

MEETING NOTES

Iowa Advisory Council on Automated Transportation

Wednesday, December 4, 2019

1:00-3:00PM

Iowa League of Cities

500 SW 7th Street, Suite 101, Des Moines

1. Welcome – Mark Lowe (5 minutes)

Attendees:

- Mark Lowe (ATC Chair), Donna Matulac, Adam Shell, Andrea Henry, Andy Lewis, Susan Fenton, Steve Gent, Mikel Derby, Garrett Pedersen, Daniel Yeh, Rianna Lane – Iowa DOT
- Dylan Mullenix (Policy & Legislation Subcommittee Chair) – Des Moines Area MPO
- Rick Peterson (Economic Development Subcommittee Chair) – Iowa Economic Development Authority
- Catherine Lucas – Iowa Department of Public Safety – Delegate for Stephan Bayens and Nathan Fulk (Public Safety & Enforcement Subcommittee Chair)
- Erin Mullenix (Infrastructure Readiness Subcommittee Chair) – Iowa League of Cities
- Don Egli – Iowa Motor Truck Association
- Travis Grassel – Iowa Insurance Division
- Danny Waid – Iowa County Engineers Association Service Bureau
- Brian Best – Iowa House of Representatives
- Daniel McGehee, Omar Ahmad, Anna Dizack, Jacob Heiden – University of Iowa
- Neal Hawkins – Iowa State University
- Peter Rafferty – Gannett Fleming
- Mike Carberry – Green State Solutions
- John Davis – City of Des Moines
- Jennifer Banta – Iowa City Chamber of Commerce
- FLL Aztechs – First LEGO League 2019 Cityshapers Team (Waukee)

2. First LEGO League 2019 Cityshapers competition – Dylan Mullenix and First LEGO League Aztechs team (15 minutes)

<https://www.facebook.com/fllaztechs2019>

<http://www.firstlegoleague.org> .

- a. Opportunity to do STEM for the kids and learn more about robotics
- b. Cityshapers theme this month - impact of AVs
 - i. Highlighted human error was only incorporated after horse-drawn carriages were replaced by automobiles
 - ii. Need for data redundancy

- c. Jared Kirby delegate asked question about how weather would impact AVs
- d. Peter Rafferty asked the kids how they would like to ride in an AV
- e. FLL leader comments on younger perspective

3. Subcommittee Updates (25 minutes)

- a. Policy & Legislation/Public Safety & Enforcement – Dylan Mullenix
 - i. Last meeting in November had similar items cover today
 - Discussion on equity was interesting to Dylan and something need to wrestle with going forward -- how make transportation more accessibility for variety of users
 - Peter update on the ATC Vision and summarizing the key feedback on the tactical items
- b. Economic Development/Infrastructure Readiness – Rick Peterson and Erin Mullenix
 - i. Erin
 - Interactive experience Peter led through identifying and prioritizing the tactics of the ATC Vision
 - Update on the communications efforts
 - Minidi Ngyuen update on the accessibility issues
 - Adam discussed the CAT Challenge opportunity
 - ii. Rick
 - Good idea to emulate other states. Still need to figure out funding mechanism
 - iii. Donna comment on combining subcommittees to get similar themes and cross pollination discussed

4. ATC communications update – Andrea Henry (10 minutes)

- a. Continue to bring forward items from the subcommittees and other key stakeholders
- b. Some emerging topics that have communication needs in the near future but not immediate
- c. Request for additional communication staff to support this group
- d. Website is available and up and running - <https://iowadrivingav.org/>
 - i. Currently only sharing meeting notes but working to expand this
 - ii. Comment on the SharePoint site and putting a link on the resources page and must sign-in if a member of the Council and have access
 - iii. Working on migrating the contact page to a general email address
 - iv. Splitting the AT Council resources and docs into separate pages - look at providing a resource and education page --- few critical resources and pages have been identified and will be put on the website
- e. No questions on the website when Andrea asked
 - i. Encouraged the group to provide feedback if they have any
- f. Branding Materials update
 - i. PowerPoint and handout template on SharePoint
 - ii. Logo being developed and discussed next meeting
- g. Communications and Response Plan
 - i. Emphasized *incident* response plan, not disaster response
 - ii. Need to be in position to respond positively – develop talking points

- h. Donna reinforced Andrea's comments about letting us know what we want on the website – this is an ATC website, not a DOT website
- 5. Break (10 minutes)
- 6. MAASTO CAV Summit – Mark Lowe (10 minutes)
 - <https://topslab.wisc.edu/cav/#maasto-cav-summit>
 - a. Takeaways
 - i. Common thoughts by states on where to go with things such as tech and policy
 - ii. Differences by states such as the size of staffing with MNDOT CAV-X team having several members
 - b. Through MAASTO, can use collective resources to develop pooled fund studies with a regional focus – this topic doesn't stop at our borders. Need for collaboration and improvement
 - c. No questions
- 7. Iowa CAT Challenge Opportunity – Adam Shell (10 minutes)
 - a. Highlighted recent discussion with subcommittees and CAT challenge onset
 - b. Cooperative Automated Transportation (CAT) --- reflects the broader aspects of automation, and expands beyond just the vehicle to include all modes, business processes, and mobility services
 - c. The CAT Challenge tactic:
 - i. Cascades directly from the ATC strategy
 - ii. Central to Infrastructure Readiness but extends into two other focus areas, Economic Development and Policy & Legislation
 - iii. And directly advances at least four of the stated outcomes (of the 20) that have been identified in the Vision document
 - d. While there are other grant opportunities occurring nationally or regionally, this provides an opportunity to focus on our needs in Iowa to be AV ready
 - e. Existing Programs
 - i. Georgia DOT
 - ii. Michigan DOT Mobility Challenge
 - iii. Minnesota DOT (“MinnDOT”)
 - f. Opportunities
 - i. Support research, innovation, and pilot opportunities in Iowa
 - ii. Coordination and partnership opportunities both regionally and nationally
 - f. Challenge
 - i. Dedicated funding source(s)
 - g. Closing comments
 - i. Input from the subcommittee members determined a CAT Challenge pilot program as being one of the highest priorities for the ATC (#2 in both Mentimeter polls conducted during the recent joint ATC subcommittee meetings)
 - h. Optional follow-up comments after Adam's presentation from Mark Lowe
 - i. There is clearly a lot yet to be determined, such as establishing funding and leadership roles

- ii. An opportunity for further work by various ATC subcommittees to jointly coordinate on this and determine next steps to address how this can be accomplished
- 8. General updates (15 minutes)
 - a. Cooperative and Automated Transportation Service Layer Plan (CAT SLP) – Adam Shell
 - i. CAT service layer plan has been established to guide the key tactical activities for the department over the next several years. Living document
 - ii. CAT SLP is more focused to the DOT business case while the ATC Vision is more broad, touching on other areas such as economic development, enforcement, and insurance.
 - iii. Available online: <https://iowadot.gov/tsmo/Service-Layer-Plans>
 - b. Senate File 302 (“AV Framework” bill) AV legislative working group status – Adam Shell
 - i. Internal multi-disciplinary working group created following bill passage to determine next steps and make recommendations to management for possible rulemaking
 - ii. Rulemaking likely next year, including jobs/fiscal impact
 - iii. Gather additional feedback, possibly next ATC meeting
 - c. Ford Partnership & Data Pilot Opportunity – Adam Shell
 - i. Ford Mobility - <https://www.ford.com/mobility.html> - group within Ford dedicated to solving mobility issues for various partners
 - ii. Insight Solutions Platform - develop solutions that are centered around allowing for data driven decisions - <https://www.cityinsights.ford.com/#/marketing/landing-page>
 - iii. Safety Insights – web-based tool developed by Ford as part of USDOT data visualization competition - <https://safetyinsights.ford.com/>
 - iv. Possible Partnership and Data Pilot Opportunity between Iowa and Ford
 - d. Automated Driving Systems (ADS) for Rural America USDOT demonstration grant – Omar Ahmad
 - i. 2.5 year automated transit demonstration project focused on older, mobility challenged population in rural areas
 - ii. Project will produce big data that can be used by outside parties
 - iii. Opportunity for collaborators in Iowa and ATC to build on work to benefit the state
- 9. ATC vision plan draft – Peter Rafferty (15 minutes)
 - a. Vision plan developed by determining focus areas, outcomes, and tactics
 - b. Pilot program central tactic for subcommittees
 - c. Subcommittees need to develop work plans and timelines
 - d. Share any comments by the end of the year
- 10. Wrap-up – Mark Lowe (5 minutes)
 - a. Next Meetings
 - i. ATC Meeting Scheduled:
Wednesday, March 11 from 1:00-3:00 pm

Iowa League of Cities
500 SW 7th Street, Suite 101, Des Moines

- ii. Subcommittee meetings still being scheduled for next quarter
- b. Adjourn



IOWA ADVISORY COUNCIL ON AUTOMATED TRANSPORTATION

Council Meeting
December 4, 2019

WELCOME

Mark Lowe

Automated drive

Destination: 50° 43' 50.34" N 6° 10' 55.294" E
Arrival: 08:55 pm - Distance 783 miles

TCP/IP:192.56.327.684.1
SYNC: **enabled** | Sensors: **active** | Cameras: **active**

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FIRST LEGO LEAGUE 2019 CITYSHAPERS COMPETITION

Dylan Mullenix and
First LEGO League
Aztechs Team



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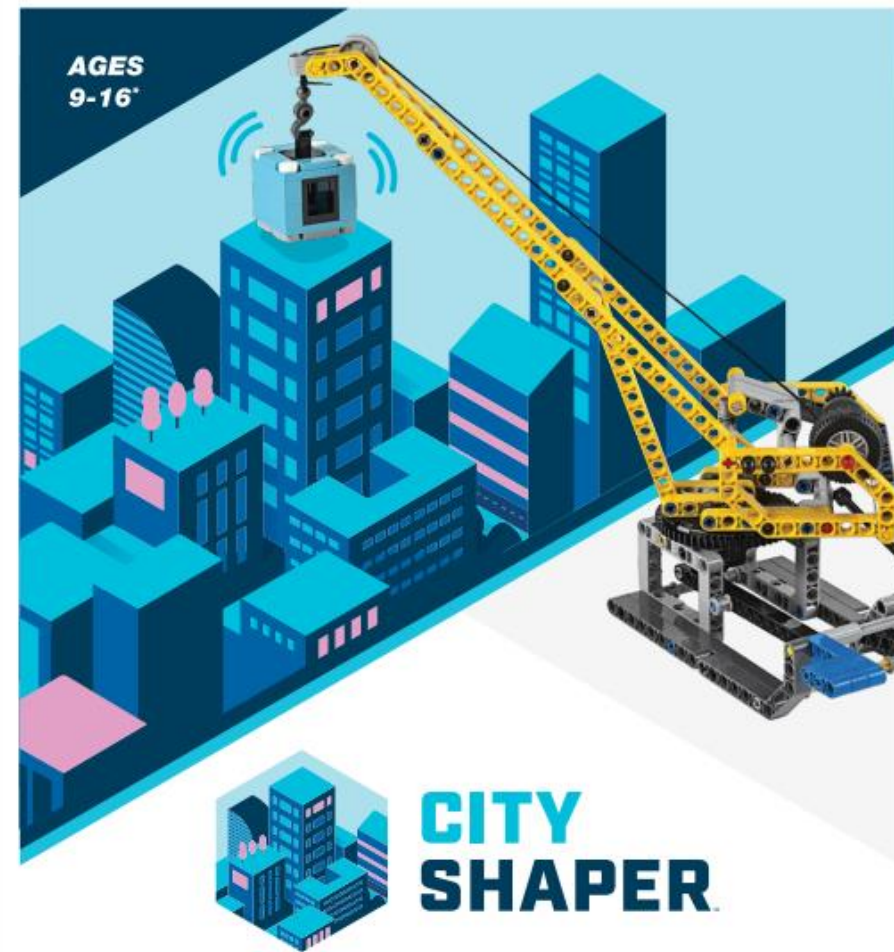
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FIRST[®] LEGO[®] League is the most accessible, guided, global robotics competition, helping students and teachers to build a better future together. The program is built around theme-based Challenges to engage children ages 9 to 16* in research, problem solving, coding, and engineering. The foundation of the program is the *FIRST*[®] Core Values, which emphasize teamwork, discovery, and innovation. Students emerge more confident, excited, and equipped with the skills they need in a changing workforce.



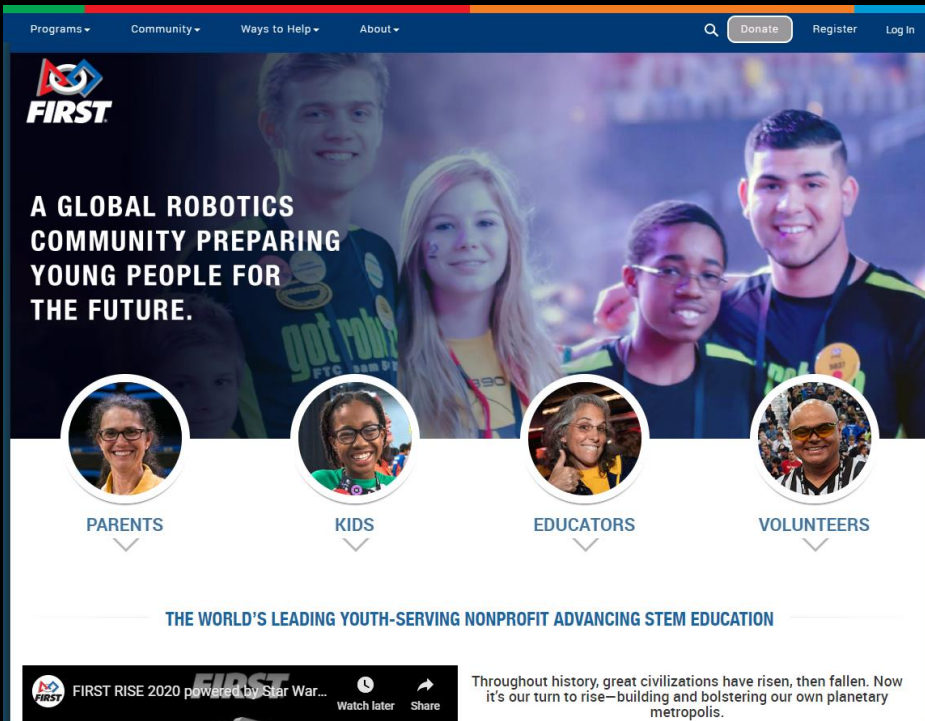
Attention, builders of tomorrow! Let's design and build better places to live and work for everyone. Combine your problem-solving skills and creativity in the 2019/2020 CITY SHAPERSM season, where you and your friends will shape a better future – together.

SEASON STARTS: 1 AUGUST 2019

JOIN US – www.firstlegoleague.org | www.firstinspires.org/first-rise-2020



LEGO[®] is a registered trademark of the LEGO Group. FIRST[®] LEGO[®] League, and CITY SHAPERSM are registered trademarks of FIRST and the LEGO Group. FL046.
*Ages vary by country



<https://www.firstinspires.org/robotics/fl>

Aztechs Profile



Anshul Barve
8th Grade, Timberline School,
Waukee, Iowa
FLL Statement: "Enjoyable,
Interesting, Challenging"
Team Statement: "My team
members are funny, clever and
determined."



Atiksh Hood
7th Grade, Waukee Middle School
FLL Statement: "Ambition,
Exploration and Journey"
Team Statement: "Inquisitive,
Dependable and Collaborative"



Avinash Ganti
7th Grade, Waukee Middle School,
Waukee, Iowa
FLL Statement: "FLL is Inspiring,
Educational and Fun"
Team Statement: "Intelligent,
Chaotic & Fun- This is my team
Aztechs in brief!"



Dhruv Chatterjee
8th Grade, Timberline School,
Waukee, Iowa
FLL Statement: "Fun, Creative,
Innovative"
Team Statement: "Our team
members are exciting, smart and
funny"



Lavanya Prem
8th Grade, South Middle School
FLL Statement: " Outreach,
STEM and Competitive"
Team Statement: "Our team is
good with networking, and are
hardworking and creative"



Lincoln Hutt
7th Grade, Waukee Middle School
FLL Statement: "FLL has taught
me how to program well. It is fun
and engaging activity"
Team Statement: "We like to have
fun and program. We hope to
make to State competition"



Shreeya Yarlagadda
8th Grade, Cowles Montessori
FLL Statement: "FLL is
engaging. It is fun, helps with
team building and to think out of
the box."
Team Statement: "Aztechs are
Goofy, Hard-working and
Smart."



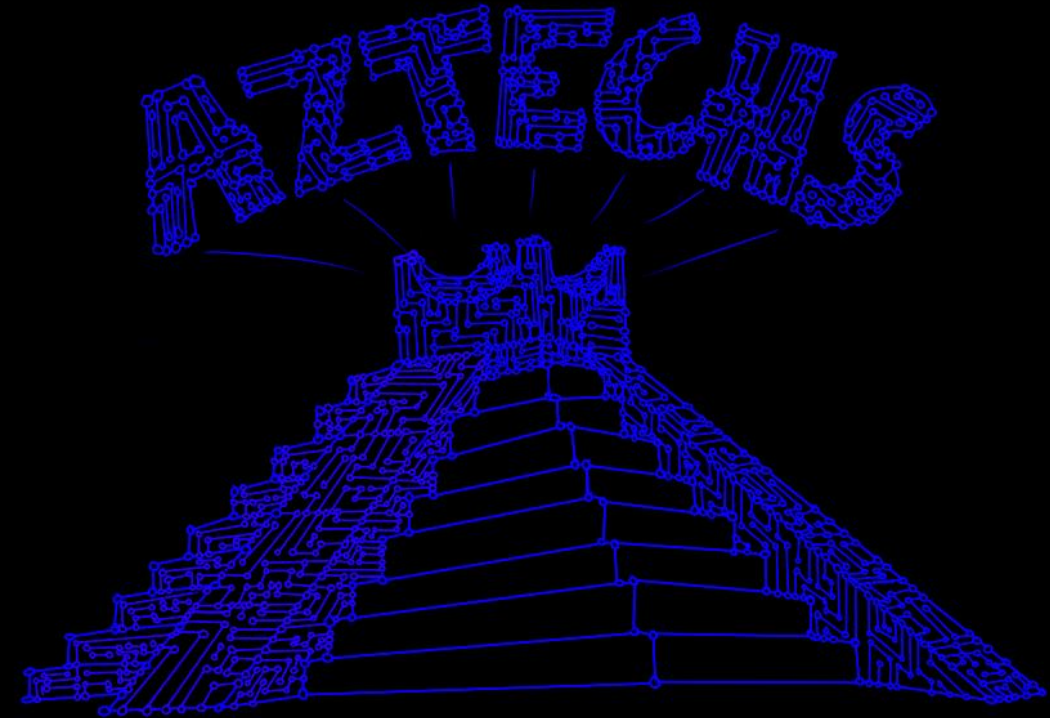
Zak Shlomi
6th Grade, Waukee Middle School
FLL Statement: "FLL is challenging,
fun & exciting"
Team Statement: "My Team
members are helpful, funny &
hardworking"



Sashank Ganti
FLL Coach, Product Mgr,
Siemens
FLL Statement: "Coaching FLL
has probably been the single most
rewarding parenting experience."
Team Statement: "Aztechs are a
clever, positive, hardworking
bunch"



Priyonath Chatterjee
FLL Co-Coach, Sr. Solutions
Manager, Vitech Systems Inc.
FLL Statement: "Always cherish
working with FLL teams. It is
challenging yet rewarding."
Team Statement: "Aztechs are
fun-filled, clever and awesome
bunch of kids that amaze me."



#3401

5



Introduction

- Autonomous vehicles are bound to happen.
- Vehicles used to have minds of their own
- That changed when a new invention was created
 - The car
- Added human error factor
- Autonomous vehicles remove that factor
- Cities will need to undergo a lot of preparation to accommodate them



It has been 134 years...

ROADS

- 134 years since cities had to redesign roads due to new technology
- Autonomous Vehicles will change that
- Some changes cities will see are:
 - Relocate Parking lots
 - Redesign traffic regulations
 - More Public transportation

SMART ROADS FOR SMART CITIES



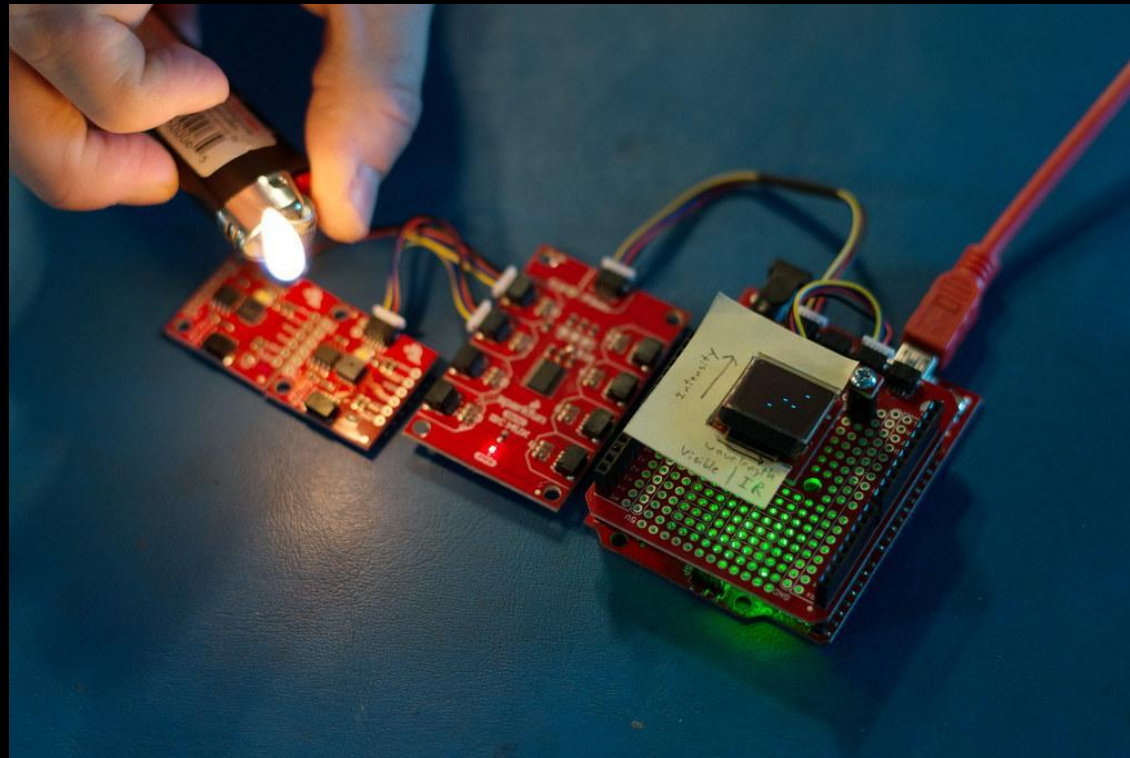
When the first cars
came



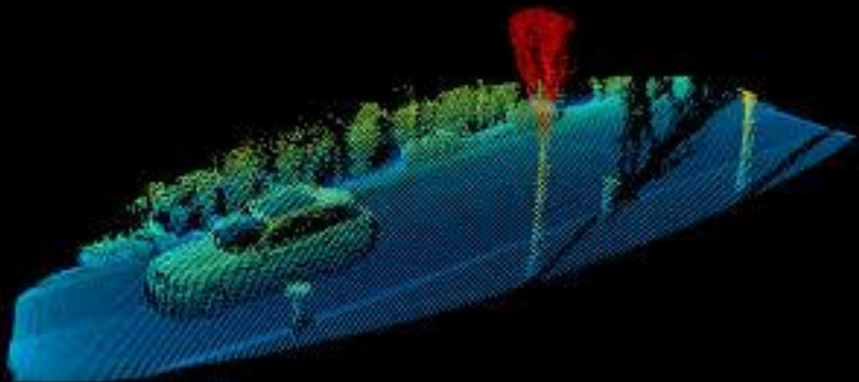
Today, when
autonomous cars are
coming

This is not going to happen overnight ...

- Around the next 40 years
- Prepare now
- Cities will need to change to help improve reliability and accuracy of Autonomous Vehicles



LIDAR, Radar, GPS, and Video Sensors

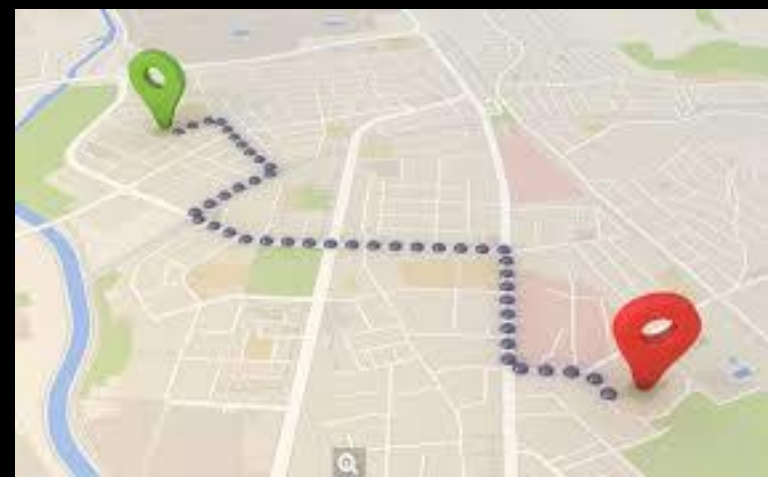


LIDAR

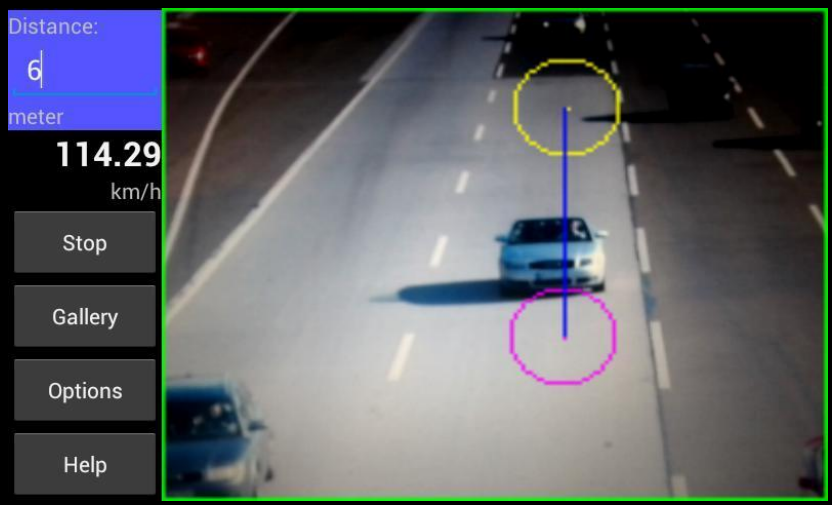
Identity & Velocity of an object



VIDEO SENSORS Lane Markings



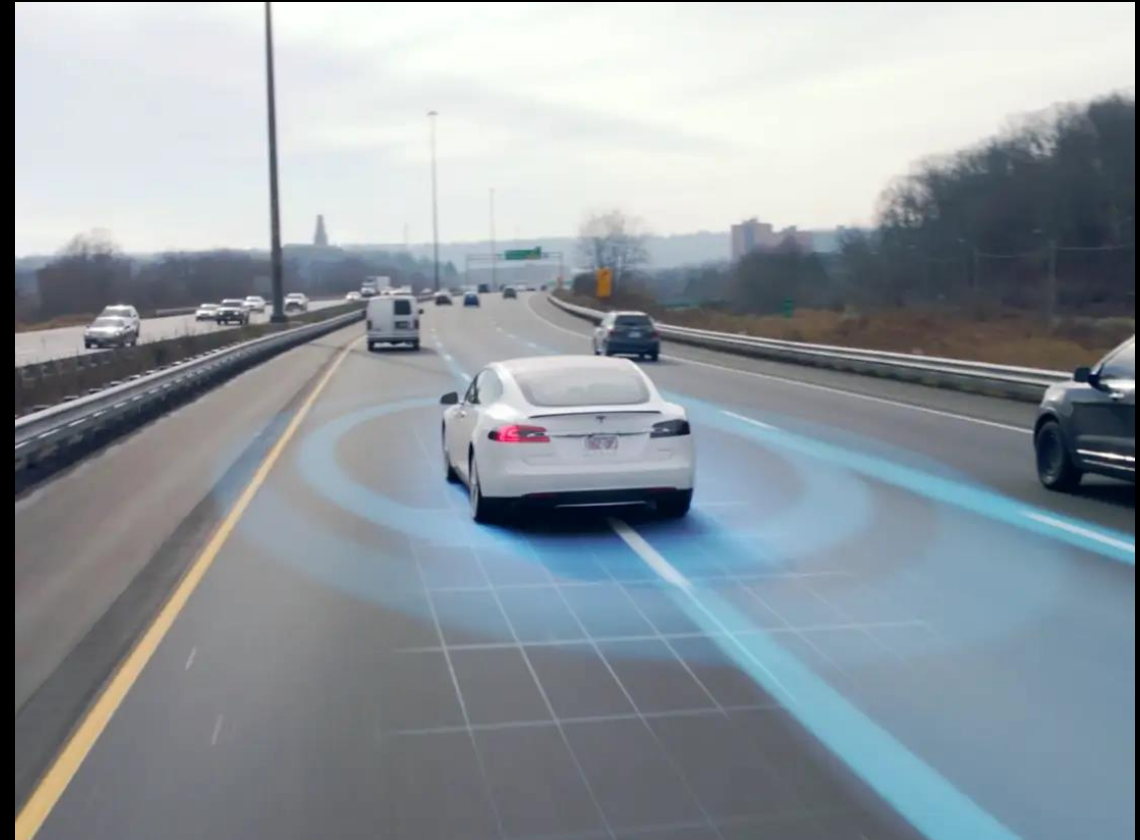
GPS Traffic and Location



RADAR Used in GPS Will tell when to turn

Smart Roads

- Connected roads that carry information
- Enhance Lane markings to become “beacons of information”
- Use Smart paints
 - Battery paints that can turn any surface into a battery
 - Touch sensitive paint



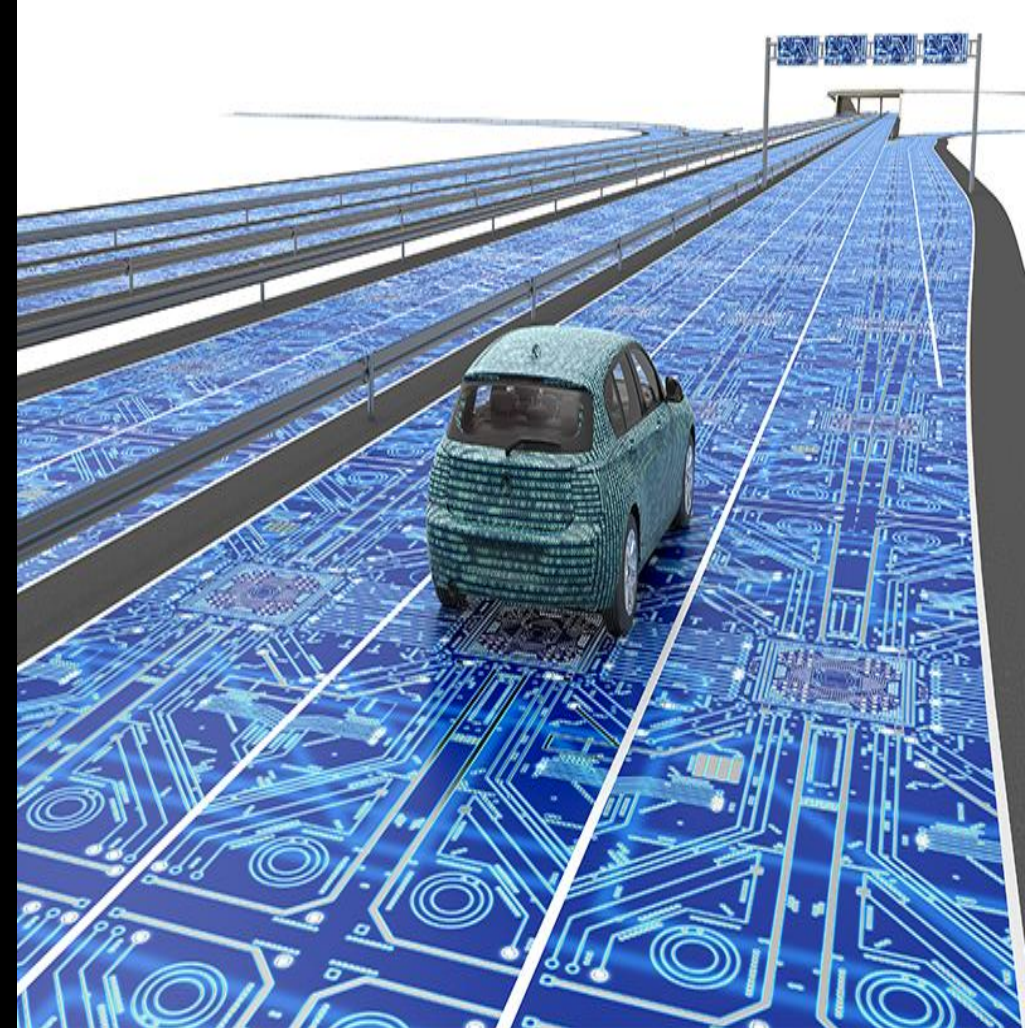
Passive and Active Sensors

Passive sensors for static information such as location, road conditions, road material, banking angle etc.

- Requires low power signals and can be longer lasting
- Equivalent of a QR code or a barcode that cars can scan

Active sensors for more real-time up to date information

- Need more power
- Low power connected network



Implementation

- Cost - today's Sensor paint costs \$20 per meter - prohibitive
- Reliability - Autonomous technology requires lots of redundancy
 - About 20-40% of sensors need to be working all the time
- Cities will have to regularly monitor and maintain the lane markings
- Phasing:
 - 10 years, one lane on Freeway
 - 20 years, Freeways autonomous only
 - 40 years most roadways autonomous



Counterclaim

- Smart Paint Maintenance
 - Snow cleaning
 - Rural Roads
- Hackers! Hackers! Hackers!
- Vandalism
- Software Bugs
- Surveillance State
 - People wouldn't want their car to be under constant surveillance
 - Privacy concerns



The Future

- There are some problems but new jobs can help
- Lots of new jobs
 - New technological jobs
 - New kind of road maintenance
 - Improving autonomous vehicles
 - Network Security
 - Law and order
 - Keeping track of vehicles
 - Updating tracking chips



THANK YOU!



SUBCOMMITTEE UPDATES

- Policy & Legislation / Public Safety & Enforcement – Dylan Mullenix
- Economic Development / Infrastructure Readiness – Rick Peterson and Erin Mullenix

ATC COMMUNICATIONS UPDATE

Andrea Henry

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IowaDrivingAV.org

- Expanded Meeting Notes
- Link to Sharepoint
- Potential FAQ
- Add “About Automated Transportation” Page
 - MyCarDoesWhat.org
 - Iowa DOT Cooperative Automated Service Layer Plan
 - US DOT Automated Driving Systems: A Vision for Safety 2.0
 - US DOT Preparing for the Future of Transportation: Automated Vehicle 3.0
 - AAMVA - Jurisdictional Guidelines for Safe Testing and Deployment of Highly Automated Vehicles
 - J3016 Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles (SAE J3016)

Branded Materials

- PowerPoint Template on Sharepoint
- Handout Template to come
- Logo to come
- What else is needed?





Emergency Communications Plan

- Start with press release and talking points
- Focused on:
 - What Iowa is doing to prepare for AT
 - Safety benefits that come with AT
- Literature review of other states' plans

An aerial photograph of a suburban area, featuring a mix of residential neighborhoods, commercial buildings, and green spaces. A large, semi-transparent white rectangular box is centered over the image, with a dark teal border. The word "BREAK" is written in a bold, black, sans-serif font within this box. The background shows a highway interchange with several roundabouts, a baseball field, and various industrial or commercial structures.

BREAK

MAASTO CAV SUMMIT

Mark Lowe

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CONNECTED AND AUTOMATED VEHICLES SUMMIT

— OCTOBER 16-18, 2019 —

MAASTO CAV SUMMIT

- October 16-18, 2019 in Madison, WI
- 9 of 10 states present, plus invited speakers, about 65 people
- Included roundtables, breakouts, strategic planning, and specific topics



IOWA CAT CHALLENGE OPPORTUNITY

Adam Shell



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FROM AT STRATEGY TO CAT CHALLENGE PILOT PROGRAM

Strategic (purpose, vision, mission, goals)

“advance HAV technologies”
“create an AV-ready driving environment”
“enable the advancement of AT systems”
“function as a catalyst for AT systems”
“promote testing and deployment”
“remove barriers”

Programmatic (objectives, outcomes)

Infrastructure Readiness:
Accelerate Infrastructure Readiness

Policy & Legislation:
Advise on Legislation
Community Readiness

Economic Development:
Foster Business Growth

Tactical

Implement Iowa
CAT Challenge
Pilot Program

COMPETITIVE GRANT CHALLENGE PROGRAM EXAMPLES

Existing Programs

- [Georgia DOT Smart Vehicle Tech Challenge](#)
- [Michigan DOT Mobility Challenge](#)
- [Minnesota DOT CAV Challenge](#)

Interested States

- Connecticut, Missouri, Ohio, Pennsylvania, Texas, and Washington



SHOULD IOWA PURSUE A CAT CHALLENGE PILOT PROGRAM?

Opportunities

- Support research, innovation, and pilot opportunities
- Consider MIDOT and MNDOT approaches and apply any lessons learned
- Economic (business growth)
- Coordination and partnerships
 - [Empower Rural Iowa Initiative](#)
 - [Future Ready Iowa](#)
 - Regional and national (MAASTO/AASHTO)

Challenge

- Dedicated Funding Source(s)





DISCUSSION

GENERAL UPDATES

- Cooperative and Automated Transportation Service Layer Plan (CAT SLP) – Adam Shell
- Senate File 302 (“AV Framework” bill) AV legislative working group status – Adam Shell
- Ford Partnership & Data Pilot Opportunity – Adam Shell
- Automated Driving Systems (ADS) for Rural America USDOT demonstration grant – Omar Ahmad



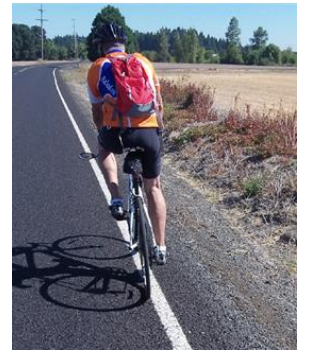
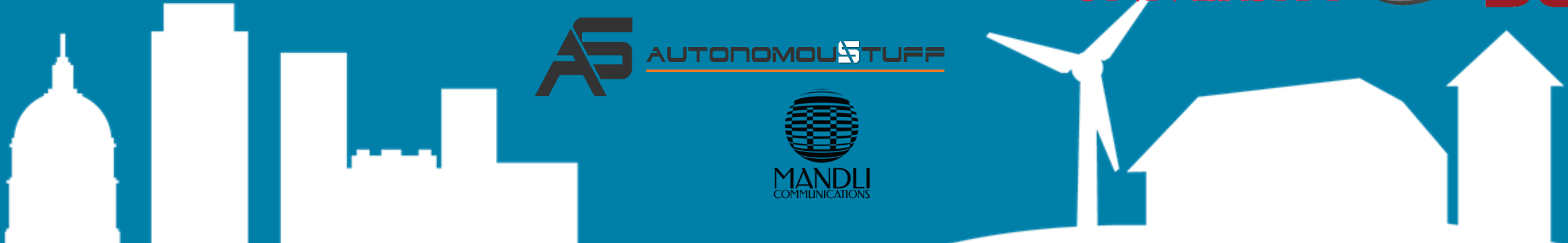
ADS FOR RURAL AMERICA

UNIVERSITY OF IOWA

IN PARTNERSHIP WITH THE IOWA DOT
AND IOWA STATE UNIVERSITY

MARCH 2019

IOWA STATE
UNIVERSITY



Demonstration
(2.5 years)

Data Sharing
(5 years)

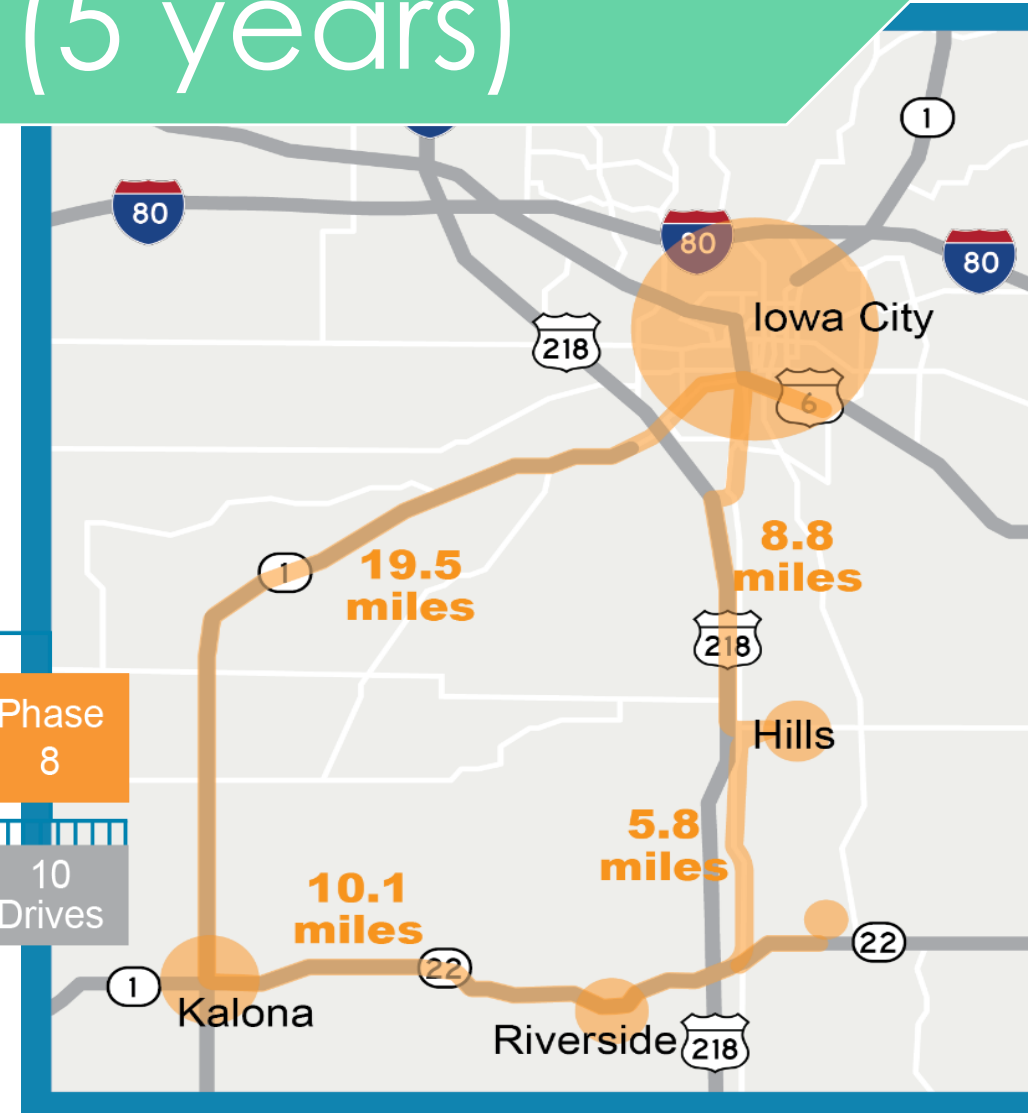
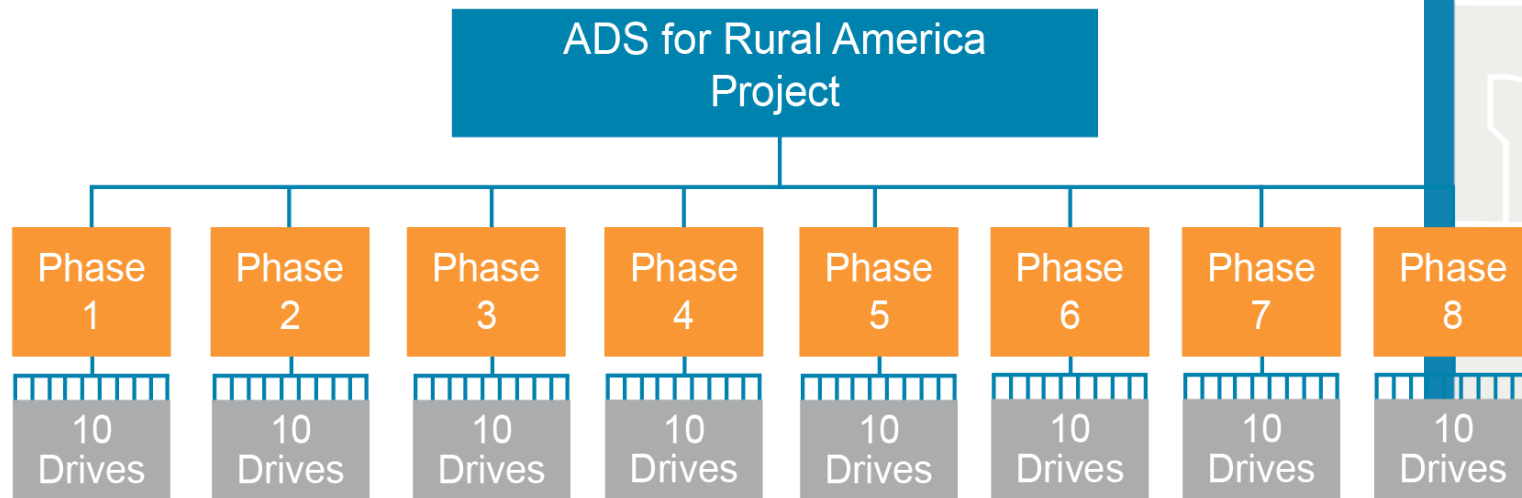
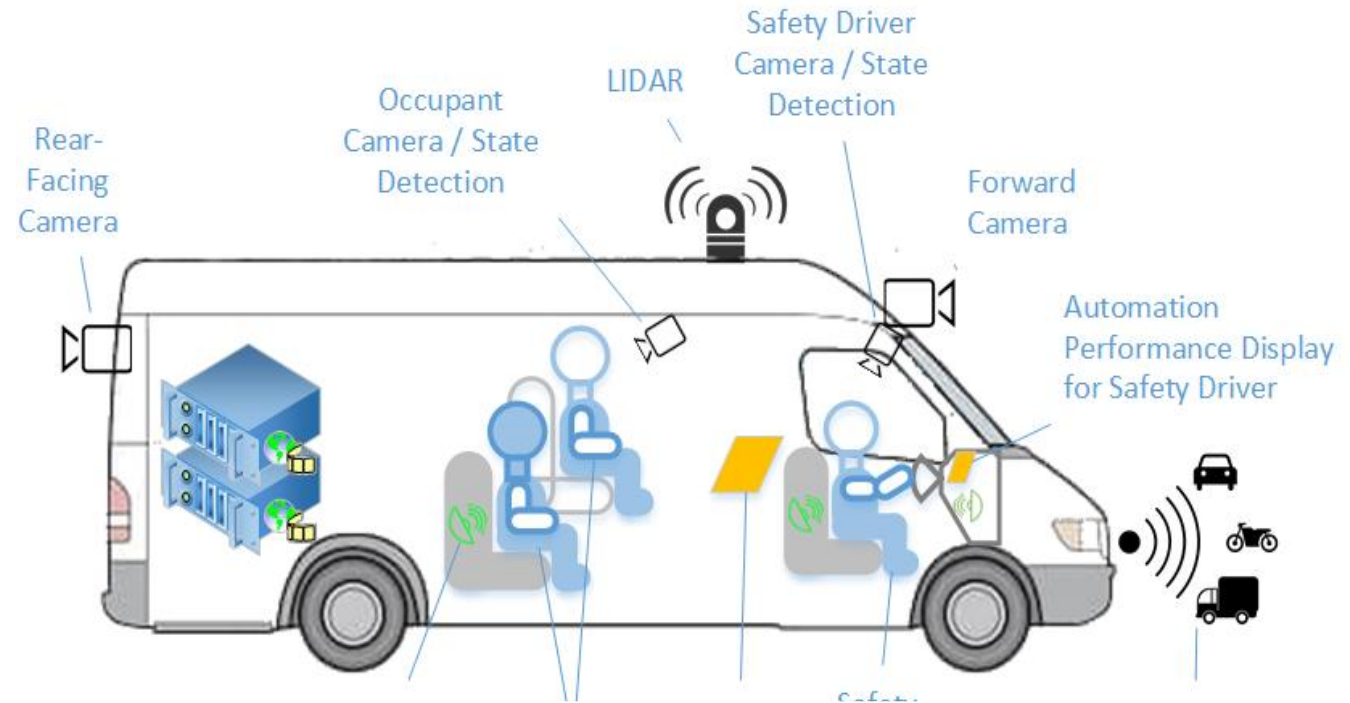


Figure 1. ADS for Rural America map

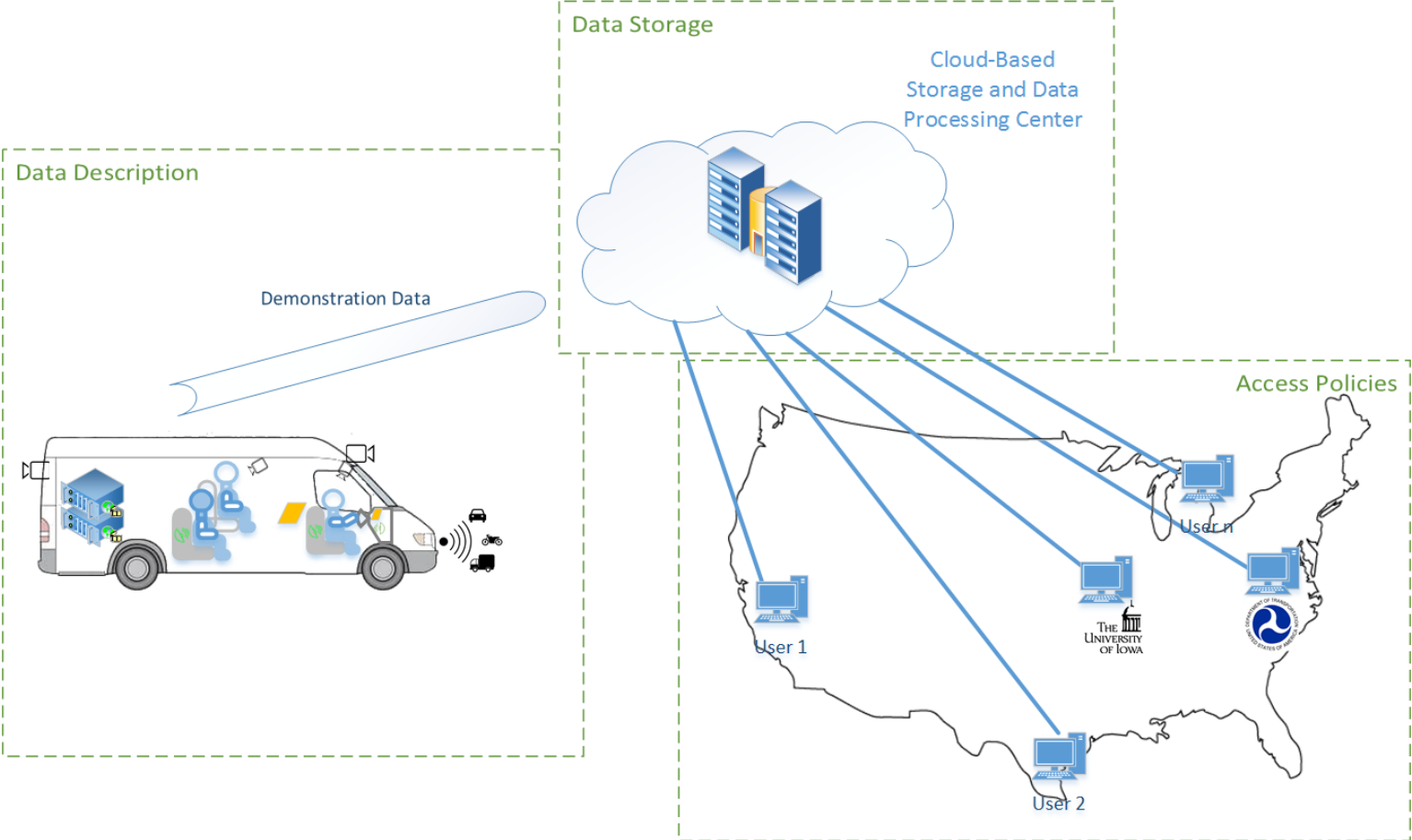
ADS VEHICLE

ADS for Rural America will utilize a commercially available, mobility-friendly vehicle engineered with ADS technology capable of demonstrating L3 and greater automation.



Data Source	Data
VehicleCAN	Gear shifter position, steering wheel angle, vehicle speed, odometer, outside temperature, seatbelt status, accelerator pedal position, brake pedal position, low/high beam status, brake light status, fog lamp status, wheel speed, airbag status, anti-lock brake system status, cruise control status
UserCAN	By-wire system commands, software commands, status faults, ROS topic subscriptions, etc.
LIDAR	LIDAR localization, point cloud data of roadway, scenery and objects near the vehicle
Radar	Adaptive cruise control, tracks (ESR), and detections (SRR)
GPS system	GPS time, position latitude, longitude, elevation, quality, receive TRK corrections
High resolution camera x 2	Object detection with sensor fusion and deep neural net algorithms
Cohda MKS OBU	On-board unit receiving smart infrastructure V2X data
Mobileye	Collision avoidance warning, pavement marking, signing, and pothole roadway condition
Webcam video	Forward view, rear view, passenger face and torso, safety driver face, hands, torso and feet
Millimeter wave sensor	Passenger biometrics such as heartbeat and respiration rate

DATA APPROACH




WHAT DOES THIS MEAN FOR IOWA?

- Highlight issues related to implementation of AVs in Iowa
 - Challenging rural roadway types
 - Interactions with non-autonomous vehicles, animals, unexpected situations
 - Connectivity issues
 - Weather issues
 - Mobility for aging population
- Create opportunities for involvement by other public/private entities by writing proposals to enhance data being collected or analyze data
- Create opportunities for future demonstrations



LONG-TERM OBJECTIVES



**Connected
and
Automated
Vehicles**

IMPROVE SAFETY

- Reduce crashes using higher levels of automation/control
- Improve roadway utilization and efficiency

BROADEN MOBILITY

- Increase transportation options
- Connect rural communities to urban centers

ENHANCE MOVEMENT OF GOODS

- Improve efficiency
- Increase competitiveness of agricultural and commercial trucking sectors
- Grow the economic base

ATC VISION PLAN DRAFT

Peter Rafferty

Automated drive

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SYNC: **enabled** | Sensors: **active** | Cameras: **active**

Automated drive

Destination: 50° 43' 50.34" N - 6° 10' 55.294" E
Arrival: 08:55 pm - Distance 783 miles

TCP/IP: 192.56.327.684.1
SYNC: **enabled** | Sensors: **active** | Cameras: **active**

IOWA'S AT VISION DRAFT

- Draft also posted on SharePoint site
- Documents the collaborative strategic planning work of the Council and Subcommittees
- Comments, questions, feedback welcome anytime, but please return requests for changes by the end of December to

Adam Shell (adam.shell@iowadot.us)
or Peter Rafferty (prafferty@gfnet.com)

IOWA'S

AUTOMATED
TRANSPORTATION
VISION



IOWADOT

Iowa Advisory Council on Automated Transportation
Iowa Department of Transportation



WRAP-UP

Mark Lowe

- Next meetings
 - ATC meeting: Wednesday, March 11th, 1-3pm, Iowa League of Cities
 - Subcommittee meetings currently being scheduled
- Adjourn



THANK YOU