



DriveOhio



Project Update

CRLC Supply Chain Evolution
August 24, 2023



TRUCK
AUTOMATION
CORRIDOR

Agenda

1. Introduction to DriveOhio
2. I70 Truck Automation Corridor
 1. History and Overview
 2. “The Pre-quel” ADS grant project
 3. Project Approach
 4. Current Status
3. Deployment Team 1: Ease+Kratos
4. What’s next





DriveOhio

Advancing Smart Mobility



ADVANCED AIR



CONNECTED



AUTOMATED



ELECTRIC

*Smart mobility on
the ground, in the
air, everywhere*

Project Overview

- 2019 FHWA ATCMTD Grant Application
 - 50% FHWA funded, 50% 'other' match
 - Safety, efficiency, environmental impact
- Main Goals
 - Advance Truck Automation in the Midwest
 - Prepare Infrastructure – What is an “Automation Ready” roadway?



Deploying Truck Automation Technologies

- Four-year grant project
- For trucks carrying loads
- Piloting truck automation technologies
 - Platooning
 - Level 2 automation
 - Level 4 automation



Deploying Truck Automation Technologies



Level 1	Level 2	Level 4
<p>Truck Platooning Automation</p> <p>Connectivity between a convoy of two or more trucks. The lead truck is driven manually. Following trucks use vehicle-to-vehicle communications and automated driving technology to operate in partially- or fully-automated mode.</p>	<p>Partial Automation</p> <p>Vehicle has combined automated functions, like acceleration and steering but the driver must remain engaged with the driving task and monitor the environment at all times.</p>	<p>High Automation</p> <p>The vehicle can perform all driving functions under certain conditions.</p> <p>The driver may have the option to control the vehicle.</p>



Sources: NHTSA, Society of Automotive Engineers

Redefining Transportation Innovation

EASE

DriveOhio's Rural Automated Driving Systems (ADS) Project

EASE Logistics is the host fleet partner for DriveOhio's testing of automated driving systems (ADS), helping demonstrate how connected and automated semi-trucks could improve safety for drivers, passengers, freight, and communities in rural settings.

Goals

- 1 Safety
- 2 Data collection for analysis and rulemaking
- 3 Community & Industry Impact
- 4 Collaboration



DriveOhio's I-70 Truck Automation Corridor (TAC) Project

EASE and KRATOS Defense & Security Solutions, Inc. have partnered with DriveOhio, ODOT, and INDOT to test automation across Ohio and Indiana. Join the movement to support drivers with automated technology to optimize efficiency and safety.

Goals

- 1 Improve crash-avoidance capabilities
- 2 Reduce fuel consumptions
- 3 Increase productivity
- 4 Increase acceptance of technology





Rural Automated Driving Systems

The Goals

Demonstrate how **connected and automated semi trucks and passenger vehicles** could improve safety for drivers, passengers and other travelers in **rural settings**

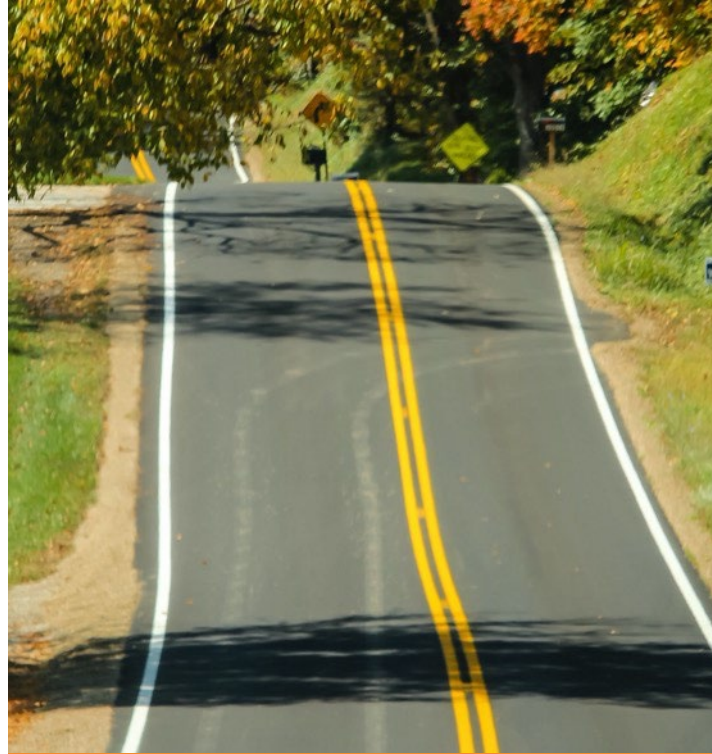
Help define technology needs and limitations and inform the **safe scaling** of future deployments



Rural Challenges



Curvy, hilly terrain



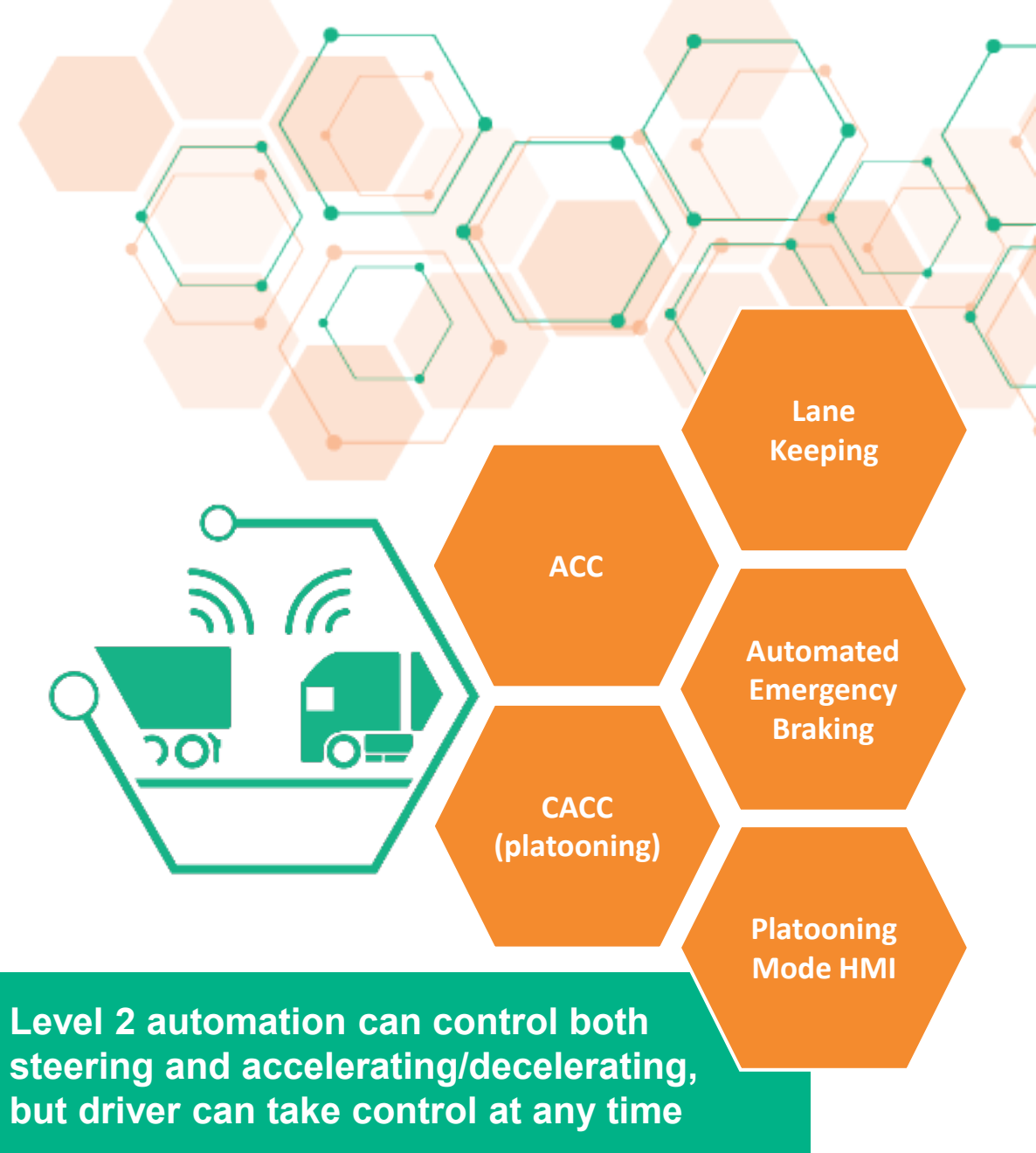
Limited sight distances



Shaded tree canopies, limited internet

Truck Automation

- Will test partial, Level 2 automation technology in single tractor and platoon modes
- Platooning links two or more vehicles via technology
- Will collect data in-revenue service on public roads with host fleet



Automated Driving Systems & Platooning

ADS Technology Features

Operational Deployment

- Truck and Trailer agnostic system
- Hardened for Winter deployment
- Capture Unique “Human vs. Machine” data
- Day/Night/Twilight and Harsh Environment operation

How Platooning Works

- Platoon-equipped tractor-trailers are connected by automation technology.
- Both trucks are equipped with radar to detect other vehicles and monitor and adjust to the changing environment.
- The lead vehicle controls the speed, braking, acceleration for both vehicles.
- EASE’s team of highly vetted and specialized EASE drivers have undergone 400 hours of training at Transportation Research Center (TRC) to operate these trucks.

Primary Objectives

- Reduced risk of driver fatigue.
- Reduced risk of over-weighting trucks.
- Reduced risk of speeding and other traffic violations.
- Reduced stress of all involved because a driverless option is now available.

**THE GOAL IS NOT TO ELIMINATE THE DRIVER,
BUT RATHER TO OPTIMIZE EFFICIENCY AND
SAFETY.**

Lane Selection Criteria*

- Orders booking more than 24 hours out
- Utilizing equipment limited to box truck, power only, sprinter vans, dry van, van teams
- Routes under 450 miles roundtrip
- Running in year 2023



Rural ADS Project Rollout



First Customer Freight Shipment Deployment



NBC4: Semitruck Automation on Rural Roads



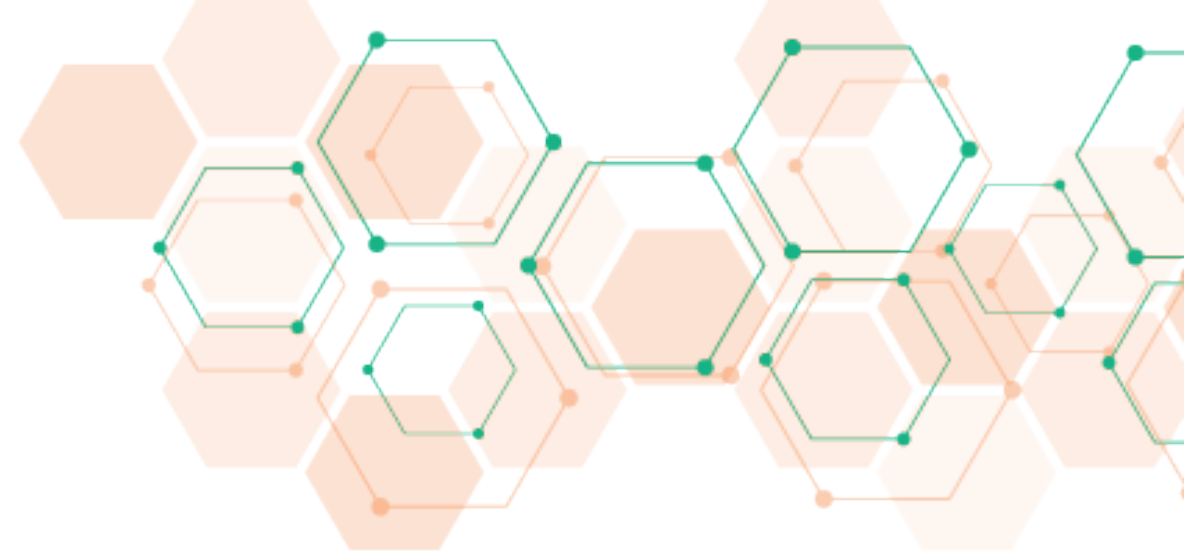
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I-70 Truck Automation Corridor



Anticipated Project Outcomes



- **Safety**

- *Improve crash avoidance capabilities*
- *Reduce driver stress*



- **Environment**

- *Reduce fuel consumption and emissions output*



- **Efficiency**

- *Increase labor productivity*
- *Positive return on investment*



- **Acceptance**

- *Improve fleet and driver acceptance of automated vehicle technology*
- *Mitigate barriers to adoption*

Operational Scenarios

1. Trucks enter/exit the interstate
2. Trucks interact with other vehicles and users
3. Truck navigates around a roadway obstacle and/or accommodates a stopped vehicle
4. Truck responds to a dramatic change in weather conditions
5. Truck responds to dramatic change in traffic conditions
6. Truck traverses an interstate work zone

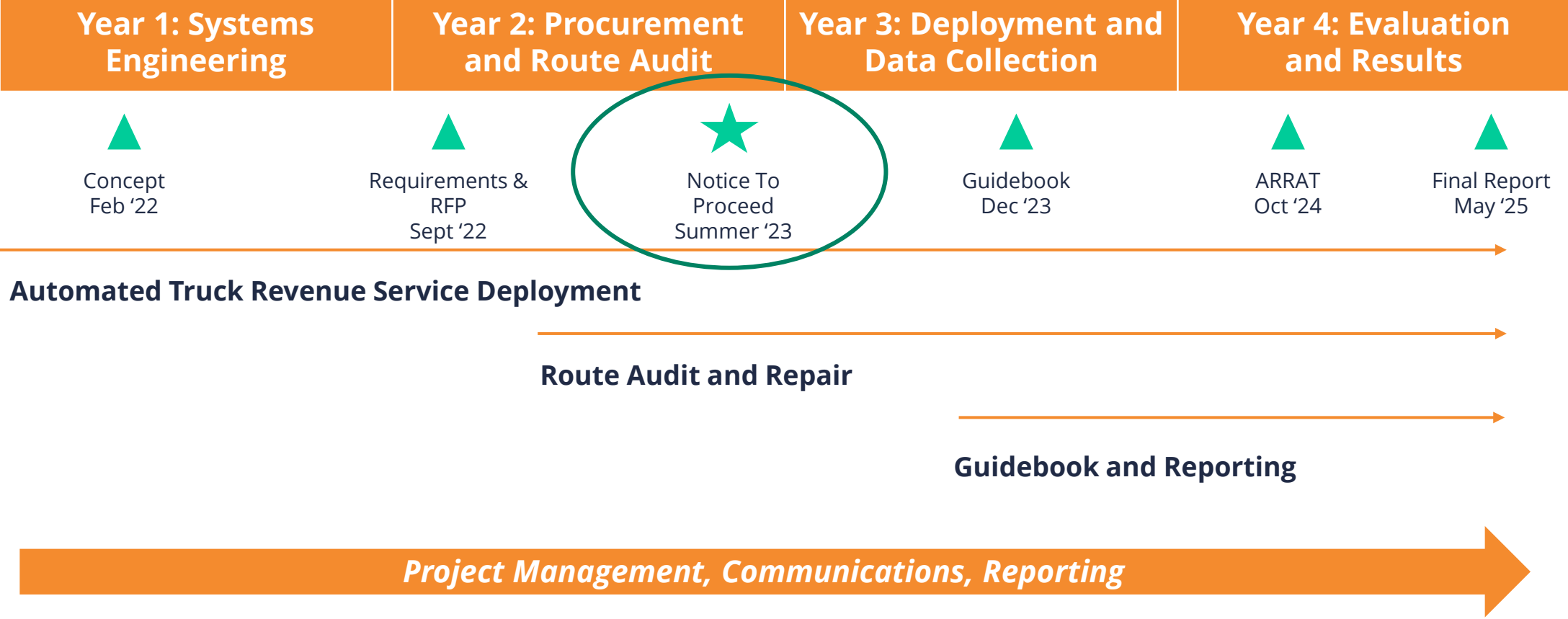
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Project Status



High Level Timeline



MAJOR MILESTONES

Concept Feb '22

Requirements & RFP Sept '22

Notice To Proceed Summer '23

Guidebook Dec '23

ARRAT Oct '24

Final Report May '25

Automated Truck Revenue Service Deployment

Route Audit and Repair

Guidebook and Reporting

Project Management, Communications, Reporting



Recent Milestones

- Outreach and engagement with fleets and developers: March – December 2022
- RFP #1 Release: September 27, 2022
- Selection/Award: January 2023
- NTP: September 2023 (anticipated)
- RFP #2: November 2023 (anticipated)



Deployment Teams



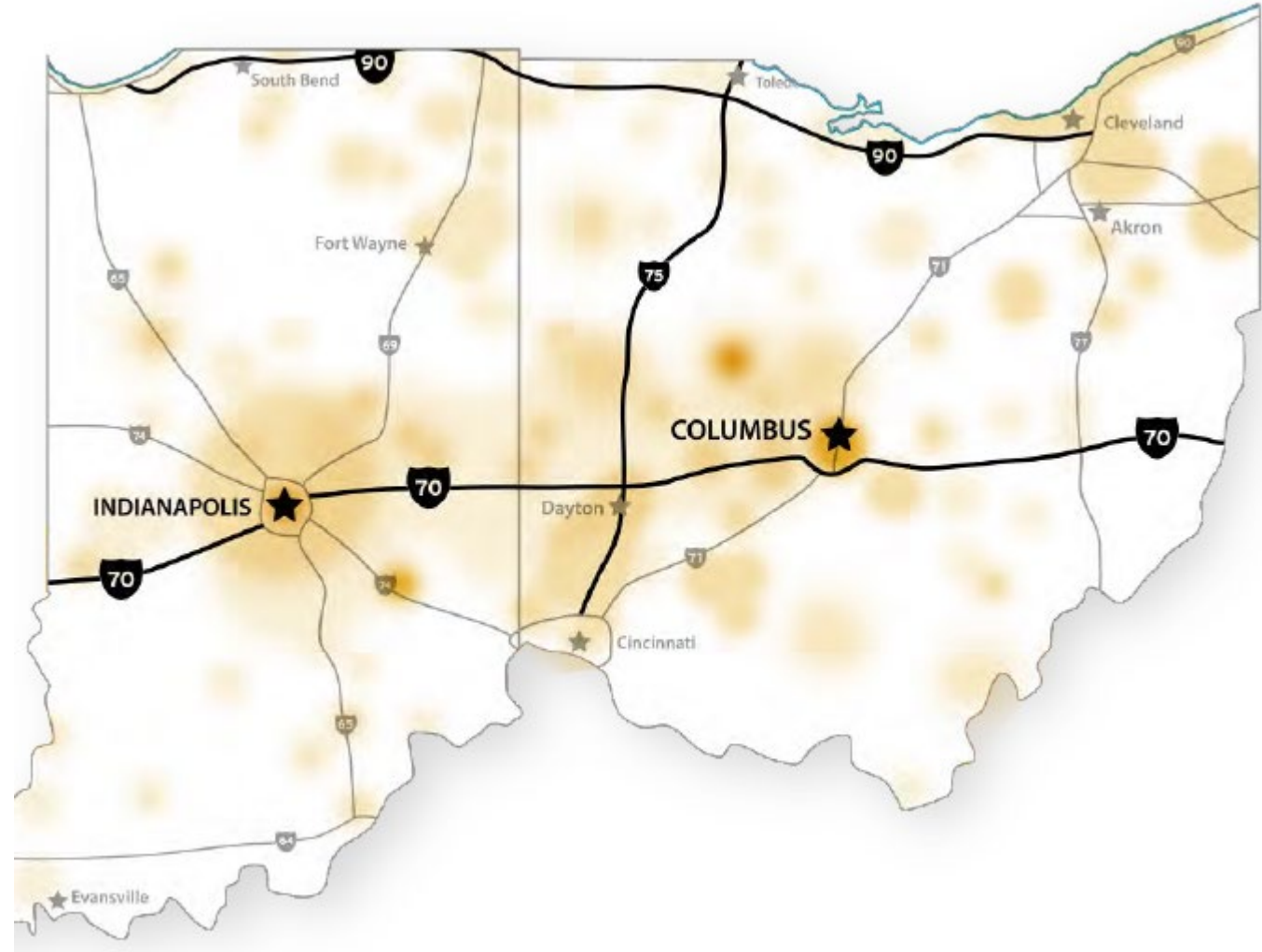
Team 1: Truck Platooning

- Ease Logistics:
 - EASE (3rd party logistics)
 - EASE Expedited (truck assets):
 - 2 tractors
 - Multiple trailers
- Kratos:
 - Leader/Follower Platooning (retrofit)



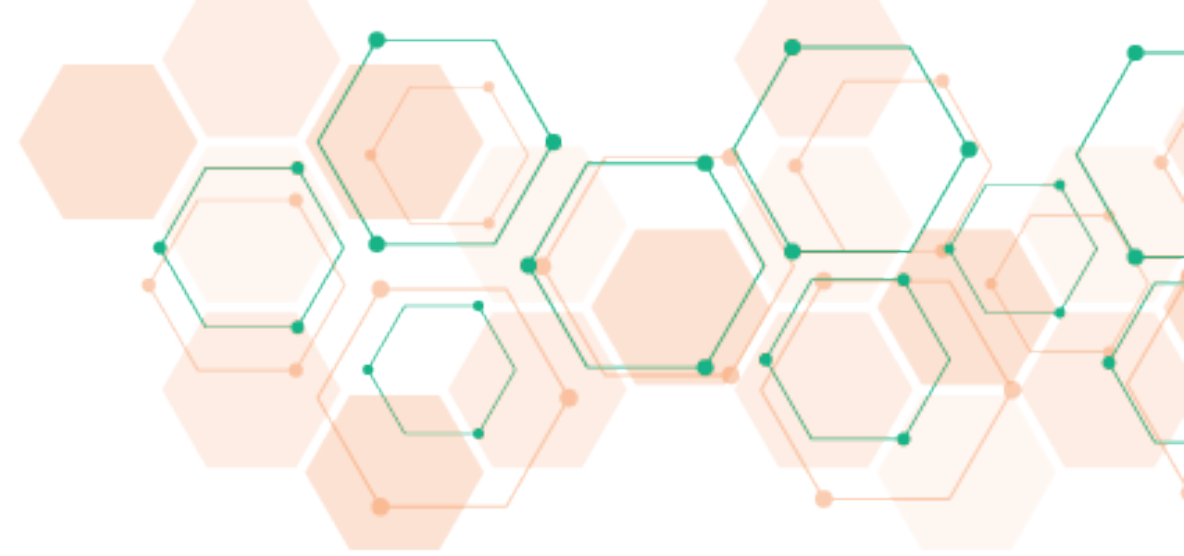
Team 1: Routing and Volumes

- Daily lanes
- 15.5K revenue generating routes annually
- Plan routes to hook up mid-transit to maximize platooning



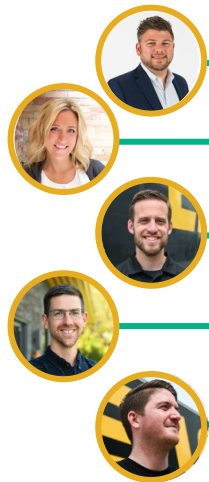
Team 1: Objectives

- Reduce driver fatigue
- Reduce over-weighting trucks
- Reduce risk of speeding and other traffic violations
- Reduce stress



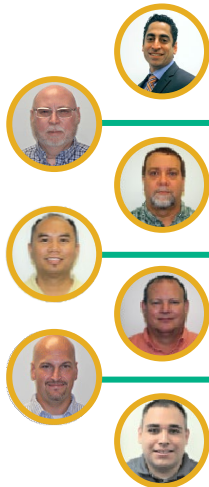
I-70 Truck Automation Corridor Project Partners

EASE ROLE: FLEET PROVIDER



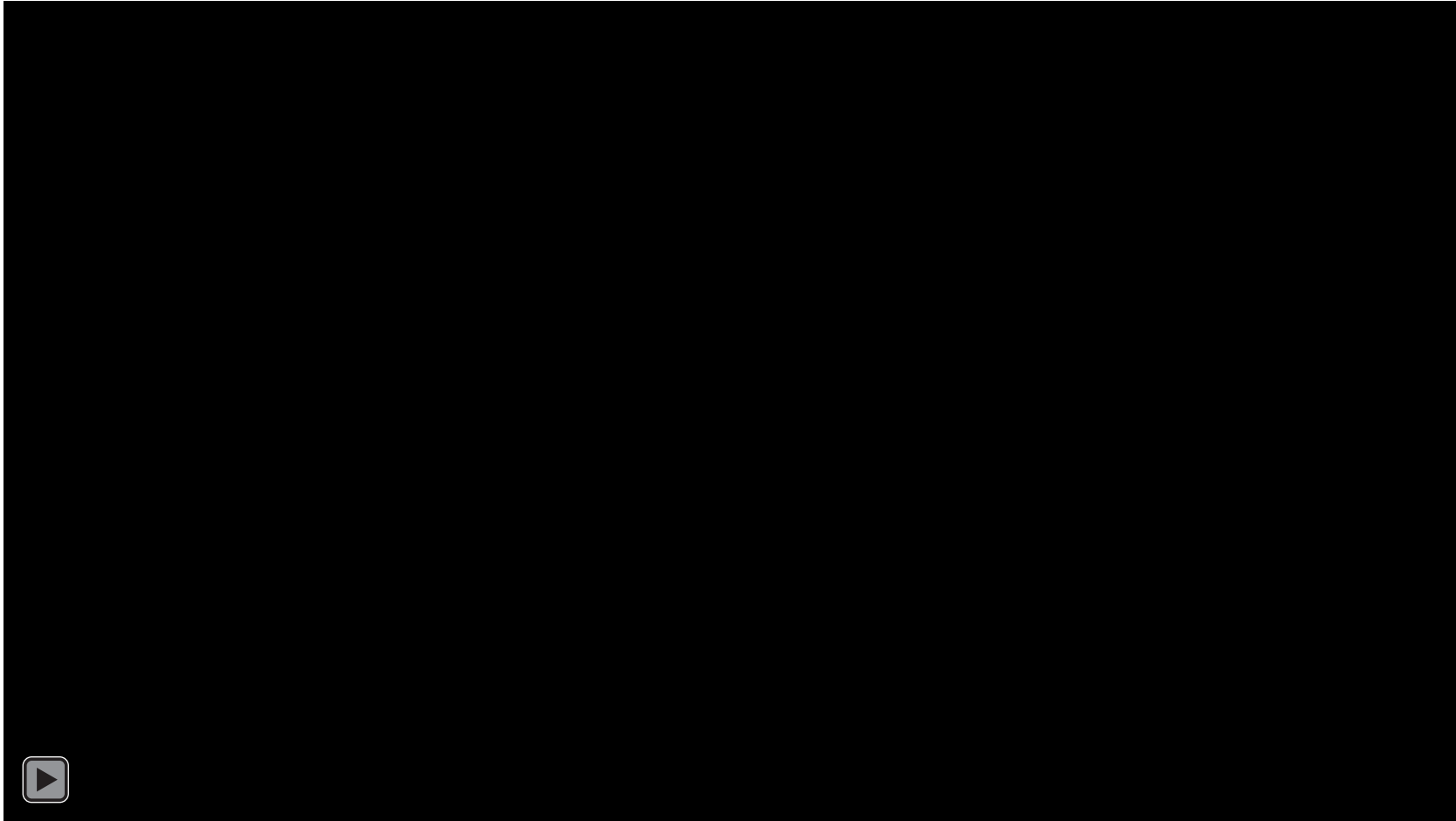
INDIVIDUAL	RESPONSIBILITIES & ASSETS
PETER CORATOLA JR EASE President & CEO	TRUCKING FLEET PROVIDER AND MANAGEMENT CENTER <ul style="list-style-type: none"> • Provide shared program management • Provide CDL Drivers (leader vehicle and follower Safety Rider) • Provide Trucks • Support Testing/Training • Deployment to I-70 Routes • Provide back-office logistics support • Support logistics data collection, formatting, and analysis support ASSETS <ul style="list-style-type: none"> • 2 tractors • Multiple trailers, based on revenue generating lanes
ABBI FAILLA* Director of Strategy and Innovation <i>* Primary Point of Contact</i>	
MATTHEW BIRDSALL EASE Expedited Manager	
BEN HOGUE EASE Expedited Safety Manager	
JOSH MCMULLEN EASE Corporate Development Manager	

KRATOS ROLE: ADS TECHNOLOGY PROVIDER



INDIVIDUAL	RESPONSIBILITIES & ASSETS
MAYNARD FACTOR VP, Business Dev. <i>* Primary Point of Contact</i>	ADS TECHNOLOGY DEVELOPER <ul style="list-style-type: none"> • Provide ADS technology • Retrofit EASE trucks • Support calibration and test • Provide system training • Provide preliminary deployment support • Provide technical and program support • Support ADS data collection, formatting, and analysis support ASSETS <ul style="list-style-type: none"> • Leader/Follower Platooning (LFP) ADS technology kits (leader and follower vehicle kits)
TODD MONTGOMERY Sr. Program Manager, PMP	
GLEN LARMORE VP, Engineering	
WON KYAW Sr. Software Engineer	
MARK BLECHINGER Sr. Mechanical Engineer	
RONALD MAAS Sr. Systems Engineer	
ZACHARY RAMIREZ System Integrator	

Kratos Autonomous Systems



What's Next



RFP Overview

Deployment Teams

- Integrated teams (i.e. technology provider(s) and fleet)
- Reflect multiple organizations representing the intended audience

Multiple Awards

- Deployment of L2 and L4

Deployment

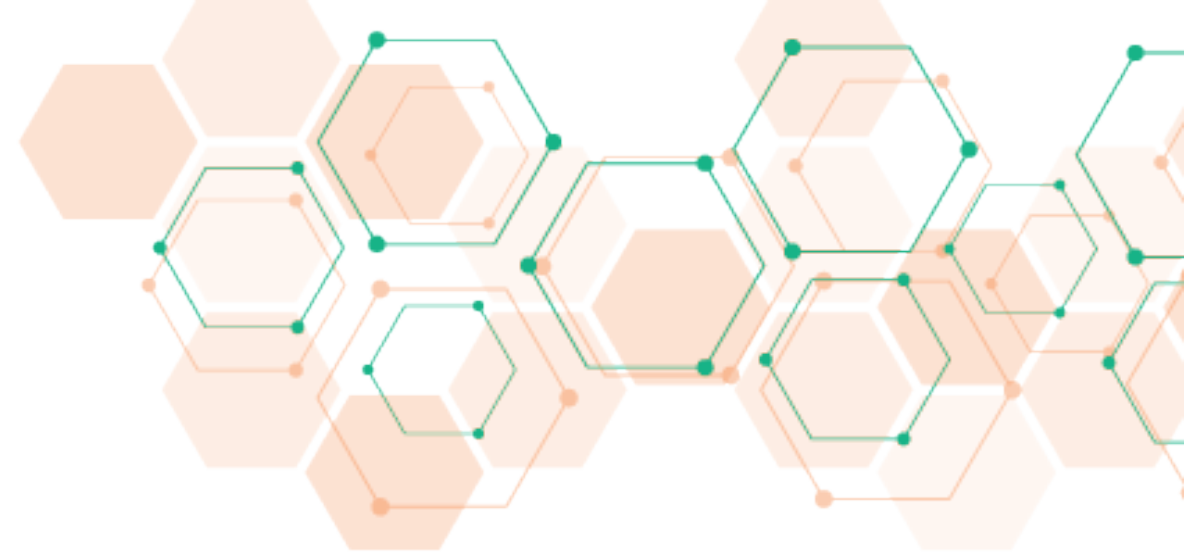
- Flexible start
- Minimum of 3 months of data (longer if possible)
- Data collection complete by December 2024



RFP Overview

Program funding available for:

- **Equipment** (Commercial Tractor or Truck/Trailer Combo)
 - Technology Installation
 - Maintenance of equipment during deployment period
- **Labor** (Training, on-boarding, project survey time, etc.)
- **Telematics** (New telematics solution)
- **Technology** (New technology installation/deployment)
- **Data** (from existing telematics device, from new or existing , L2, L4 technology provider)





Long-term and Sustainable



TRUCK AUTOMATION CORRIDOR

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Questions?

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