MEETING NOTES

Iowa Advisory Council on Automated Transportation (ATC)
Infrastructure Readiness Subcommittee Meeting
Thursday, March 5, 2020

1-2 pm

Action Items:
- All subcommittee members – review desired outcomes, tactics, and workplan for Infrastructure Readiness; volunteers needed to support various tactics
- All subcommittee members – partner with Economic Development subcommittee to determine details for CAT challenge

1. Welcome and introductions – Jacob Heiden, UI National Advanced Driving Simulator
     - Erin Mullenix (Infrastructure Readiness Subcommittee Chair) – Iowa League of Cities
     - Liesl Seabert – Iowa Economic Development Authority
     - Neal Hawkins – Iowa State University, InTrans
     - Mike Lauer – Iowa Communications Network
     - Mark Nahra – Woodbury County Engineer, National Association of County Engineers
     - Rachel Bennett – Iowa State Association of Counties
     - Sandra Larson – Stanley Consultants
     - Peter Rafferty – Gannett Fleming
     - Garrett Pedersen, Jim Schnoebelen, Renee Jerman, Brent Paulson, Michael Kronzer, Donna Matulac, Adam Shell – Iowa DOT
     - Jacob Heiden, Dan McGehee, Omar Ahmad – University of Iowa, National Advanced Driving Simulator

2. Chair Update – Erin Mullenix, Infrastructure Readiness Subcommittee Chair
     a) ATC December meeting
          i. Lego League presentation – did well at the state level
          ii. Subcommittee updates
          iii. Vision comments
          iv. Communication updates
               1. Website up and running. Link provided to group: https://iowadrivingav.org/
               2. Branding for ATC
               3. Coordinating networking
               4. Communications and response plan discussion
          v. CAT Challenge update by Adam Shell
          vi. Brief comment on legislation
     b) Dan McGehee

       i. Comment on the Aztechs Lego League team – they won state competition and are headed to Detroit in the finals against 49 other states.

      ii. NADS is sponsoring the group for $1000 for expenses

     iii. Made recommendation to support the group if possible. Contact Dan with any questions on this.

3. Governor's Empower Rural Iowa Initiative – Liesl Seabert, Iowa Economic Development Authority
   a) 2019 Empower Rural Iowa (ERI) Recommendations - https://www.iowaeconomicdevelopment.com/userdocs/news/2019eri_recommendations.pdf
   b) Overview of Rural Revitalization
      i. Housed in Iowa Economic Development Authority
      ii. Responsible for day-to-day operations of ERI and liaison to rural communities
      iii. April 29- May 1st – Annual Rural Summit - https://iowardc.org/summit/
   c) ERI Initiative Overview
      i. Executive Order created ERI in July 2018 (same month the ATC started)
      ii. Empower Rural Iowa Act – created 3 tasks forces set on developing recommendations (linked above) including broadband, workforce, housing
         1. Investing in Rural Iowa
         2. Growing Rural Iowa
         3. Connecting Rural Iowa
      iii. Connect
         1. Requested $10 million for 2 years, received $5 million – all has been awarded
         2. Will be requesting $15 million this year. (Program need was $20 million total. Only received $5 million last year)
         3. Focus
            a. Optimize existing broadband grant, update maps of broadband connectivity, support rural innovation grants.
         4. Rural Innovation Grants
            a. Still in rulemaking, hoping to get out soon
            b. Matching grant for supporting out-of-the-box solutions that fit under the umbrella of ERI recommendations
            c. Funding – minimum of $1000 to maximum of $20,000
      iv. Grow
         1. Matching grant program focused on developing rural leaders
         2. Encourage implementation of community vision plans by funding a rural set-aside in quality-of-life programs
         3. Support Existing leadership programs and provide resources for development of new programs
         4. Continue support for Rural Innovation Grants
      v. Invest

1. Streamline eligibility and application processes for state administered programs impacting abandoned or derelict buildings
2. Increase funding, rural set-asides and flexibility for programs with demand to support quality, transformations projects in rural communities
3. Continue "small cities set-aside" in the Workforce Housing Tax Credit program and continue support for Rural Innovation Grants and Rural Housing Grants

    vi. Empower Rural Iowa membership will have openings this summer. Appointments are made by Governor

4. Pavement Markings 101 – Neal Hawkins, ISU InTrans
   a) Pavement Marking Orientation/Guidance
      i. Critical – "instrumental" in supporting automation
   b) Overview
      i. Iowa DOT pavement marking task force
      ii. Current needs
         1. Drivers
         2. Vehicle Capabilities – Automated Driving Assist Systems (ADAS)
      iii. Future needs
         1. Higher levels of automation
      iv. Pavement markings are another traffic control device (TCD)
         1. If no signage, markings only way to know curve is ahead
         2. Image showing double lines in the middle of road under wet condition – lines further ahead look yellow whereas lines closer to the vehicle look white
         3. Performance of markings at night and in wet conditions can be difficult without glass beads
      v. Fatal Crashes 2014-2018 (FARS) by select atmospheric conditions
         1. 70% crashes nationally and 65% of crashes in Iowa occur in clear conditions. The remainder occur in variety of atmospheric conditions
         2. As with other snow belt states, snow and rain/mist-related weather are when majority of crashes occur but rain is still the primary issue for Iowa and across nation
      vi. Damage to pavement markings is especially common in state like Iowa due to snowplows
         1. Plow trucks remove and scrape paint off and can leave pot marks
         2. Often requires pavement markings to be repainted annually in some locations
         3. Painting markings is a safety concern for workers. Painting occurs at 9-10 mph in live traffic
      vii. Visibility Performance Operations
         1. Every minute while we are on this call people are driving 70mph negotiating driving decisions with only a certain level of paint on the road.
         2. Drivers need appropriate amount of paint to orient us as we drive
      viii. How to address problems
         1. Wider lines

a. Standard is 4 inches
            b. Going to 6 inches in some areas
        2. Wet weather markings
        3. Durability
            a. Desire to keep paint on road for up to 5 years
            b. Keep crews off roads
    ix. Why wider markings?
        1. Comparative B/C findings – wider 6 inches vs 4 inches edge lines on 2-lane roads
        2. Wider Pavement markings have a much greater B/C and are a proven crash reduction strategy
    x. Safety of weather markings
        1. Studies showed wet weather markings could reduce crashes 49%
    xi. Vehicle Technology (ADAS)
        1. Technology with greatest potential to reduce crashes is lane departure warning (29% reduction in all fatal crashes)
            a. This technology is available in 40-80% of new car sales in 2020
            b. Projected to be available in 70-99% of new car sales in 2025
    xii. Marking standards
        1. Start implementing with reconstruction projects on interstate. Following new interstate projects, program remainder of interstate and shift to maintenance on a 4-year cycle
        2. Standards
            a. 6 inch pavement markings
            b. Long life marking material
            c. Shadow stripe on the white skip line
            d. Grooved-in wet weather markings
            e. Durable legends, arrows, ONLY's, stop bards, cross walks
    xiii. Questions
        1. Does the DOT have paint trucks that can meet these standards?
            a. The paint trucks needed are $500,000. Outsource this work to allow existing crews to focus on other areas and do as much painting as possible
            b. DOT trucks are set up for water-borne paint, not the multi-component spray needed for markings.
            c. Reality is it's expensive and made sure private industry is geared up for this

5. ATC Vision and Workplan: Next Steps – Peter Rafferty, Gannett Fleming
    a) Highlighted desired infrastructure readiness outcomes
    b) Tactics
        i. Access and advance AT readiness: infrastructure, traffic control, comms, related roadways systems
        ii. Implement pilot program (CAT challenge)
        iii. Improve pavement marking (Peter noted limited risk of investing in this now due to benefit to human operators)
        iv. Build out fiber backbone

          v.   Define data systems architecture

    c) Workplans are being formulated. Subcommittees will identify who is tasked with what responsibilities.

6.   Information and key upcoming dates – Jacob Heiden, UI National Advanced Driving Simulator
   - Iowa ATC Meeting: Wednesday, March 11th, 1-3pm, Iowa League of Cities
   - ATC considering moving from 4 meetings per year to 3 meetings per year

ATC SUBCOMMITTEE MEETING

Infrastructure Readiness

March 5, 2020

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

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

WELCOME AND INTRODUCTIONS

Jacob Heiden

UPDATE ON THE ATC MEETING HELD DECEMBER 4, 2019
Erin Mullenix

GOVERNOR'S EMPOWER RURAL IOWA INITIATIVE

Liesl Seabert, Iowa Economic Development Authority

2020 Task Force Recommendations & Center of Rural Revitalization

ATC Infrastructure Readiness Subcommittee

March 5, 2020

Office of Rural Revitalization

- The Office of Rural Revitalization, housed within the Iowa Economic Development Authority (IEDA), is responsible for the day-to-day operations of the Empower Rural Iowa (ERI) initiative, implementing ERI task force recommendations, acting as a liaison to rural communities and helping small communities access programs that support rural areas.

Governor's Empower Rural Iowa Initiative

- Created by executive order - July 2018

- Partnership with the Iowa Rural Development Council
  - Co-chaired by Lt. Governor Adam Gregg and IRDC Chair Sandy Ehrig

- The Empower Rural Iowa Act created three task forces
  - develop recommendations

Governor's Empower Rural Iowa Initiative

- Investing in Rural Iowa
  - Addressing rural housing shortage and dilapidated buildings in community centers

- Growing Rural Iowa
  - Addressing leadership and community development

- Connecting Rural Iowa
  - Addressing the issue of financing broadband connectivity

Connect Task Force

- Optimize the existing broadband grant program by providing additional funding and a higher state match for projects that provide higher levels of speed and service.

- Continue to improve and update the maps of broadband connectivity in the state of Iowa.

- Continue support for the Rural Innovation Grants created during the last legislative session.

Grow Task Force

- Create a matching grant program focused on developing rural leaders by engaging communities in professional visioning processes.

- Encourage implementation of community vision plans by funding a rural set-aside in quality of life programs, such as Enhance Iowa and Iowa Great Places.

- Support existing leadership programs and provide resources for development of new rural leadership programs.

- Continue support for Rural Innovation Grants created during the last legislative session.

Invest Task Force

- Streamline eligibility and application processes for state-administered programs impacting abandoned or derelict buildings.
- Increase funding, rural set-asides and flexibility for programs with abundant demand to support quality, transformational projects in rural communities:
  - Increase funding for the Iowa Department of Natural Resources Derelict Buildings Grant program.
  - Provide an additional rural set-aside in the Community Catalyst grant program and provide additional funding.
  - Increase the $1 million cap on Main Street Challenge Grants.
  - Expand the Iowa Department of Transportation's RISE Grant authority to support rural housing projects.
  - Reform the Nuisance Property and Abandoned Building Remediation Loan Program by modernizing interest rates and using a portion of the funds to provide loan guarantees rather than loans.
- Continue the "small cities set-aside" in the Workforce Housing Tax Credit program and continue support for Rural Innovation Grants and Rural Housing Assessment Grants, created during the last legislative session.

Thank You!

PAVEMENT MARKINGS 101

Neal Hawkins, ISU
InTrans

REACTOR LAB

Pavement Marking
Orientation/Guidance

IOWA STATE UNIVERSITY
Institute for Transportation

IOWA DOT

Current

- **Drivers**
- **Vehicle Capabilities**
  ADAS = Automated Driving Assist Systems

Future

- **Higher Levels of Automation**

IOWA STATE UNIVERSITY
Institute for Transportation

IOWA DOT

TCDs

U.S. **Fatal Crash** 2014 to 2018 by Select Atmospheric Conditions

Rain (Mist)

Fog, Smog, Smoke

Sleet, Hail (Freezing Rain or Drizzle)

Severe Crosswinds

Blowing Sn...

Snow

Freezing...

Blowi...

70% No Adverse Atmospheric Conditions/ Clear /Cloudy

Iowa Fatal Crash 2014 to 2018 by Select Atmospheric Conditions

Rain (Mist)

Snow

Fog, Smog, Smoke

Freezing Rain or Drizzle

Blowing Sand, Soil, Dirt

Severe Crosswinds

Blowing Snow

Sleet, H...

65% No Adverse Atmospheric Conditions/ Clear /Cloudy

Visibility Performance Operations

Visibility Performance Operations

IOWA STATE UNIVERSITY
Institute for Transportation

IOWA DOT

Visibility Performance Operations

Visibility Performance Operations

- **Wider Lines**
- **Wet Weather**
- **Durability**
- **Keep crews off the road**

Comparative B/C Findings

Wider 6" vs 4" Edge Lines on 2-lane roads

Treatment	B/C Ratio
Wider Edge Lines	**$33 - $55 per $1**
Rumble Strips	$37 - $46 per $1
Chevrons	$9 - $46 per $1
RRPMs	$13 per $1

**Proven
Crash
Reduction
Strategies**

Safety of Wet-Weather Markings

All Weather

Approach	Percent Crash Reduction (Uncertainty Estimate)					
	Wet-Night	Dry-Night	Wet-Night Fatal Injury	Dry-Night Fatal Injury	Wet-Night Run Off Road	Dry-Night Run Off Road
Empirical Bayes	**28%** (11%)	7% (8%)	**53%** (12%)	16% (10%)	*25%* (13%)	12% (8%)
Full Bayes	**32%** (12%)	9% (10%)	**49%** (15%)	9% (14%)	19% (15%)	7% (12%)
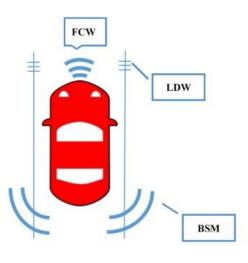
Note: 1. Uncertainty estimate is standard error for EB and posterior standard deviation for FB; 2. Statistically significant results with 95% (*90%*) confidence/probability are shown in **bold** (*in italic*).

Road Infrastructure

Vehicles Capabilities (ADAS)

The technology that could affect the largest number of fatal crashes is a **LDW** system, which has the potential to **prevent *or* reduce** the severity of up to 9,020 fatal crashes or...

29% reduction of all fatal crashes

Harper, C. D., Hendrickson, C. T., Samaras, C. Cost and benefit estimates of partially-automated vehicle collision avoidance technologies. Accident Analysis & Prevention, 95, 104–115. 2016 IIHS, Status Report, Vol. 52, No. 6, August 23, 2017

IOWA STATE UNIVERSITY
Institute for Transportation

IOWA DOT

Lane Departure Warning (LDW)

- **2020: std. 40-80% of new car sales**
- **2025: std. 70-99% of new car sales**
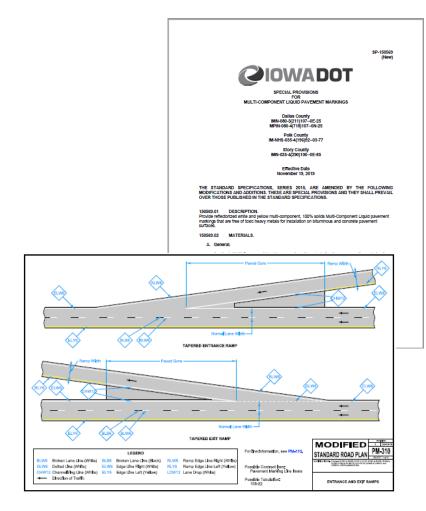
Lane Keep Assist (LKA)

- **2020: std. 10-24% of new car sales**
- **2025: std. 30-73% of new car sales**

J. Cicchino. Effects of lane departure warning on police reported crash rates. Journal of Safety Research, 66, 2018

1. Starting with new projects on Interstate

- ✓ **6" (Wider) Pavement Markings**
- ✓ **Long Life Marking Material**
- ✓ **Shadow stripe on the white skip line**
- ✓ **Grooved in Wet Weather Markings**
- ✓ **Durable Legends, Arrows, ONLY's, Stop Bars, Cross Walks**

2. Program remainder of Interstate strategically

- ✓ 6" (Wider) Pavement Markings
- ✓ Long Life Marking Material
- ✓ Shadow stripe on the white skip line
- ✓ Grooved in Wet Weather Markings
- ✓ Durable Legends, Arrows, ONLY's, Stop Bars, Cross Walks

3. Concurrently...DOT Maintenance can focus on non-Interstate

- ✓ **Standard program 4" and 6"**
- ✓ **Apply safety strategies based on data driven approach**

REACTOR LAB

IOWA STATE UNIVERSITY
Institute for Transportation

IOWADOT

Neal Hawkins
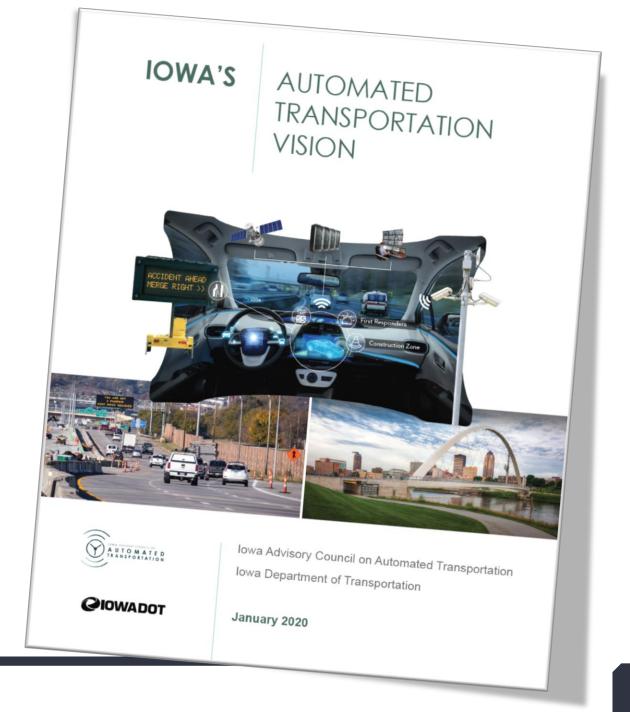hawkins@iastate.edu

ATC VISION AND WORK PLAN: NEXT STEPS

Peter Rafferty, Gannett Fleming

IOWA'S AT VISION

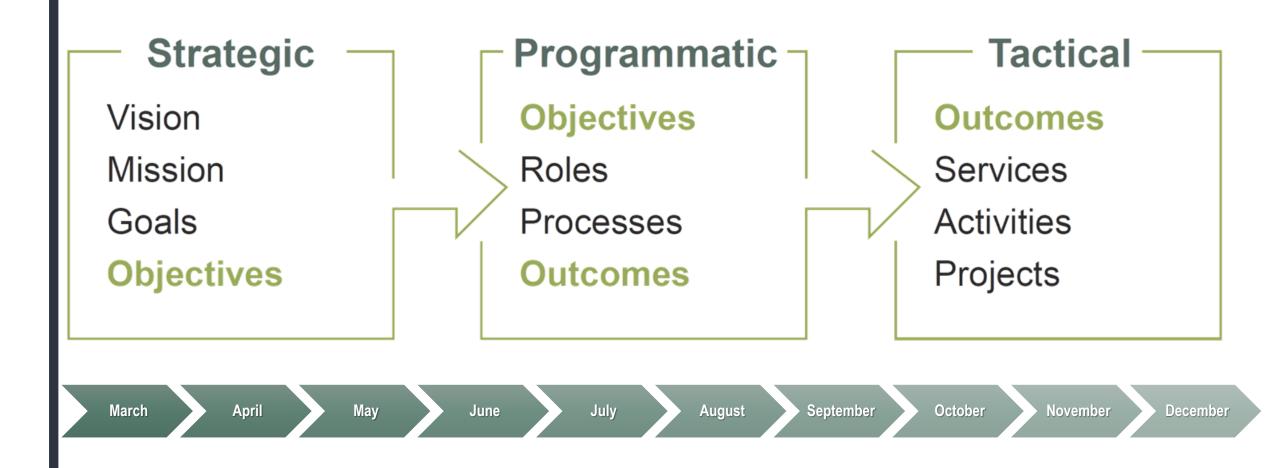January 2020

Six Sections:

1. Summary

2. Overview & Approach

3. Strategic Foundation

4. Programmatic Approach

5. Tactical Initiatives

6. Summary & Next Steps

THREE-PRONG PLANNING FRAMEWORK

Strategic
- Vision
- Mission
- Goals
- **Objectives**

Programmatic
- **Objectives**
- Roles
- Processes
- **Outcomes**

Tactical
- **Outcomes**
- Services
- Activities
- Projects

March → April → May → June → July → August → September → October → November → December

SIX OBJECTIVE AREAS

1 Infrastructure Readiness

- Digital
- Energy
- Electrification
- Planning
- Land Use
- Freight
- Security
- Institutional
- Workforce

Associated Subcommittee

2 Policy & Legislation

- Administration
- Liability
- Insurance
- Finance
- Privacy
- Land Use Planning

Associated Subcommittee

3 Economic Development

- Workforce Development
- Employment
- Entrepreneurship
- Freight
- Commerce
- Efficiency
- Reliability
- Industry
- Manufacturing

Associated Subcommittee

4 Public Safety & Enforcement

- Regulations
- First Responder Safety
- Operator Responsibilities
- Safe Deployment
- Vulnerable Road Users

Associated Subcommittee

5 Communication, Outreach, & Education (crosscutting)

6 Research, Development, Testing, & Evaluation (crosscutting)

ATC DESIRED <u>OUTCOMES</u>

Infrastructure Readiness

A. Accelerate Infrastructure Readiness – Support infrastructure readiness initiatives and coordinate with Iowa DOT and partner organizations

B. Implement National Guidance – Be up to date and work to implement guidelines and best practices for infrastructure readiness

C. Improve Traffic Control Assets – Advancing best practice in maintaining and upgrading traffic control assets

D. Leverage Communications Infrastructure – Prepare communications infrastructure for automated transportation applications, including capacity, coverage, and security

E. Develop Agency Workforce – Be a resource for AT-related workforce capacity building and supports efforts to close gaps with resources and education

ATC <u>TACTICS</u> IDENTIFIED

Infrastructure Readiness

In Priority Order:

1. **Assess & Advance AT Readiness** – assess infrastructure, traffic control, communications, and related roadway systems (to align with CAT SLP and may also relate to platooning readiness in Economic Development)

2. **Implement Pilot Program** – develop and implement the *Iowa CAT Challenge* (also with Infrastructure Readiness and Policy & Legislation)

3. **Improve Pavement Marking** – inventory, policy and criteria advancement, resourcing

4. **Build Out Fiber Backbone** – communications infrastructure for CAV operations, execute DOT's ITS & Comm SLP, with ICN and Governor's Broadband Initiative

5. **Define Data Systems Architecture** – preparation for new and more data while ensuring performance, security, and privacy

ATC WORK PLANS

For Each Objective Area

Five Sections:

1. Tactical Priorities

2. Roles and Responsibilities

3. Resourcing

4. Scenario Planning

5. Timelines

ATC WORK PLANS
Infrastructure Readiness

	Deliverables (what)	Lead(s) (who)	Resources (how)	Scenarios (options)	Timeline (when)
Advance AT Readiness					
CAT Challenge					
Pavement Marking					
Fiber Backbone					
Data Systems					

INFORMATION AND KEY UPCOMING DATES

Next ATC Meeting

- Wednesday, March 11th, 1-3pm

- Iowa League of Cities (subcommittee member attendance option via Skype call-in)

- ATC considering moving from 4 meetings per year to 3 meetings per year

THANK YOU