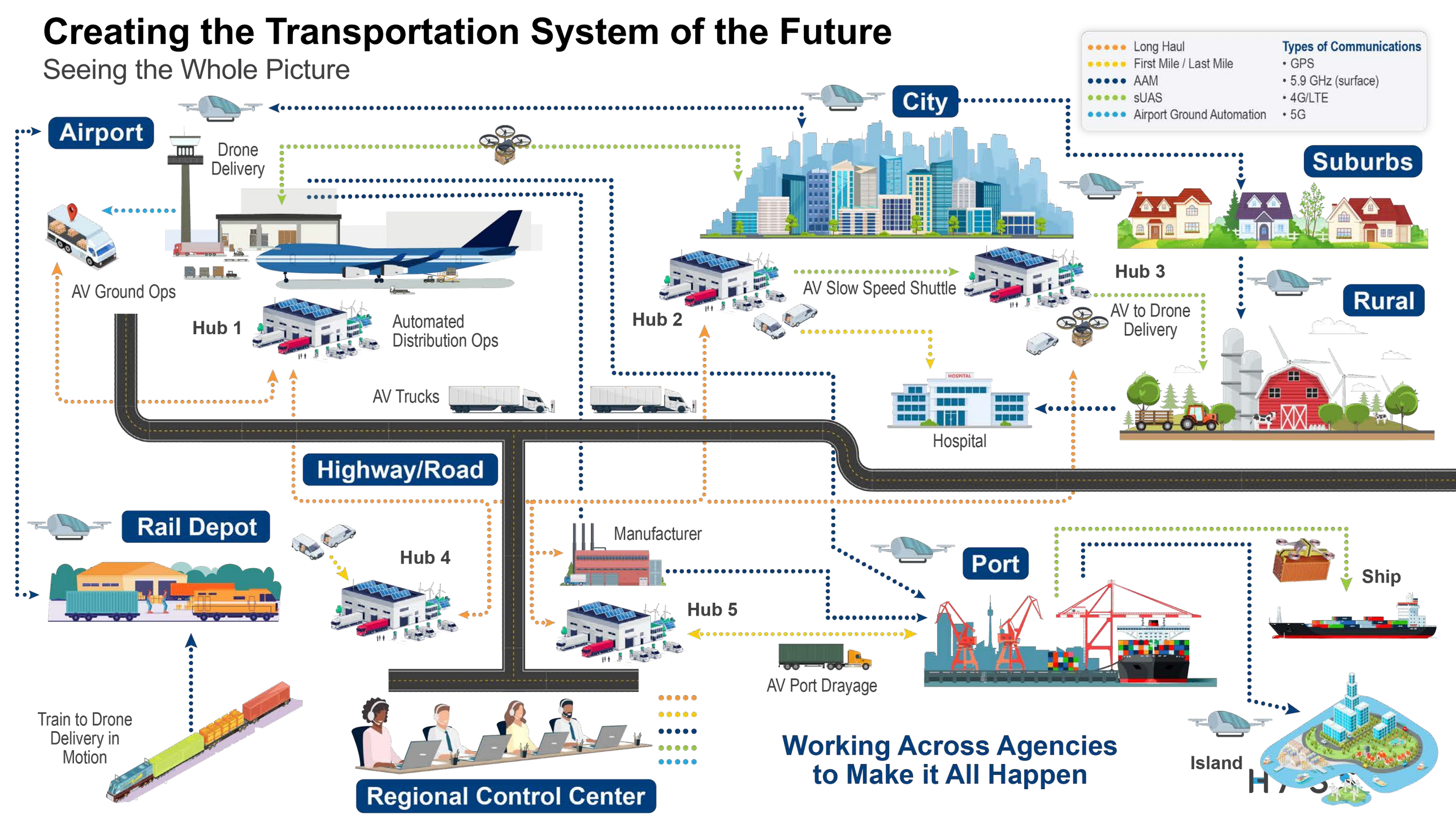
linkedin.com/company/hasscoe

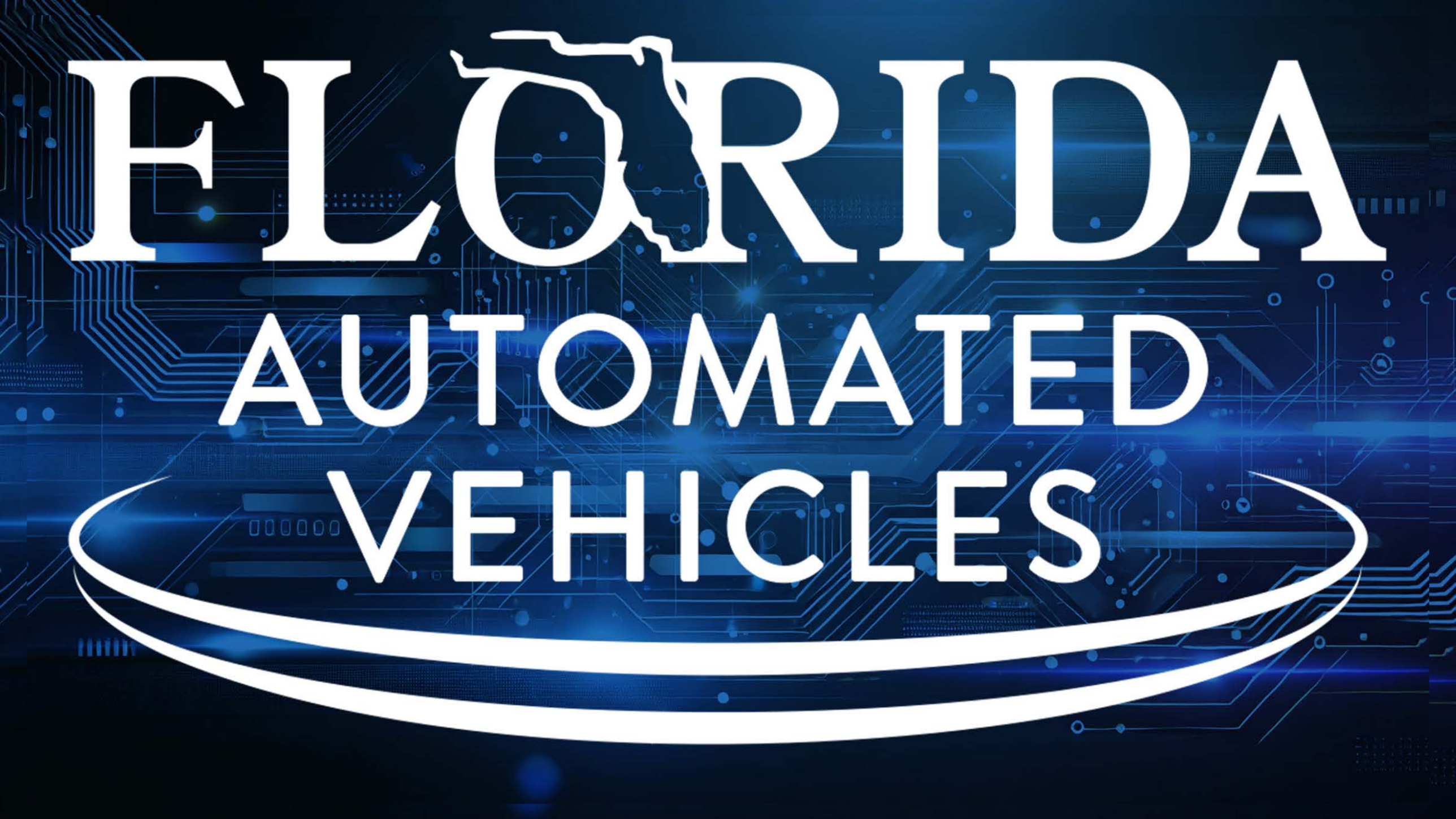
U.S. Department of Transportation

HASS
Highly Automated Systems Safety
Center of Excellence

Creating the Transportation System of the Future

Seeing the Whole Picture

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Mobility's Next Act-
Perspectives on the Current State and Outlook of the Ongoing Mobility Disruption

Philipp Kampshoff

McKinsey Center for Future Mobility, McKinsey Consulting

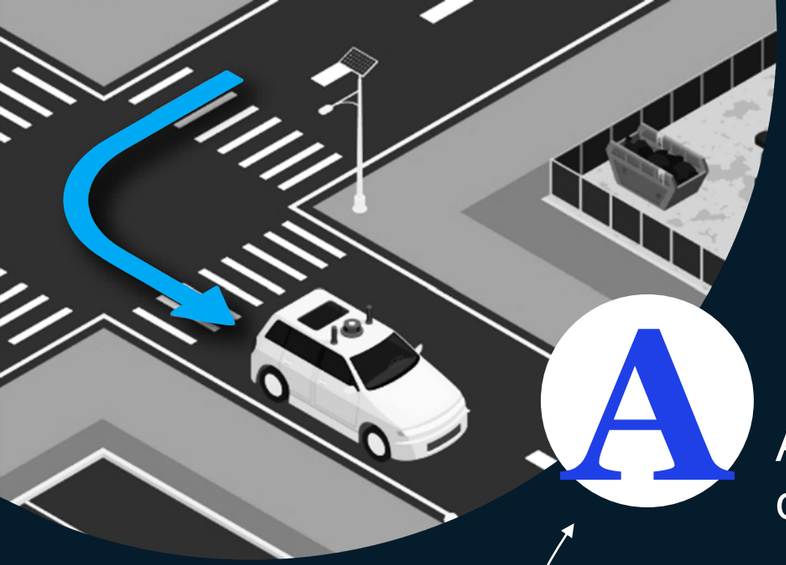
FLORIDA AUTOMATED VEHICLES

McKinsey & Company

Mobility's Next Act

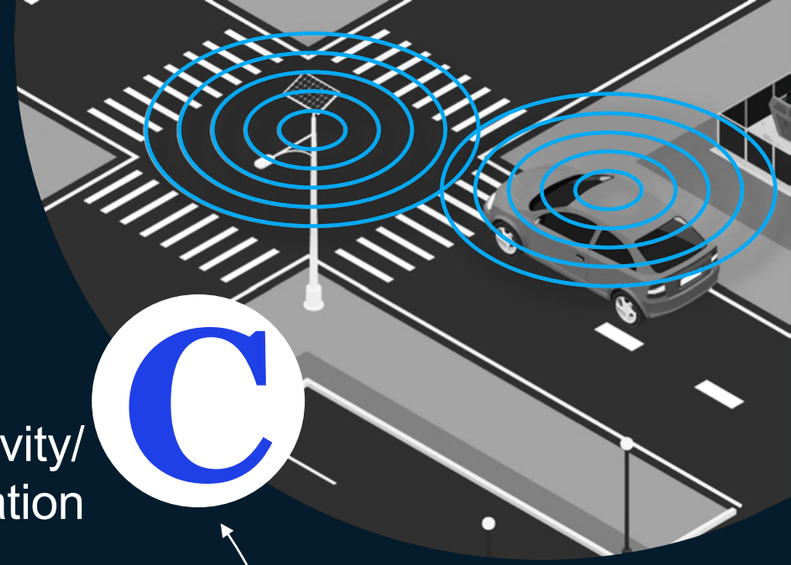
A Sneak Peek into Mobility's Future

By Dr. Philipp Kampshoff



A

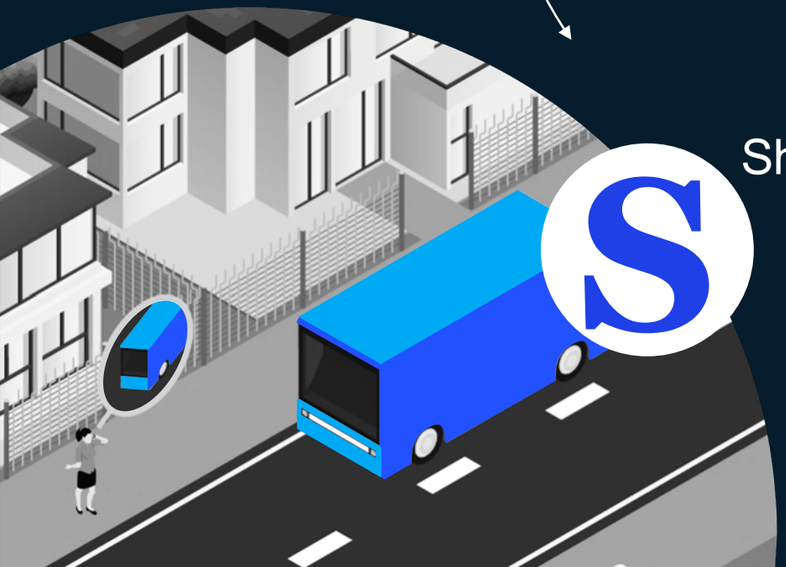
Autonomous driving



C

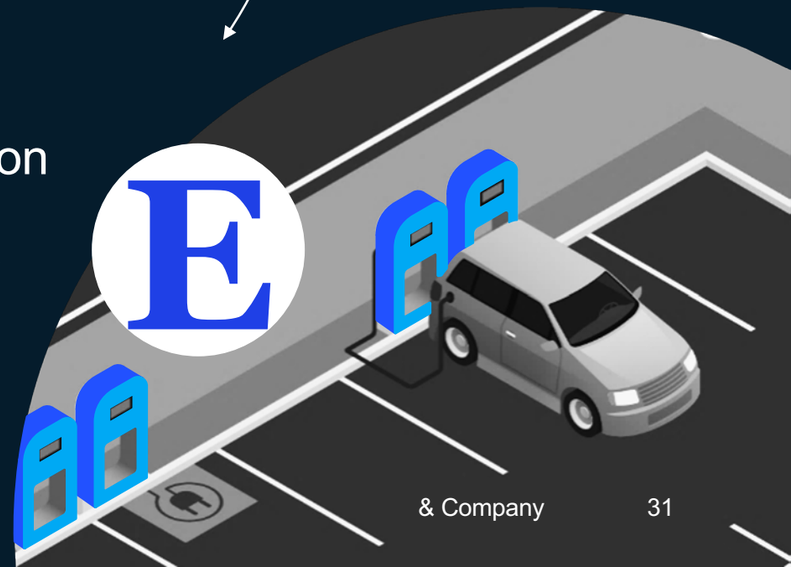
Connectivity/ Digitization

The mobility industry is poised for more disruption in the next decade than the last 5 decades combined



S

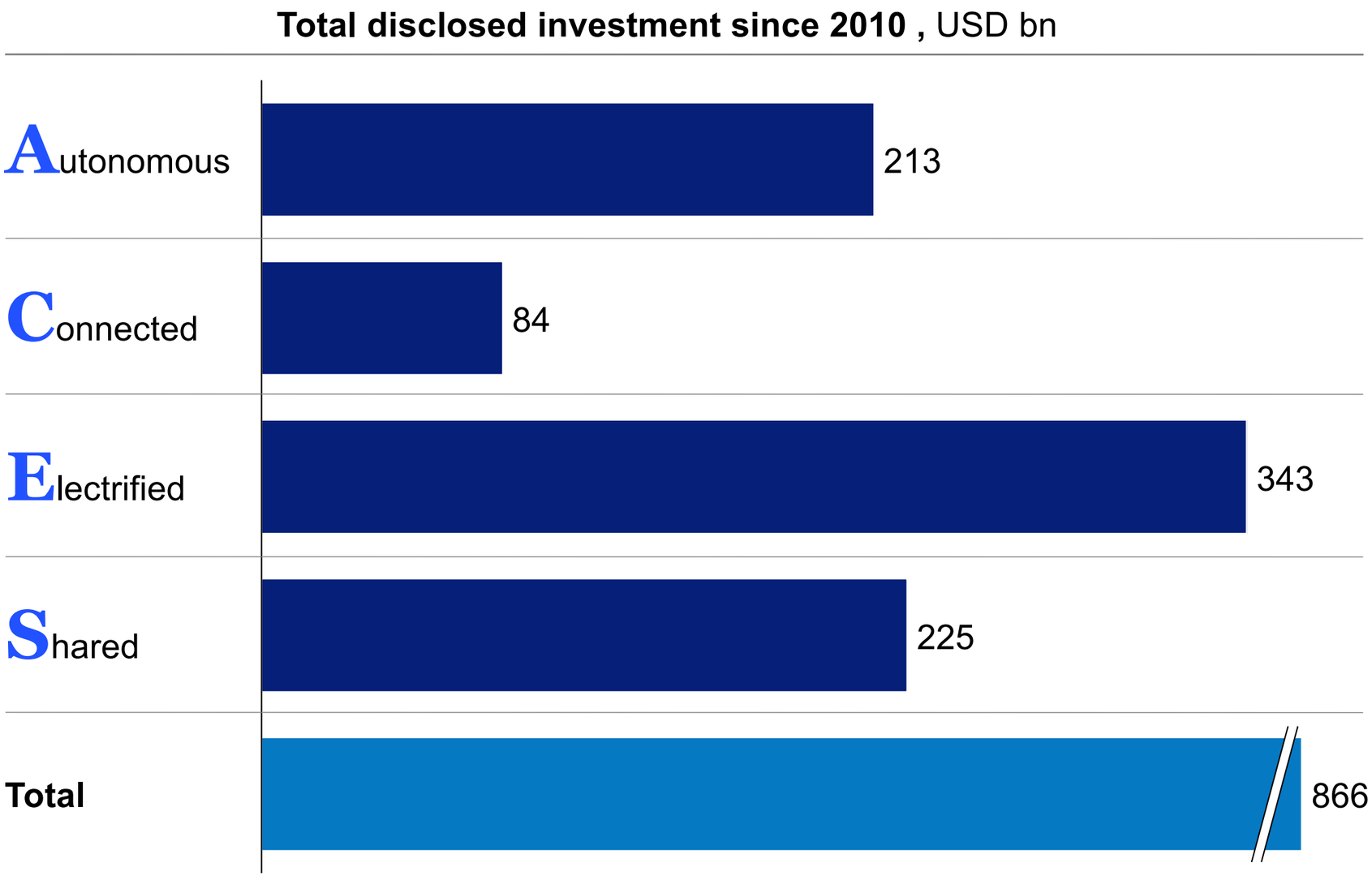
Shared mobility



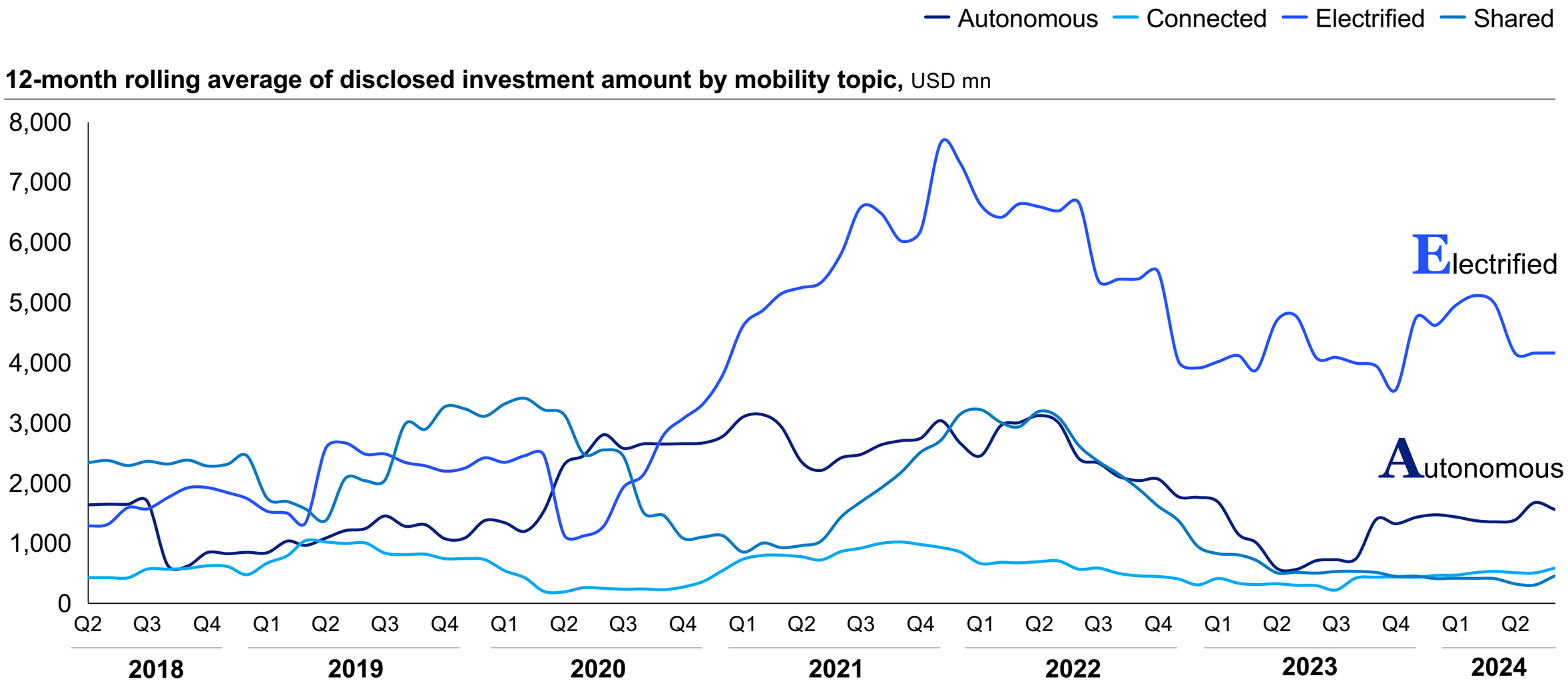
E

Electrification

>850B have been invested into the ACES

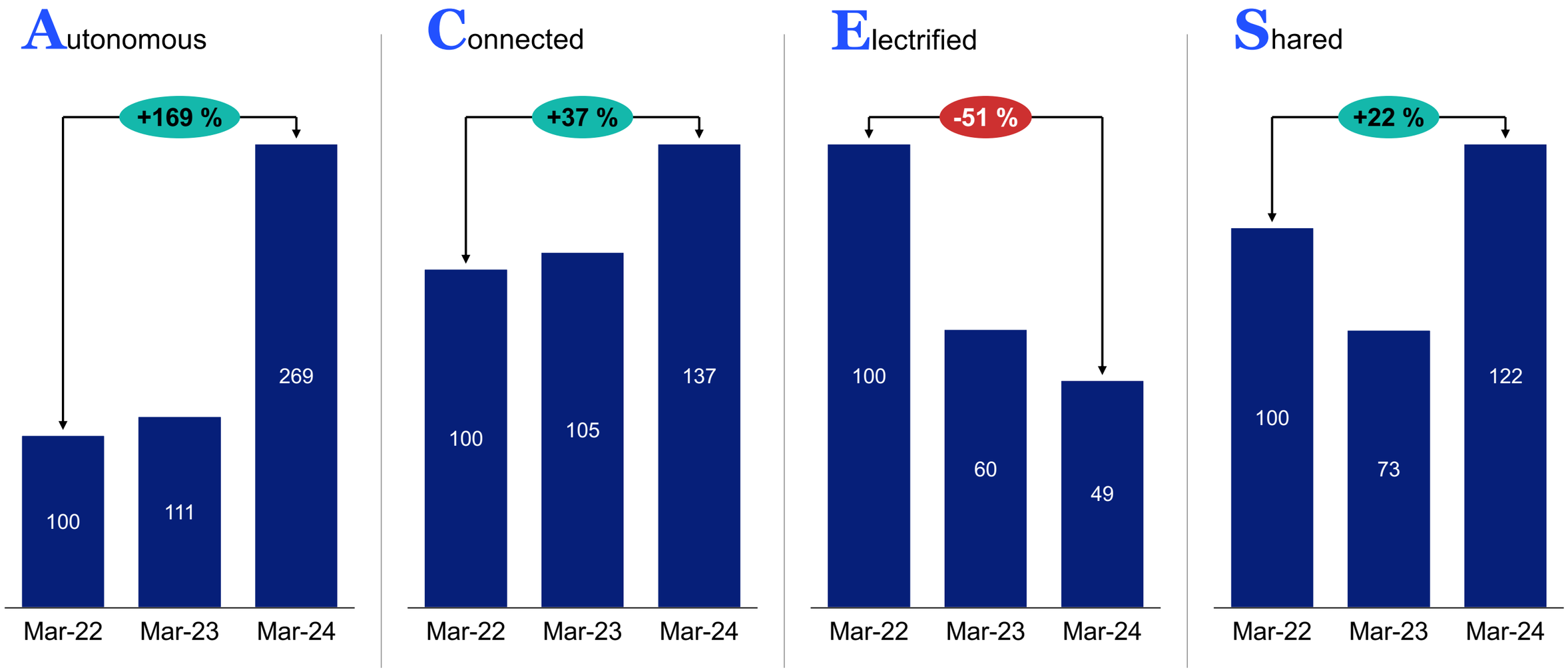


Electrified still attracts most investments while Autonomous is picking up momentum recently



Autonomous has seen the largest gains in market cap recently

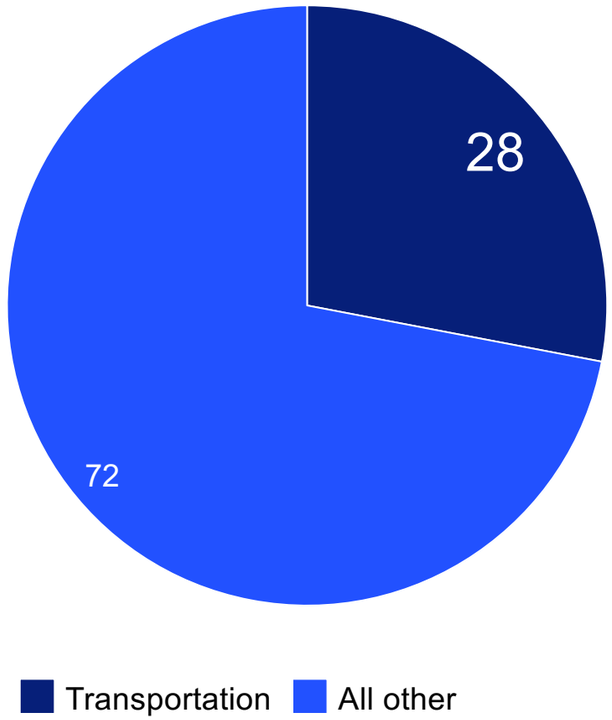
Index of market capitalizations among cluster peer-set, in percent




E
Electric

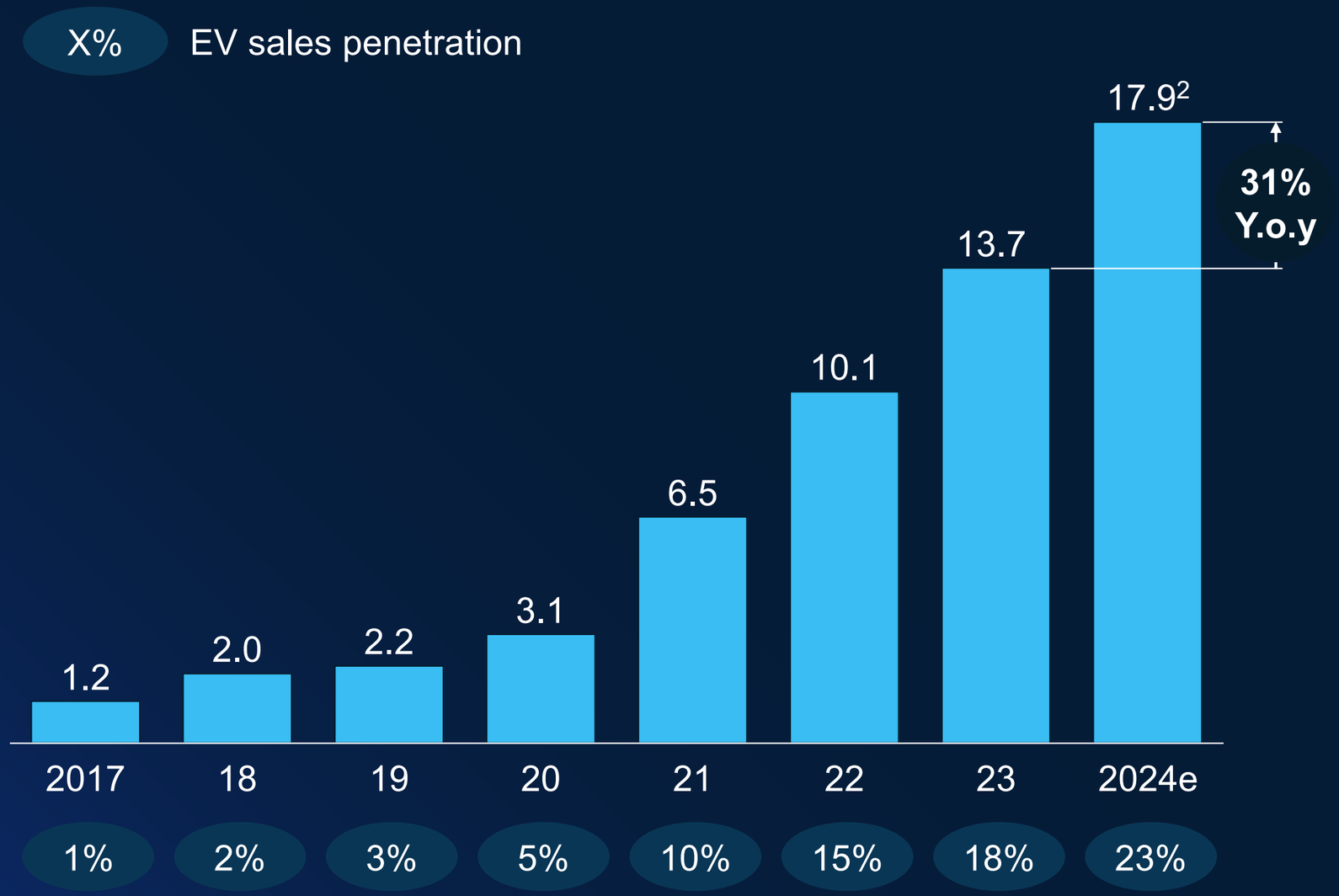
28% of US GHG emissions come from transportation

Sources of Green house gas emissions in the US (%)



Globally EV sales show continued growth in 2024

Global electric[1] passenger car sales, M units

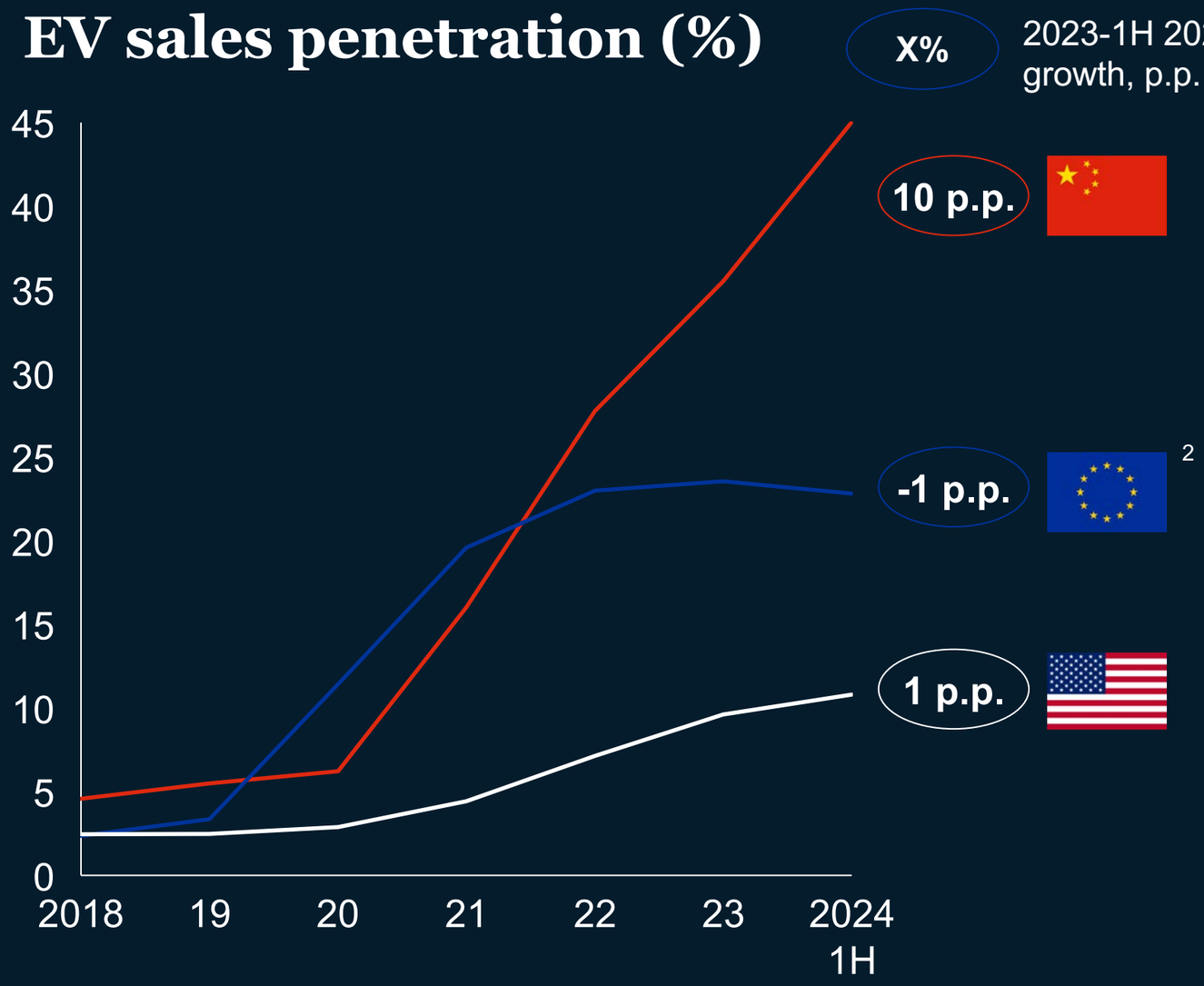


1. 2H 2024 estimated based on EV SAAR over last 8 years and IHS full year estimate

China leads in EV penetration, with Europe and US growth slowing

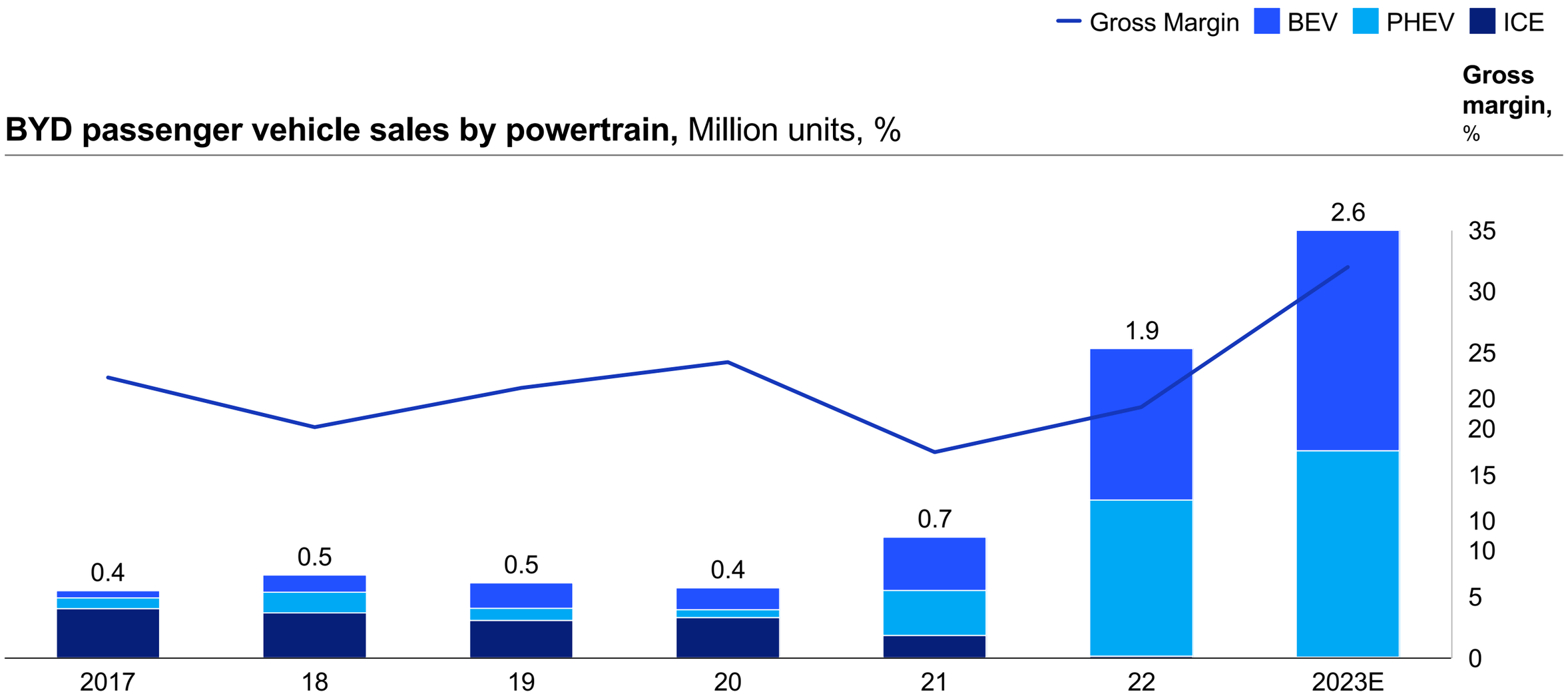
Aug 2024

EV sales penetration (%)



BYD managed transition to EVs while increasing margin

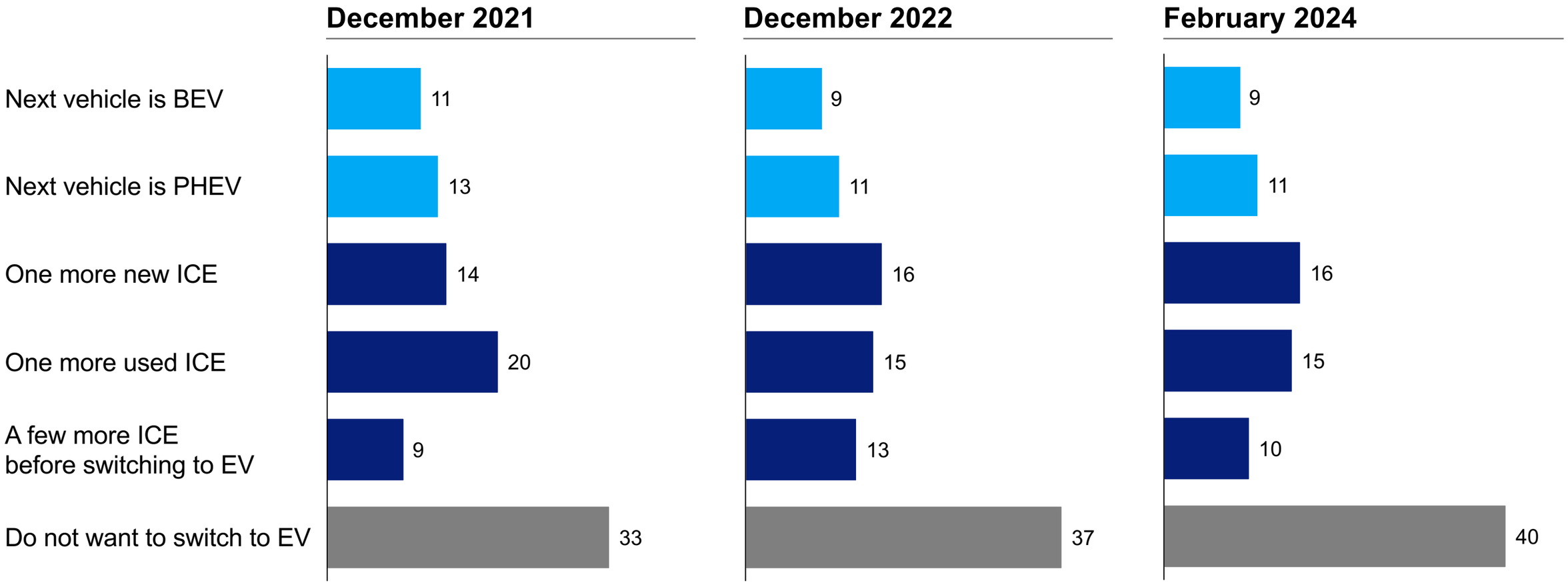
BYD passenger vehicle sales by powertrain, Million units, %



Source: McKinsey Center for Future Mobility

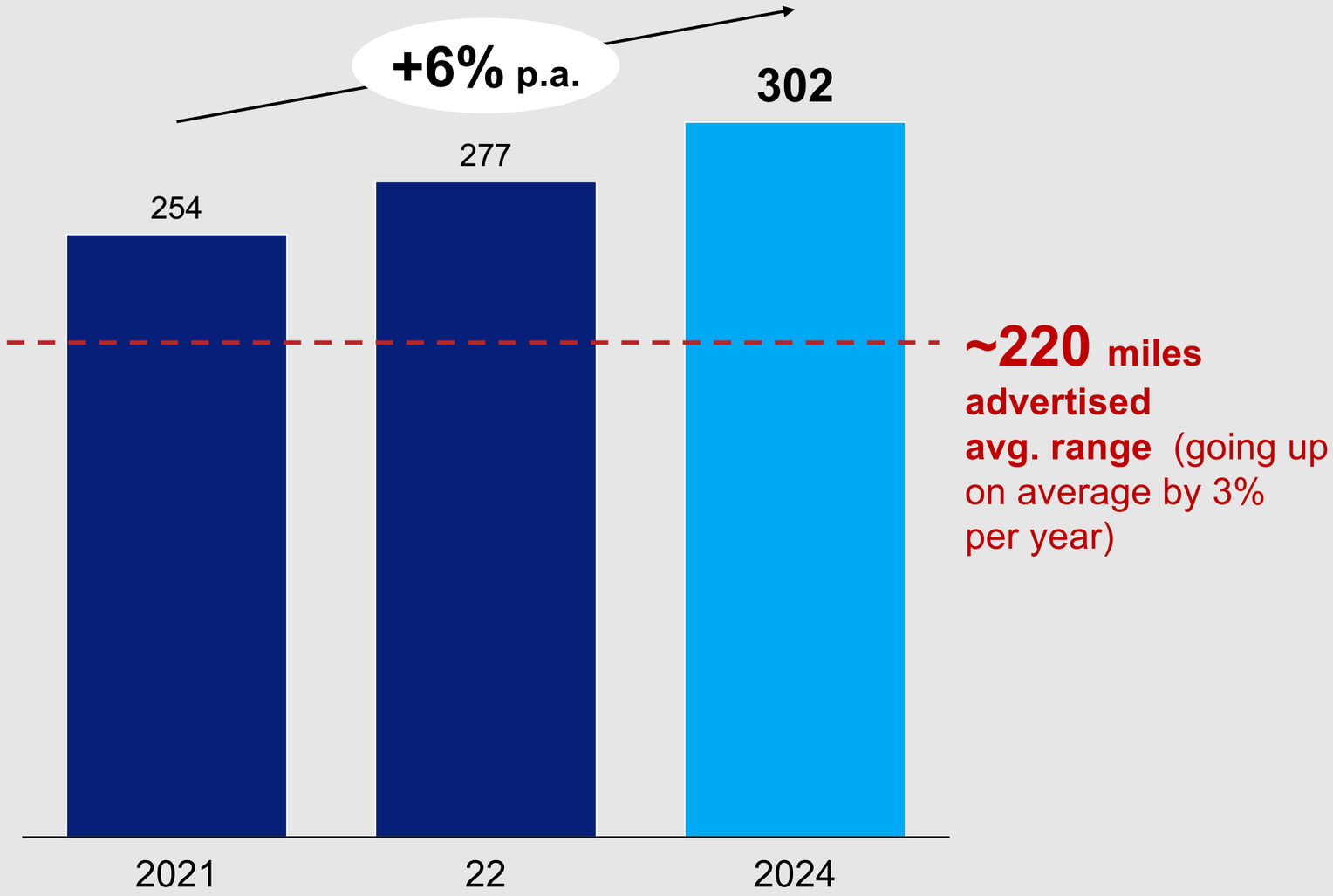
US purchase intent for electric vehicles has been relatively flat over the past two years

Powertrain consideration for current non-EV owners, In percent



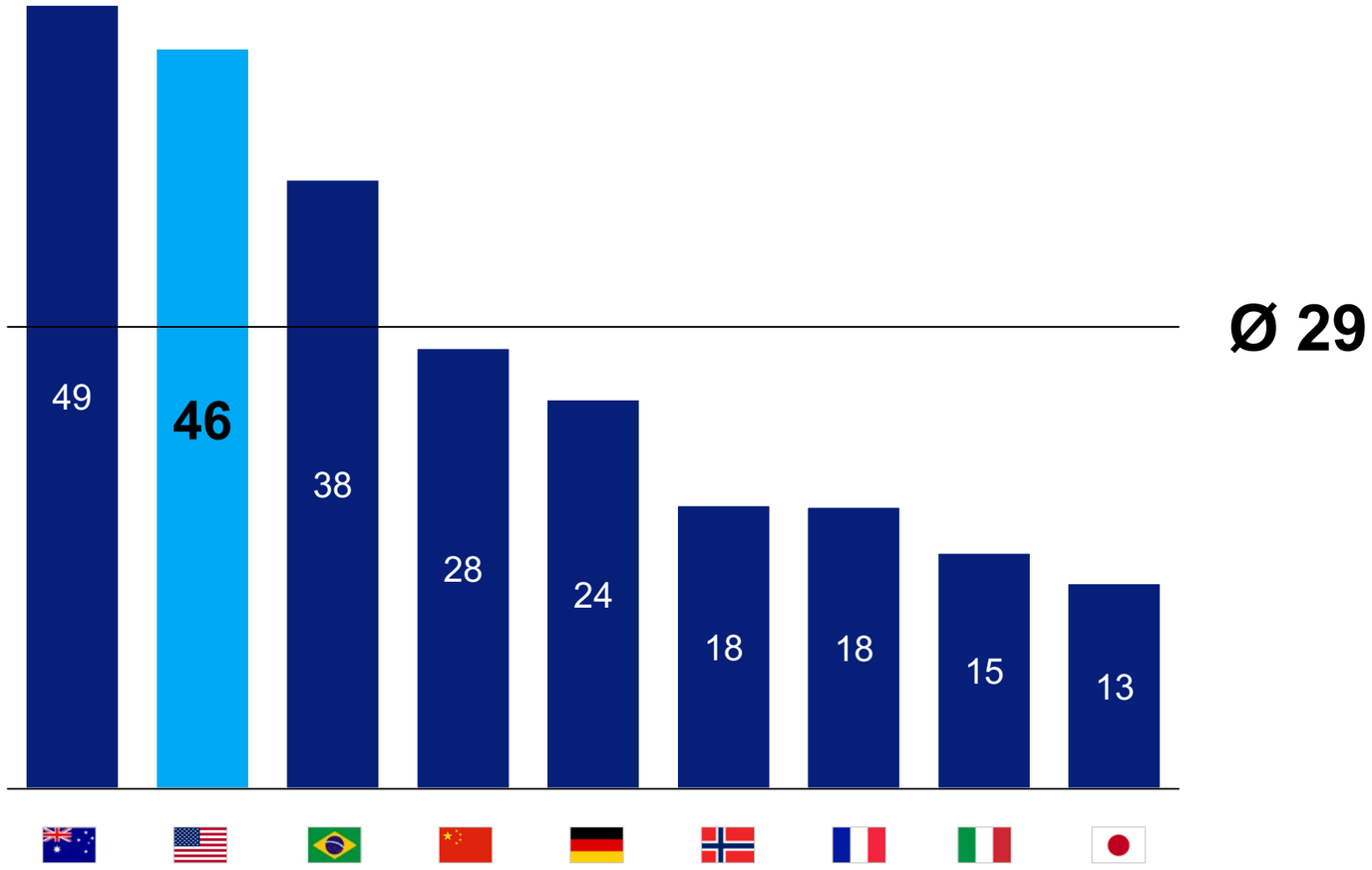
Battery range expectations have been increasing over time

BEV battery range expectations for EV considerers in US, in miles

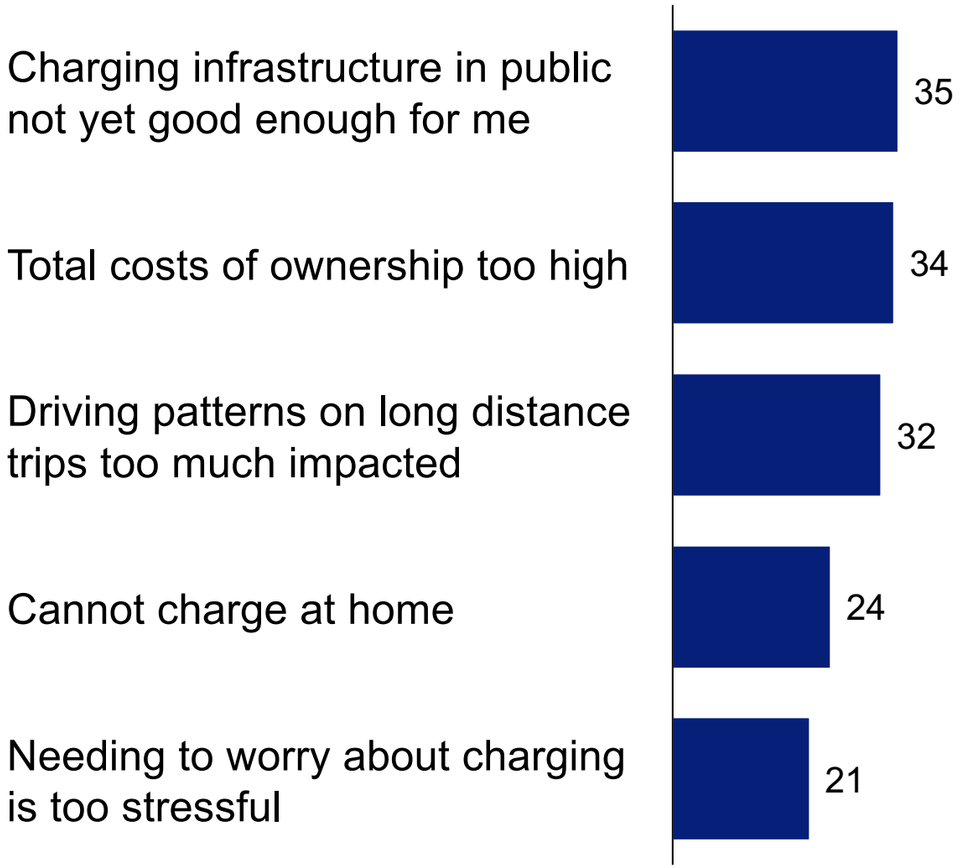


Large share of EV owners might switch back to ICE

Share of EV owners (very) likely to switch back to ICE (%)



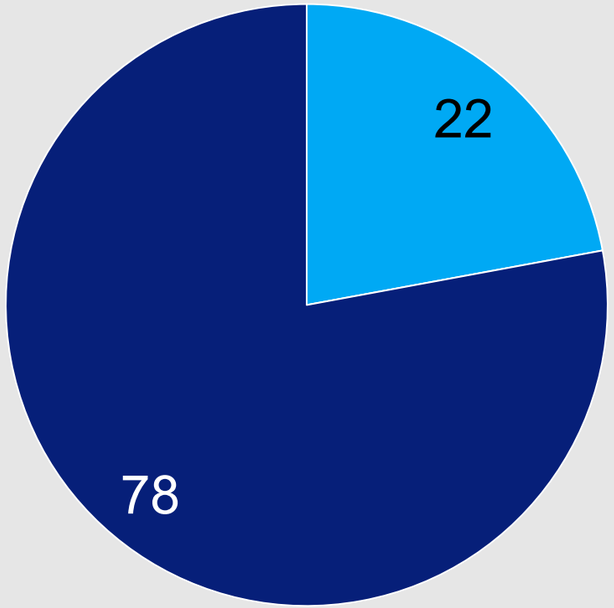
Top 5 Reasons to switch back to ICE



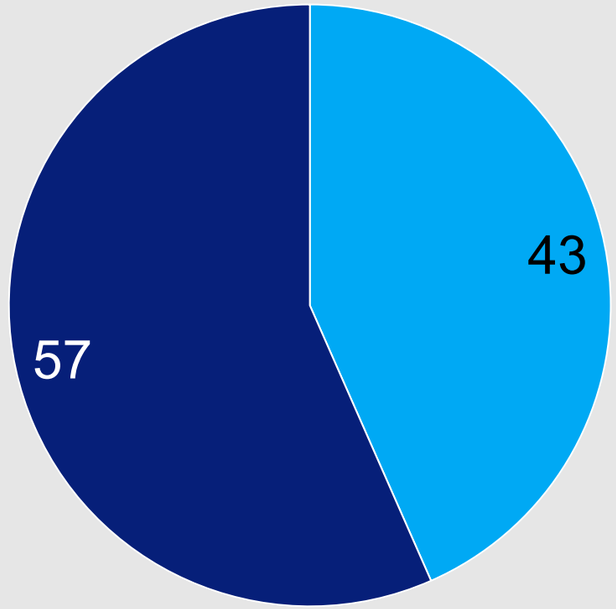
Residual values of BEVs are still declining more rapidly than ICE vehicles

Average resale price in % of MSRP after 2 years at 10,000 miles p.a

ICE



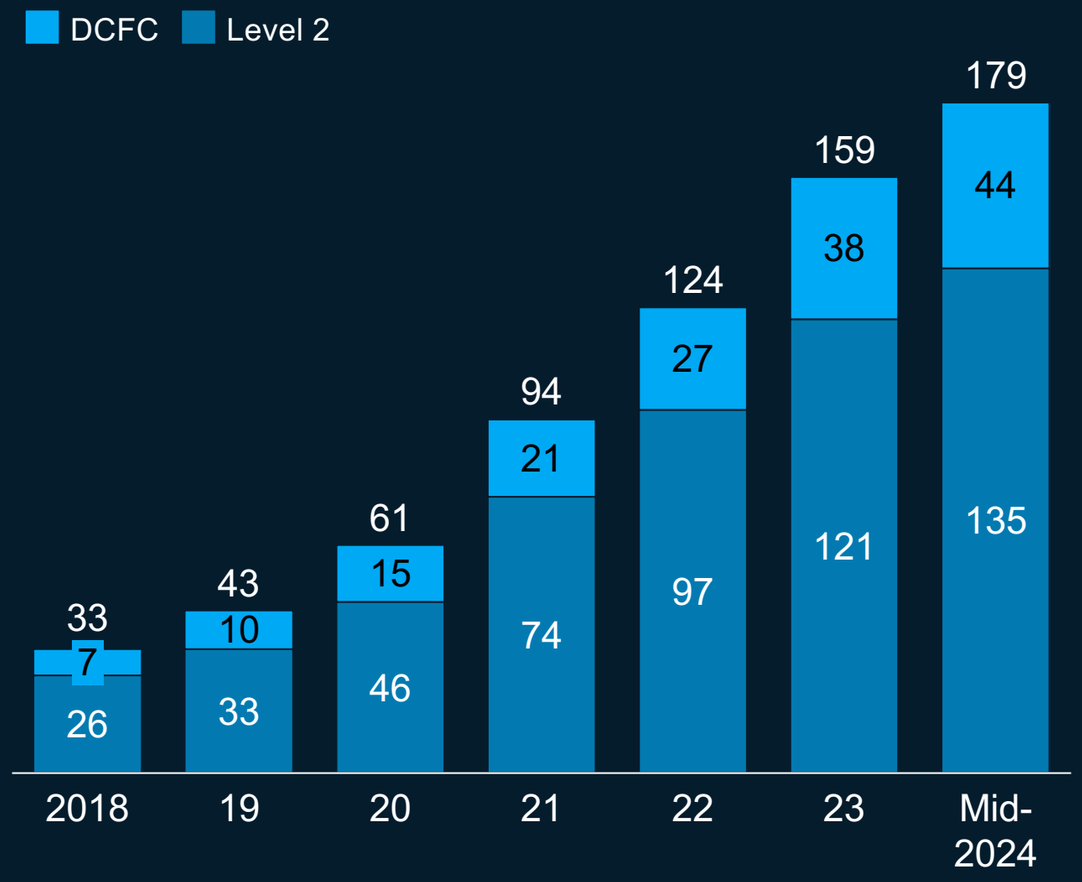
BEV



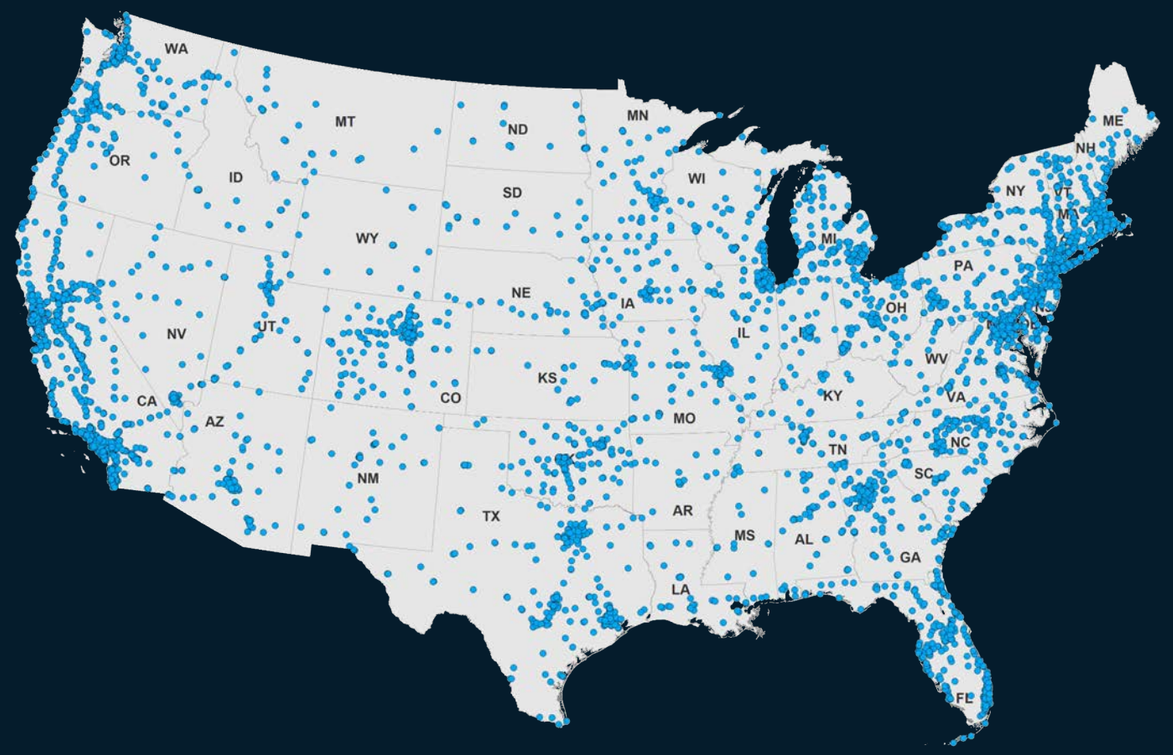
Value loss Remaining value

We have seen a continuous expansion of public charging

US charger port installed base
# of charge ports, thousands



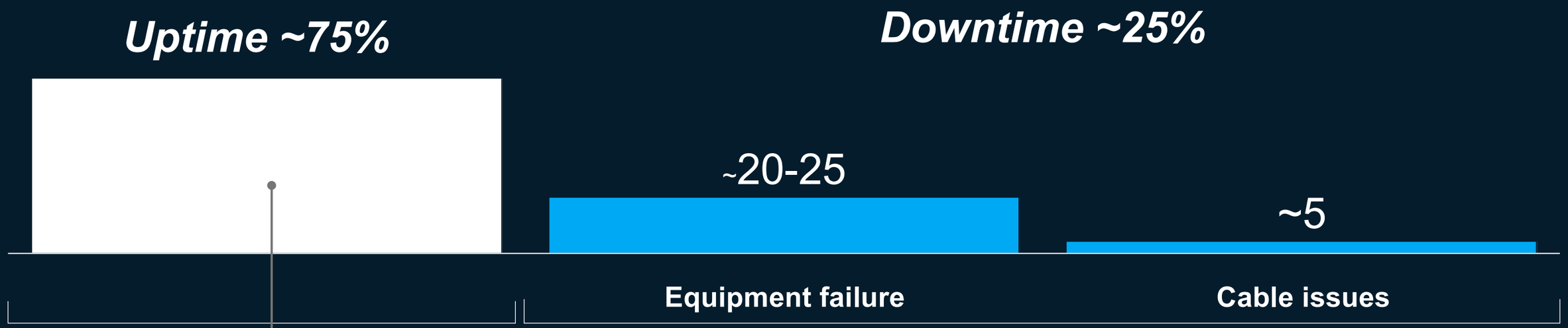
2024 US charging station footprint
DC fast chargers



~119k Fuel retail stations

~11k DC fast charging stations

Charger downtime is still an issue that needs to be resolved



Even during uptime, charger may be unusable due to other reasons such as occupied parking/ charging spots

Key drivers

Eqmt. failure

Software

Connectivity

Vandalism

A

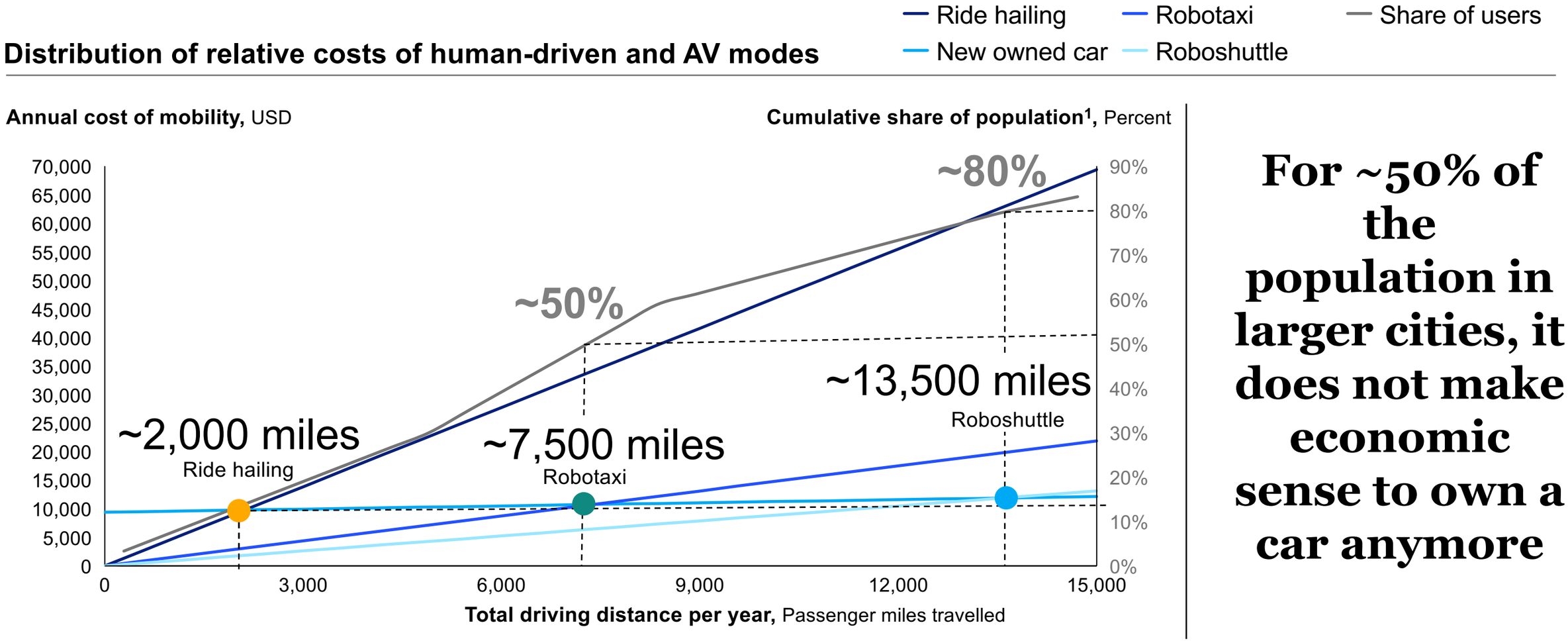
Autonomous
driving

“Autonomous vehicles” have different definitions based on levels of automation as prescribed by the SAE

	SAE level	Name	Execution of Steering and Acceleration/ Deceleration	Monitoring of Driving Environment	Fallback Performance of Dynamic Driving Task	System Capability (Driving Modes)
ADAS	0	No automation	Human driver	Human driver	Human driver	n/a
	1	Driver assistance	Human driver and system	Human driver	Human driver	Some driving modes
	2	Partial automation	System	Human driver	Human driver	Some driving modes
AD	3	Conditional automation	System	System	Human driver	Some driving modes
	4	**High automation**	**System**	**System**	**System**	**Some driving modes**
	5	Full automation	System	System	System	All driving modes

What will happen to private car ownership in an AV world?

Distribution of relative costs of human-driven and AV modes



For ~50% of the population in larger cities, it does not make economic sense to own a car anymore

Autonomous technology is starting to be ready for broad based adoption

Applications allowing mass adoption

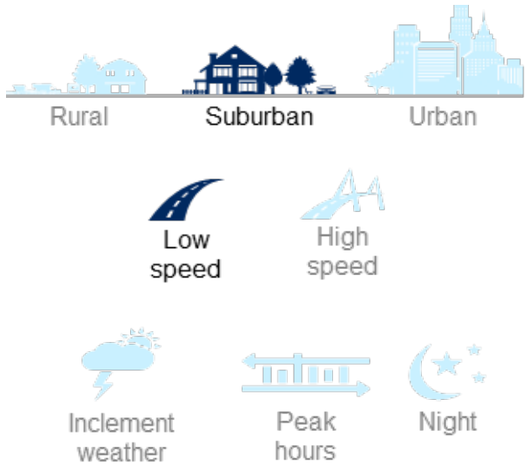
Development & Piloting

Before 2019

Drive with a human present to take control

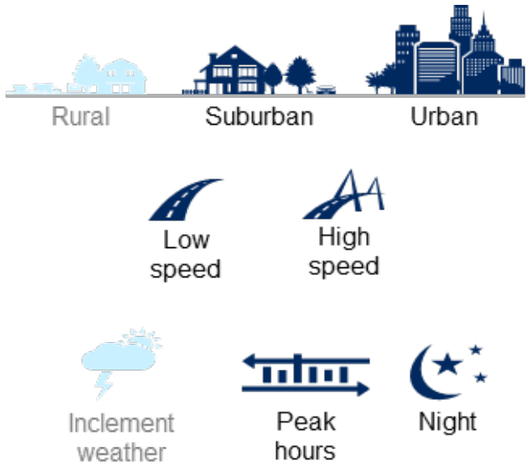
AV 1.0

2019-2022



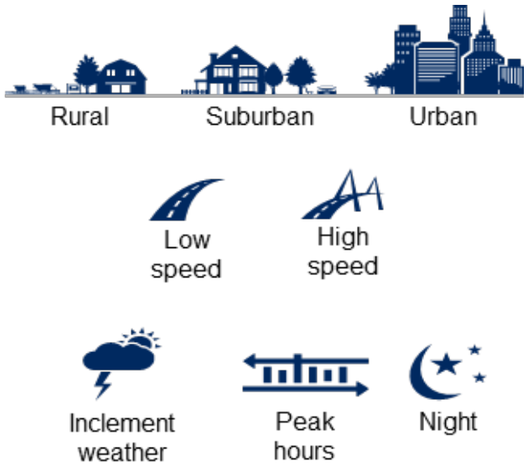
AV 2.0

2023-27



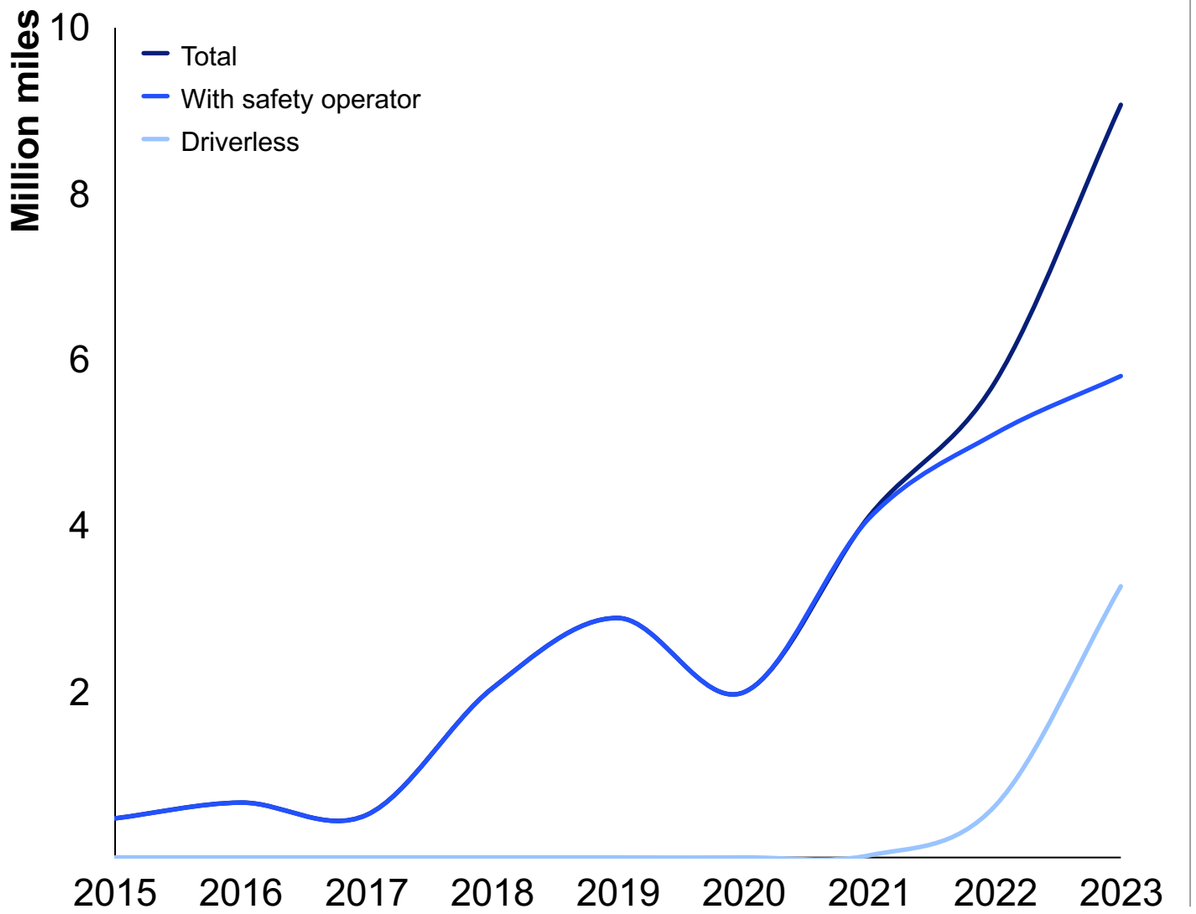
AV 3.0

2027+

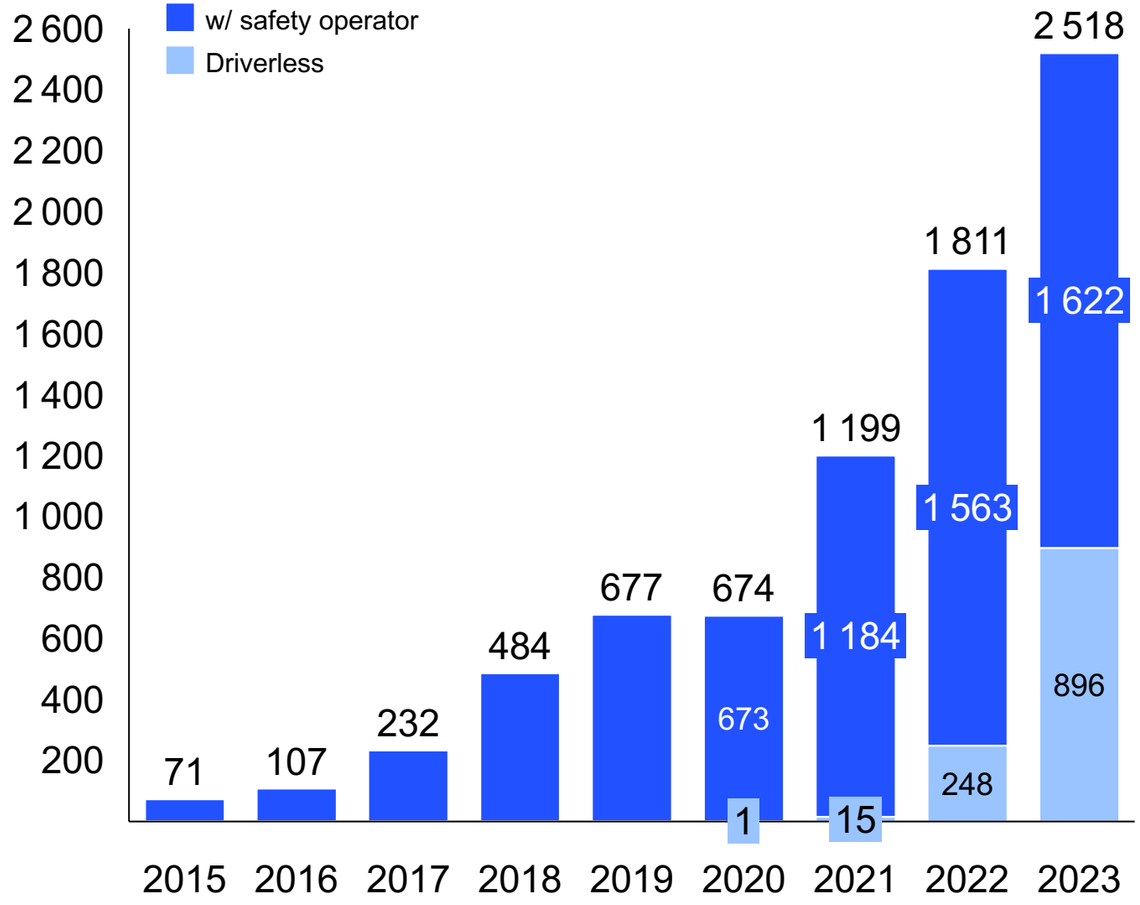


We already see a clear acceleration in autonomous miles driven

Total mileage by year in CA, all AD L4 permit holders



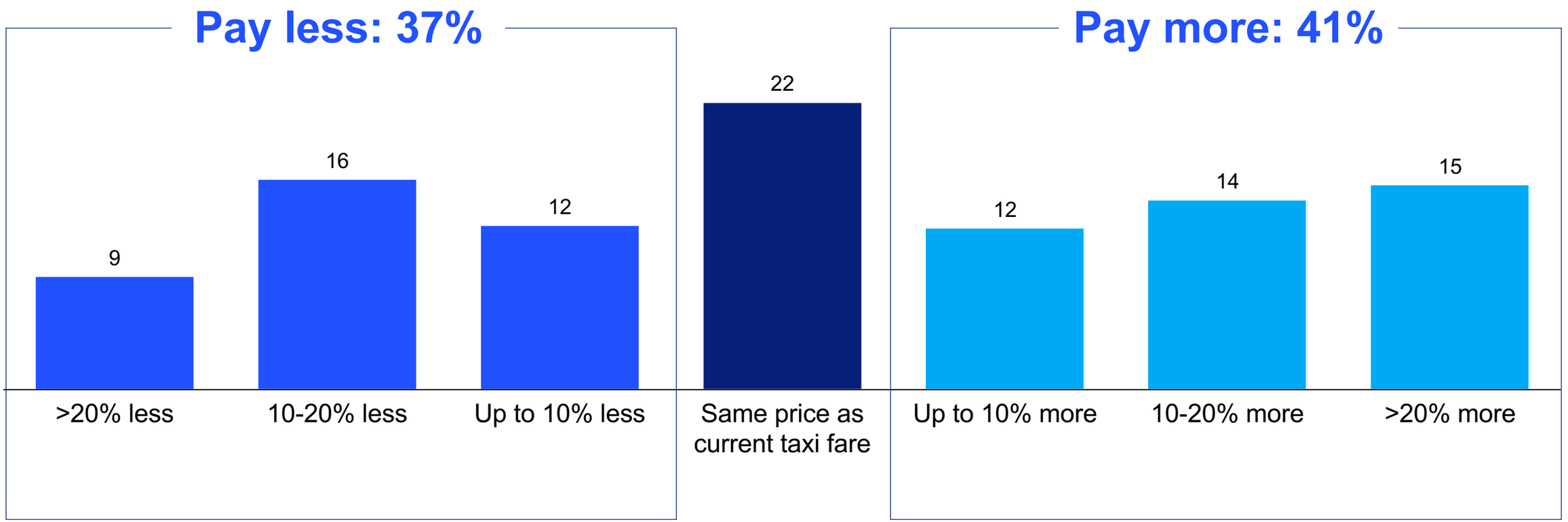
Number of vehicles operated in CA



Source California DMV Disengagement reports: https://www.dmv.ca.gov/portal/vehicle-industry-services/autonomous-vehicles/disengagement-reports/

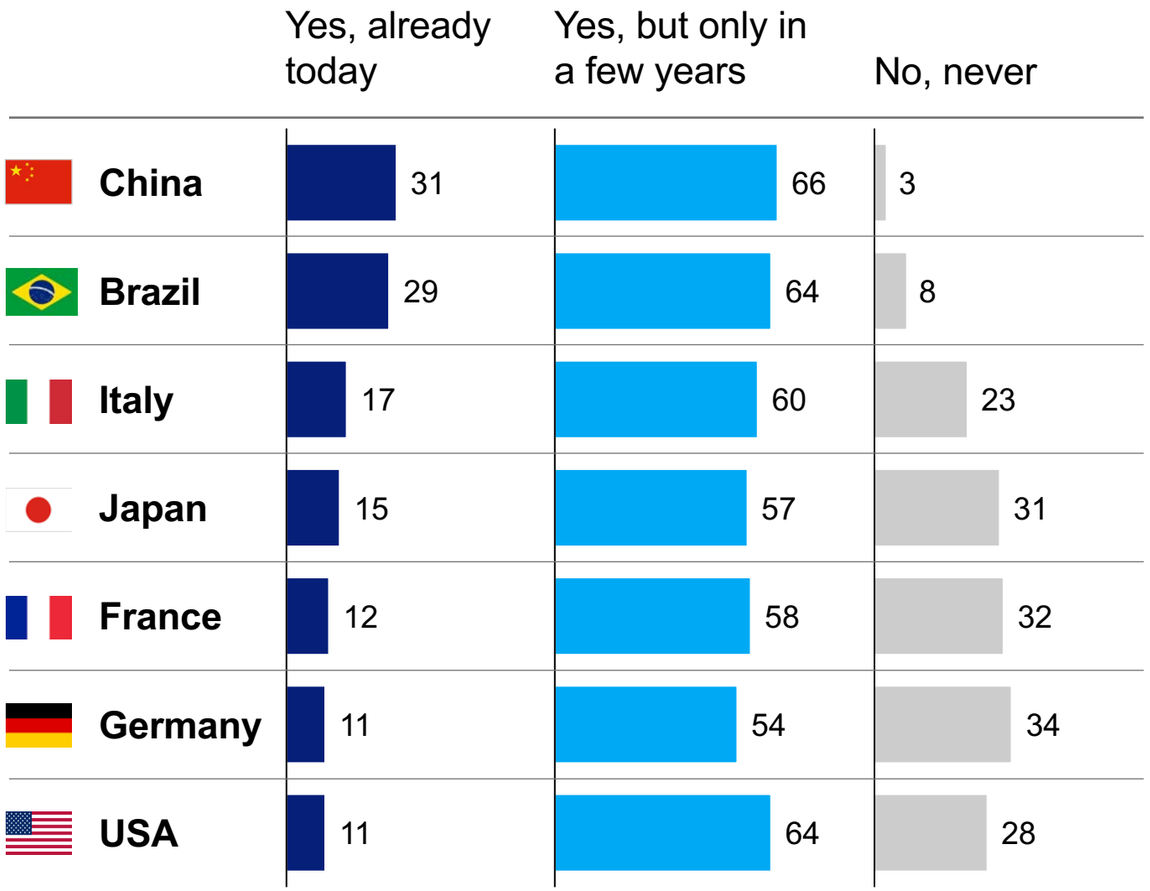
Are customers willing to pay more for robotaxis?

Price expectation from urban customers for autonomous taxis vs. current taxi fees

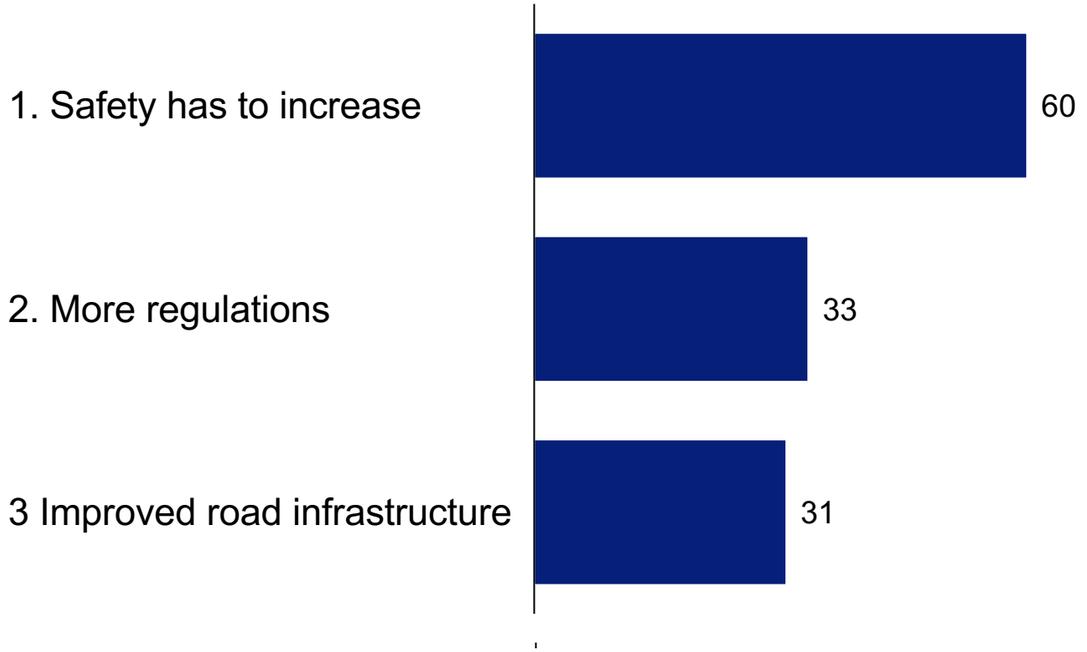


Overall readiness to adopt autonomous driving technology is still a bit lower in the US

Agreement to government legalizing fully autonomous cars
Share of respondents



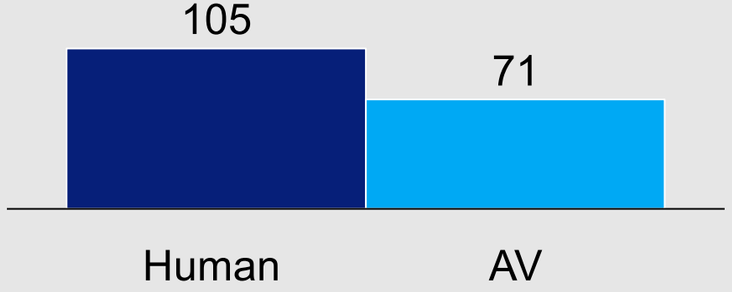
Top 3 roadblocks to adopt autonomous driving
Share of US respondents



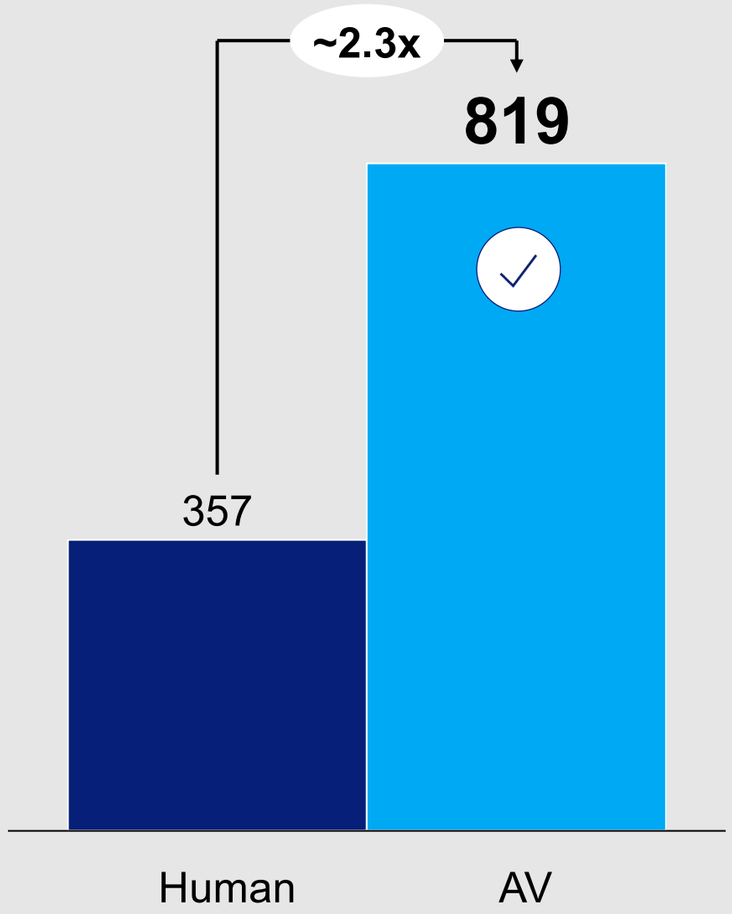
Autonomous vehicles currently drive >2x longer before sustaining an accident with injuries

Miles driven between accidents, by accident type, #, k miles travelled

Miles driven between all type of accidents (incl. “fender benders”)



Miles driven between accidents with injuries or fatalities



Source: NHTSA Standing General AD Crash Order report, NHTSA FARS accident database

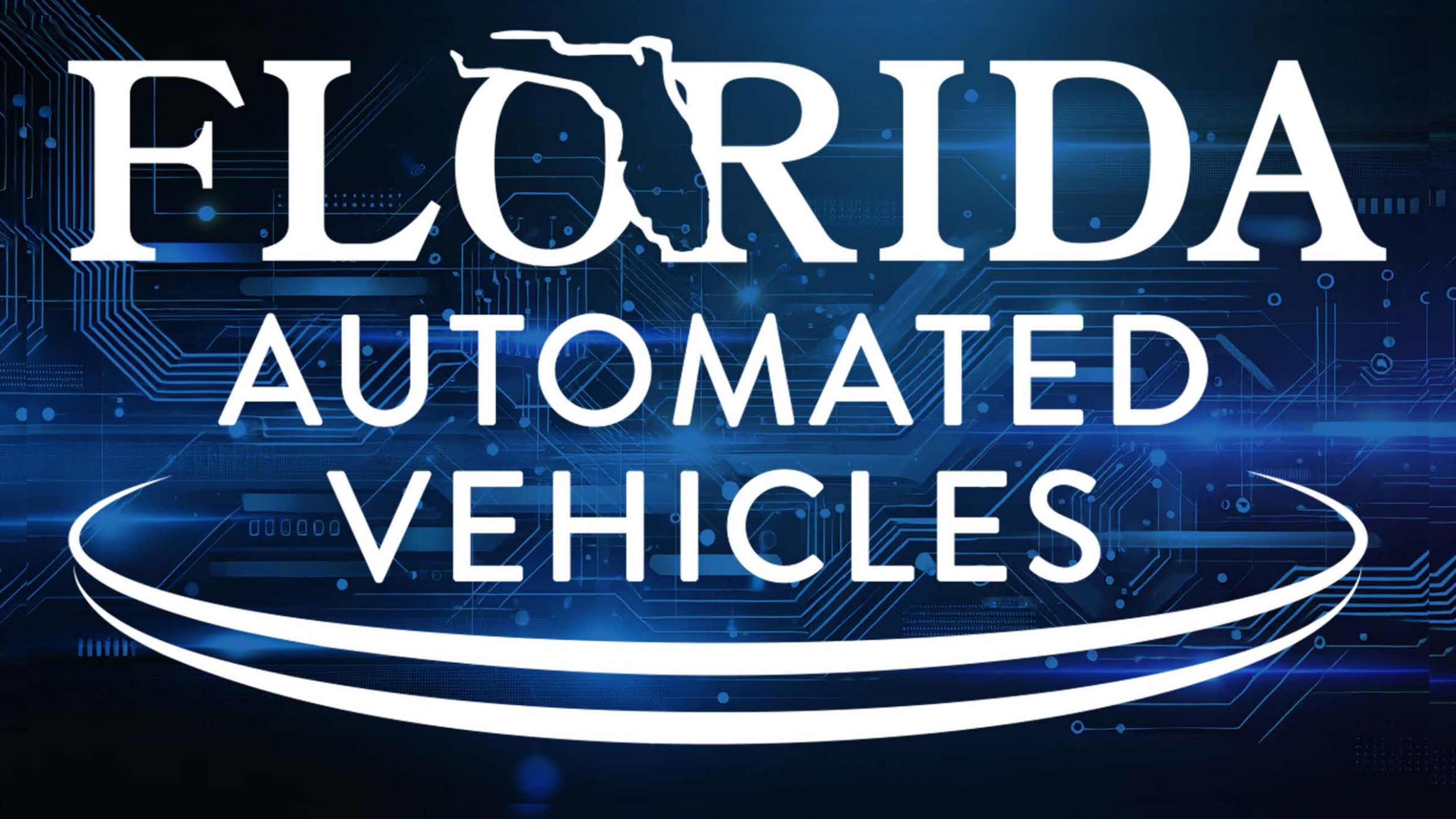
On a personal note…

~30%
of Greenhouse gas emissions

~40k
fatal accidents

~60
minutes of driving per day

What we do is important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How Safety Can Drive Emerging Technologies

Todd Inman

National Transportation Safety Board

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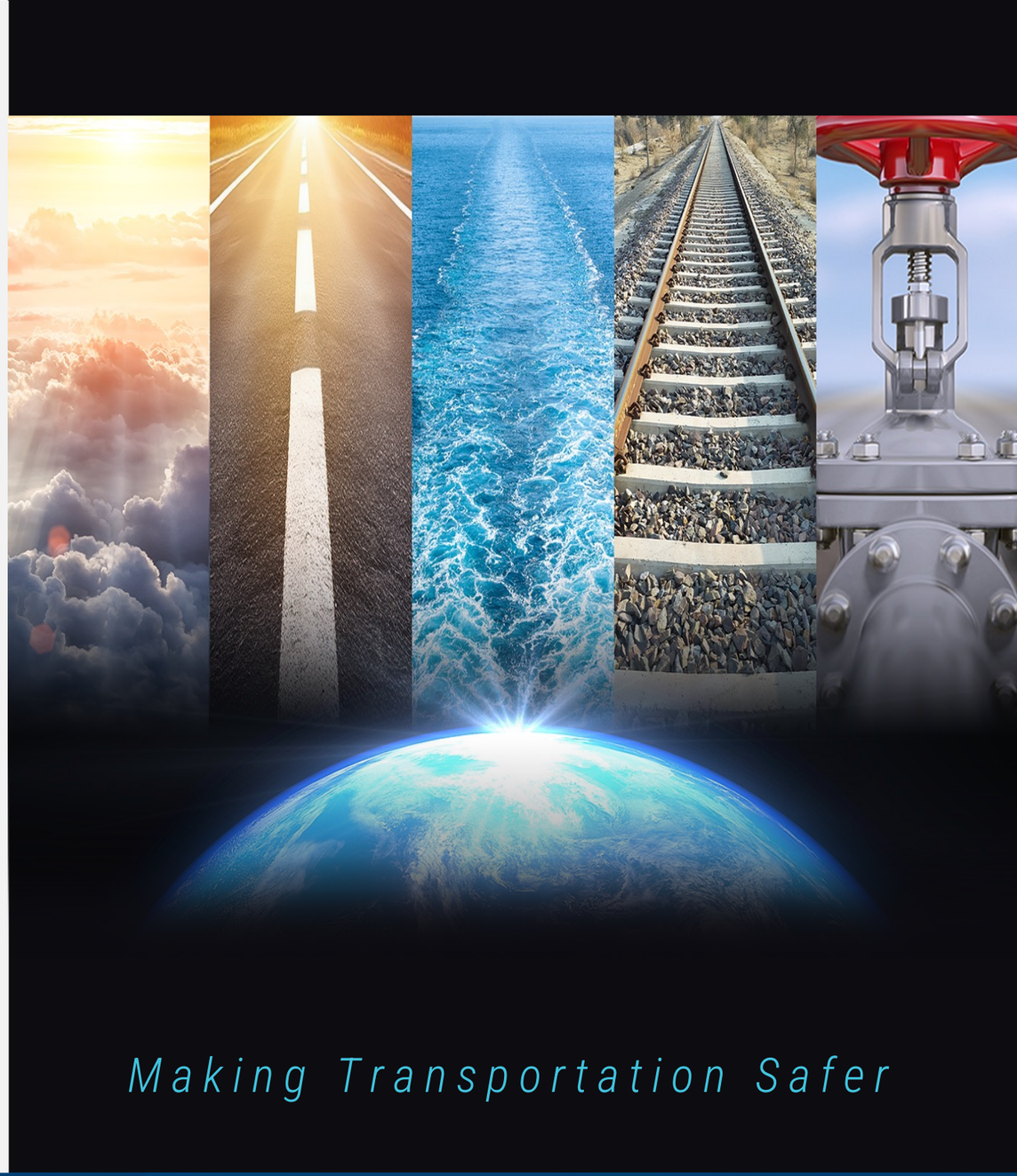
How Safety Can Drive Emerging Technologies

J. Todd Inman

Board Member, NTSB

September 5, 2024



NTSB At A Glance

- Investigate accidents in aviation, railroad, transit, highway, marine, pipeline, and commercial space
- Determine probable cause and issue safety recommendations
- Five Board Members nominated by the President and confirmed by the Senate to serve 5-year terms
- A staff of more than 400 investigators, analysts, researchers, and others support the mission
- 15,000+ safety recommendations, 82% adoption rate

#1: Incidents are almost NEVER single-factor events

- **Often a triggering event**
- **Absence of effective redundancies are contributing factors and often correlate to the severity and impact of a crash**
- **Contributing factors can include physical infrastructure, vehicle design, human factors, signage, maintenance, training.**

#2: The economics of safety

- **Safety is paramount to the success of our transportation systems and the entities that run it**
- **We must acknowledge cost can be limiting to innovation**
- **How do you define ROI?**
- **Safety does NOT have a cost – what is the real cost of not having a culture of safety?**

#3: Transportation is safe and getting safer

- **We tend to overlook safety improvements of the past**
- **Reality can be exaggerated when an incident occurs**
- **Building confidence takes time**
- **Are you ready for the next Tempe?**

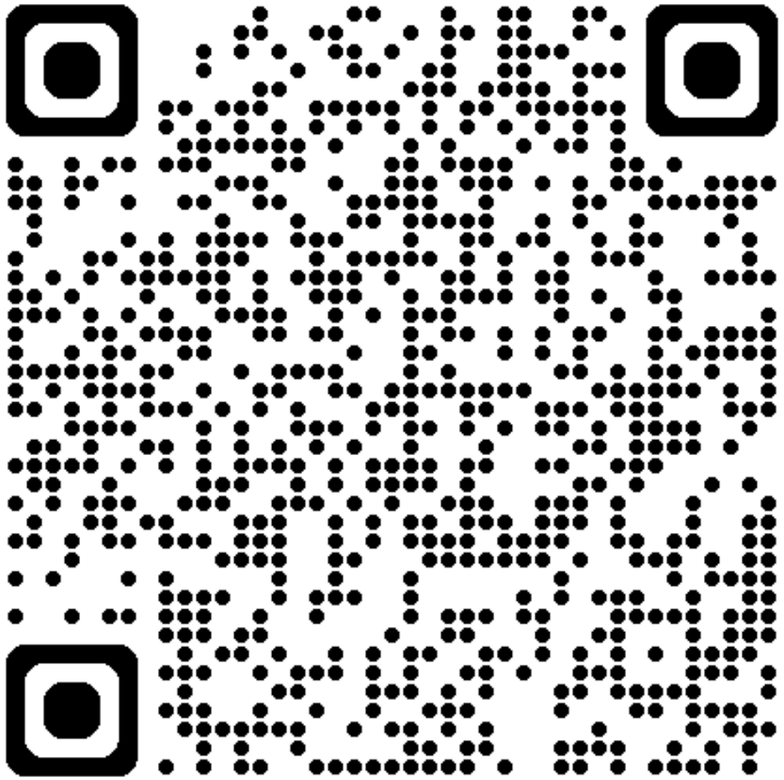
#4: Safety has a Spectrum

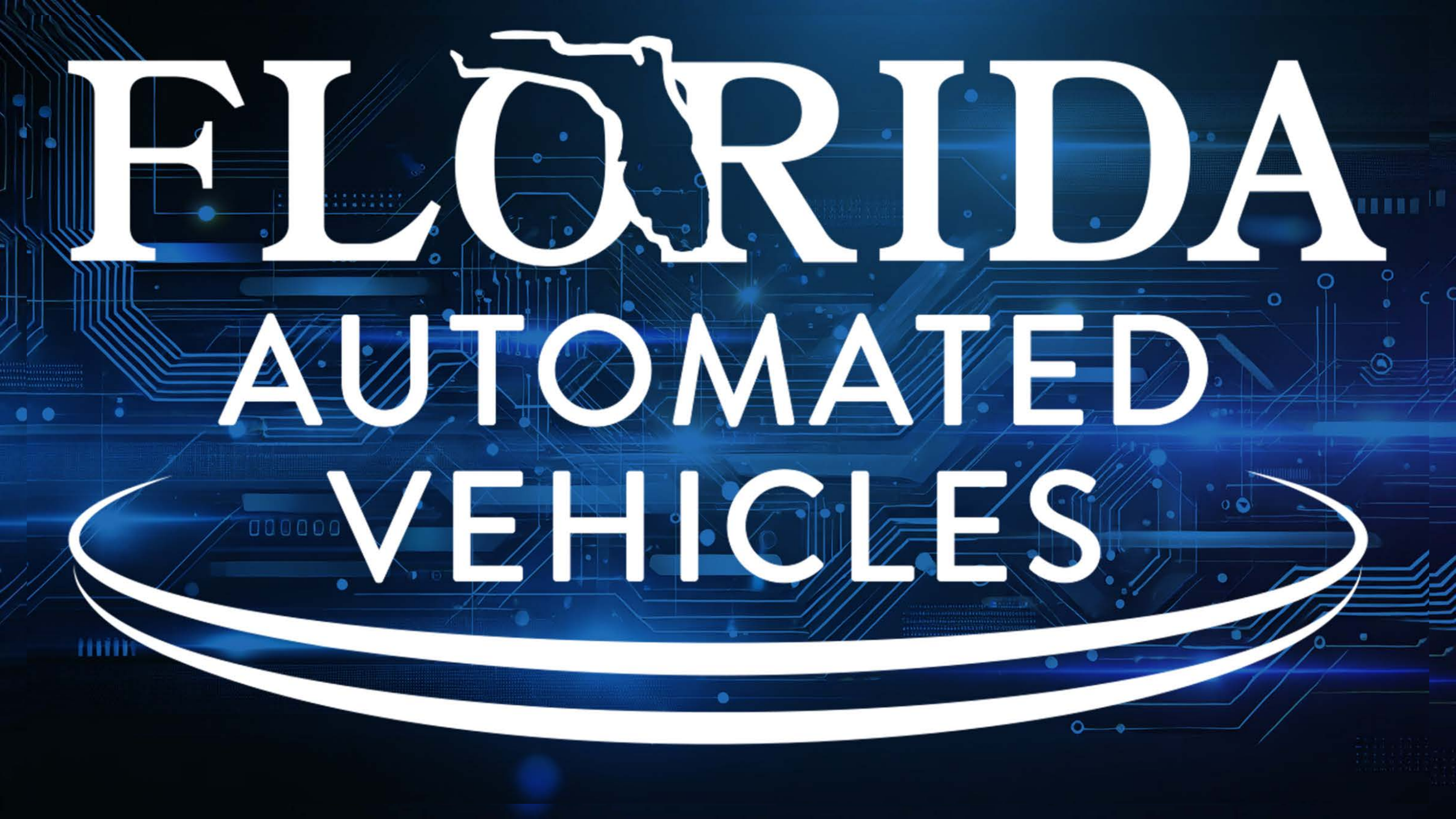
- **Find a balance between risk threshold and commerce**
- **Regulators need to understand business dynamics**
- **Set expectations for consumers**
- **Experimentation can reduce risk when done properly**

What does this mean for you?

- Do not wait for government
- Industry consensus can drive regulations
- Safety Management Systems make a difference
- Show how you are solving for safety

NTSB Automated Vehicle Resources

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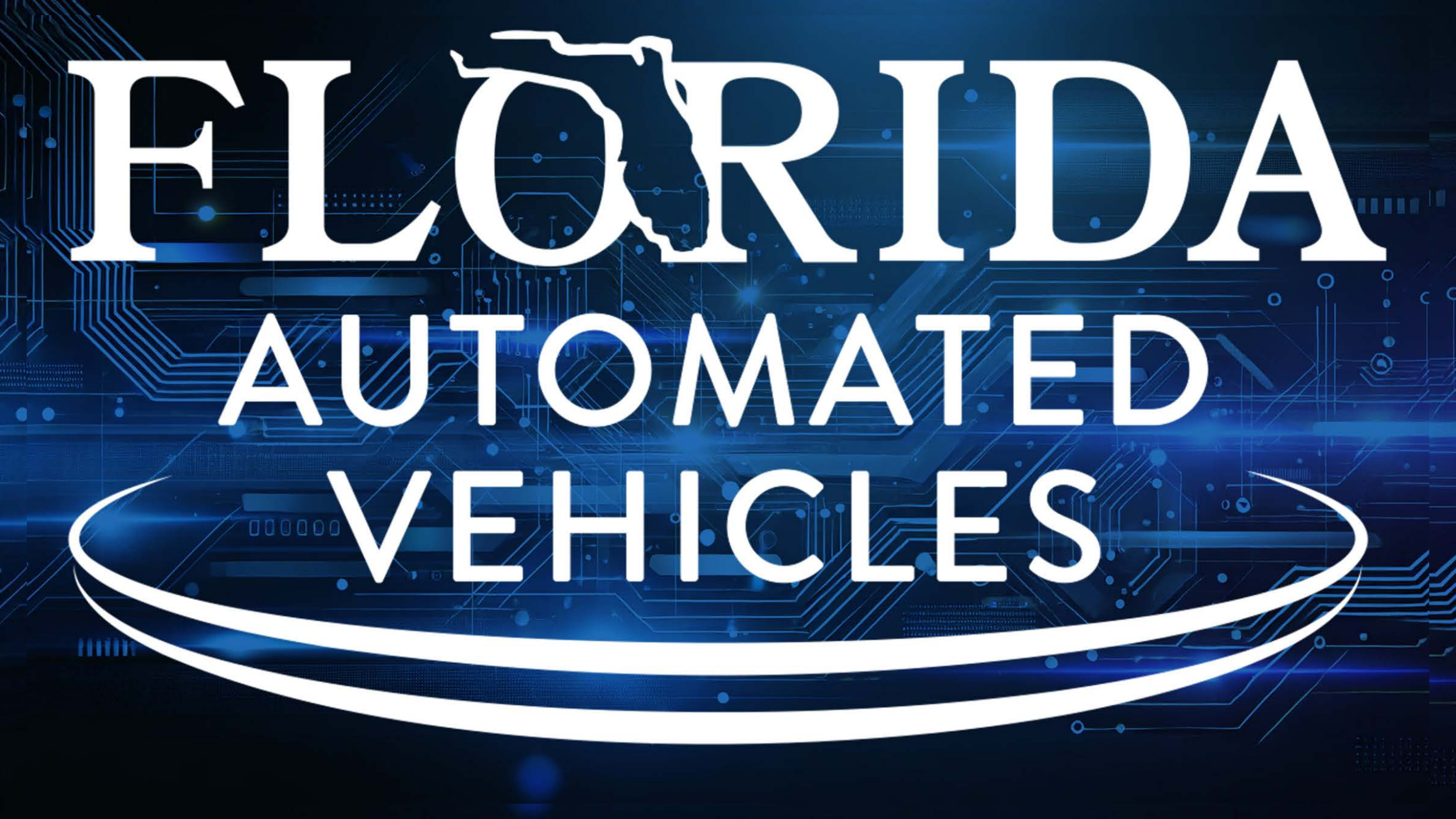
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CONGRATULATIONS FIONA MCFARLAND

Congratulations to Representative Fiona McFarland on the birth of their new baby!

FLORIDA AUTOMATED VEHICLES

Driving the Future: Autonomous Vehicles in the Sunshine State

Moderator:
Jeffrey Brandes
CEO/Founder
Florida Policy Project

Michelle Peacock
Global Head of Public Policy, Waymo

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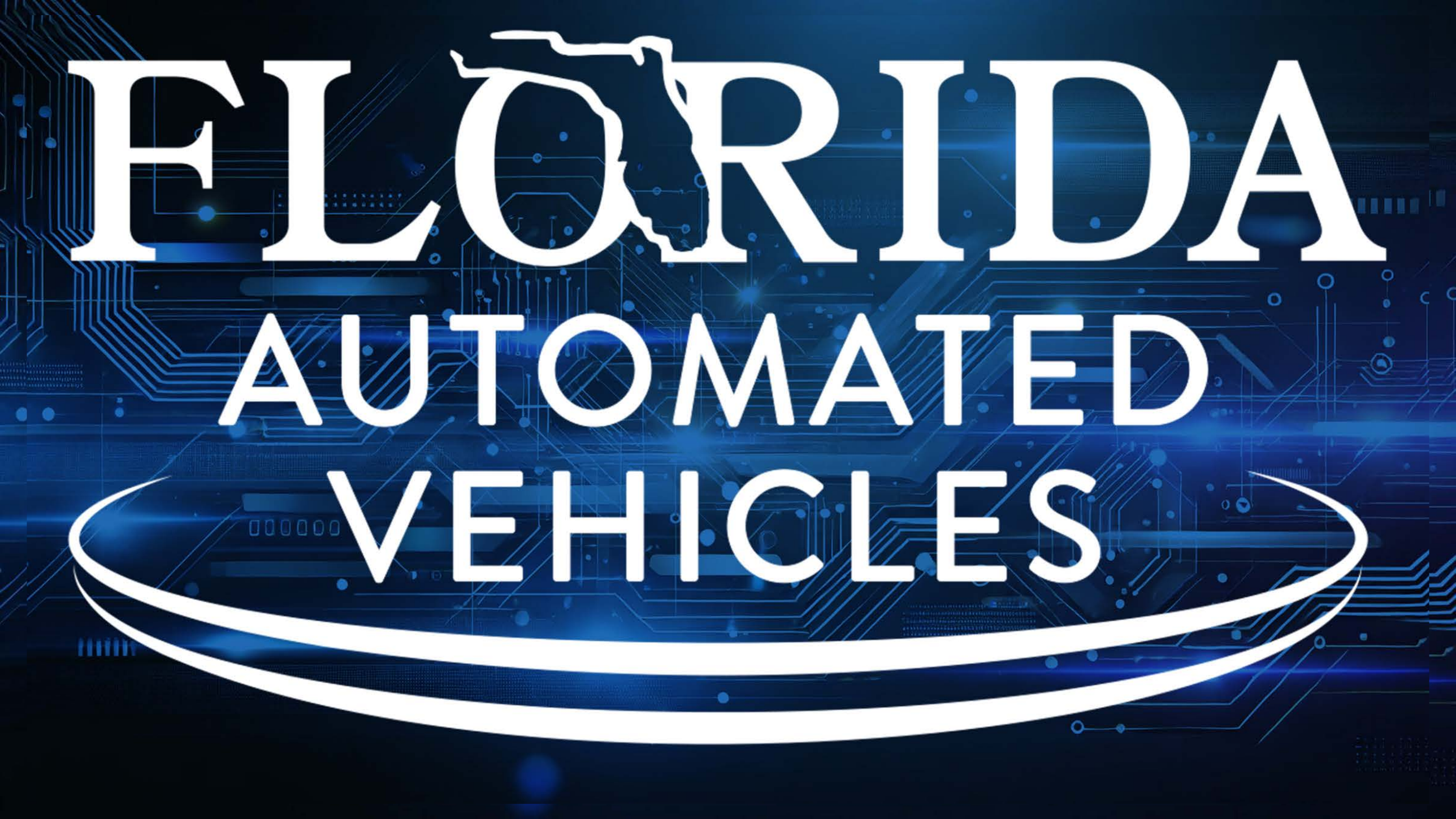
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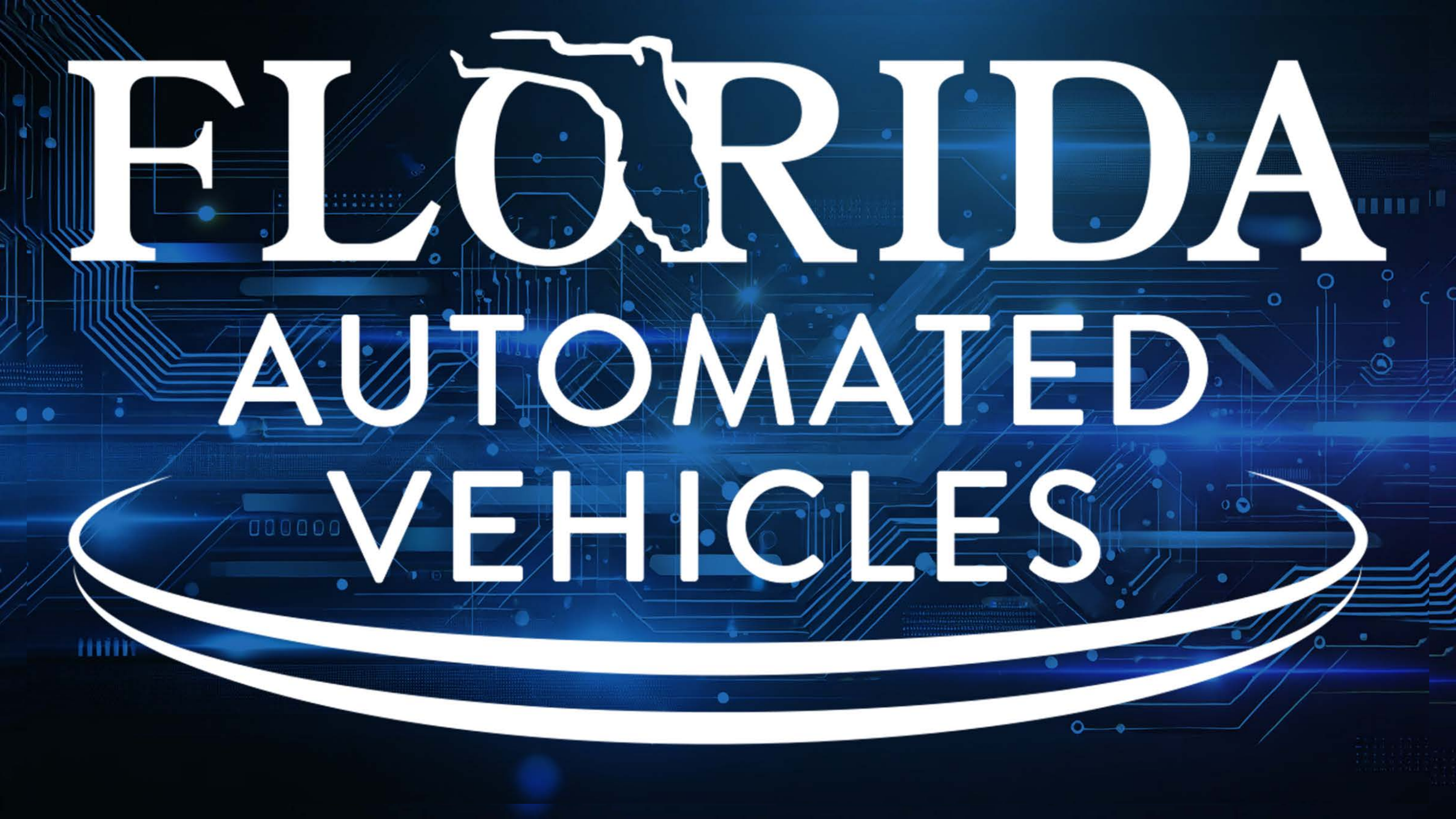
At the Intersection of Supply Chain Adaptation: Integrating and Scaling AV Trucking

Moderator:
Lee White
President, LM Consulting
Moderator

Alix Miller
President & CEO Florida Trucking Association

Mike McGhan
Head, Truck Yard Business, Forterra

Dan Goff
Director, External Affairs, Kodiak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Advanced Air Mobility - Building Florida's Ecosystem

Moderator:
Crystal Stiles
Executive Director, Development Distributed Technologies and Mobility, Florida Power & Light

Dr. Jim Gregory
Professor & Dean, College of Engineering, Embry-Riddle Aeronautical University

Matt Chesnut
Vice President Business & Economic Development, Space Florida

Katie Hogan
Economic Development Manager, Florida Power & Light

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