Meeting Agenda

1. Welcome and Introductions
2. First Lego League
3. Automated Transportation/National Advanced Driving Simulator
4. Des Moines International Airport Parking Garage Navigation System
5. Electric Scooters
6. Feedback and Topics for Next Meeting
7. Other Items of Interest
8. Adjournment
INTRODUCTIONS
Team Presentation

FIRST LEGO LEAGUE
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.

https://www.firstinspires.org/robotics/fll
Aztecs Profile

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

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

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

Lavanya Prem
6th Grade, South Middle School
FLL Statement: "Quirky, 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."

Shreya 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: "Aztecs are Grooty, Hard-working and Smart."

Zak Shimi
6th Grade, Waukee Middle School
FLL Statement: "FLL is challenging, fun & exciting."
Team Statement: "My team members are hard-working, funny & hardworking."

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

Akhil Hood
7th Grade, Waukee Middle School
FLL Statement: "Ambition, Exploration and Journey"
Team Statement: "Equisitive, Dependable and Collaborative."

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

- 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

RADAR
Used in GPS
Will tell when to turn

GPS
Traffic and Location

VIDEO SENSORS
Lane marking

[Image of LIDAR sensor and a map with GPS coordinates]
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!
University of Iowa National Advanced Driving Simulator

AUTOMATED TRANSPORTATION
Driving Excellence: Transforming the Future

Our Mission:
Improving safety by researching the connection between drivers, motor vehicles, and road users

INNOVATION  COLLABORATION  EMPOWERMENT  INTEGRITY  COMMITMENT TO OUTREACH
On-road vehicles

To detect and to swerve...
The National Advanced Driving Simulator at the University of Iowa
Smith’s Horsey Horseless 1899
Project Goals:

- **Improve safety** on our Nation’s roadways by beginning to lay the groundwork for the safe integration of ADS
- Work to **address disparities** in our Nation’s roadway system by focusing demonstrations and ADS data gathering on rural roadways
- Demonstrate how ADS can be used to **enhance mobility** for transportation-challenged populations such as the aging populations in our rural communities
Five levels of automation

- **L0**: Driver operates vehicle
- **L1**: Driver holds wheel or controls pedals
- **L2**: Driver monitors at all times
- **L3**: Driver ready to regain control
- **L4**: Driver not required at all times
- **L5**: Vehicle drives itself - during specific use case (e.g. highway)

**Today in production**

- Vehicle steers or controls speed
- Vehicle drives itself – not 100% safely
- Vehicle drives itself – but may give up control
- Vehicle drives itself door to door
State monitoring

• Used to detect ‘breaks’ in perception-attention-action loop

• Monitor for
  • % road center gaze
  • Head pose
  • Posture/seat position
The Solution:

MycarDoesWhat.org
Know More. Drive Safer.
A Driver Education Program featuring Advanced Driver Assistance Systems

Back-Up Camera
Shows you a view behind your car when backing up

Automatic Emergency Braking System
May brake for you if a front-end crash is imminent

Blind Spot Monitor
Helps you know what cars might be hidden to your left or right

Lane Departure & Lane Keeping Systems
Warms you if you’re drifting out of your lane and may steer you back

Automatic Parallel Parking
Helps you safely navigate into a parallel spot. You control braking, it controls steering

MycarDoesWhat.org
A website that answers all your questions about new car safety technologies...

...and so much more.
Provide administrative climate for testing and operation
Cities – what’s ahead

• Micro transit and ride sharing for off hours
• Key headline in downtown areas
• Automated vehicles operate slow
driving Iowa nice
Thank you
daniel-mcgehee@uiowa.edu

@DanCrashMan
Des Moines International Airport

INDECT PARKING GUIDANCE SYSTEM
INDECT Parking Guidance System
Improving the Travel Experience

FLY DSM

Des Moines International Airport
## Airport Campus & Parking

### Real-Time Parking Availability

Last updated: 12/03/2019 10:53 AM

[Refresh Data](#)

<table>
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<tr>
<th>PARKING LOT</th>
<th>COST (PER HOUR)</th>
<th>MAX PER 24 HOURS</th>
<th>PERCENTAGE FULL</th>
<th>OPEN SPOTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hourly</strong></td>
<td>First 20 minutes free. Each additional 20 minutes $1.00. Pay by cash/credit all hours.</td>
<td>$36/day</td>
<td>49%</td>
<td>115</td>
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<tr>
<td><strong>Premium Long Term</strong></td>
<td>$1/20 min. Pay by cash/credit all hours.</td>
<td>$25/day</td>
<td>99%</td>
<td>1</td>
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<tr>
<td><strong>Long Term</strong></td>
<td>$1/20 min. Pay by cash/credit all hours.</td>
<td>$15/day</td>
<td>99%</td>
<td>22</td>
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<tr>
<td><strong>Economy 1</strong></td>
<td>$2/hour. Pay by credit/debit only all hours.</td>
<td>$6/day</td>
<td>54%</td>
<td>342</td>
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<tr>
<td><strong>Economy 2</strong></td>
<td>$2/hour. Cashier from 10am-12pm or Pay by credit/debit all other hours.</td>
<td>$8/day</td>
<td>57%</td>
<td>261</td>
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<tr>
<td><strong>Economy 3</strong></td>
<td>$2/hour. Pay by credit/debit only all hours.</td>
<td>$10/day</td>
<td>92%</td>
<td>27</td>
</tr>
</tbody>
</table>

Convenience starts at home.

[www.FlyDSM.com](http://www.FlyDSM.com)
LED RGB Sensors
Live Shuttle Tracker

www.FlyDSM.com
INDECT PARKING GUIDANCE SYSTEM

✓ Increased flexibility and efficiency
✓ Increased parking space usage
✓ Enhanced customer satisfaction
FLY DSM

QUESTIONS?
Preparations in Des Moines

ELECTRIC SCOOTERS
MICROMOBILITY AND GREATER DES MOINES
What is Shared Micromobility?

Shared Micromobility encompasses all shared-use fleets of small, fully or partially human-powered vehicles such as bikes, e-bikes, and e-scooters.

- Station-based bike share (including e-bikes)
- Dockless bike share (including e-bikes)
- Scooter share

Source: NACTO
More travel choices are the key to a sustainable future.

Source: Dan Songer
WHY E-SCOOTERS?

• Talent and visitor attraction
• Fosters multimodal transportation
• Serves as first-mile/last-mile connector

WHY NOW?

• E-scooters are already here
• Vendors are asking
• Seasonality
VALUES

• Safety
• Choice
• Strength
• Cleanliness
• Equity
Fact Finding

- Issue Request for Qualifications (RFQ) - DART
- Conduct stakeholder outreach and public engagement - MPO

Develop Recommendation

- Develop program criteria
- Identify code changes needed
- Define roles and resource needs

Determine Pilot Program

- Make code changes
- Issue Request for Proposals (RFP)
- Issue Permits

Operations

- Enforce permit regulations
- Customer service
- Collect data and evaluate
KEY STAKEHOLDER MEETINGS

- Businesses
- Neighborhood Associations
- Public safety
- Economic development
- Public health advocates
- AARP
- Disability community advocates
- Public meeting(s)
FEEDBACK AND QUESTIONS?
FEEDBACK AND TOPICS FOR NEXT MEETING