



# Working with USDOT UTCs: From Conception to Implementation

TRB AJE35 RIIM Coordination and Collaboration Subcommittee

April 11, 2025

TRB AJE35 RIIM Webinar: WORKING WITH USDOT UTCS:  
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## **TRB AJE35 RIIM Coordination and Collaboration Subcommittee : Co-Chairs**

- Mr. Curtis Bradley, North Carolina DOT
- Dr. Marwa Hassan, Louisiana State University
- Dr. Laurence Rilett, Auburn University

## **Acknowledgements**

- AASHTO RAC Coordination and Collaboration Task Force
- Council of University Transportation Centers
- AUTRI Alabama Transportation Assistance Program

## **TRB AJE35 RIIM Webinars**

- ✓ **Communicating Research Priorities from a State DOT Perspective: Lessons Learned**
- ✓ **The ABCs of TCIs and UTCs**
- ☐ Working with USDOT UTCs: From Conception to Implementation
- ☐ Leveraging Your State Research Funding with Federal Research Programs

# Overview of Webinar

- Panelists
  - 10-15 minutes to provide their thoughts
- Questions and Answers
  - Please put all questions into the Q&A
  - Will limit questions until the end
- Note:
  - We will be making the recording available
  - PDH – cover at end



## Panelist 1

**Robert Hampshire, Ph.D.**

*Associate Professor of Public Policy,  
University of Michigan*



## Panelist 2

**Curtis Bradley, Ph.D.**

*Manager of Research & Development, North  
Carolina Department of Transportation*



## Panelist 3

### **Sarah Searcy**

*Emerging Technologies and Innovation  
Manager, Office of Strategic Initiatives and  
Program Support (SIPS), North Carolina  
Department of Transportation*





## Panelist 4

**Ali Karimoddini, Ph.D.**

*Director, CR<sup>2</sup>C<sup>2</sup> Regional University*

*Transportation Center*





**NORTH CAROLINA**

Department of Transportation

# North Carolina Department of Transportation Research & Development – UTC Engagement

Curtis T. Bradley, Ph.D. – NCDOT – Research & Development Manager

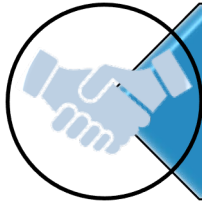
Sarah Searcy – NCDOT – Emerging Technologies & Innovation Manager

Dr. Ali Karimoddini – NCA&T – CR2C2 Regional UTC Director

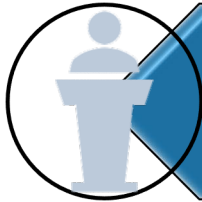
April 11, 2025

Connecting people, products and places safely and efficiently with customer focus, accountability  
and environmental sensitivity to enhance the economy and vitality of North Carolina

## Table of Contents



Overview of UTC Engagement



NCDOT Subject Matter Expert



UTC - Researcher

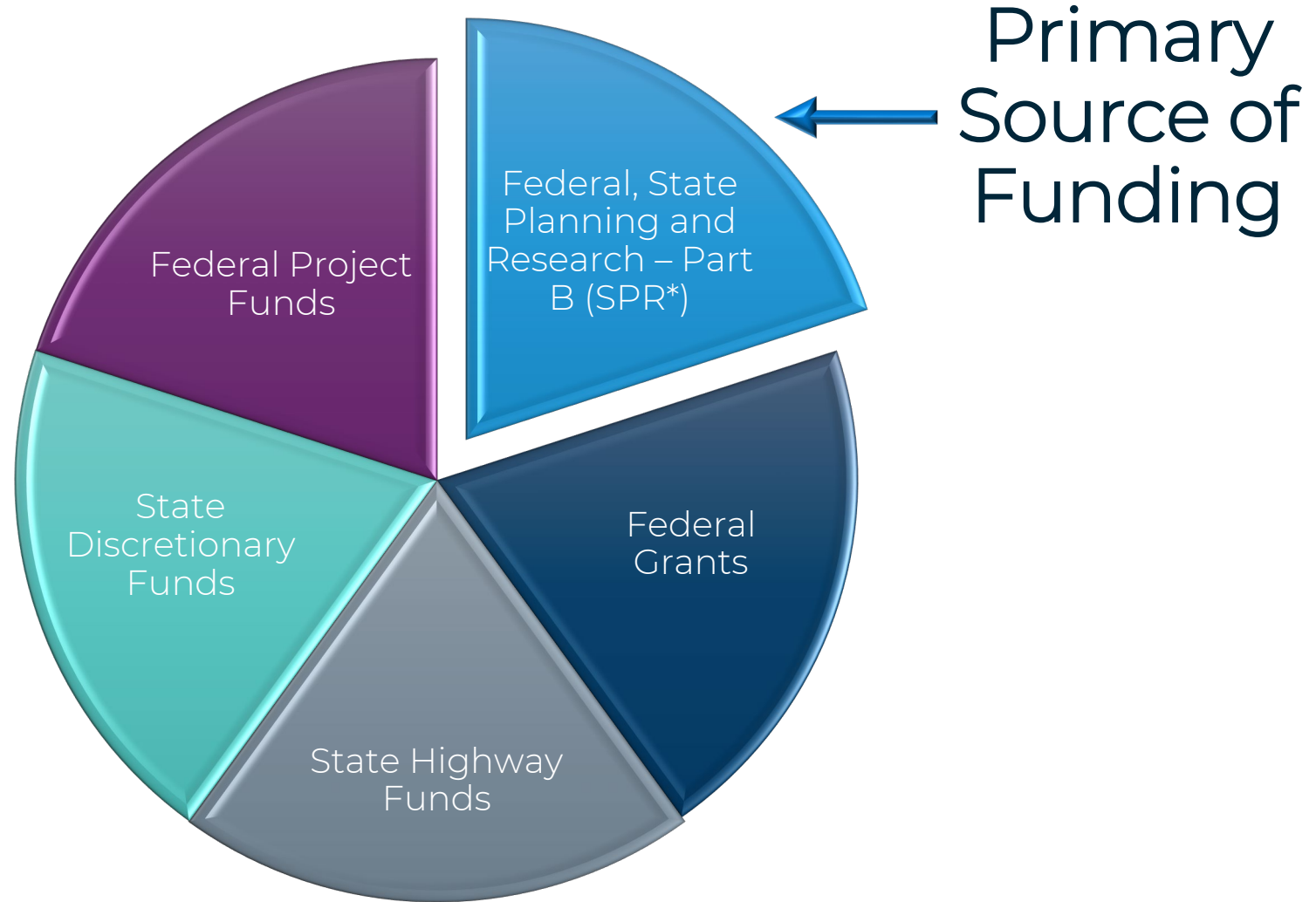


Open Discussion

# Overview of University Transportation Center Program

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## How is NCDOT Research Funded?





## What Makes a Good Research Idea / Proposal for NCDOT?



Collaborate with  
NCDOT Subject  
Matter Expert –  
**ALL NCDOT  
SPONSORED  
RESEARCH MUST  
HAVE A NCDOT  
CHAMPION**



Lines up with  
ongoing  
initiatives and  
supports  
NCDOT's current  
mission and goals



Clearly  
articulated  
methodology:  
Needs to be  
useable for  
NCDOT



Tangible /  
Useable  
Deliverables  
(Implementation)

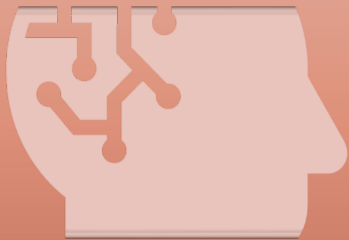
## University Transportation Center – Match (Goals)



Investigate Disruptive  
Methodologies & Technologies



Leverage University Lead Research



Potential for Future Research Ideas  
and Projects

## NCDOT Match Type



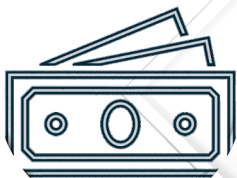
### Passive / Soft Match

- Existing Projects



### In Kind Match

- NCDOT Time, Material, Resources, etc.



### Hard Match

- Monetary Match

## NCDOT Engagement with UTC



# NCDOT Subject Matter Expert (S. Searcy)

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## Keys to Successful Partnership

- ✓ Alignment on needs and priorities.
  - How does the project align with NCDOT's mission, vision, and values to:
    - Connect people, products, and places safely and efficiently.
    - Support cost savings through better use of infrastructure and resources.
    - Promote the development and use of new and better solutions.
    - Provide reliable data, analyses, and tools to inform best practices.
- ✓ Real-world transportation problems in search of solutions.
- ✓ Assembling the right team – project champion, internal & external stakeholders, SMEs.
  - Designated point of contact.
  - Guidance, oversight, and course correction from stakeholders.
- ✓ Frequent, consistent communication.
- ✓ Strategic "building block" approach.
- ✓ Tracking outcomes and lessons learned.



## Example: Emerging Technologies for Public Transportation

- How can connected and automated vehicles (CAV) be used for public transportation?
- What are the capabilities and limitations of CAV for public transportation?
- How can the technology be developed to better serve riders with different needs and in different environments?
  - General population, paratransit
  - Fixed route & circulator, on-demand & curb-to-curb
  - Urban, suburban, rural



*Assess emerging technology to determine if it meets transportation needs and can be integrated and scaled as an option in the existing transportation system.*



## Partnership with N.C. A&T State University



Test &  
Evaluate



Engage &  
Educate



Ensure  
Readiness

RP 2022-16 & TCE 2020-03:  
CAV testbed, test track,  
and automated shuttle  
fleet



TT 2025-05:  
Teleoperations platform

TT 2023-35: Open road  
demonstration of  
automated shuttle fleet

# **University Transportation Center – Research (A. Karimoddini)**

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# Working with USDOT UTCs From Conception to Implementation

**Ali Karimoddini**

Director, Center for Regional and Rural Connected Communities  
North Carolina A&T State University



<https://www.cr2c2.com>



NORTH CAROLINA  
AGRICULTURAL AND TECHNICAL  
STATE UNIVERSITY



UNIVERSITY OF  
GEORGIA

THE UNIVERSITY OF  
ALABAMA



University of  
Kentucky



THE UNIVERSITY OF  
TENNESSEE  
KNOXVILLE

Working with USDOT UTCs: From Conception to Implementation  
April 11, 2025



# Center Components

Adopting Emerging Transportation Technologies to Enhance Mobility of People and Goods in Rural and Under-served Communities

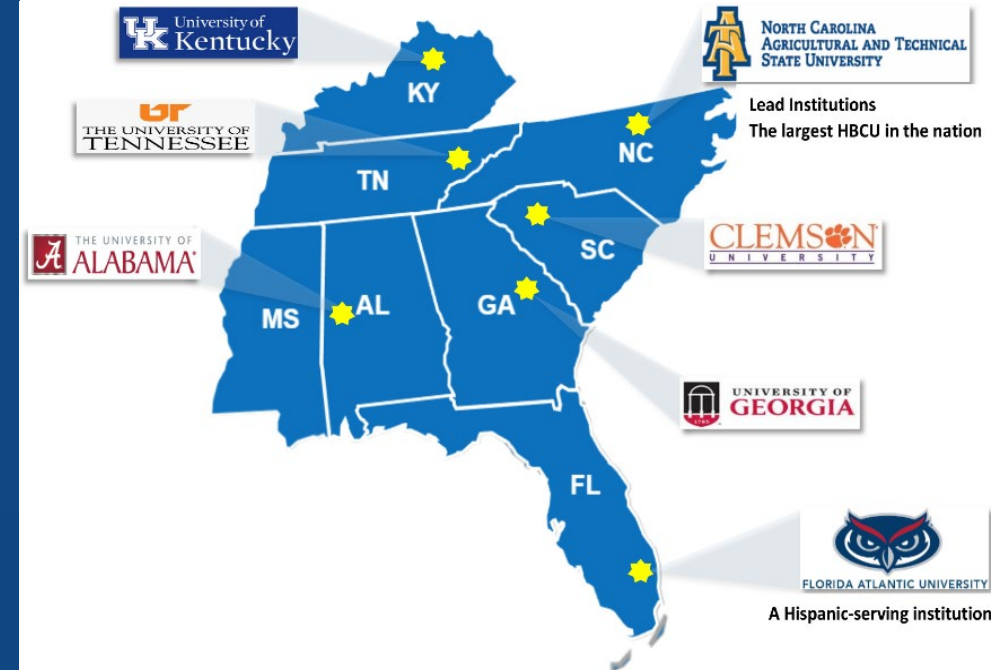
**MRI 1** *Integrating emerging technologies into transportation planning and policy*

**MRI 2** *Developing technological solutions for connected, safe, reliable, and secure transportation services*

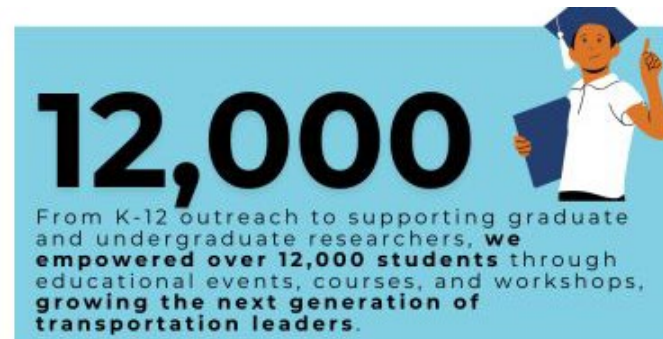
**MRI 3** *Providing equitable technology-driven mobility services*

Education & Outreach

Technology Transfer & Collaboration



# Center Impact (2024)





# Center Leadership



**Ali Karimoddini, Ph.D.**  
**CR2C2 DIRECTOR**  
[NC A&T State University](#)



**Maranda E McBride, Ph.D.**  
**CR2C2 CO-DIRECTOR**  
[NC A&T State University](#)



**Doug Kreis, Ph.D., P.E.**  
**RESEARCH DIRECTOR**  
[University of Kentucky](#)



**Steven Jones, Ph.D.**  
**TECHNOLOGY TRANSFER  
AND  
COLLABORATION DIRECTOR**  
[The University of Alabama](#)



**DeAnna Flinchum**  
**EDUCATION AND  
WORKFORCE  
DEVELOPMENT  
DIRECTOR**  
[University of Tennessee](#)



**Jerry Everett, Ph.D.**  
**ASSOCIATE DIRECTOR  
AND MRI-1 LEAD**  
[University of Tennessee](#)



**Jidong Yang, Ph.D.**  
**ASSOCIATE DIRECTOR  
AND MRI-2 LEAD**  
[University of Georgia](#)



**Evangelos Kaisar, Ph.D.**  
**ASSOCIATE DIRECTOR  
AND MRI-3 LEAD**  
[Florida Atlantic University](#)



**Venktesh Pandey, Ph.D.**  
**MRI-1 CO-LEAD**  
[NC A&T State University](#)



**Reginald Souleyrette, Ph.D., P.E.**  
**MRI-2 CO-LEAD**  
[University of Kentucky](#)



**Rongfang R Liu, Ph.D.**  
**MRI-3 CO-LEAD**  
[NC A&T State University](#)



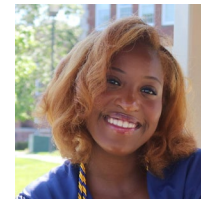
**Mashrur "Ronnie"  
Chowdhury, Ph.D.**  
**ASSOCIATE DIRECTOR**  
[Clemson University](#)



**Pamela Murray-Tuite, Ph.D.**  
**ASSOCIATE DIRECTOR**  
[Clemson University](#)



**Selim Zoorob, Ph.D.**  
**PROGRAM MANAGER**  
[NC A&T State University](#)



**Christina Mosley**  
**Communication Director**  
[NC A&T State University](#)



## Government & Public Sector:

- North Carolina Department of Transportation
- Florida Department of Transportation
- Tennessee Department of Revenue
- Alabama Department of Transportation
- Kentucky Transportation Cabinet
- Georgia Department of Transportation
- South Carolina Department of Transportation
- City of Greensboro
- Greensboro Department of Transportation
- City of Raleigh
- Rockingham County Government
- U.S. Department of Transportation
- Federal Highway Administration

## National Labs:

- Sandia National Laboratories
- Oak Ridge National Lab

## Academic Institutions:

## Nonprofits & Community-Based Organizations:

- Downtown Greensboro Inc.
- Aging, Disability, and Transit Services (ADTS), Reidsville, NC
- Upper Cumberland Human Resource Agency (UCHRA), TN
- Southern Alliance for Clean Energy (SACE), TN
- Black Belt Community Foundation

## Industry & Private Sector:

- Verizon
- Intel
- Google
- Waymo
- General Motors
- VOLVO
- Verizon
- SAE International
- Hexagon
- Cepton
- GALLUP
- Dewey Data

# CR2C2 Advisory Board



**Sarah Searcy**  
**CHAIR OF THE ADVISORY BOARD**  
**Emerging Technologies and Innovation Manager**  
**Office of Strategic Initiatives and Program Support (SIPS)**

[North Carolina Department of Transportation](#)



**Eric Conklin**  
**State Transportation Data Administrator,**  
**Office of Transportation Data**

[Georgia Department of Transportation](#)



**Taft Kelly**  
**Regional Field Administrator at Federal Motor**  
**Carrier Safety Administration**

[Federal Motor Carrier Safety Administration](#)



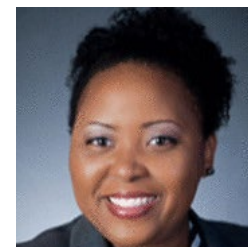
**Gregory D. Krueger**  
**Emerging Technologies Program Manager**  
**and Associate Vice President**

[HNTB Corporation](#)



**Matthew Lesh**  
**Managing Director**

[TESIAC](#)



**April Rai**  
**President & CEO at COMTO**

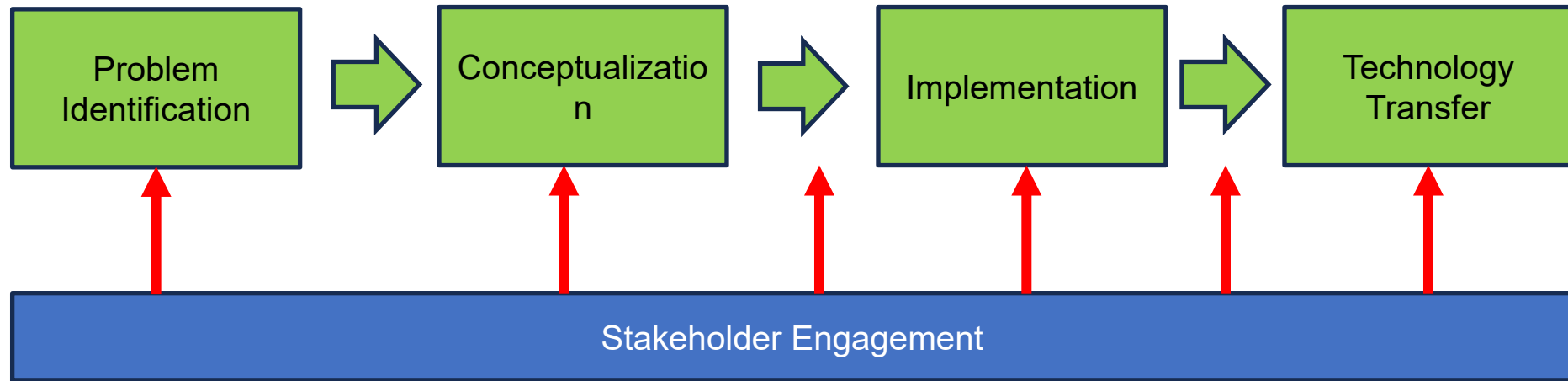
[Conference of Minority](#)  
[Transportation Officials \(COMTO\)](#)



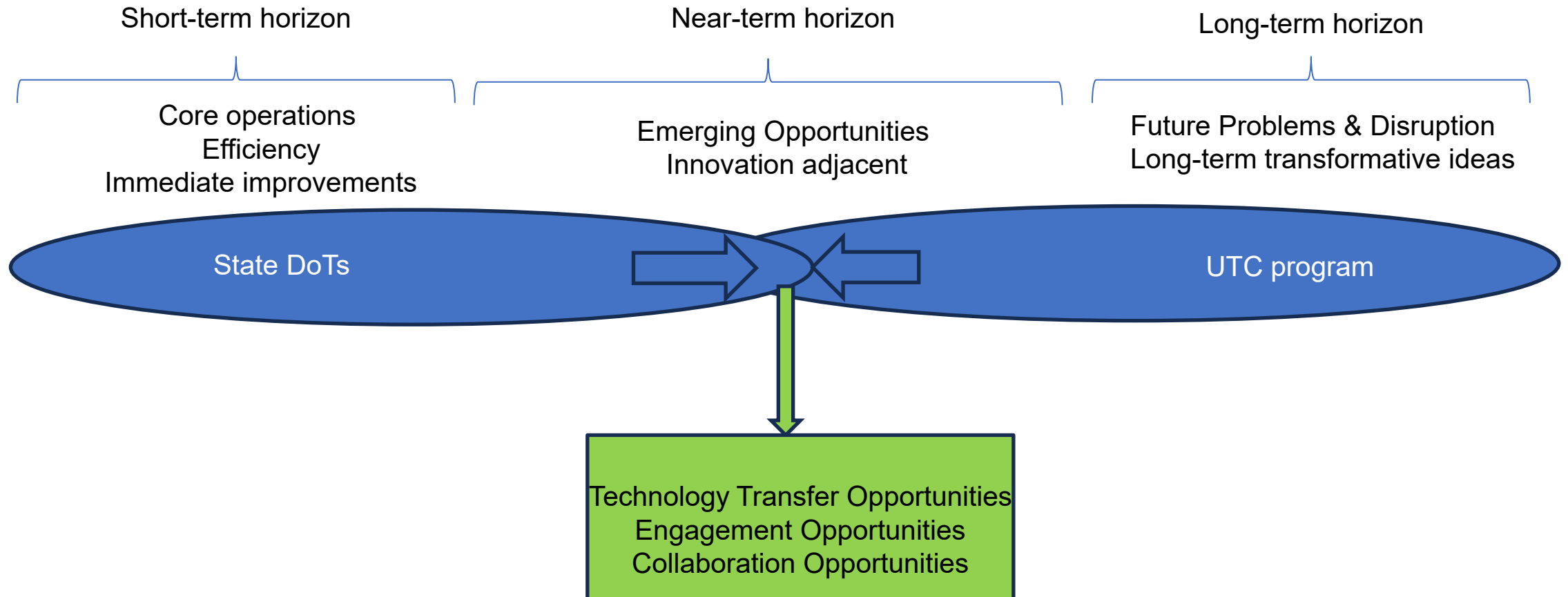
**Allanté V. Whitmore, Ph.D.**  
**Director, Autonomous Vehicle**  
**Initiative**

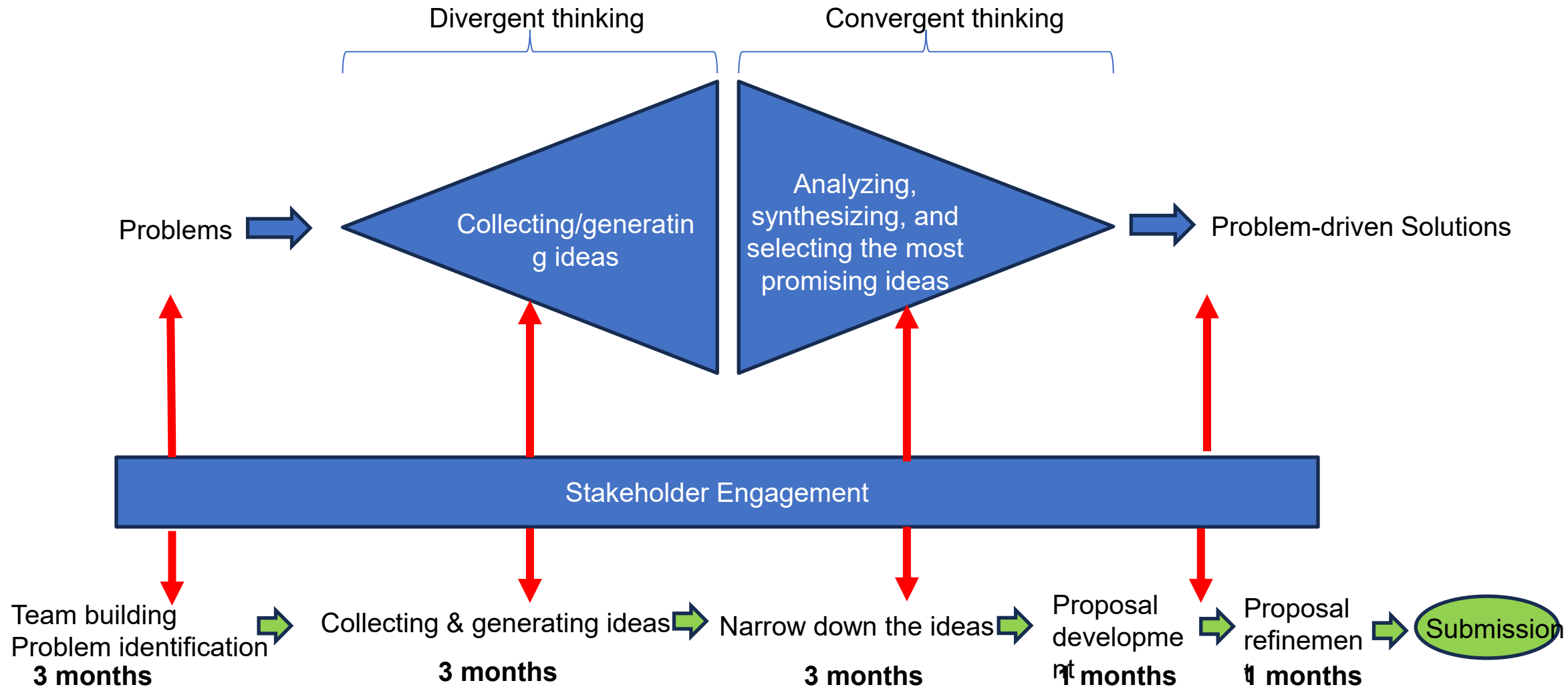
[SAFE](#)

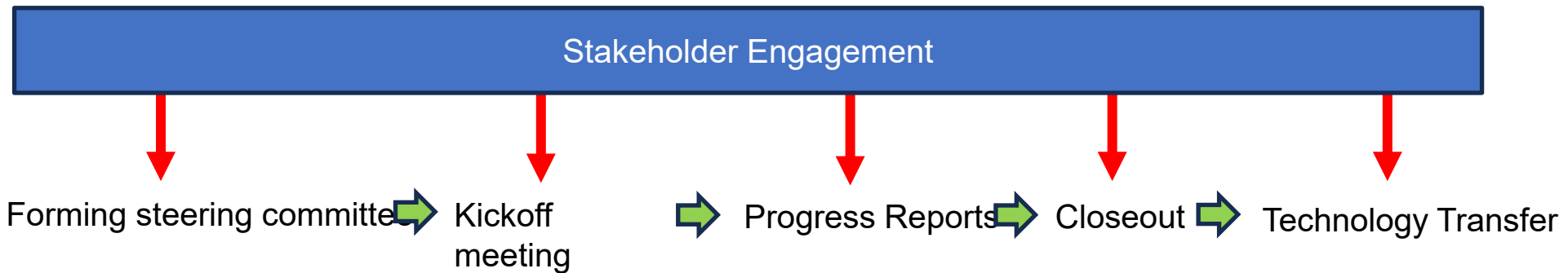


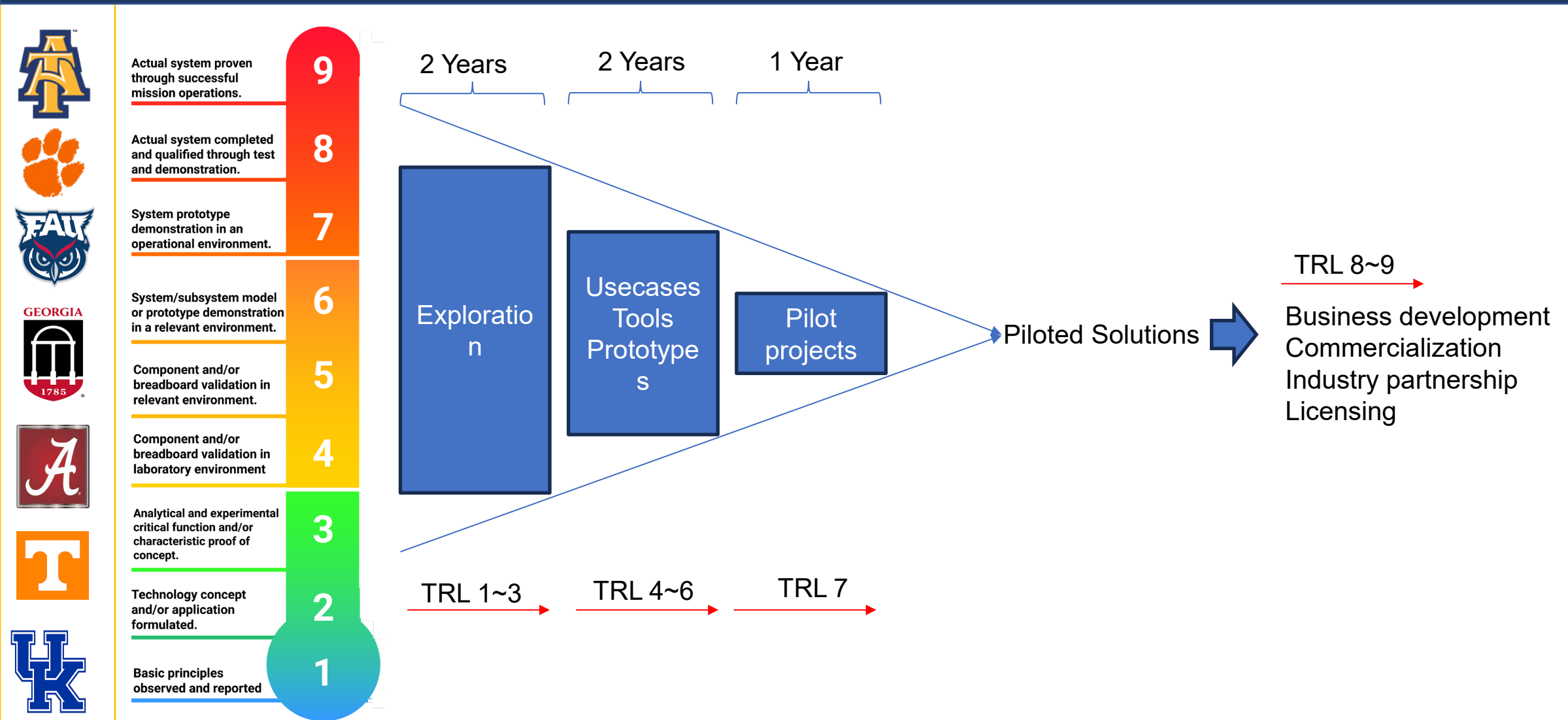


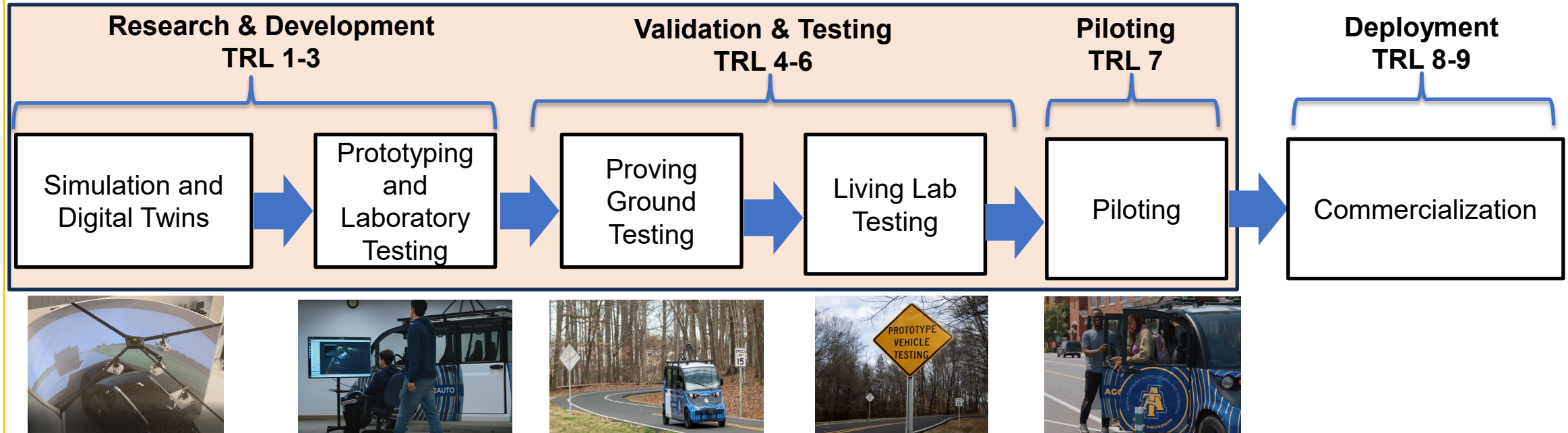
# CR2C2 Problem Identification











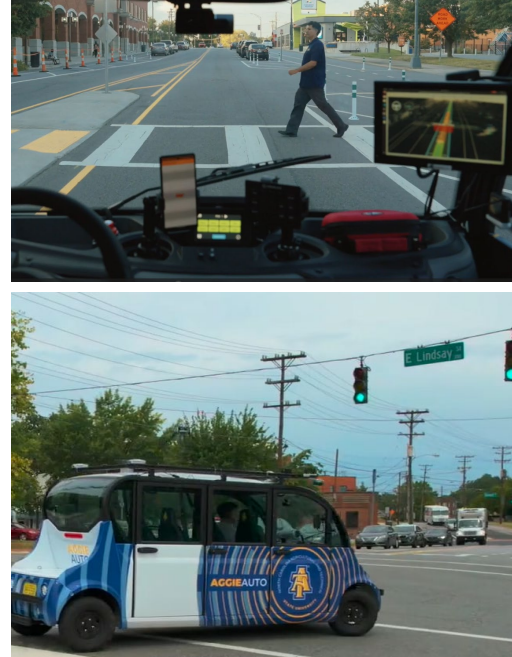




Laboratory Testing



Closed-Track Testing



Public Street Testing

Giving Rides to the Public on Public Streets



**NCDOT Research Project Number: RP 2022-16:**  
Developing and Operationalizing a Testbed of  
Connected Self-driving Shuttles to Test and Develop  
CAV Applications in North Carolina

**NCDOT Research Project Number: TT 2023-35:** Microtransit  
Pilot Project in Greensboro, NC



**NCDOT Research Project Number: TT 2023-35:** “Technology Transfer ( $T^2$ ): *Microtransit Pilot Project in Greensboro, NC,*” April 15, 2023- May 15, 2024.

## Public Deployment of Aggie Auto Shuttles



SEPTEMBER  
**18**

OCTOBER  
**13**



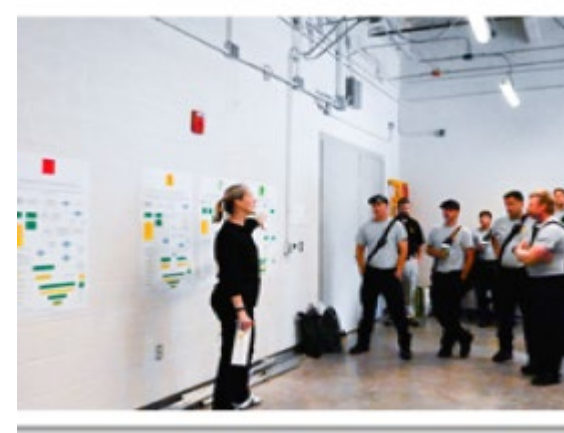
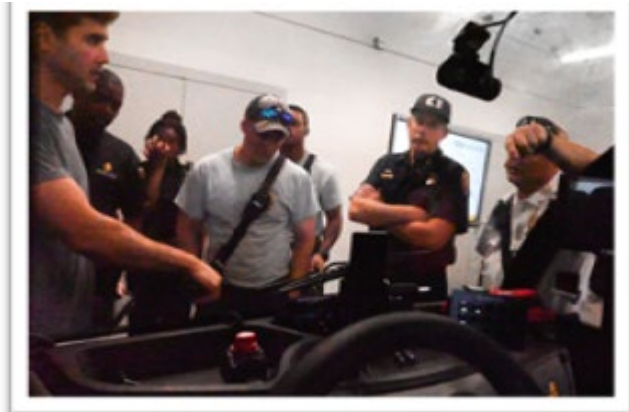


<https://youtu.be/vm0-hw0h06s?si=menNd5IWmOpkIP09>






<https://youtu.be/OPX2fcnT-Gw?si=PsJ8GzV-xt92IA1d>







Lessons Learned From  
Aggie Auto Pilot Program

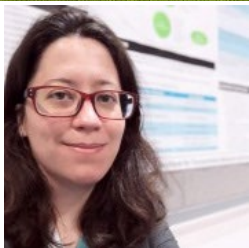


**NORTH CAROLINA AGRICULTURAL  
AND TECHNICAL STATE UNIVERSITY**

**Connecting the Future:  
Autonomy at A&T**

*Connecting N.C. A&T and Downtown Greensboro  
with the Aggie Autonomous Vehicles*

Monday, Sept. 18, 12:30-3 p.m.



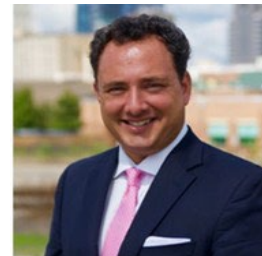
**Sarah Searcy**

Senior Advisor for Innovation, NCDOT Integrated  
Mobility Division (IMD)  
[North Carolina Department of Transportation](#)



**Chris Spencer**

Transportation Engineering Manager  
Greensboro Department of Transportation



**Zack Matheny**

President  
Downtown Greensboro Incorporated



**John LeGrand**

Captain of Patrol Operations  
Police Department  
North Carolina A&T State University

[https://youtu.be/wdmT-npRhaw?si=r\\_IJ8kywGOwELZAp](https://youtu.be/wdmT-npRhaw?si=r_IJ8kywGOwELZAp)

**NCDOT Research Project Number: TT 2025-05: “Technology Transfer (T<sup>2</sup>): Piloting the remote-controlled operation of automated driving shuttles,”** Nov 15, 2024 – Feb 14, 2026



Driver Initiative



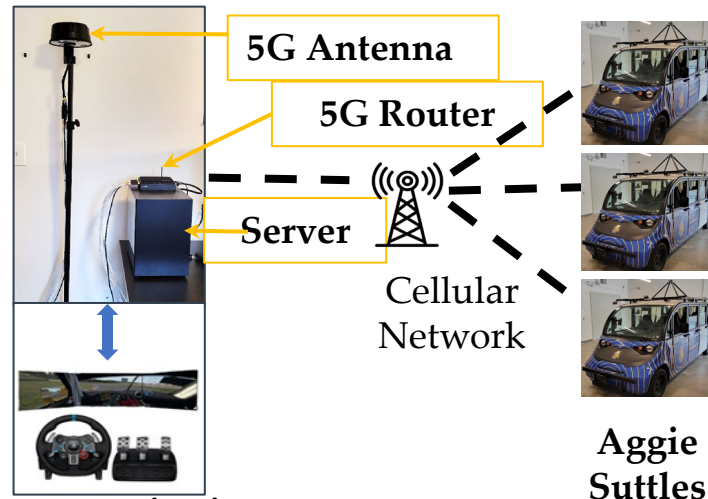
Autonomy Initiative



Near-Full Automation + Remote Operation (backup)



Full Autonomy




Remote Monitoring Control Station

Aggie Shuttles



<https://youtu.be/rZ0kPBej4x4>



2-DAY WORKSHOP  
**PIONEERING TRANSPORTATION INNOVATION WITH GENERATIVE AI**

For more details, scan the QR code or visit  
<https://shorturl.at/9CamW>

**Sponsors and Host Organizations:**

U.S. Department of Transportation  
Federal Highway Administration

leidos BLUEHALO

T&D

CMM

CR2C2

Turner-Fairbank Highway Research Center

**WHEN**  
MARCH 13 - 14, 2025

**WHERE**  
CLARK HALL, UNIVERSITY OF MARYLAND, COLLEGE PARK

## Workshop Sessions

- Panel Discussion: Transportation Needs and Emerging Practices
- Revolutionizing Traffic Operations & Management with Generative AI
- Enhancing Urban and Rural Traffic Safety through Generative AI Innovations
- Generative AI in Action: **Insights from Federal and State Agencies**
- Unlocking the Potential of Generative AI
- Revolutionizing Traffic Operations & Management with Generative AI
- From Concept to Reality: Generative AI in the **Transportation Industry**

<https://sites.google.com/view/generative-ai-in-transport>





[https://youtu.be/-66x\\_oIEDCw?si=546V-P0vcy1OiEeC](https://youtu.be/-66x_oIEDCw?si=546V-P0vcy1OiEeC)



Thank You!



**And all other  
stakeholders**



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AGRICULTURAL AND TECHNICAL  
STATE UNIVERSITY**



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GEORGIA**

**THE UNIVERSITY OF  
ALABAMA**



**University of  
Kentucky**



**THE UNIVERSITY OF  
TENNESSEE  
KNOXVILLE**



**Ali Karimoddini**

**[akarimod@ncat.edu](mailto:akarimod@ncat.edu)**

Q&A

PDH certificates will be provided following the conclusion of the webinar via email used for registration.

## **TRB AJE35 RIIM Webinars**

- ✓ **Communicating Research Priorities from a State DOT Perspective: Lessons Learned**
- ✓ **The ABCs of TCIs and UTCs**
- ✓ **Working with USDOT UTCs: From Conception to Implementation**
- ☐ **Leveraging Your State Research Funding with Federal Research Programs**

Thank you for  
participating!