



Michigan Connected and Automated Vehicle Working Group

October 30, 2019



Meeting Packet

1. Agenda
2. Meeting Notes
3. Attendance List
4. Presentations

Michigan Connected and Automated Vehicle Working Group



October 30, 2019

Centrepolis Accelerator at Lawrence Technological University

21415 Civic Center Drive, Suite 100.

Southfield, MI

Meeting Agenda

08:30 AM **Registration and Networking**

09:00 AM **Introduction and Update**

Zahra Bahrani Fard, Transportation Systems Analyst, Center for Automotive Research

Welcome Remarks

Dan Radomski, Director, Centrepolis Accelerator at Lawrence Technological University

Ford Connected Mobility

Samer Ibrahim, Connected Vehicle Smart City Supervisor, Ford

Powering the Future: Mobility Engineers

Jessica Robinson Executive Director, Michigan Mobility Institute

Urban Transportation

Brett McMillan, Vice President of Finance, May Mobility

10:20 AM **Networking Break**

10:40 AM **Hot Topics Discussion**

Frank Perry, Principal Consultant, CAV Program Manager, WSP

Update on MDOT CAV Activities

Joseph Gorman, Connected Vehicle Engineer, Michigan Department of Transportation

Oakland County ITS and CV Update

Danielle Deneau, Director of Traffic-Safety Road Commission for Oakland County

State of AV Regulations in the U.S.

Eric Paul Dennis, Senior Transportation Systems Analyst, Center for Automotive Research

12:00 PM **Meeting Adjourned**

Michigan Connected and Automated Vehicle Working Group

October 30, 2019



Meeting Notes

The Fall 2019 meeting of the Michigan Connected and Automated Vehicle Working Group was held on October 30th, 2019, and hosted by the Centripolic Accelerator at Lawrence Technological University located at 21415 Civic Center Drive, Suite 100, Southfield MI, 48075.

Zahra Bahrani Fard, Transportation Systems Analyst, CAR welcomed the group and provided an introduction to the meeting, followed by updates with recent CAV-related noteworthy news and events.

Samer Ibrahim, Connected Vehicle Smart City Supervisor, Ford, presented “Ford Connected Mobility”. Mr. Ibrahim talked about the future of mobility and highlighted the important role that connectivity will play. Ford has chosen to enable these connections using cellular technologies (CV2X), naming it a standard new feature on all new vehicles starting in 2022. Mr. Ibrahim explained the company’s preference comes from CV2X’s reliability of reception, minimal interference with existing V2X applications, and low implementation costs. The goal of Ford’s Connected Mobility initiative is “to connect vehicles, cities, and pedestrians to deliver experiences that concentrate on reshaping how people move around while keeping everyone safe”.

Jessica Robinson, Executive Director, Michigan Mobility Institute, presented “Powering the Future: Mobility Engineers”. The Michigan Mobility Institute strives to accelerate mobility workforce development, upskilling programs, and post-secondary degrees, all by bringing industry and education partners together. Ms. Robinson discussed the abundant future of the mobility workforce, providing examples of potential new jobs in the industry. She also discussed Wayne State University’s partnerships with the Michigan Mobility Institute to launch the country’s first degreed mobility program, as well as establishing the Center for Advanced Mobility. These mobility initiatives will help make Michigan a leader for its overall workforce contributions to the industry.

Brett McMillan, Vice President of Finance, May Mobility presented on May Mobility’s urban transportation journey and initiatives. May Mobility’s autonomous shuttles can function in almost any mobility sector; examples include delivery, mass transit, hospitality, robo-taxi, and personal use. Each shuttle utilizes LiDARs, RADARs, and cameras, as well as decision-making software that’s capable of navigating through different driving scenarios. As of October 2019, the company’s technology can operate in complex environments, such as urban cores and mixed traffic, with up to 95% autonomy. Shuttles have already been deployed and are running routes in Detroit, Grand Rapids, and Providence, RI.

After the networking break, **Scott Shogan, Vice President and CAV Market Leader**, and **Frank Perry, Principal Consultant and CAV Program Manager, WSP** continued the meeting with the Hot Topics discussions. Mr. Shogan and Mr. Perry discussed two topics: 1) Highlights from the 2019 ITS World Congress in Singapore; and 2) Highlights from the 2019 AV Tech Expo in Novi, MI. The highlights from

the ITS World Congress included a new agreement between ITS America, ITS Europe, and ITS Asia-Pacific to develop common policies, standards, governance, business models, and technology for the MaaS industry. Also, a large number of European road agencies endorsing a connected vehicle policy designating DSRC for short-range (and low latency) communications and cellular for long-range (and high latency) communications. The AV Tech Expo featured over 100 exhibitors around the themes of safety, simulation, and validation. The rest of the discussion covered other industry updates.

Joseph Gorman, Connected Vehicle Engineer, Michigan Department of Transportation, provided an update on MDOT CAV and ITS activities. Mr. Gorman spoke about MDOT updated policy on pavement markings. According to Mr. Gorman, to support automated driving systems operations, MDOT is planning to increase width of lane lines on freeways and add on and off ramp dotted line extensions. Both changes will be included in 2021 construction program

Danielle Deneau, Director of Traffic-Safety Road Commission for Oakland County presented “Oakland County ITS and CV Update”. The Road Commission for Oakland County (RCOC) has safety as its top priority, it oversees about 900 square miles of land and maintains 1,400 traffic signals. There are now plans to update and expand the system, including the installation of roadside units that can communicate with CVs. In 2018 the RCOC and the county created a Connected Vehicle Task Force with the mission of testing CV infrastructure and creating a CV business model.

Eric Paul Dennis, Senior Transportation Systems Analyst, CAR presented “AV Industry Update: Regulation, Standardization, Commercialization”. There are now 43 states (+ Washington D.C.) with some form of regulatory approach towards AVs, with current hopes to introduce federal AV legislation soon. Mr. Dennis also spoke about Standard for Safety for the Evaluation of Autonomous Products, UL 4600. There is currently a draft proposal in the preliminary review process.

The meeting adjourned at 12:00.

MDOT maintains a webpage dedicated to its work related to CAV technologies (http://www.michigan.gov/mdot/0,1607,7-151-9621_11041_38217---,00.html). The page includes documents, presentations, and other materials that may be of interest to CAV stakeholders. Meeting packets containing materials (agenda, meeting notes, attendance, and presentation slides) from past Michigan Connected and Automated Vehicle Working Group meetings are also available on this page.

Michigan Connected and Automated Vehicle Working Group

October 30, 2019



Attendance List

First	Last	Organization
Adit	Joshi	Ford Motor Company
Ahmad	Jawad	Road Commission Oakland County
Alan	Rudnick	Mechanical Simulation Corp.
Benigno	Cruz	Macomb Community College
Bert	Baker	Great Wall Motors
Bill	Shreck	MDOT
Brett	McMillan	May Mobility
Chris	Talwar	FEV
Christyn	Lucas	Detroit Regional Chamber
Colin	Schmucker	PPG
Eric	Gannaway	Siemens
Frank	Perry	WSP
Gary	Streelman	Marelli
Gina	Jackson	Michigan State University
Heinz	Mattern	Visteon
John	Abraham	Road Commission Macomb County

First	Last	Organization
Jessica	Robinson	Michigan Mobility Institute
Joseph	Bartus	Macomb County Dept. of Roads
Jsana	Cehaja	MDOT
Karley	Thurston	Workforce Intelligence Network
Keith	Van Houten	General Motors – Global Autonomous Driving Center
Kelly	Bartlett	MDOT
Ken	Yang	AECOM
Kristie	Pfosi	Mitsubishi Electric Automotive
Kyle	Pryce	City of Southfield
Mark	Peters	Qualcomm
Meredith	Nelson	MDOT
Mike	Miller	Orion Measurement Solutions
Nelson	Kelly	Macomb Community College
Oge	Udegbumam	Tyme Consulting Engineers, Inc.
Parwaiz	Nur	Tyme Consulting Engineers, Inc.
Prajakta	Pimple	Mercedes-Benz R&D. North America
Richard	Beaubien	Beaubien Engineering
Rochelle	Freeman	City of Southfield
Samer	Ibrahim	Ford
Sean	Kelley	Mannik Smith Group
Stephen	Selander	Miller Canfield
Steven	Litz	Powerlink Systems
Terni	Fiorelli	CAR

First	Last	Organization
Terrence	Hicks	Metro Strategies, Inc.
Tom	Bruff	SEMCOG
Wayne	Snyder	NextEnergy
Zahra	Bahrani Fard	CAR

Michigan Connected and Automated Vehicle Working Group



Presentations



Michigan Connected and Automated Vehicle Working Group

Zahra Bahrani Fard, Transportation systems Analyst, CAR

October 30, 2019

Centrepolis Accelerator At Lawrence Tech University, Southfield

Meeting Agenda

9:00 AM Introductions and Update

Zahra Bahrani Fard, Transportation Systems Analyst, CAR

Welcome Remarks

Dan Radomski, Director, Centrepolis Accelerator at Lawrence Technological University

Ford Connected Mobility

Samer Ibrahim, Connected Vehicle Smart City Supervisor, Ford

Powering the Future: Mobility Engineers

Jessica Robinson Executive Director, Michigan Mobility Institute

Urban Transportation

Brett McMillan, Vice President of Finance, May Mobility

10:20 AM Networking Break

10:40 AM Hot Topics Discussion

Frank Perry, Principal Consultant, CAV Program Manager, WSP

Update on MDOT CAV Activities

Joseph Gorman, Connected Vehicle Engineer, Michigan Department of Transportation

Oakland County ITS and CV Update

Danielle Deneau, Director of Traffic-Safety Road Commission for Oakland County

State of AV Regulations in the U.S.

Eric Paul Dennis, Senior Transportation Systems Analyst, Center for Automotive Research

12:00 PM Meeting Adjourned

Tour of Centrepolis Accelerator

Working Group Mission



Cooperatively pursue projects and other activities that are best accomplished through partnerships between multiple agencies, companies, universities, and other organizations and that ultimately advance Michigan's leadership position in connected and automated vehicle research, deployment, and operations.

Goals

- Benefit our state and our industry (automotive and more)
- Enhance safety and mobility in Michigan and beyond



Upcoming CAV Events

Happening Now:

- **SAE Innovations in Mobility**
October 29-31, 2019 | Novi, MI

Upcoming:

- **2019 Mcity Congress**
November 6, 2019 | Ann Arbor, MI
- **OESA 2019 Automotive Supplier Conference**
November 13, 2019 | Novi, MI
- **US Army Autonomy and Artificial Intelligence Symposium and Exposition**
November 20-21, 2019 | Detroit, MI
- **ITS World Congress 2020**
October 4-8, 2020 | Los Angeles, CA
- **Others?**

Thank you to our
hosts!

CENTER FOR AUTOMOTIVE RESEARCH





Ford Connected Mobility

Samer Ibrahim
Connected Vehicle Smart City

Oct-30-2019

The Future of Mobility



Connectivity is Key to Addressing our Mobility Challenges

Vehicle-to-infrastructure (V2I)

e.g. traffic signal timing / priority



Vehicle-to-network (V2N)

e.g. real-time traffic / routing, cloud services



Vehicle-to-vehicle (V2V)

e.g. collision avoidance safety systems



Vehicle-to-pedestrian (V2P)

e.g. safety alerts to pedestrians, bicyclists

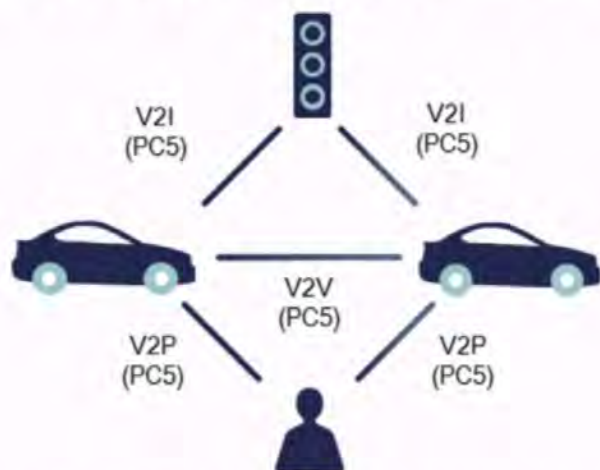


CV2X Communication



Direct

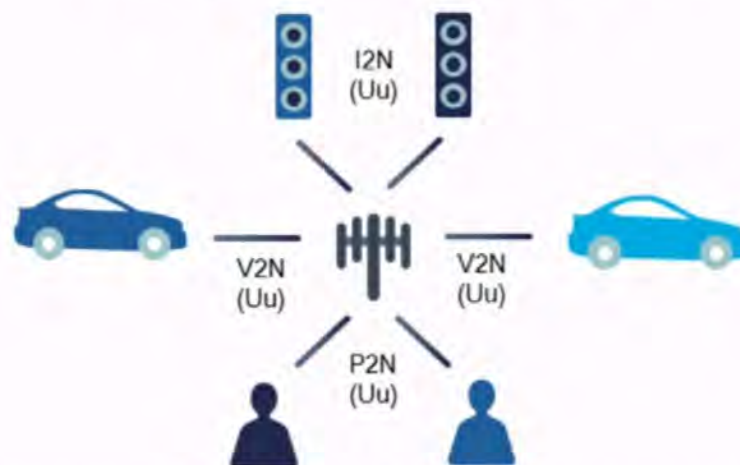
V2V, V2I, and V2P operating in ITS bands (e.g. ITS 5.9 GHz) independent of cellular network



Short range (<1 kilometer), location, speed ...
Implemented over "PC5 interface"

Network

V2N operates in traditional mobile broadband licensed spectrum



Long range (>1 kilometers). e.g. accident ahead
Implemented over "Uu interface"

Why CV2X



- CV2X does not require a cell tower or a SIM card
- CV2X is a viable alternative to meet and exceed V2V requirements
- CV2X provides additional improvement in reliability of reception in realistic road situations including non-line-of-site and WiFi interference conditions.
- CV2X provides an improved radio interference with a minimal change to the V2X application stack. leveraging many years of V2X research
- CV2X is part of a large ecosystem of today's 4G and tomorrow's 5G mobile devices and network infrastructure
 - Lower societal implementation costs
 - Clear evolutionary path to 5G which ensures future versions will remain functionally backward compatible
 - Much larger penetration and deployment rate through mobile devices and installed network nodes.

CV2X

A standard feature on
all new vehicles
starting MY 2022



Our Connectivity Commitment



100%

OF NEW VEHICLES
IN US CONNECTED
BY 2019



NEW VEHICLES WILL
BE CAPABLE OF OTA
UPDATES BEGINNING
2020

100%

OF NEW MODELS IN
US EQUIPPED WITH
C-V2X STARTING
IN 2022

Vision

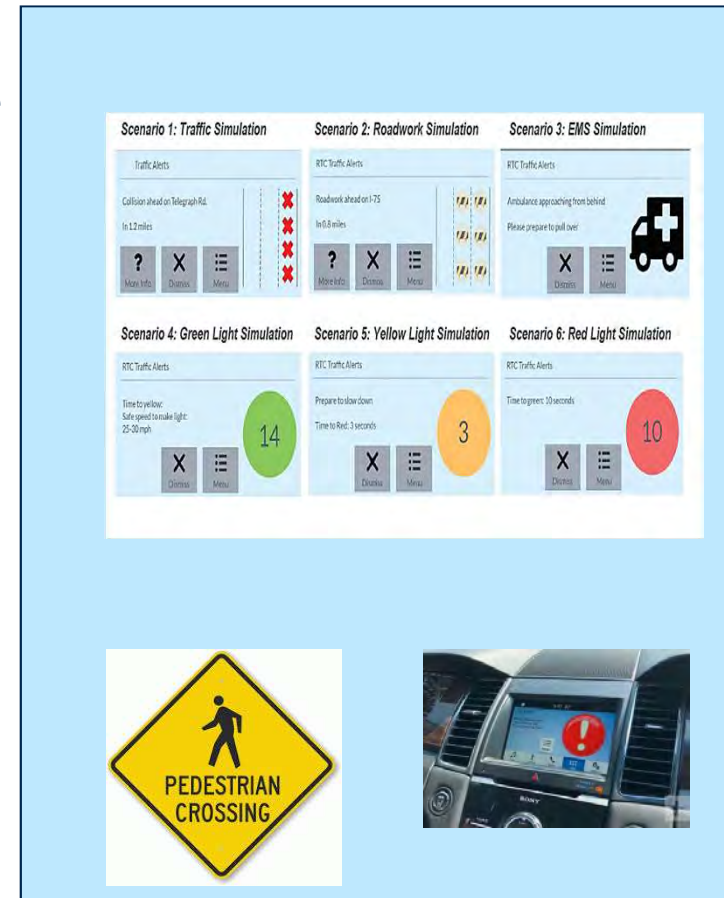


Goal:

Connect Vehicles, Cities and Pedestrians and deliver Experiences that concentrate on reshaping how people move around while keeping everyone safe.

Areas of Concentration:

- Bringing Traffic Management Center's Information into the Vehicles
- Find Solutions to Pedestrian and Vulnerable road users.
- Manage Traffic and Increase vehicle flow and safety at Intersections.
- Find solutions to complex interaction use cases that use potential two way communications
- Create new concepts around road usage that could replace fuel tax.
- Interoperability and Technology Neutrality



V2X Demos

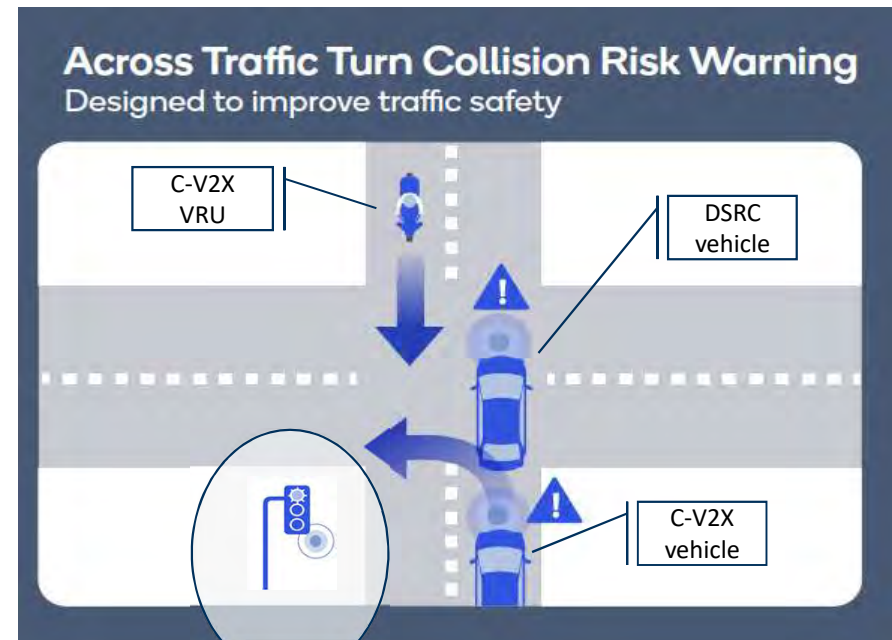


4 Way Intersection with Blockchain



Scooter to Vehicles
(BT to CV2X)

CV2X/DSRC Interoperability



Roadside unit (RSU) serves as a bridge between the DSRC and C-V2X communication networks operating in separate channels by connecting ("bridging") C-V2X and DSRC radios.

THANK YOU

OUR MISSION:

Accelerate.

The Michigan Mobility Institute accelerates mobility workforce development, upskilling programs, and post-secondary degrees by bringing industry and education partners together. We merge the historic excellence of engineering, design, and supply chain in Michigan with deep insight into the global hiring needs of next-generation mobility disruptors.



OUR VISION:

Purpose-built mobility education, research, and entrepreneurship hub in the heart of Detroit.

MOBILITY INNOVATION





IN THE NEXT DECADE...

45,000 new mobility engineers

70,000 new skilled trade workers

FOR MICHIGAN



12,000 new mobility engineers

63,000 additional direct, supplier & induced jobs

6X

Gap in computer-focused graduates entering the industry

**SMART
PARKING**

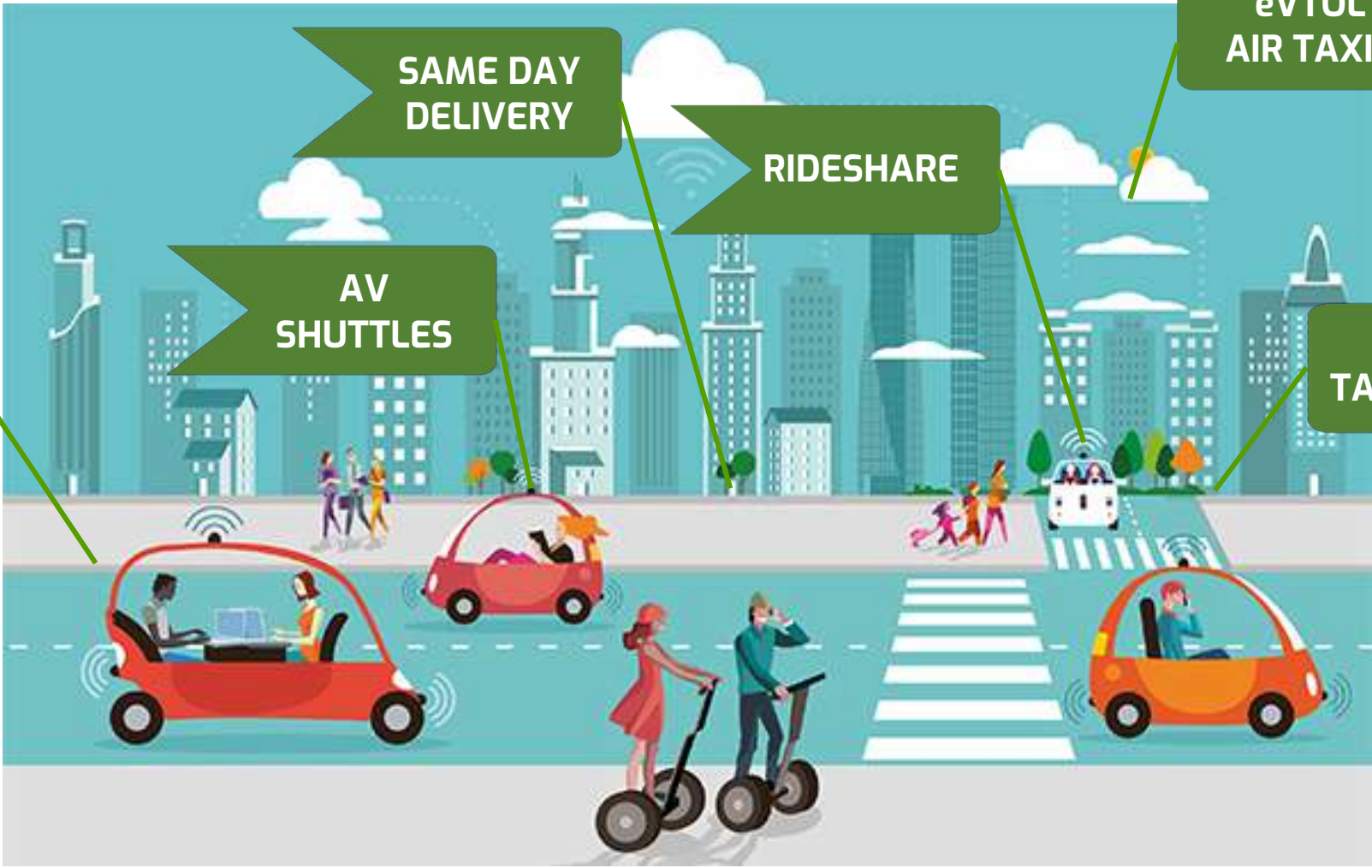
**AV
SHUTTLES**

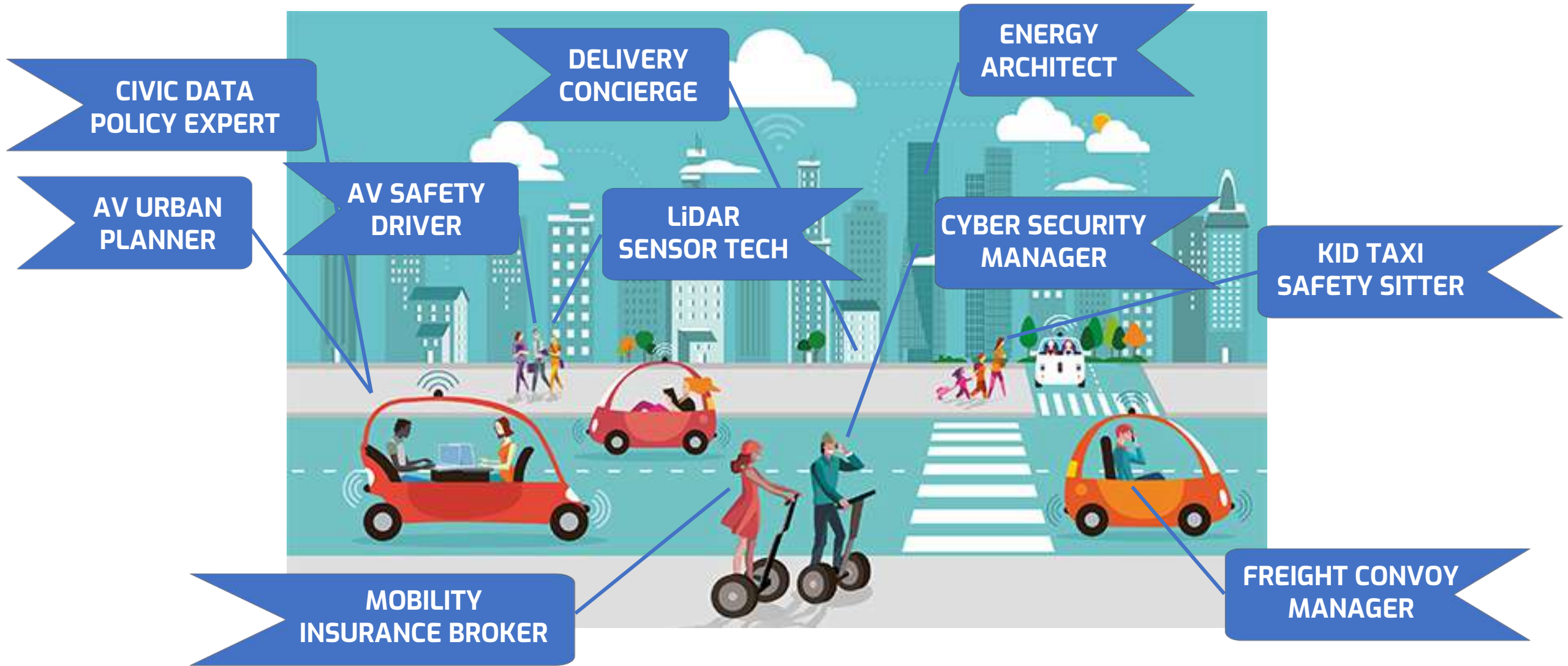
**SAME DAY
DELIVERY**

RIDESHARE

**eVTOL
AIR TAXIS**

**DRIVE-THRU
TABLET ORDERING**





A tall, multi-story brick building with a green sign at the top that reads "WAYNE STATE UNIVERSITY". The building has many windows and is set against a clear blue sky. In the foreground, there are some trees and a street with cars.

'Critically Important': Michigan Mobility Institute, Wayne State University Partner On Advanced Mobility Curriculum

– **Yahoo Finance**

A degree in mobility? It will soon be possible at Wayne State

– **Crain's Detroit Business**

Detroit Steals a March on Silicon Valley by Launching 1st Degreed Mobility Program

– **Forbes**

May: Michigan Mobility Institute and Wayne State University Announce Development of Advanced Mobility Curriculum



An 'Epicenter': Michigan Mobility Institute,
Wayne State University to Launch Center
for Advanced Mobility

– **Yahoo Finance**

The evolution of Detroit from an auto
manufacturing powerhouse to a tech-
transport leader is set to advance another
stage with the opening of a new mobility
center housed at Wayne State University.

– **FreightWaves**

**August: Center for Advanced Mobility at Wayne State University to Launch
This Fall**



October: Mobility On-Ramp Collaborative Receives Grant to Address Critical Workforce Needs

EDUCATION



WORKFORCE DEVELOPMENT



NEXT STEP: HUB



We are now focused on the structure and founding partners for the Center for Advanced Mobility.

CONTACT:

Jessica Robinson, Executive Director

Michigan Mobility Institute

jessica@michiganmobilityinstitute.org

313-338-8820

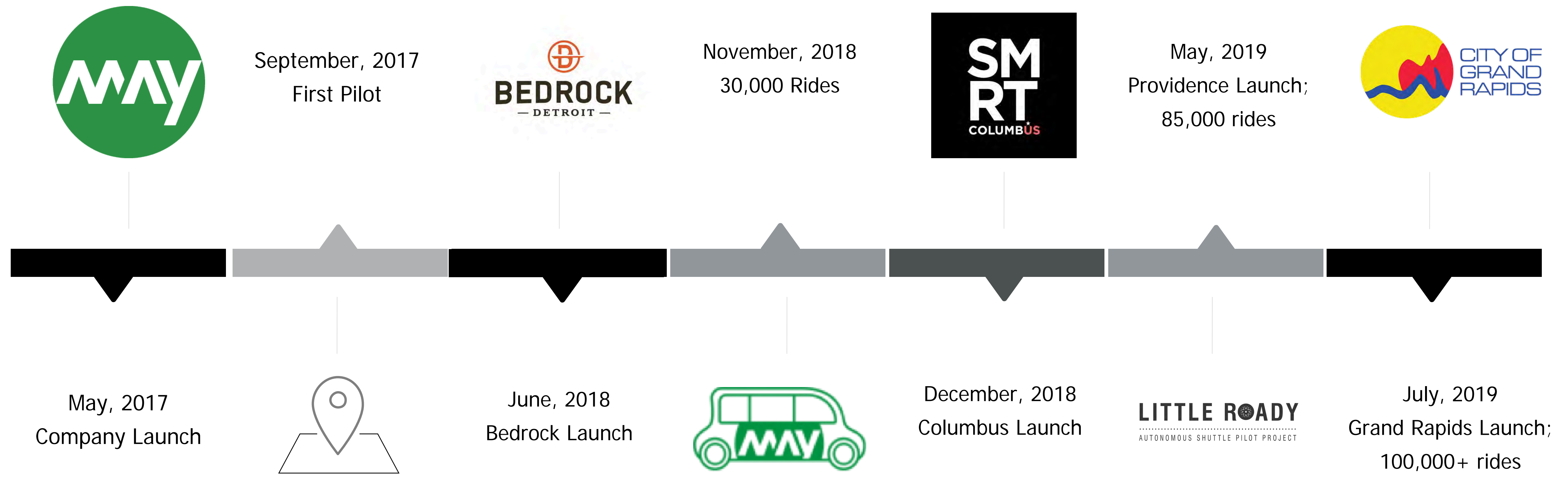


May Mobility is the leader in
Urban Transportation

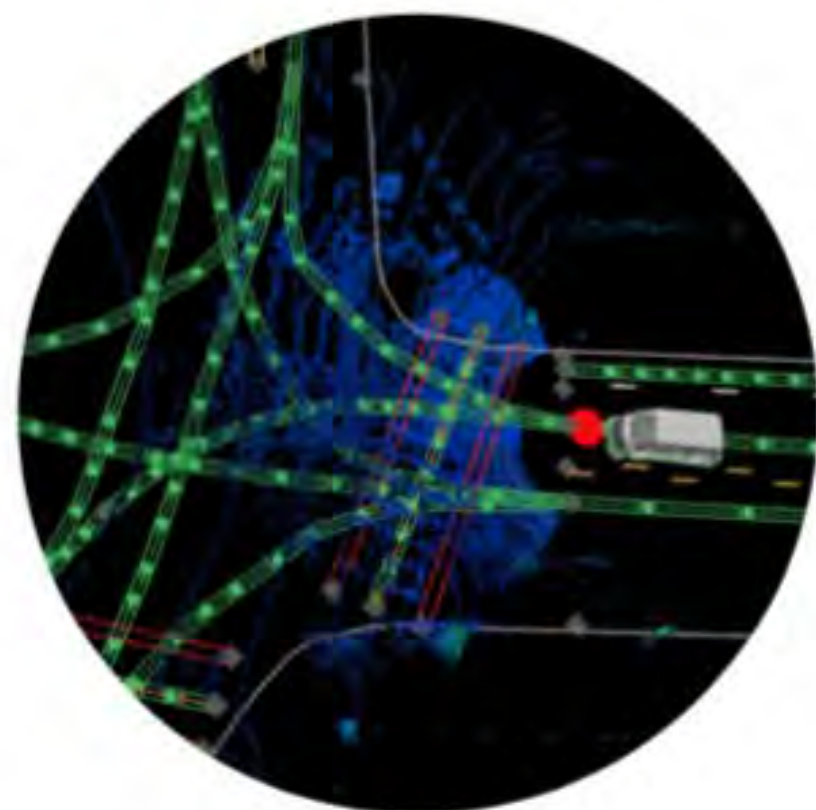
Agenda

- Background
- AV Market
- Current Operations
- Technology
- Q&A

Timeline



AV Enterprise Solutions



**Proprietary Autonomous
Vehicle Technology Stack**

+



**Customized Vehicle
Platform**

+



**Local Operations and
Customer Success**

=



**Great User Experience
and Reduced Wait Times**

1 to 3 Mile Routes
in City Centers and
Corporate Parks



Vertically Integrated
for High Value Routes

AV Observations

1. Technology has not caught up to ambition shooting for L5 autonomy
2. There's still plenty of use cases for self-driving cars in the near term
3. Customers shouldn't have to become experts in AV tech to benefit
4. There's value in owning the whole AV stack

Use Cases

Our technology applies to almost any mobility sector

robo-taxi

delivery

mass transit

personal vehicles

hospitality

Enterprise AVs are the best first market



The Market

Good for us

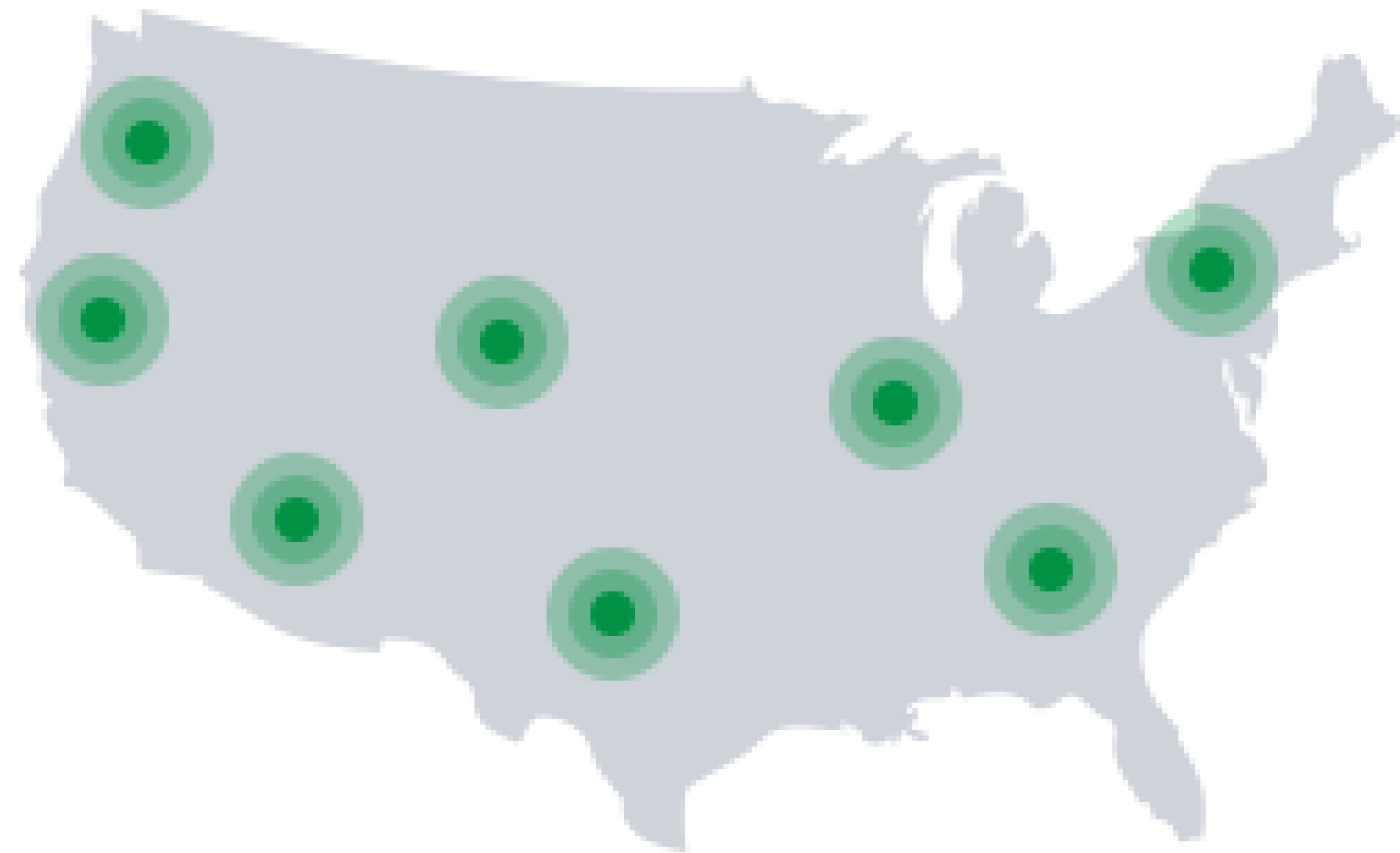
- ▶ Known routes reduce scope & complexity = revenue service now
- ▶ Lower barrier to entry than robo-taxi
- ▶ Capital-efficient growth path

\$ **28B** US TAM
x10 Globally

Good for enterprises

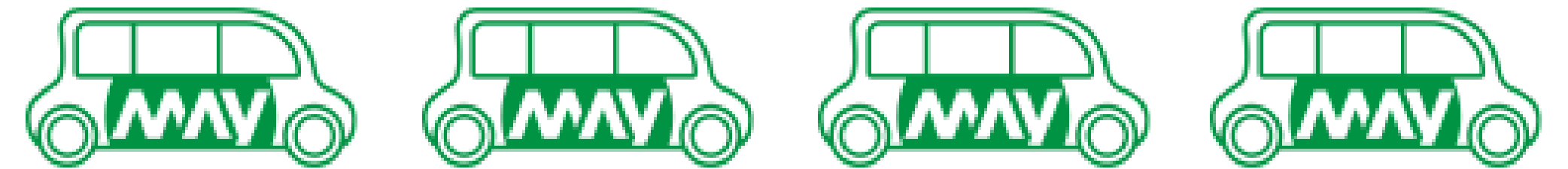
- ▶ Better mobility makes them more money
- ▶ May Mobility outperforms alternatives
 - ▶ ~3-6x service, same price
 - ▶ Happy riders, increased ridership, more value created

Scale

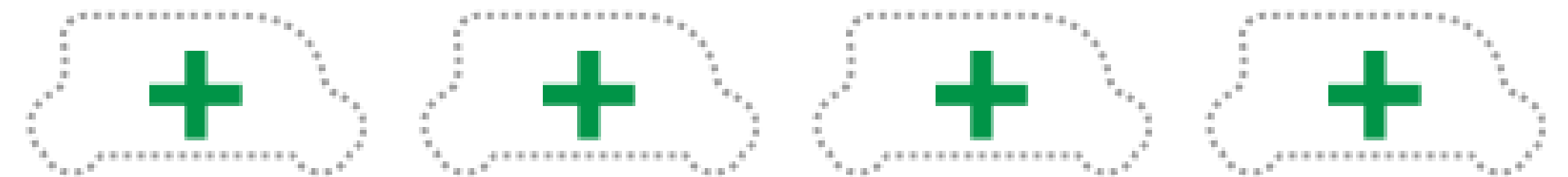


Building on Anchor Partners...
We Land and Expand

1 Anchor Customers
Help us to land in a new market



2 Local Expansion
Add new customers with low marginal costs



3 Broaden Market
Positions us for market segment expansion

Operate in Complex Environments

- Public Roads
- Urban Cores
- Mixed Traffic at 25mph
- Traffic Lights and Stop Signs

up to **95%** autonomy



Detroit, MI

Private Partnership



5 AM TO 12 AM

5 Days a Week, Year Round

90,000+

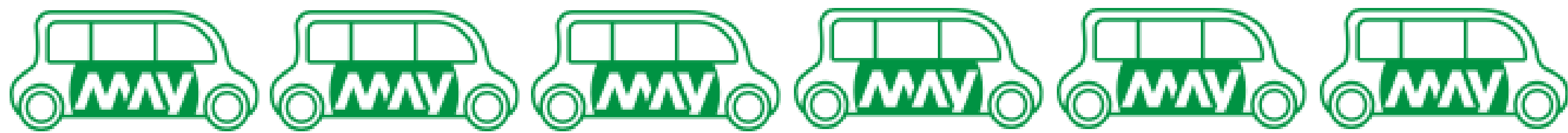
Rides Served

better mobility increases Bedrock's value to their employees and tenants



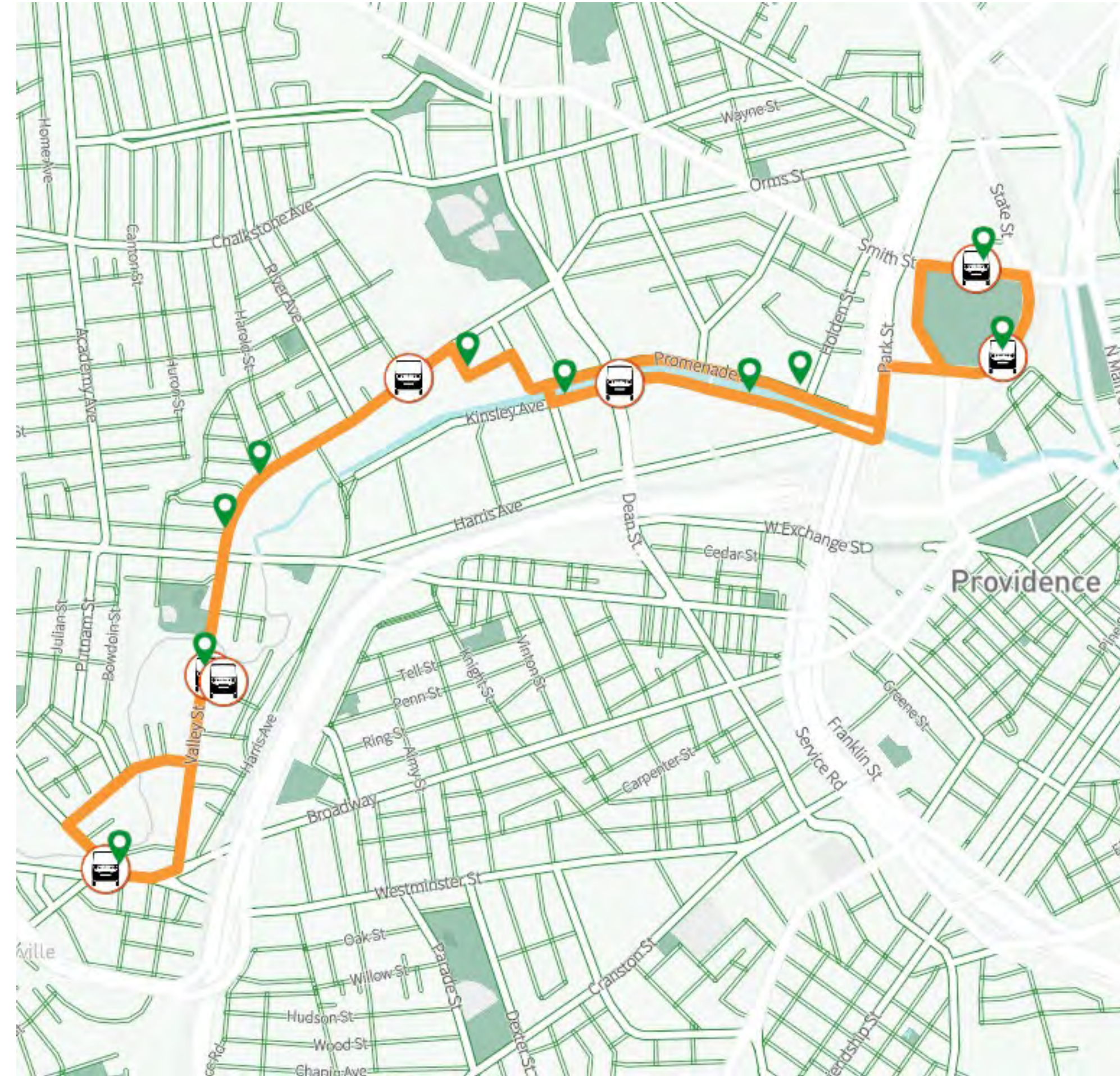
Providence, RI

Public Partnership



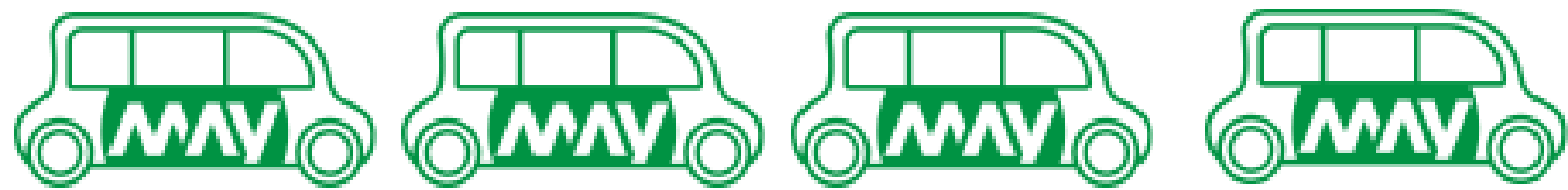
6:30 AM TO **6:30** PM **20,000+**
7 Days a Week, Year Round Rides Served

partnered with RIDOT to develop AV policy



Grand Rapids, MI

Private + Public Partnership



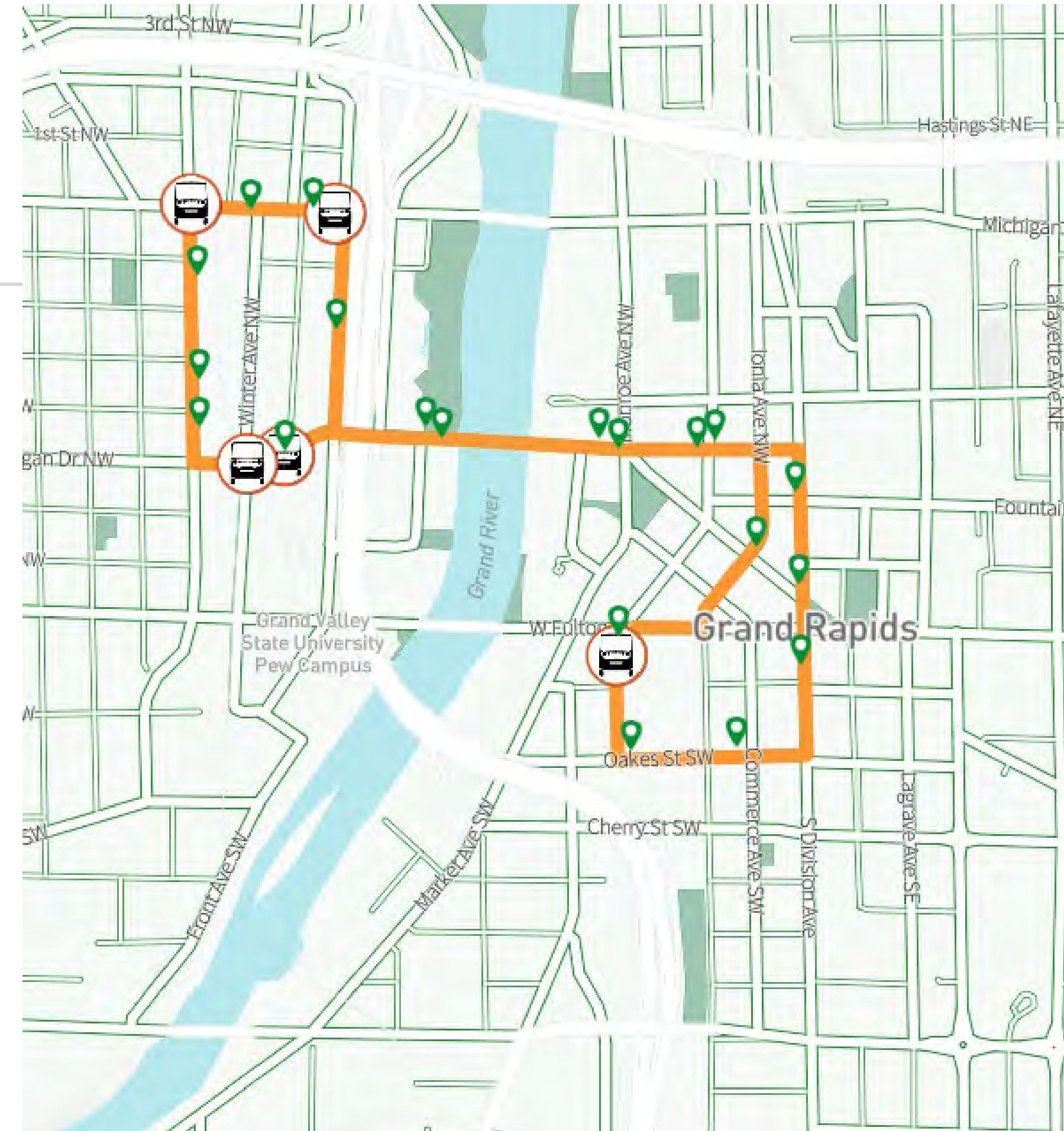
7 AM TO 7 PM

5 Days a Week, Year Round

25,000 +

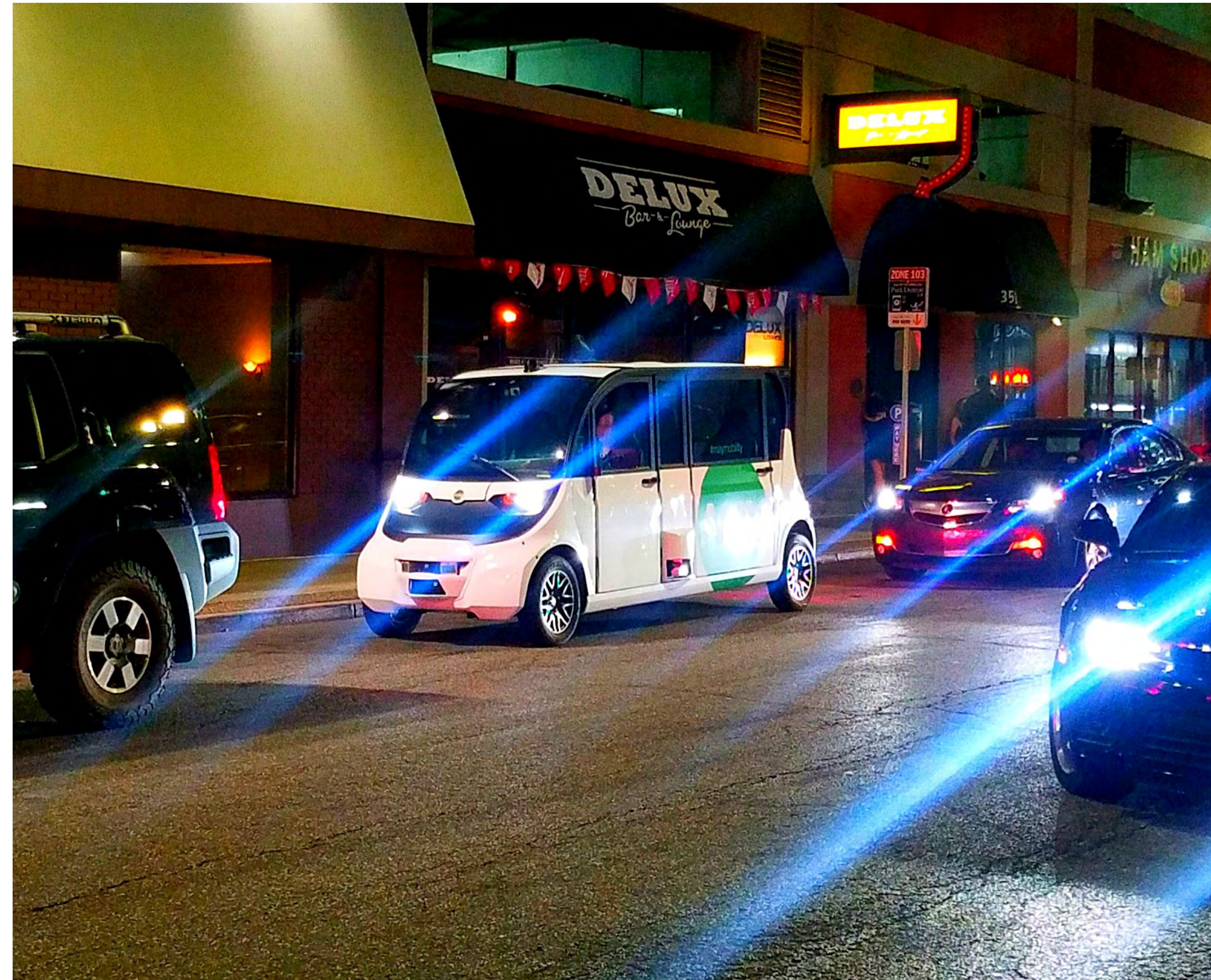
Rides Served

partnered with the City of Grand Rapids and private partners to test and develop AV policy



Shuttle Features

- All-electric 6-seater based on Polaris GEM E6
- Autonomous drive-by-wire control system
- Custom Li-ion power plant
- Full multi-sensor suite giving 360 degree vision
- Smooth ride at speeds up to 25 MPH
- Staffed with human Fleet Attendant
- Panoramic full-glass roof
- Extra-wide doors
- “Campfire” seating configuration
- Immersive 49” digital display
- Unique M-name e.g. “Mimi” or “Marco”



Wheelchair Accessible Shuttles

- **Custom modifications to shuttles to accommodate wheelchairs and mobility scooters**
- **Restraints**
 - ✓ Floor-mounted restraints that secure the wheelchair at each of the four corners of the cabin
 - ✓ Retractable lap and shoulder belt for passenger securement
- **Ramp**
 - ✓ 32 inches wide x 53 inches long w/ 2 inch side walls
 - ✓ Lowers to the ground manually from its stowed position
 - ✓ Steel construction
 - ✓ Redundant securement mechanism (pin and latch)



Hardware

REDUNDANCY



Low range-noise
Localization

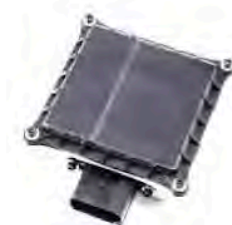


Imaging LIDAR



Light-curtain/
safety/
blind spot

LIDARs



All weather,
range-optimized



All weather,
field-of-view
optimized

RADARs



Object identification,
Infrastructure

Cameras

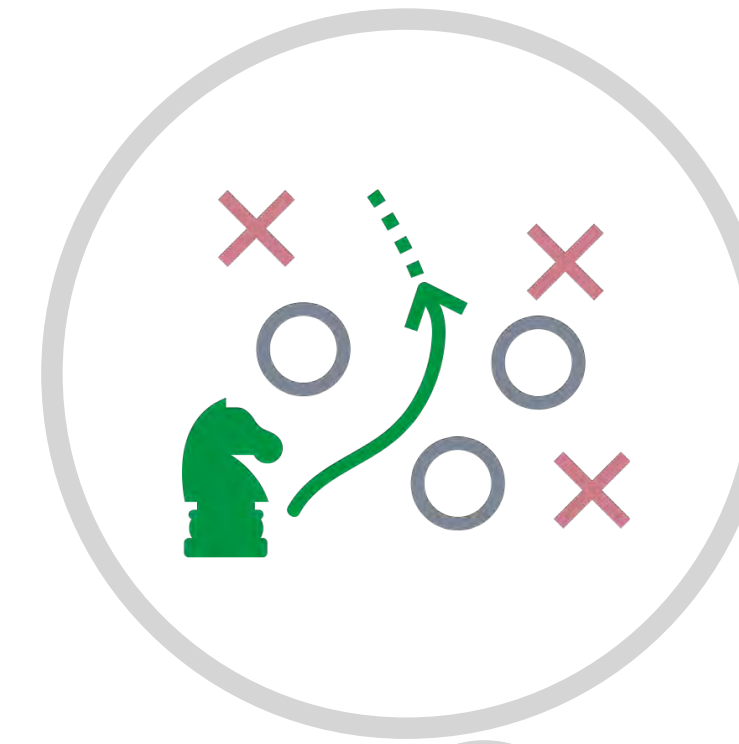
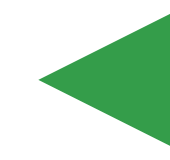
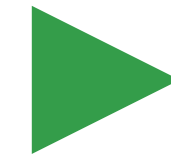
REDUNDANCY

REDUNDANCY



Software: Multi-Policy Decision Making

Compares to
Static Snapshots



Runs Realtime
Simulations



Most AV Stacks Need to
**Catalog & Recognize
Every Scenario**

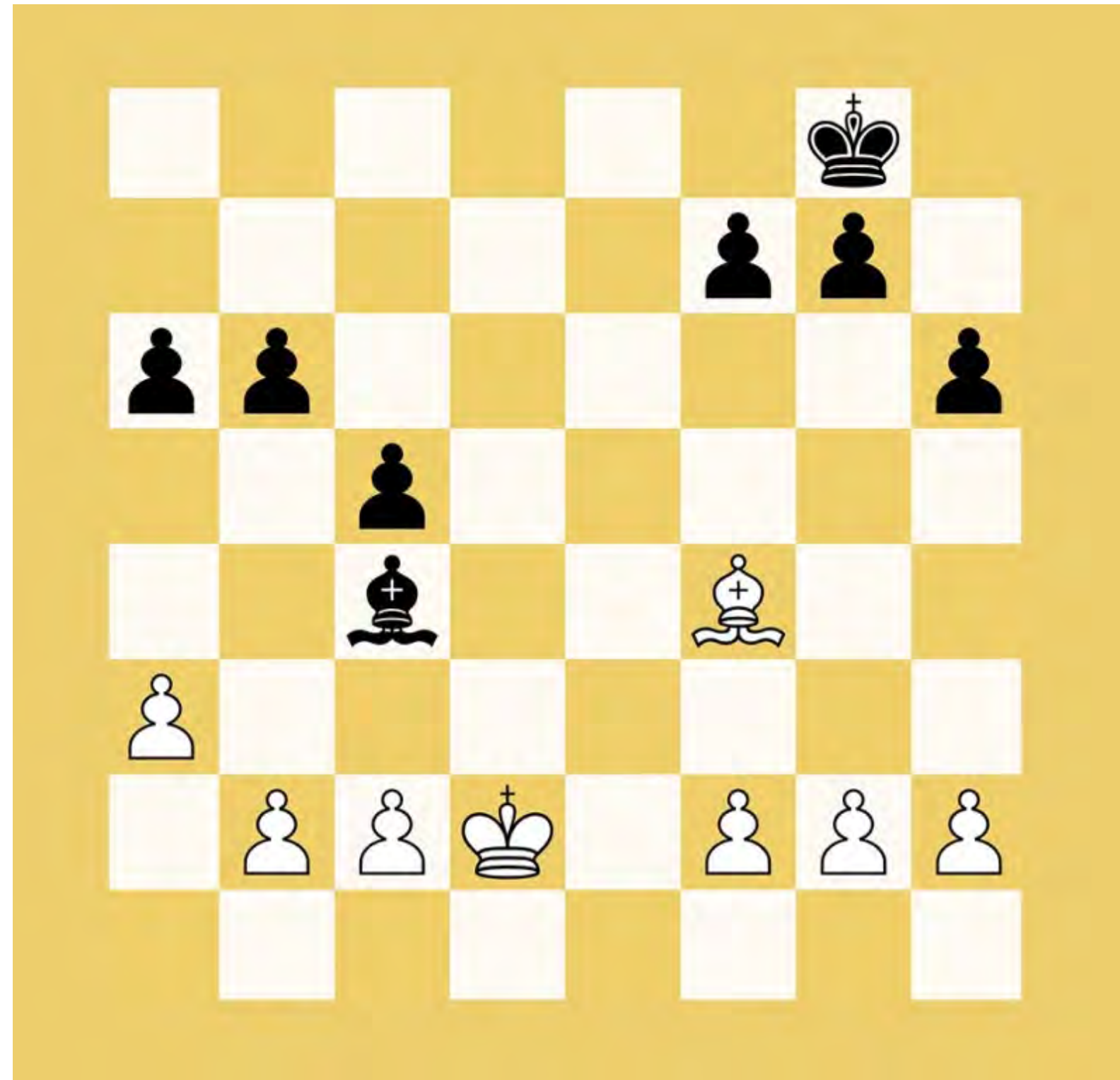
May Mobility's AV Stack
**Understands a Scenario
the *First Time***

MPDM vs. Rules-Based

	Rules-Based	MPDM
Getting Started	Easy to get started; fast initial progress	Policies are harder to write than rules
Novel situations?	Lead to unexpected behavior	No problem
Extending capabilities?	Difficult - simple behavior changes can touch <i>many</i> rules.	Just add a new policy.
Benefits of data	Use data to test rules	use data to test policies (today), learn policies (soon)
Performance	System only as good as the worst rule.	System generates <i>emergent behaviors</i> that are smarter than any one policy. Really smooth ride.

MPDM is the technology that the whole industry will need to build autonomous vehicles.

MPDM vs. Rules-Based



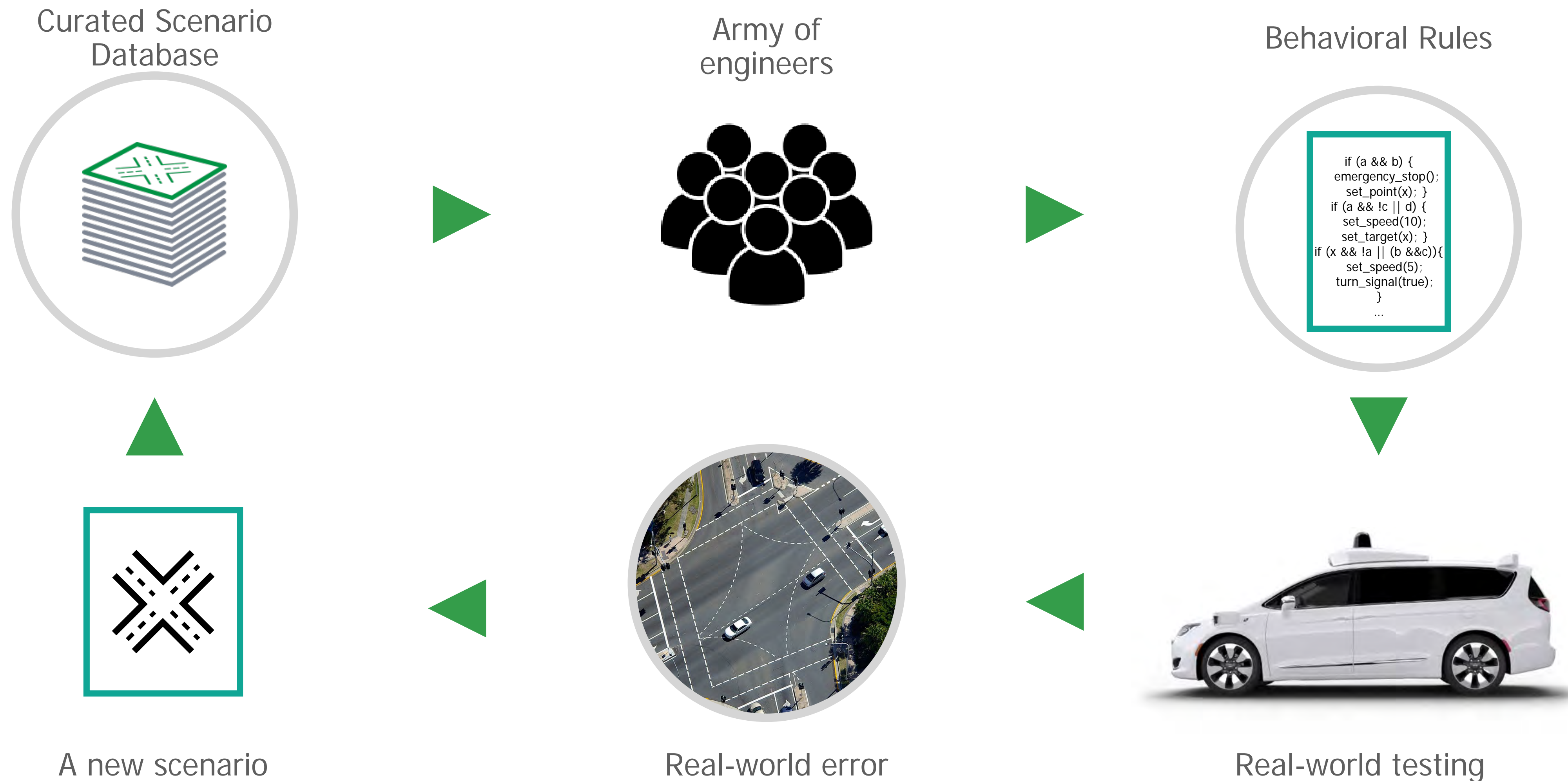
In chess, you **can** play the first few moves using rules...

but quickly, the number of possibilities becomes too large, and rules don't work.

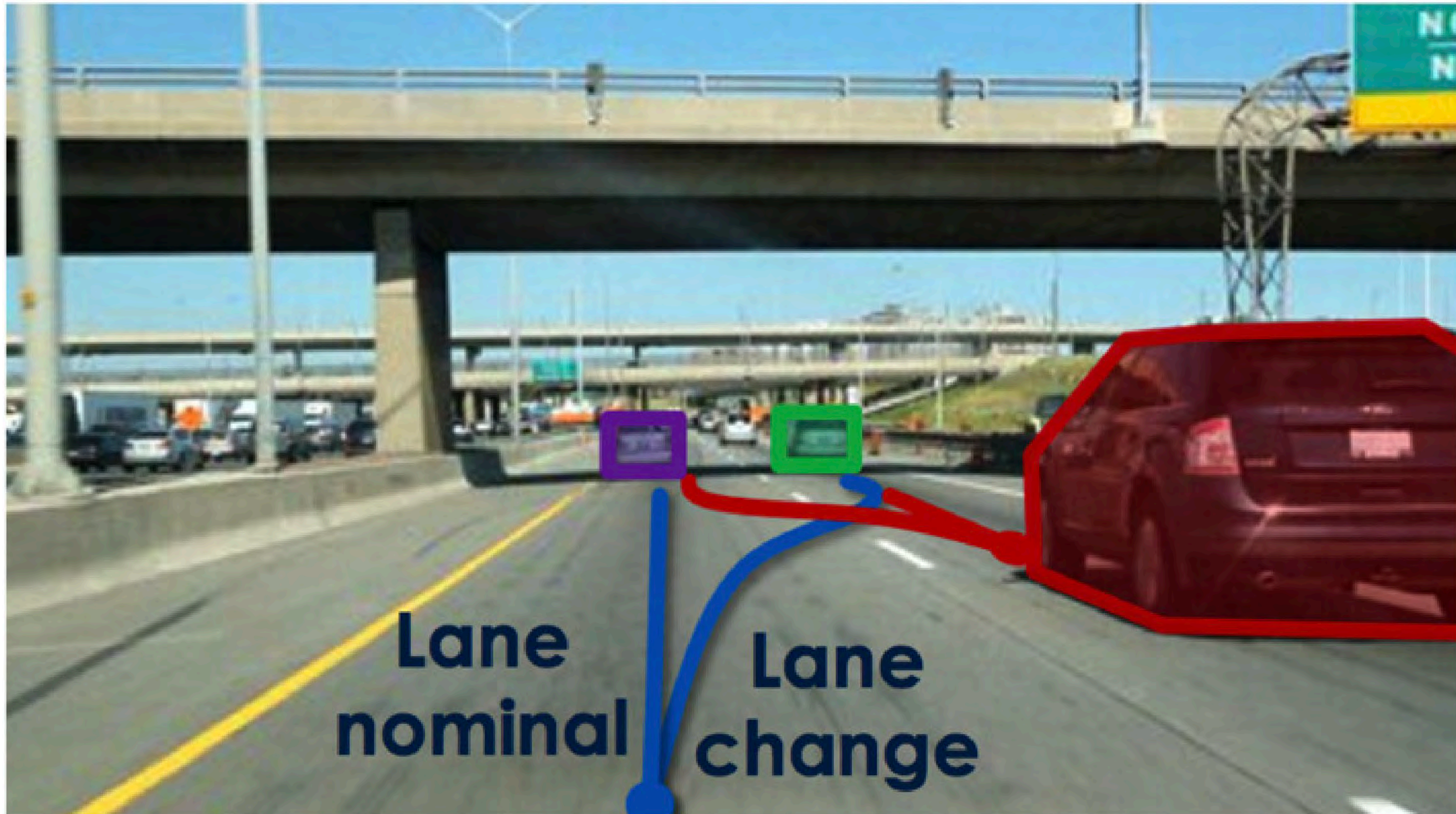
We know! We've built these kinds of systems many times before!

You must be able to reason about *new* situations.

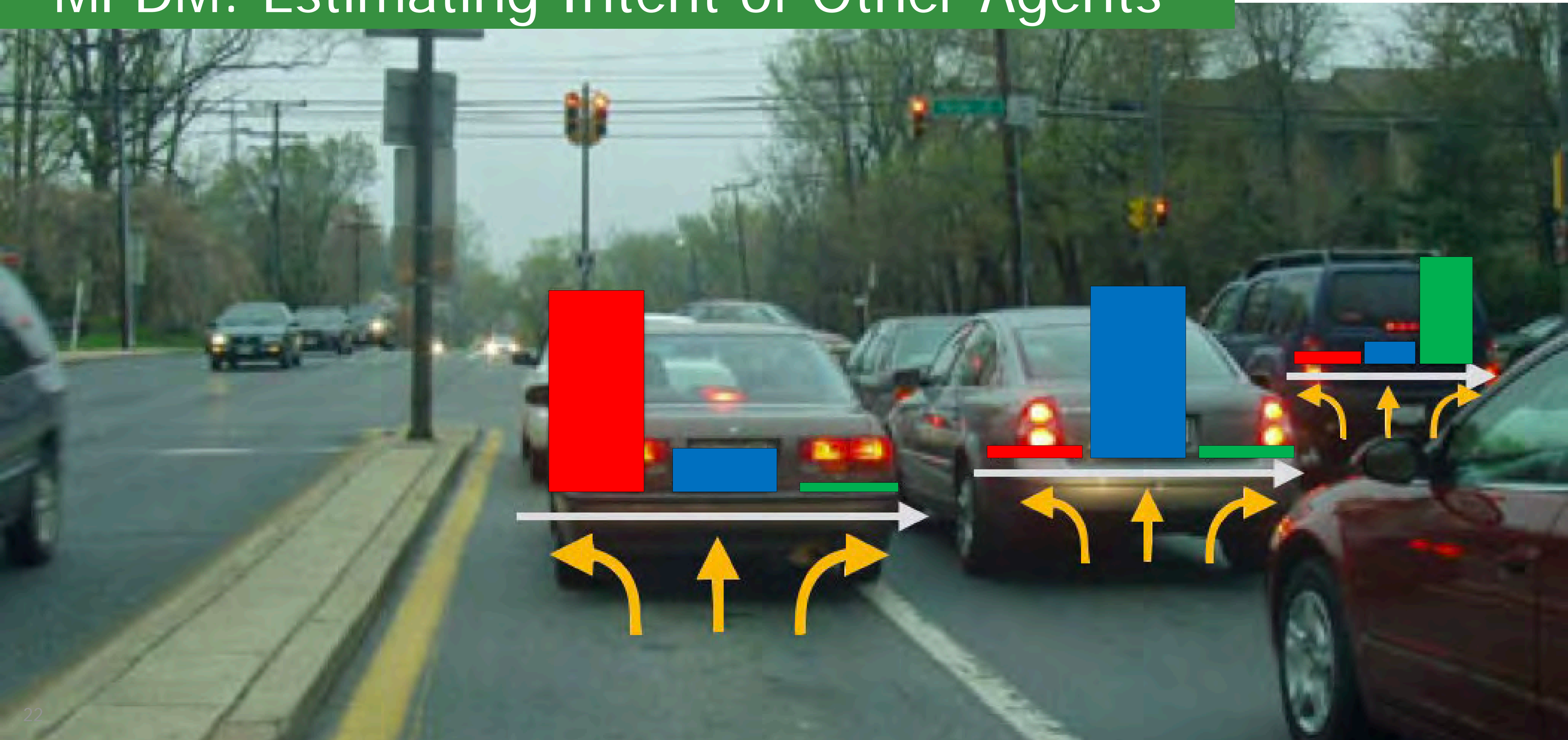
Rules-Based Approach



MPDM: What is a Policy?



MPDM: Estimating Intent of Other Agents

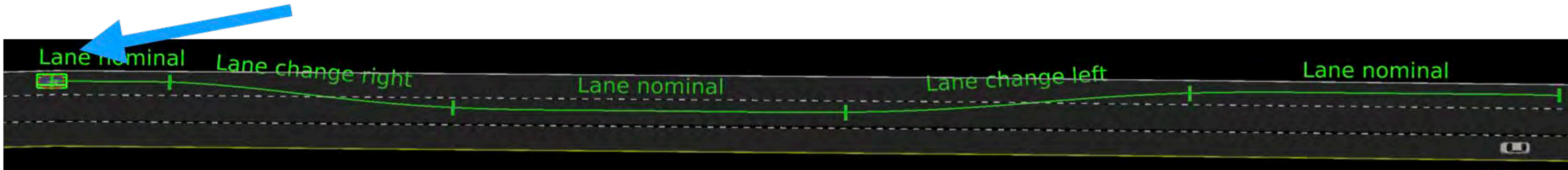


MPDM: Intent Classification

- What are the other agents doing?
- What is their goal?
- How are they likely to react to our actions?

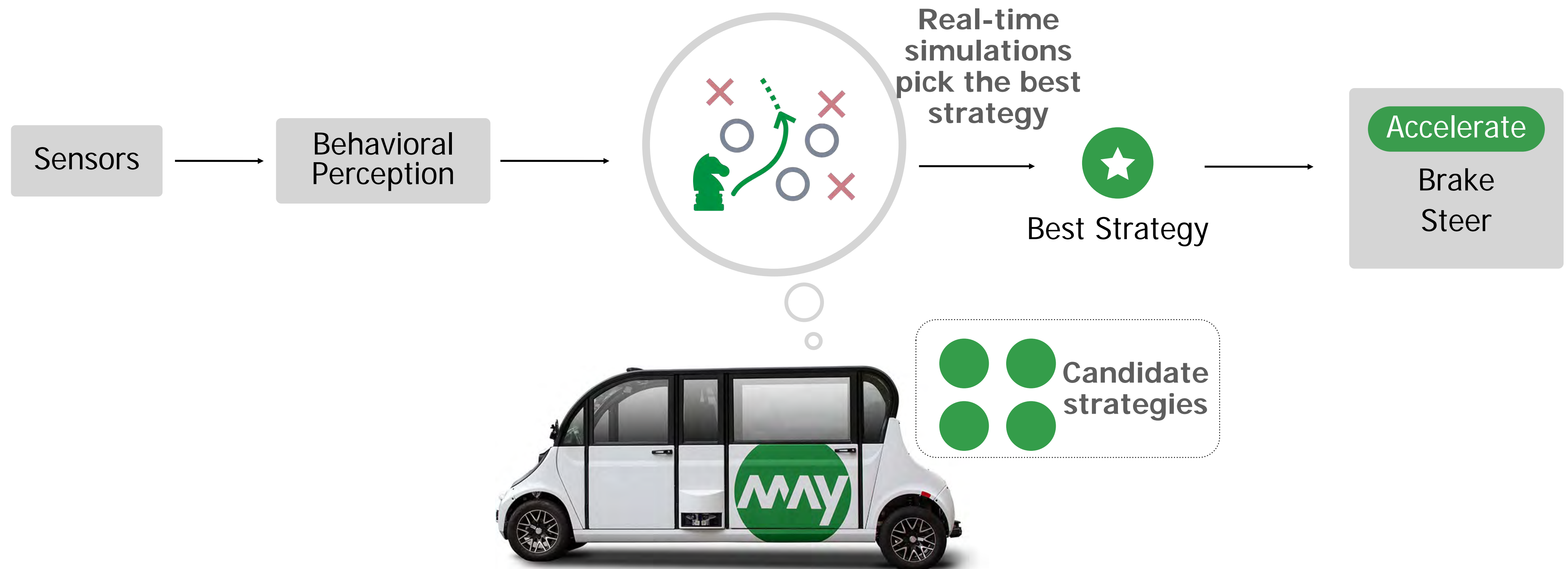


Tracked Car



Our Car

MPDM In Summary...



Our technology is better because it makes decisions based on *outcomes* not on *rules*.



MAY

MICHIGAN DEPARTMENT OF TRANSPORTATION

Statewide CAV Program Update



CAR CAV WG 2019 | October 30th, 2019

Infrastructure Deployment Plan

- Expansion underway to create one of the largest CV infrastructure deployments in the world



Updated Pavement Marking Policy

- Increasing width of lane lines on freeways from 4 – 6 inches
 - To support increasing use of lane departure warning and lane keeping technologies
- On and off ramp dotted line extensions included in the annual contract
 - Guide both vehicles and drivers to stay in their lane with traversing the freeway
- Both changes will be included in 2021 construction program



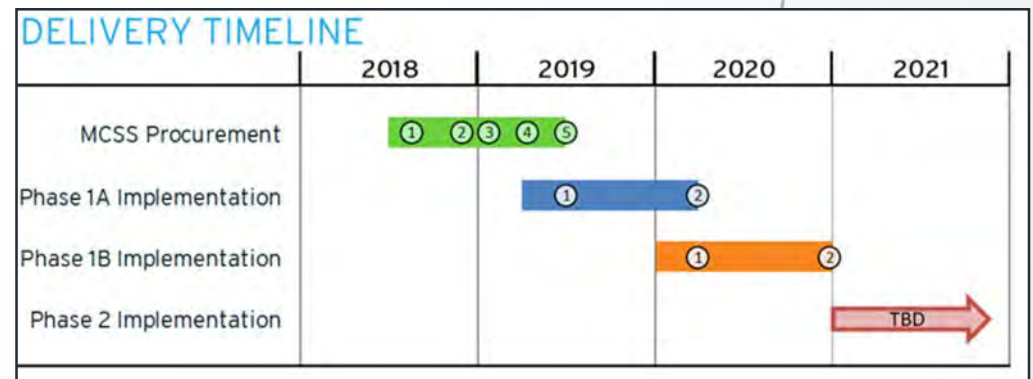
Updating Standards - Connected Signals Policy

- Coordinated effort with Signals Division to update traffic signal controller specification standards
- All new or upgraded traffic signals on the MDOT system will be CV-enabled going forward
- Developing process to configure and test RSUs at Signals Shop



Central Signal Control System

- Provide active and remote traffic signal monitoring
- Streamline the management of a critical asset
- Prepare for the future of traffic signal management



The \$8M Michigan Mobility Challenge

- \$8 million to fund multiple innovative pilot transportation projects of varying sizes that can solve mobility gaps for seniors, persons with disabilities and veterans in urban, rural and suburban communities throughout the state of Michigan.
- A collaborative effort that includes the Michigan Department of Transportation (MDOT), PlanetM/MEDC, the Michigan Department of Health and Human Services, the Michigan Veterans Affairs Agency, The Bureau of Services for Blind Persons, and the Michigan Department of Civil Rights – Division on Deaf, Deafblind, and Hard of Hearing.
- https://www.michigan.gov/mdot/0,4616,7-151-9621_17216_86614---,00.html

NAIAS 2020 Michigan Mobility Challenge

- Calls upon industry innovators to propose new and dynamic technology deployments that embody how autonomous, connected and electric vehicle technology can transform how we live, work and play.
- Demonstrate innovative solutions and cutting-edge technologies that can showcase autonomous vehicle capabilities
- Provide innovative, dynamic AV technology deployments, further solidifying the NAIAS and the Motor City as the preeminent environment for new transportation solutions.
- Operational during 2020 North American International Auto Show – June 2016
- https://www.michigan.gov/mdot/0,4616,7-151-9621_93566---,00.html

Communications

Talent

Research

Infrastructure

Applications

Data

Vehicles



Michigan is Open for Business for CV Partnership Opportunities

Oakland County ITS and Connected Vehicle Update

DANIELLE DENEAU, PE

ROAD COMMISSION FOR OAKLAND COUNTY



About RCOC

- Safety is our top priority
- County is 900 square miles
- 2700 miles of county roads, 230 mile of state highways
- 760 miles of gravel roads
- Maintain over 1,700 electrical devices
- Maintain 1,400 county, city and state traffic signals
- RCOC maintains (almost) all signals in county
- Maintain 90,000 signs

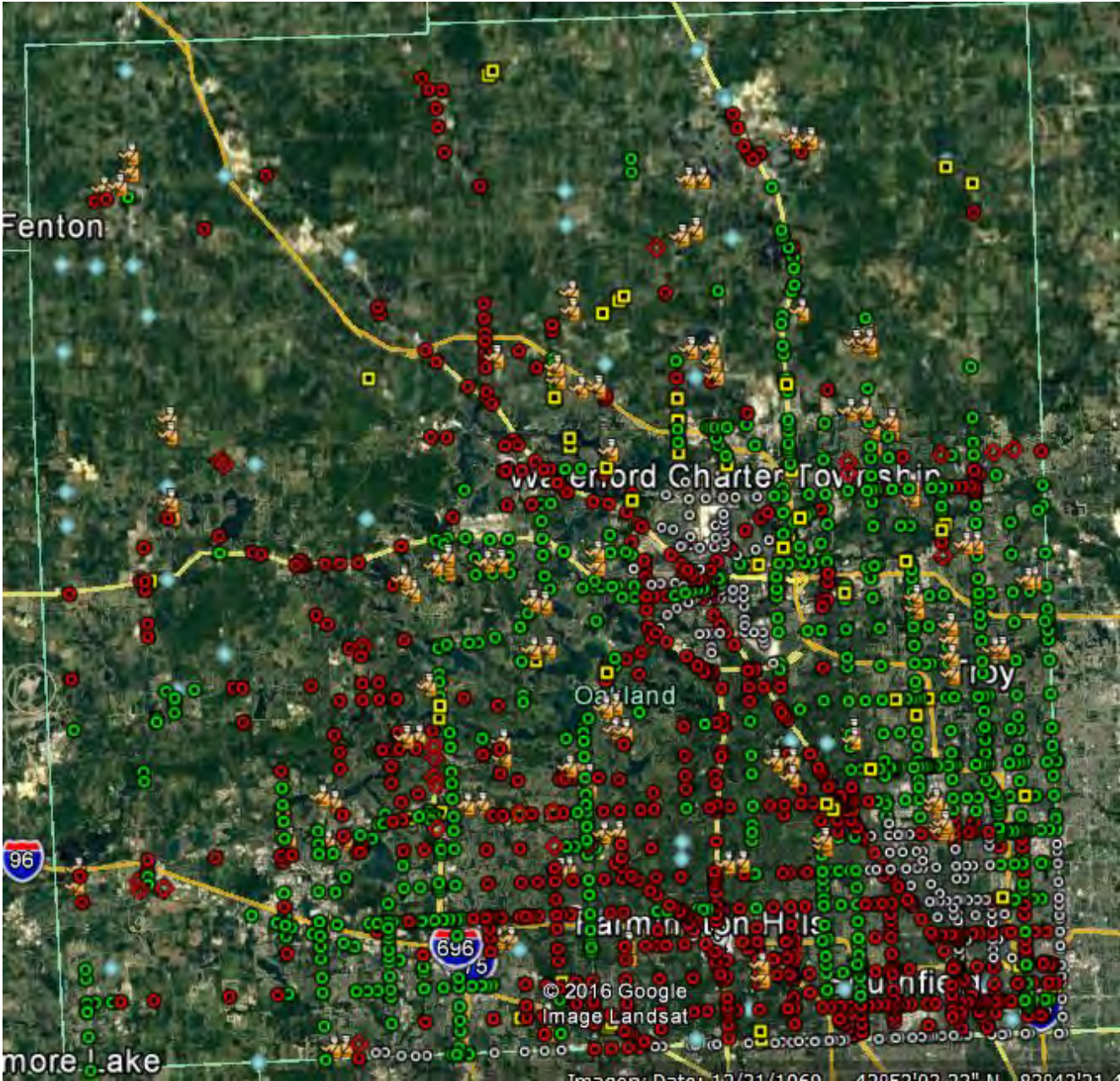
RCOC and ITS



ITS and FAST-TRAC

- Started in June 1992 with 28 intersections under SCATS and Autoscope (overhead cameras) control
- 819 traffic signals operate SCATS with various detection types
 - Adaptive traffic signal system
- SCATS operates in over 40 communities
- Maintenance includes - software, controllers, hardware
- 85 CCTV installations
- Wireless Communications Upgrade in 2017
- Real Time Traffic Map for congestion and construction information

Oakland County
Traffic Signals



SCATS Interface

SCATS Access

File View Edit Tools Window Help

Cycle lock	Trim	Detector alarm	RAM update	Short clearance	Fallback	Manager
Dwell	Notices	Lamp fault		Long clearance	High density	Region
Plan lock	Incidents	Major alarm	System alarm	Messages	Increment failure	File update

Central Manager - RCDC SCATS User 0 - Level 0

(1) 69 - Big Beaver, Adams : Troy (TROY) - AUBURN

Show Configure Options

Find Monitor Subsystem Strategic Monitor TS2; Mod 52 Scats; Terra Rackvision FLIR Cam

Alarms NF	AUBURN Subsystem 51	Degree of saturation 40	SCATS 6
Split plan 2	System plan 2	Master subsystem	Cycle generator 61
Offset plan 3	Link plan 3	Link none	Active link none
Special facilities Z3,6	Cycle plan none	Cycle time 80	Required cycle time 80
XSF 2,4,6,8			

<A>	40%	32
B	18%	14
C	25%	20
D	17%	14

Active plan

<A>	7	34
B	13	0
C	26	10
D	15	-1

Site operation

Active offset 0 D Site Fallback 0

MSS Master Isolated

TCS 69

AUBURN SS=51

8 STAGES

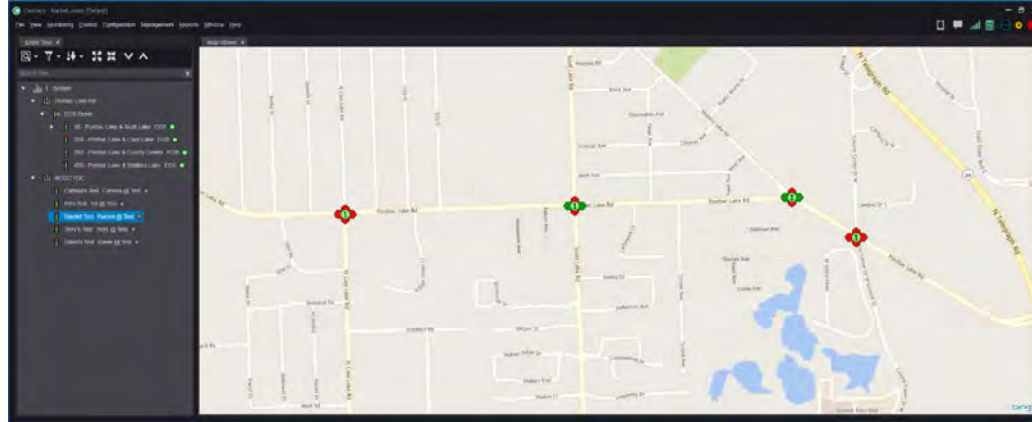
A	C
B	D
B1	D1
B2	D2

MIN A TG9 <I>

Adams & Big Beaver - UCPA.30699.001

Region - AUBURN User 0 - Level 0 3/24/2014 10:26:56 AM

Expand *FAST-TRAC*



- Central Signal System
- Econolite Cobalt with EOS Controllers
- Four intersections on Pontiac Lake Road in Waterford
- Operating CENTRACS
- Plan to update to SPM/EDAPTIVE
- Plan to install RSUs
- Expand countywide



RCOC and Connected Vehicles

What if we had CV Technology Now...

I-75 in Grayling

100-car I-75 pileup— Kills 1, injures 40



I-96 in Muskegon

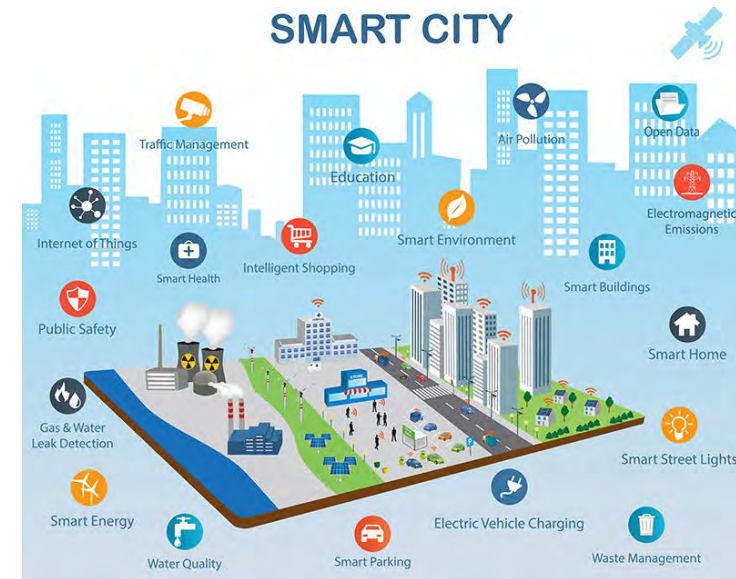
I-96 in Williamston



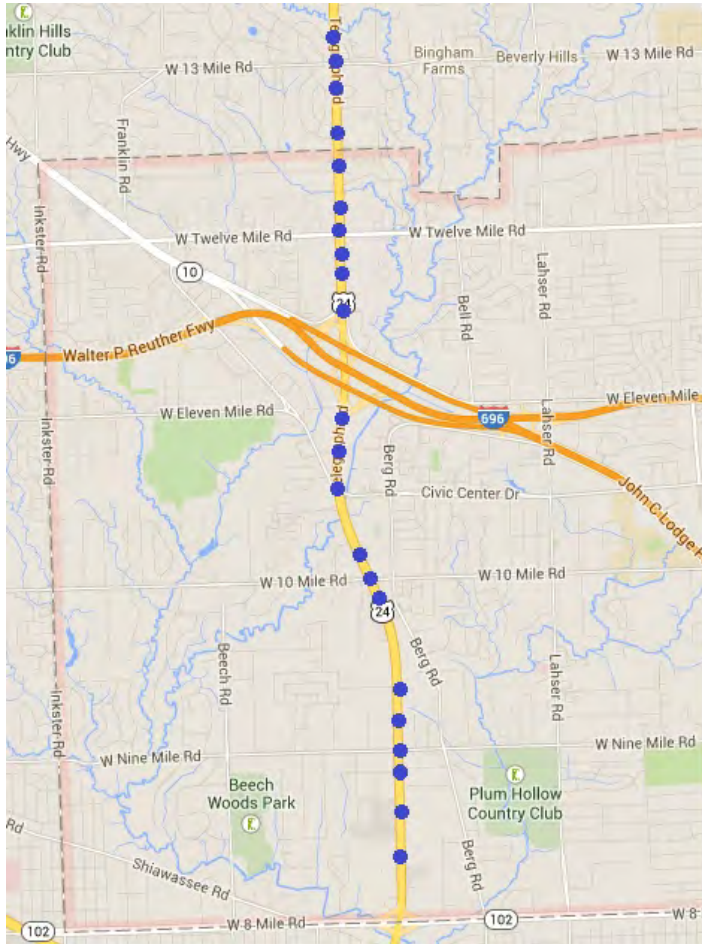
Connected Vehicle Installations

- Chrysler HQ Campus
- National Proof of Concept in Novi/Farmington Hills
- Ford
- Motorola
- CICAS
- Taiwan SPaT Demo
- UMTRI
- CAMP

Partner with MDOT
Local and National Committees



Connected Vehicle Telegraph Expansion



- 22 RSUs installed in 2010
- Open test bed
- SPaT Data
- Updating corridor with new RSUs
- Expanding to whole corridor
- North of 8 Mile to Dixie Hwy
- Additional 32 intersections

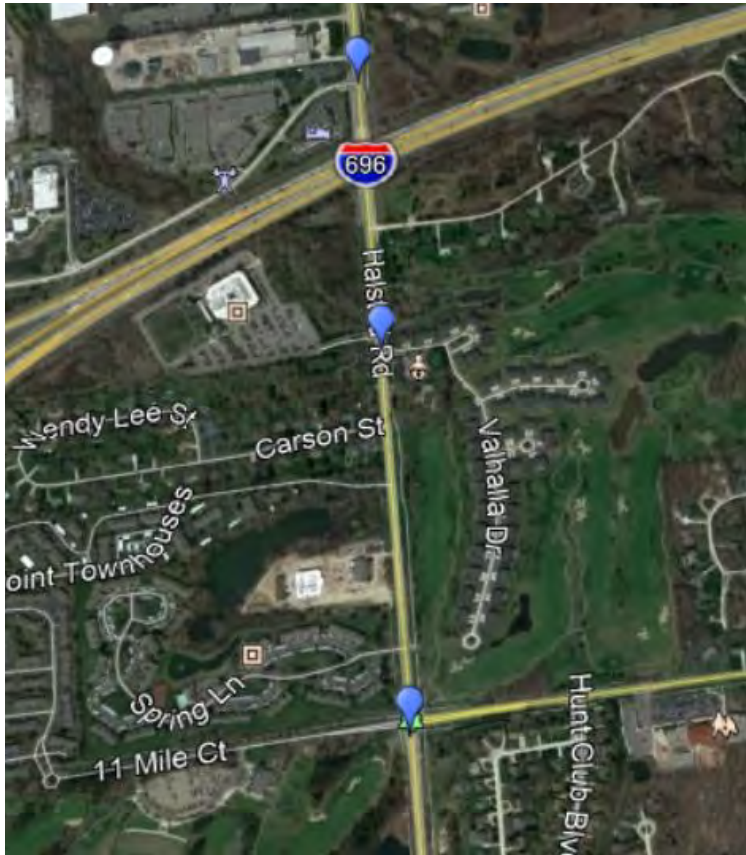
Connected Vehicle OCCV

Oakland County Connected Vehicle Task Force

- RCOC is a partner with Oakland County
- Pilot program to test CV infrastructure and create CV business model in Oakland County
- Public Private Partnership
- Project launched in 2018
- Team lead by P3 Mobility
- Scope is being refined



Connected Vehicle Farmington Hills



- Partner with Kapsch and Orange Traffic
- RSUs installed at
 - Halsted Rd & 11 Mile
 - Halsted Rd & Americure
 - Halsted Rd & Hills Tech
- SPaT Data

Questions??

Danielle Deneau, PE

Director of Traffic Safety

Road Commission for Oakland County

ddeneau@rcoc.org

www.rcocweb.org

