I-ACT
Addendum #2

Provides responses to questions received for the Illinois Automated and Connected Track (I-ACT) RFI. Also, a transcript from the Industry Day held on June 4th, 2018 at the Illini Center in Chicago is attached.

The request for a One on One meeting has been extended to 7/25/2018 at 1:30 p.m. - the same date the RFI is due.

1. What intended activities or capabilities will differentiate the I-ACT from other Connected Autonomous Vehicle test facilities and research projects in the U.S. or globally? Are you collaborating with any other initiatives?
   It is envisioned that I-ACT will be a comprehensive bed for developing, validating, and testing cyber security, control, instrumentation, safety, autonomous techniques etc. Additionally, it will allow for high speed testing of freight vehicles on a continuous loop. From a structural point of view, the preliminary design includes ramps, bridges, tunnels as well as city intersections, crossings, etc.

   The three schools and their faculty are collaborating on many initiatives and research projects. For example, UIUC is working with the University of Michigan through the Center for Connected and Automated Transportation.

2. As we were unable to attend June 4th Public Meeting, what are the initial areas of investigational research for Commercial or Freight CAVs at I-ACT?
   This will be defined by the research teams and the mutual interests of industry, academia and government

3. What Federal Grants or Awards have been extended to the I-ACT effort from USDOT, FHWA, NHTSA, or others?
   Now that we have secured a location for the I-ACT, we are preparing proposals for various grant solicitations.

4. Is it possible for you to share any links to presentations from the June 4th Public Meeting or other published information?
   Yes, the transcript from June 4th is attached with this response. Additional information was provided in Addendum #1 that was published to the Illinois Transportation Bulletin on 6/19/18.

5. From our perspective, autonomy is a software feature of the vehicle which includes interaction with its environment. One aspect is validating that it is functioning as intended (functional and safety related), and other aspects of autonomous to consider would be to incorporate cyber security. Are you considering both safety and security?
   Yes, please see response to question #1

6. Are the State and universities considering including cyber security testing in the I-ACT?
   Yes, we have a large group of security specialists involved led by internationally renowned experts
   - If so, what level of granularity of cybersecurity initiatives is the RFI seeking? (E.g. is it vehicle-focused, telematics, CAN, DSRC, infrastructure-focused, looking at secure software development, supply chain security, etc.)
     Our scholars in this field, at the three universities, have a wide-range of expertise in cybersecurity. I-ACT is open to exploring cybersecurity initiatives in all of the areas mentioned. The RFI is intended to help provide direction on this and other areas of potential interest.

7. Are you considering the Electrical Vehicles (EVs), EV Supply Equipment (EVSEs) and infrastructure, which is a strong driver in testing and research at the moment?
   Yes, electric vehicles and the associated infrastructure are being considered. Part of this RFI is to solicit input so that we can optimize the design to accommodate needs.

8. Are you looking to develop certain frameworks, procurement guidelines, standards (ISO/SAE ; UN worldforum, FASTR, ISO 20078, ISO 20730, ISO 26262) and/or governance models (continuous type approval and/or self-declaration) which should be addressed in the RFI response?
   - Are you also considering the trust frameworks as part of this exercise (i.e. autonomous vehicle cyber framework)?
     Yes, this will be considered. Part of the public sector's involvement is to ensure that proper regulations and policies are developed.

9. Related to question 5 of the RFI questionnaire:
   - Will the I-ACT test bed be interested in security function testing, cryptography, key management and more?
     Yes
   - Will the I-ACT be piloting certification programs feasibility on industry devices like telematic units?
     Yes, we expect to do so.
   - Could the I-ACT project be utilized for testing security concepts of off-road vehicles, equipment and machinery that also utilizes public roadways?
     Yes, part of the design includes an area for testing off road vehicles including industrial equipment and machinery

   Related to question 6 of the RFI questionnaire:
   - Would I-ACT be open to the idea of piloting innovative research projects?
     Yes, this is one of the goals of I-ACT.
   - Would you be open to utilizing training your working group on how a company created its Vehicle Cyber Security Program?
     I think we are open to a discussion on this, but that decision will ultimately be made by our security team.

10. Related to question 7 of the RFI questionnaire:
    Is this referencing the included universities and IDOT, or could this be expanded to other universities?
    Yes. However, we have three highly respected, research-oriented universities in Illinois to kick start the program.

11. We just wanted to ensure that you received the below email sent on June 8. Please let us know if you would be able to share the presentation and list of attendees for the Project Information Day.
    Yes, your email was received. The presentations and list of attendees from the Project Information Day was published in Addendum #1 on 6/19/18.

12. May I also know if it is possible to speak to anybody in IDOT in relation to some queries that we have?
    Questions can be submitted until 7/6/18. Also, you may complete the One on One request form by 7/25/2018. IDOT may schedule meetings following the submittal of the RFI to ask follow up and clarifying questions to the responses.

RFI Industry Day
June 4, 2018
1:30PM
Illini Center – Chicago, IL

Imad Al-Qadi, UIUC Bliss Professor of Engineering and Director of ICT, provided opening remarks. He stated the main point of the RFI Industry Day was to gather industry feedback and opinions.

Erin Aleman, IDOT Director of Planning and Programming, was introduced and discussed the Illinois Automated and Connected Track (I-ACT) project in partnership with several Illinois universities. She discussed why it is important for IDOT to invest in the future of transportation and noted that connected and automated transportation technology is developing at a rapid pace. It was noted that this type of technology has the potential to affect communities, the quality of life, and safety. IDOT truly believes that the world-renowned Illinois university partners have the support, expertise, and personnel necessary to advance these technologies and that the proposed I-ACT testing facility can aid in these advancements. Improving safety, reducing distracted driving, helping the mobility impaired, reducing commute times, and leveraging the environmental benefits are a few of the reasons IDOT is interested in connected and automated transportation technology. In order to achieve these benefits, IDOT believes more testing and advancing technologies through the Smart Transportation Infrastructure Initiative (STII) and the proposed I-ACT facility can be an essential component in advancing the State's interest in the industry and bringing life changing technologies to fruition in Illinois.

Al-Qadi presented about the status of the United States transportation infrastructure, criterial issues for the national level transportation development, STII, and the I-ACT. Al-Qadi stated the needs to reposition the state of IL to be a leader in emerging technologies, including autonomous and interconnected vehicles, smart materials and self-healing, and sensors and wireless connections, which would allow for a smart transportation intermodal connection. Al-Qadi discussed the vision of the STII and the partnership between academic, government, and industry. He explained the I-ACT would include closed test tracks, urban and metropolitan roads, multi-modes of transportation, and an interstate corridor testing facility with the focus on freight. The proposed track has four development stages: deployment of parking lot, test track, smart simulated city and suburban structures, and real city and highway corridors. The proposed 1.93-mile track will be constructed on 257 acres in Rantoul, IL and will include two lanes and two shoulders and accommodate a driving speed of 65 miles per hour. Inside the track will be a connected village.

Peter Nelson, UIC College of Engineering Dean, presented UIC's support of I-ACT. He described the areas that UIC facility are interested in: multi sensor object recognition (Electrical and Computer Engineering), safety of systems controlled by deep learning processes and real time monitoring (Department of Computer Science), and research on automated vehicles (Civil and Materials Engineering and the Urban Transportation Center (UTC)).

Bret Johnson, Associate Director Northwestern University Transportation Center (NUTC), provided an overview of the NUTC. He explained the Center is a systems engineering school that is not academic, but instead a hub for research on campus. The Center works with over 60 facility members. He noted that the 2016-2017 annual report is being released the second week of June.

Al-Qadi and Aleman opened the floor for a question and answer session.

1. Q: Will the slides be available following the meeting?
   A: Yes

2. Q: Will highway exits be accounted for in the test track?
   A: When the professional design is done, highway exits could be considered.

3. Q: Has bike travel between lanes, both motorcycle and pedaled cycle, been considered?
   A: The track is conceptual at this time, but the idea could be discussed in a one-on-one discussion.

4. Q: It was suggested to have the inter-lane be in a figure 8 with a design to allow testing under a bridge and testing visual systems.
   A: Input on the type of bridges is needed from industry.

5. Q: Can you provide the timeline for building out the physically infrastructure?
   A: The current plan is to establish the vision, ensure the idea is needed in IL, and design a unique track with a focus on freight. The team is in the process of collecting data and IDOT has requested input from industry. IDOT is also considering if there are opportunities to collaborate financially with industry members.

6. Q: It was suggested to design the track to allow for public safety vehicle (EMC, ladder trucks, and school bus) testing. It was noted that this could be a differentiator and a need, specifically related to policy.
   A: This is a good point and will be considered in this study plans.

7. Q: Will the "last mile" of freight be reviewed in this phase?
   A: Yes, this is one of the research areas that has already been proposed and will definitely be researched.

8. Q: Are you collaborating with any telecoms for 5g connectivity on trucks?
   A: Not currently, but looking for feedback on this technology.

9. Q: Will there be provisions to test electric magnetic compatibility?
   A: An industry wish list is being created to ensure all needs are covered.

10. Q: What do the one-on-one discussion entail and how long do they last?
    A: The discussions are typically 45 minutes with predefined questions, to test consistency and inconsistency, based on an overview analysis of the proposals received and followed by an open format discussion.

11. Q: Do you want industry feedback on other locations?
    A: Yes, feedback is welcomed.

12. Q: Has funding been identified for the design and development of the test track?
    A: IDOT currently spends federal dollars on hard research. IDOT will evaluate the amount of an investment they can make, in collaboration with universities and industry partners.

13. Q: Who will attend the one-on-one discussions?
    A: IDOT and University partners; it could be also on a conference video/call.

14. Q: Another wish list item would be connected street lights and traffic lights compatible for 5g testing to send data to connected street light components.
    A: Thank you

15. Q: Would the vehicles used in the facility be purchased or outside private sector fleets?
    A: Both – Industry would be asked to provide their own vehicles and then specific research items would be used by the University as it depends on the research agenda.

16. Q: Who will be the main stakeholders and what is the business model?
    A: It is not expected that the track will be for rent due to being at top research schools with a focus on development and innovation. The approach will be to work with industry to develop better products and validate products. STII will bring all transportation efforts under one umbrella to have a more focused approach and will work with many companies that have specific expertise. Suggestions or comments on the business model are welcomed.

17. Q: One thing to learn from other tracks is to allow off-hours testing to accommodate more scheduling and shorten the testing lead-time. Some operational feedback would be to determine how both large and small companies could use the track.
    A: Agree. Thank you

18. Q: Success of this track would be to integrate multiple systems and to determine how multiple users can be engaged instead of isolated. This is one of the big gaps that exists with the other tracks around the country. Feedback from all major companies is that the integration of the systems will be the future. This focus will provide a level of differentiation in this test track.
    A: Agree. Thank you

19. Q: Has the approach to simulate poor "real world" road conditions (potholes, cracks, etc.) instead of a brand new road been considered?
    A: The track will be 1.9 miles and lends itself for many studies, including addressing deterioration issues utilizing new self-healing polymers and maintenance strategies. The main focus is to build the track for the future and ensure the right infrastructure is in place to perform testing for what is predicted in 10-20 years from now.

20. Q: Have data centers been considered, (i.e. on premise data, cloud data, a redundant data center in another place)?
    A: Of course, the intent is to be prepared for big data storage and analysis, while keeping in mind different levels of security.

21. Q: In terms of government involvement related to regulations, that can delay or speed up the process, what will be the government's involvement?
    A: IDOT is actively trying to kill bad bills that would not allow large-scale environment testing.

22. Q: Will responses to the RFI be published online?
    A: Responses to the RFI are typically published; however, the one-on-one conversations will be confidential.

23. Q: A vision and concept being thrown around for a few years is separating car and truck lanes, which would allow for a larger size truck lane. FHWA has approved funding to spend on such a project, but nothing has been started yet. The intent would be for trucks to be 160,000 lbs. and in a dedicated lane. With the focus for this track on freight, integrating this concept could be very beneficial to the country.
    A: IDOT has been evaluating this in the Chicagoland area. The idea of a managed lane network is something the DOT is reviewing. The track design would allow for the testing, but may need to add to the research needs in relation to the pavement designs.

Attendees were thanked for their participation in the Industry Day and encouraged to submit responses to the RFI.