

U.S. Department of Transportation
Notice of Funding Opportunity (NOFO) # 693JJ319NF00001
“Automated Driving System Demonstration Grants”

Demonstrating Automated Driving Systems (ADS) through Highly Automated Systems (HAV) supporting Emergency Response Operations (ADS -HERO)



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MARYLAND TRANSPORTATION AUTHORITY



ADS-HERO

VISION

The safe integration of ADS into emergency response and traffic incident management operations on the nation's roadway network.

MISSION

To inform ADS technology advancement and the adaptation of transportation and emergency response procedures through demonstration tests of ADS interactions with emergency responders.



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PARTICIPATING PARTNERS

Lead Entity:
University of Maryland
Center for Advanced
Transportation
Technologies



Program/ Project
Management Lead - WSP



Human Factors Lead - Westat



Test Site – U. S. Army Aberdeen
Test Center

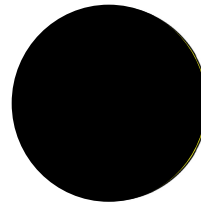


Maryland
Transportation
Authority

Agency Lead – Maryland
Transportation Authority



Stakeholder – Maryland
Transportation Authority Police



Stakeholder – Anne Arundel
County Fire Department



Stakeholder – Local Motors,
Inc.

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DEMONSTRATION SCENARIOS

Scenario 1 – Leveraging ADS for Incident Scene “Approach” Demonstrations

Images by Unknown Author(s)



ADS vehicle
approaching an
incident scene
obstructing a lane.



VARY SPEED.



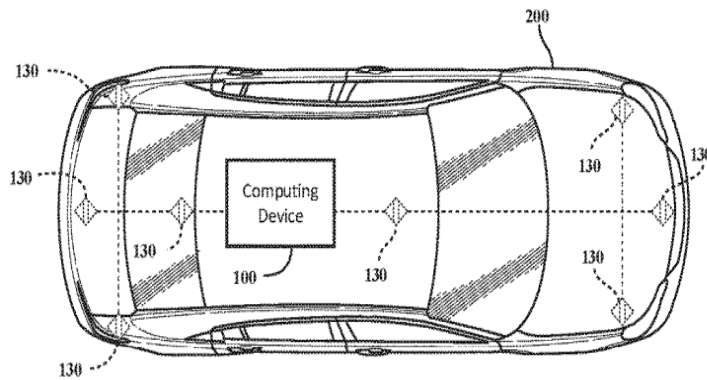
VARY LANE and
TYPE of
OBSTRUCTION.



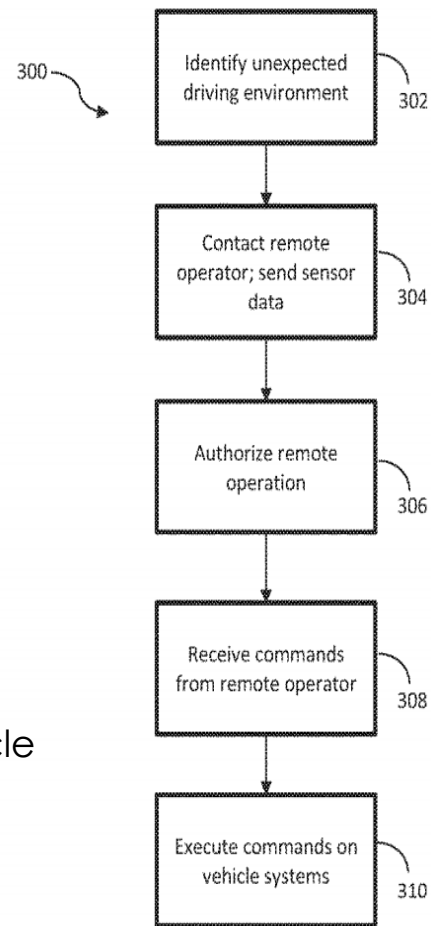
VARY ADS and
CONNECTED
VEHICLE
CAPABILITY of
RESPONDERS

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State of the Art: Scenario 1 – “Approach”



Patent Application Sample – Toyota's
Remote Operation of Autonomous Vehicle
in Unexpected Environment
Date filed: 10/28/2016



Background: As ADS in test mode move towards a time when safety operators are no longer required in every vehicle – some companies are proposing teleoperation — or remote guidance — as a safety feature.

- ▶ AV companies operate a tele-ops command center where trained drivers are prepared to offer guidance if an AV encounters a situation that's confusing, like a construction zone or a double-parked car.
- ▶ Sometimes, an operator is even able to remotely take control of the vehicle to steer around the obstacle and get it back on track.

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DEMONSTRATION SCENARIOS

Scenario 2 – – Leveraging ADS for “Move Over” Demonstrations

Images by Unknown Author (s).

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ADS vehicle being
approached by an
emergency vehicle



LIGHTS ACTIVATED.
VARY COLOR - Red,
Blue, Yellow, White



VARY - SIREN
ACTIVATED / NOT
ACTIVATED



VARY ADS and
CONNECTED VEHICLE
CAPABILITY of
RESPONDERS

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State of the Art: Scenario 2 - “Move Over”



- ▶ In 2017, 10 law enforcement and 10 firefighter personnel were struck by vehicles.
- ▶ In the ten year period between 1997 to 2007 more than 150 law enforcement officers were struck and killed by vehicles along the nation's highways.
- ▶ Injury and Fatality numbers are significantly higher when highway maintenance, safety patrol and towing personnel are included.

Statistics from the Law Enforcement Memorial Fund and the National Fire Protection Association

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DEMONSTRATION SCENARIOS

Scenario 3 - Leveraging ADS for “Pull Over” Demonstrations

Images by Unknown Author(s)

8



ADS vehicle being
approached by a
Police Vehicle



LIGHTS ACTIVATED



VARY – SIRENS
ACTIVATED / NOT
ACTIVATED



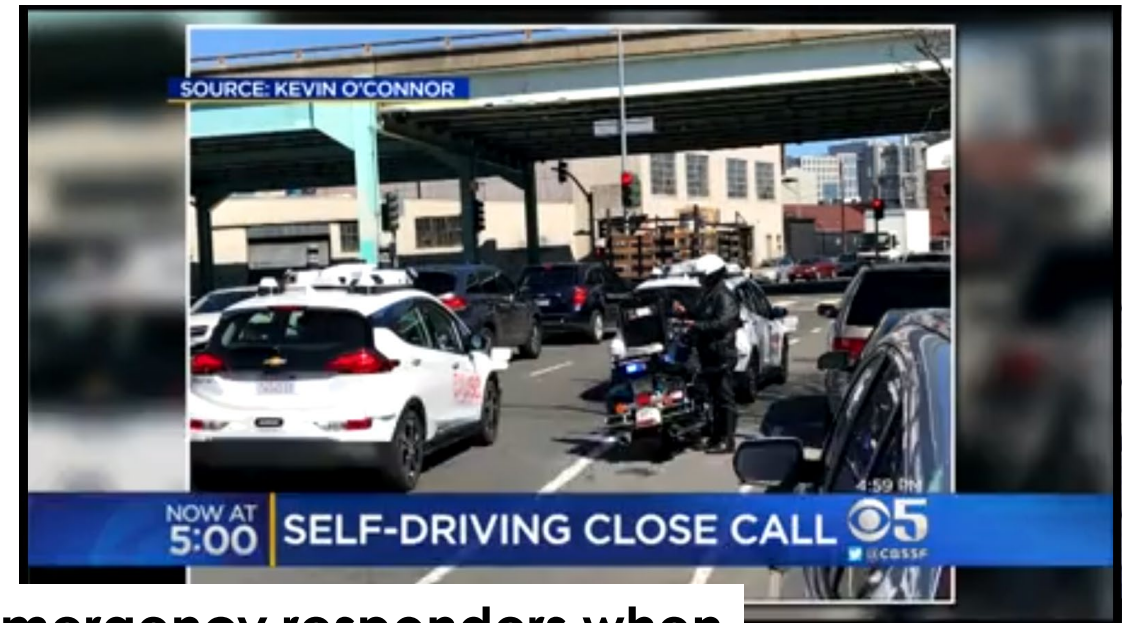
VARY ADS and
CONNECTED VEHICLE
CAPABILITY of
RESPONDERS

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State of the Art: Scenario 3 – “Pull Over”



HEADLINE: First Ever Automated Vehicle Ticket!
Screenshot: San Francisco KPIX5 - March 27, 2018



Will an ADS vehicle pull over for emergency responders when safety drivers are no longer required to be in the vehicle?

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DEMONSTRATION SCENARIOS

Scenario 4 - Leveraging ADS for “Compliance” Demonstrations

Images by Unknown Author(s).

10



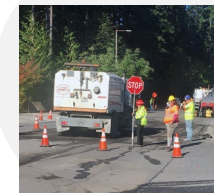
ADS approaching
incident scene being
directed by hand signals
or other devices to
proceed against
“normal” rules of the
road.



EMERGENCY
CLOSURE



EMERGENCY TURN
AROUND / DETOUR

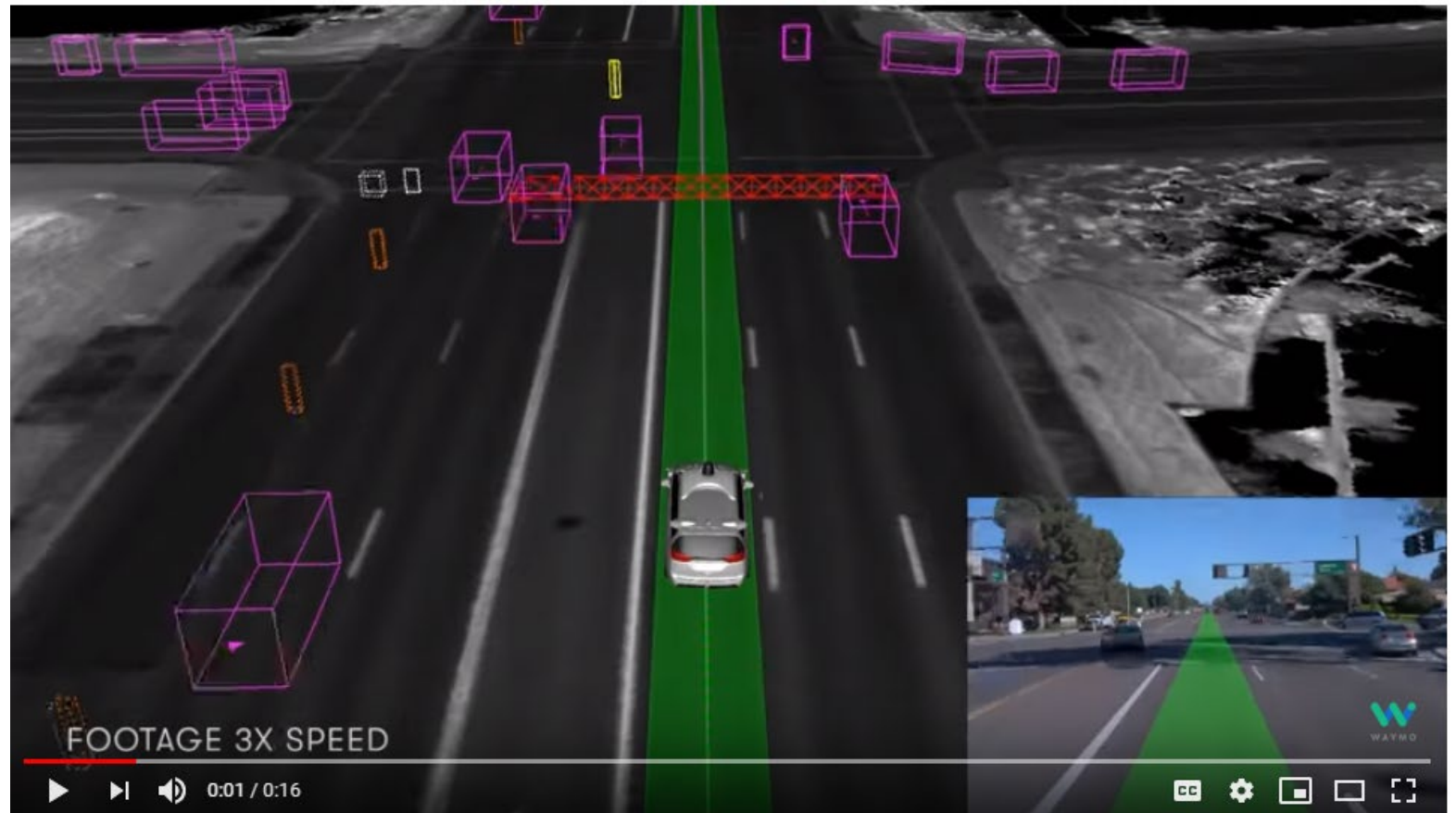


LONG TERM CLOSURE

ADS-HERO

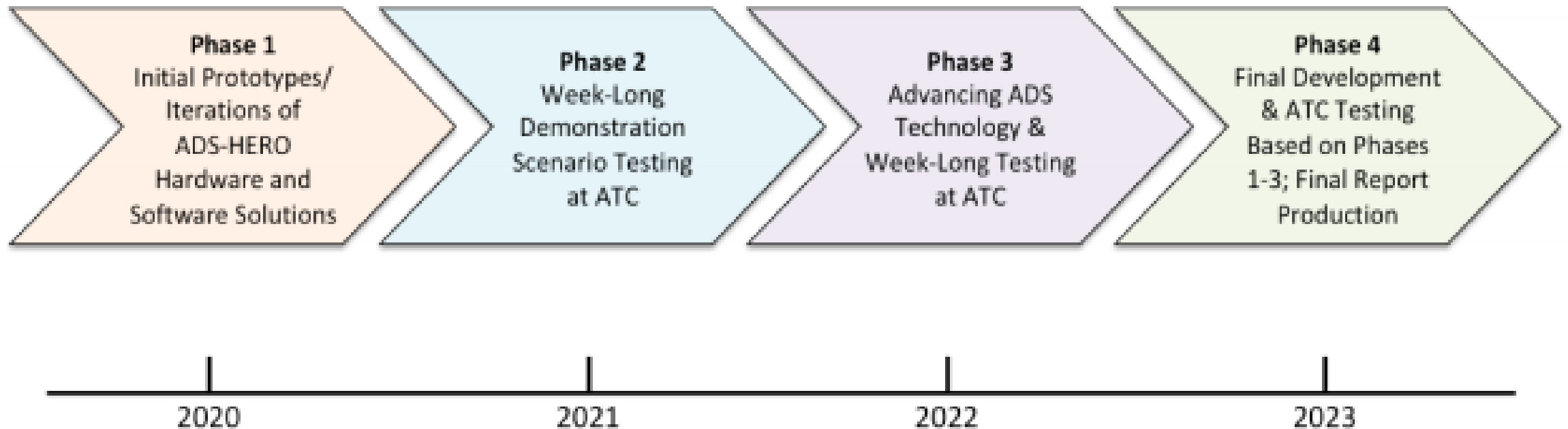
State of the Art: Scenario 4 – “Compliance”

<https://youtu.be/OopTOjnD3qY>



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Project Phases & Schedule



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Test Facility

- U.S. Army Aberdeen Test Center

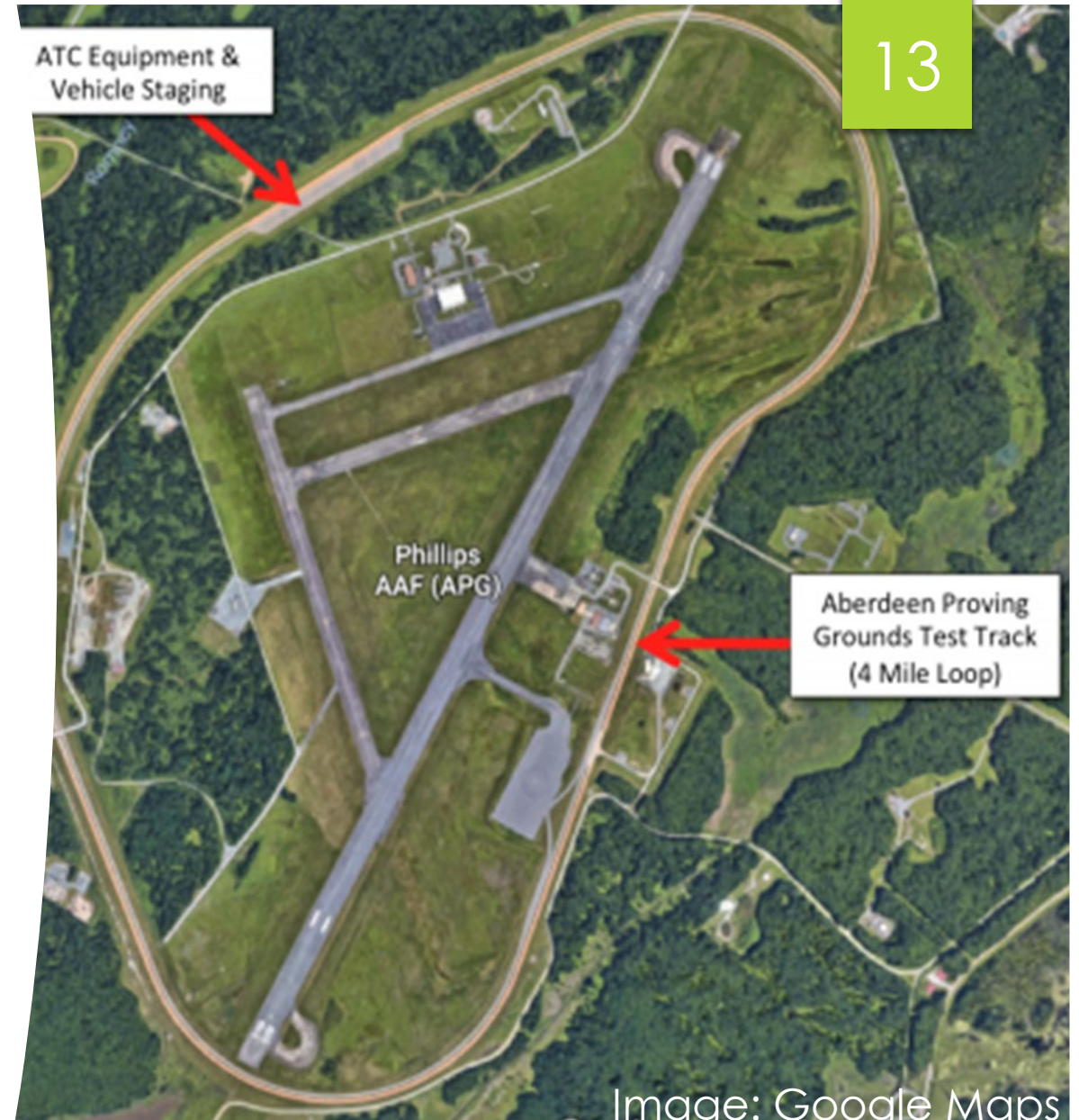


Image: Google Maps

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Technical Approach Overview

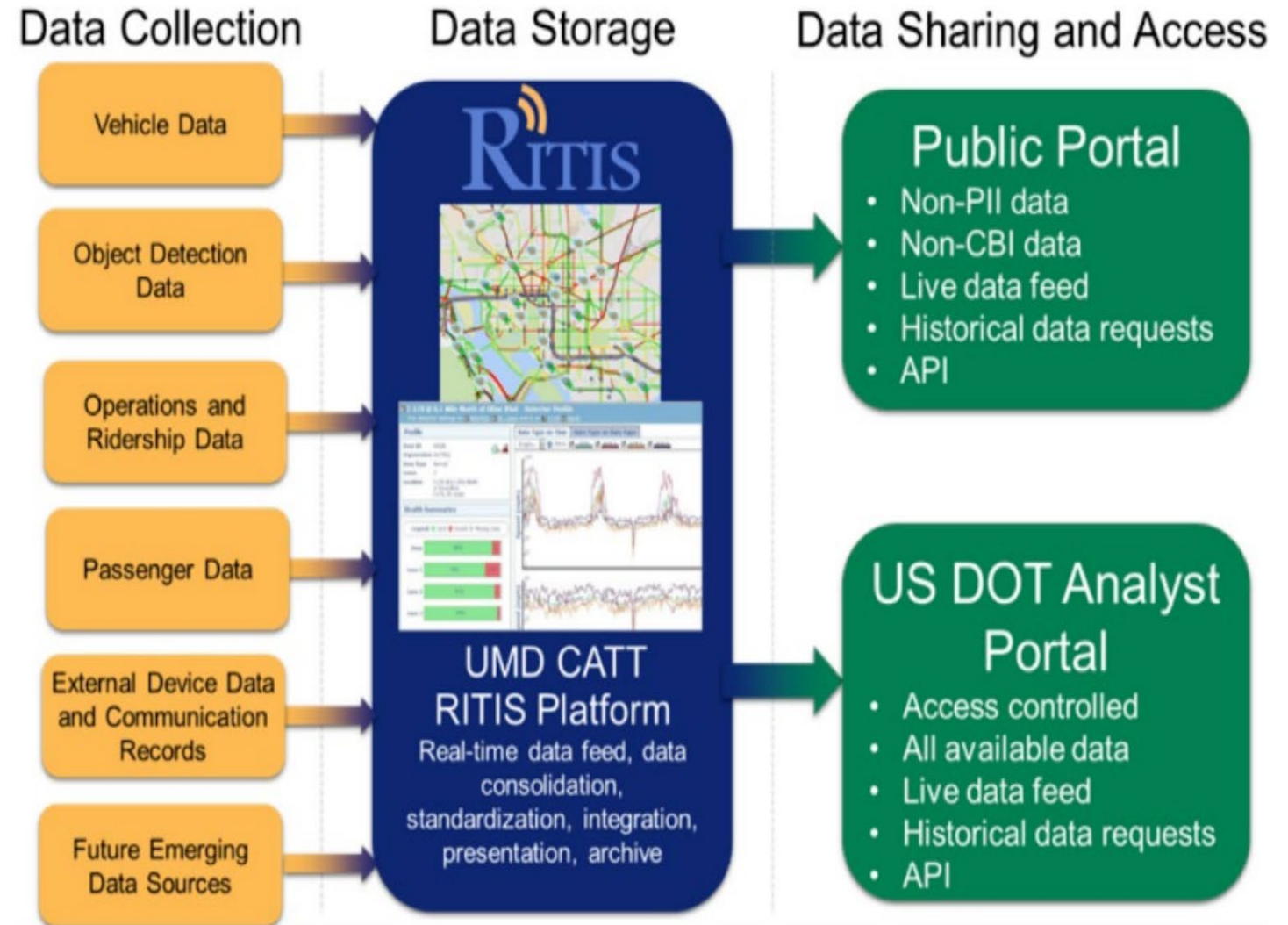
➤ Annual Cycle



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Data Management

- Collection
- Storage
- Sharing and Access



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Project Support



Westat	Commitment
WSP	Commitment
Maryland Transportation Authority	Commitment
Anne Arundel County Fire Department	Commitment
Local Motors, LLC	Commitment
Maryland U.S. Congressional Delegation	Support
Maryland Department of Transportation	Support
Maryland State Senator Robert Cassilly	Support
Maryland State Senator Pamela Beidle	Support
Maryland State Delegate Kathy Szeliga	Support
Maryland General Assembly Legislative District 21	Support
International Association of Fire Chiefs	Support
Maryland Chiefs of Police Association	Support
I-95 Corridor Coalition	Support
Emergency Responder Safety Institute	Support
Baltimore Regional Transportation Board	Support

THANK YOU!!

If you are an emergency responder and/or an ADS developer please let us know if you are interested in participating in the demonstration testing and/or a focus group.

