



Automated Transportation Update

September 29, 2021

Presentation Overview

- 
- Iowa AT Council & Iowa AT Vision
 - Vehicle & Device Sensors
 - Engagement & Guidance
 - Opportunities & Next Steps

Iowa Advisory Council on Automated Transportation

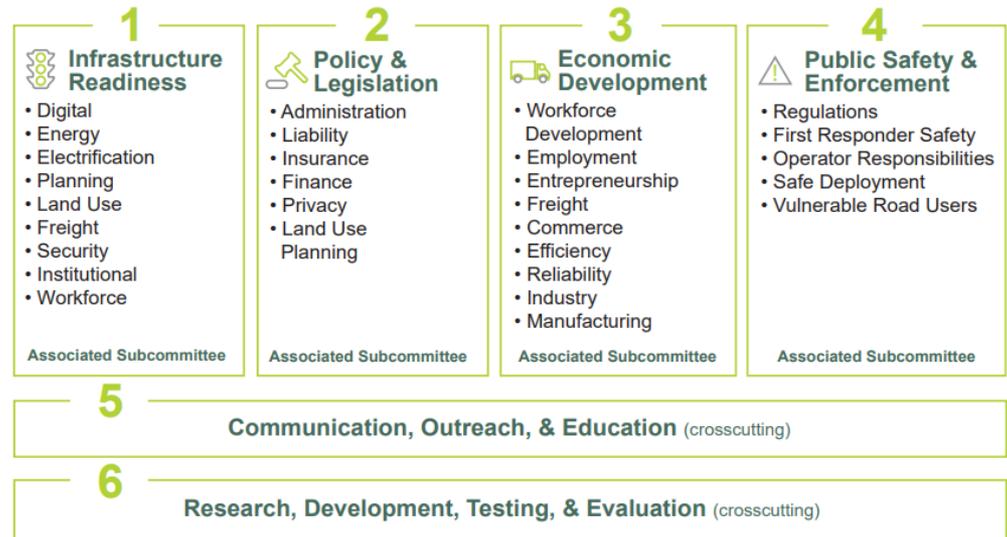
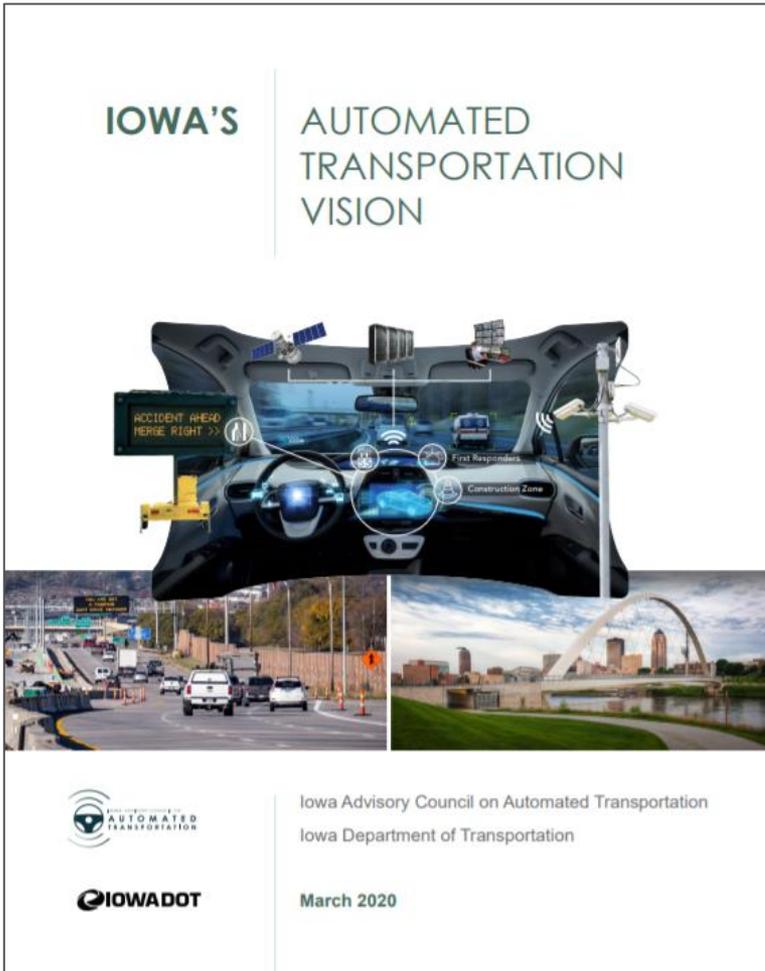


Figure 2. ATC Strategic Objective Areas

<https://iowadrivingav.org/pdf/ATC-Vision.pdf>

Iowa AT Vision



Policy & Legislation

Desired Outcome

- Community Readiness

Tactics

- Ensure CAT in Planning
- Improve Equity & Accessibility (MaaS/MOD)



Public Safety & Enforcement

Desired Outcomes

- Adapt to Changing Laws (e.g. [HF304, 2021 Session](#) - PDD bill)
- Promote Crash Data & Investigation
- Explore Vehicle Automation Indications

Tactics

- Capture AV Crash Data
- Address VRU Safety

Preparing for an AT-Ready Iowa

ATC Engagement



Vehicle & Device Sensors

Camera: surrounding light shines on objects and is reflected, being detected or seen by a camera.

Radio Detection & Ranging (RADAR): radio waves are emitted and reflected to determine if objects are within a path or nearby.

Light Detection & Ranging (LIDAR): light pulses are emitted and reflected to determine if objects are within a path or nearby

The “Big Three” Sensor Modalities

	CAMERA	RADAR	LIDAR
RESOLUTION	Good	Poor	Fair
OBJECT DETECTION	Fair	Good	Good
OBJECT CLASSIFICATION	Good	Poor	Fair
RANGING/ DISTANCE ESTIMATION	Fair	Good	Good
MAXIMUM RANGE	Fair	Good	Fair
LOW LIGHT PERFORMANCE	Poor	Good	Good
BAD WEATHER PERFORMANCE	Poor	Good	Fair
COST	Good	Good	Poor

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Vehicle & Device Sensors



Source: AV International

Infrared/ Thermal:

Subset of cameras, use heat (not light) to detect objects



Source: Teledyne FLIR

Perception of foggy night using regular camera (left) where only one of the two pedestrians is slightly visible vs after Plus's proprietary thermal augmentation (right)

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Vehicle & Device Sensors



Source: [Rainbow road sign film would be easier for autonomous vehicles to read](#) | New Atlas

Engagement & Guidance





Sections:

Background

Guidelines for Testing Personal Delivery Devices

- 20 Jurisdiction Recommendations
- 2 Manufacturer and Other Entity Recommendations

Guidelines for Deployed Personal Delivery Devices

- 5 Considerations for Jurisdictions

Benefits of Implementing the Recommendations

Challenges to Implementing the Recommendations

Conclusion

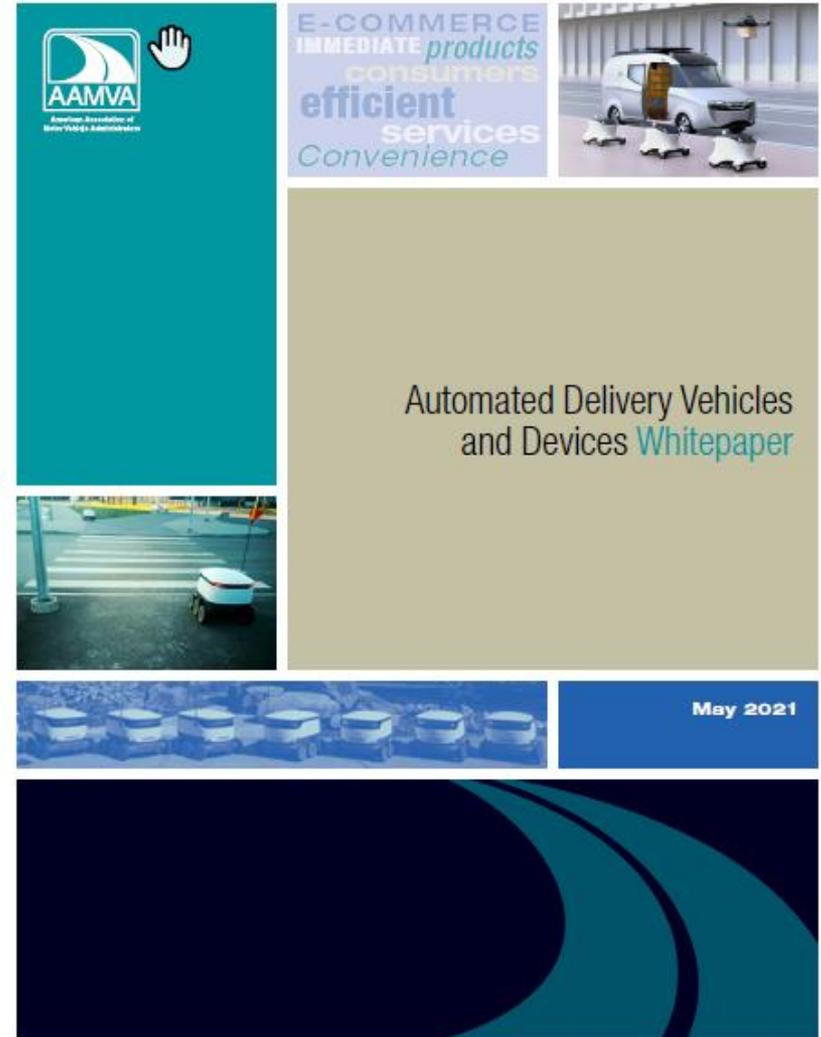
Definitions and Acronyms

Additional Recommended Resources

Members

Document available at:

[AAMVA - Best Practices and Model Legislation](#)



Preparing for an AT-Ready Iowa

Automated Delivery Vehicles (ADV)



Nuro R2



Refraction REV-1

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Personal Delivery Devices (PDDs)

Amazon Scout



FedEx Roxo



Starship Robot



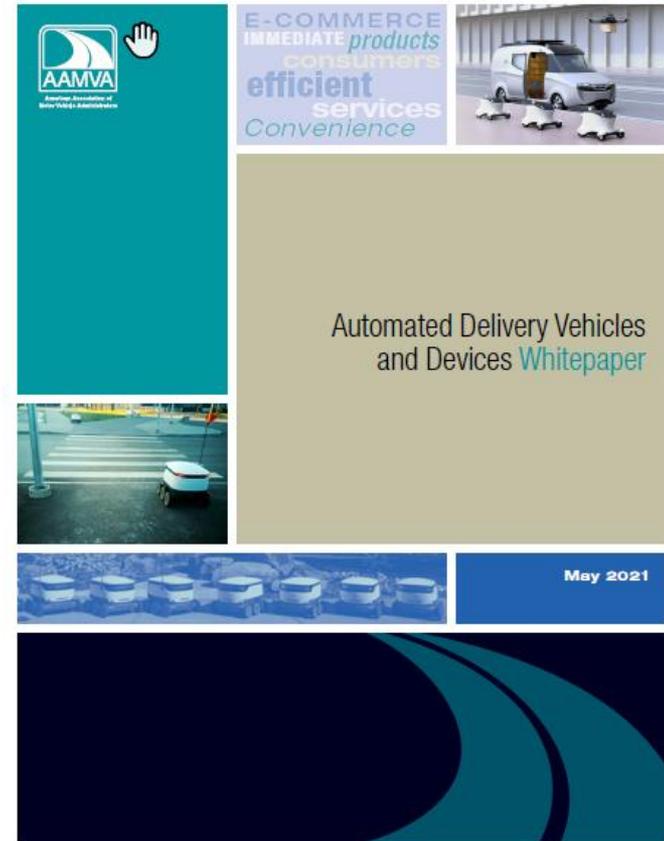
Top Lessons Learned:

1. Clear distinction between vehicles

- Automated Delivery Vehicles (ADV) operating within vehicle infrastructure should be subject to jurisdictional motor vehicle regulations
- Personal Delivery Devices (PDD) operate in pedestrian / bicycle spaces and should not be subject to jurisdictional motor vehicle regulations
- Local registration of PDD could be considered based on local needs

2. Jurisdictions should develop oversight processes for PDD involving state, local and enforcement agencies

- Provide clear guidance for how to operate on sidewalks and/or roadways
- Detail requirements for testing, braking, operation, visibility and other factors
- Establish protocols for emergencies and enforcement interaction



Opportunities & Next Steps

- Continued pursuit of the Iowa AT Vision tactics
- Continue monitoring technology advancements and research involving VRUs
- Tentative ATC engagement
 - Starship Technologies (PDD)
 - Community Deployment Experience of PDDs (e.g., Madison, WI)
 - Beep Autonomous (low-speed shuttle)



THANK YOU!



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