Welcome to the 2026 RCCADS Workshop!

The workshop will begin at 12:15pm (ET)

Please mute your microphone and turn off your video.

The chat function can be used for any questions.

Wifi Network: UVA Guest

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Event Logistics

- **Microsoft Teams:**
  - Please stay muted and leave your video off, unless you're speaking or presenting
  - Chat feature can be used at any time and is viewable by everyone in the meeting
  - Q&A: use chat feature or hand raise feature in Teams

- **In-person:**
  - Please raise your hand for questions after each presentation & a microphone will be brought to you
  - A shuttle will be available for transportation to Kardinal Hall

- **Workshop materials:**
  - Some slides will be available after the workshop
  - Workshop will **not** be recorded

In case of issues or questions about the event:
chat or email NaegeleR@trcpg.com

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Research Consortium for Crashworthiness in Automated Driving Systems (RCCADS)

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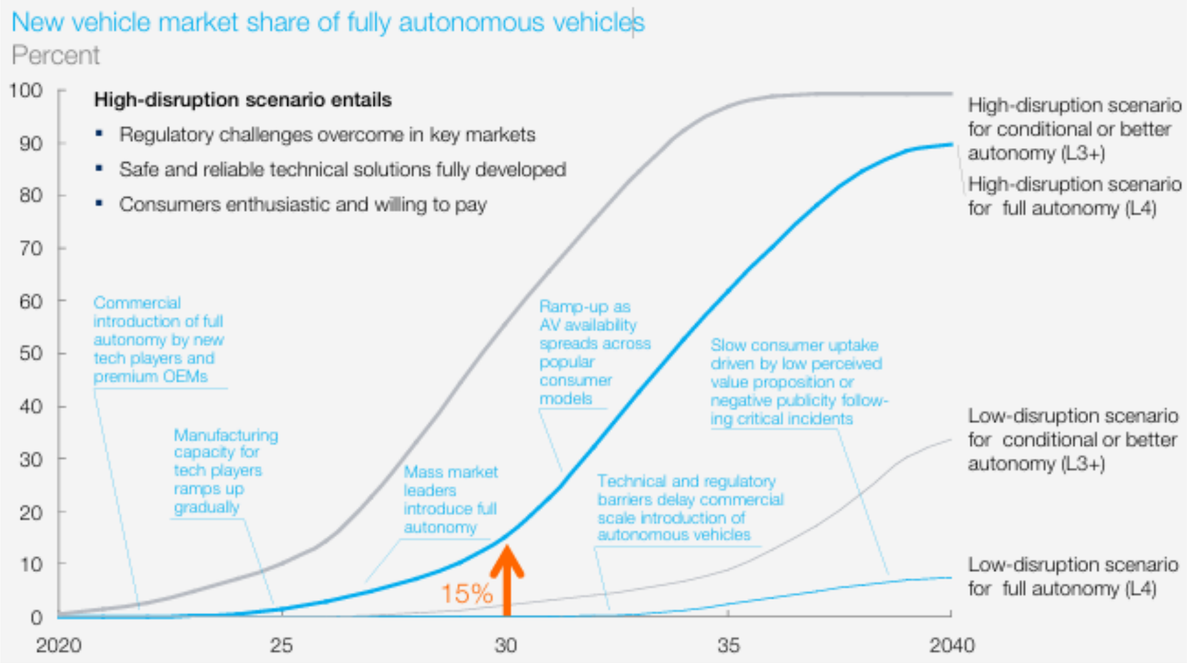
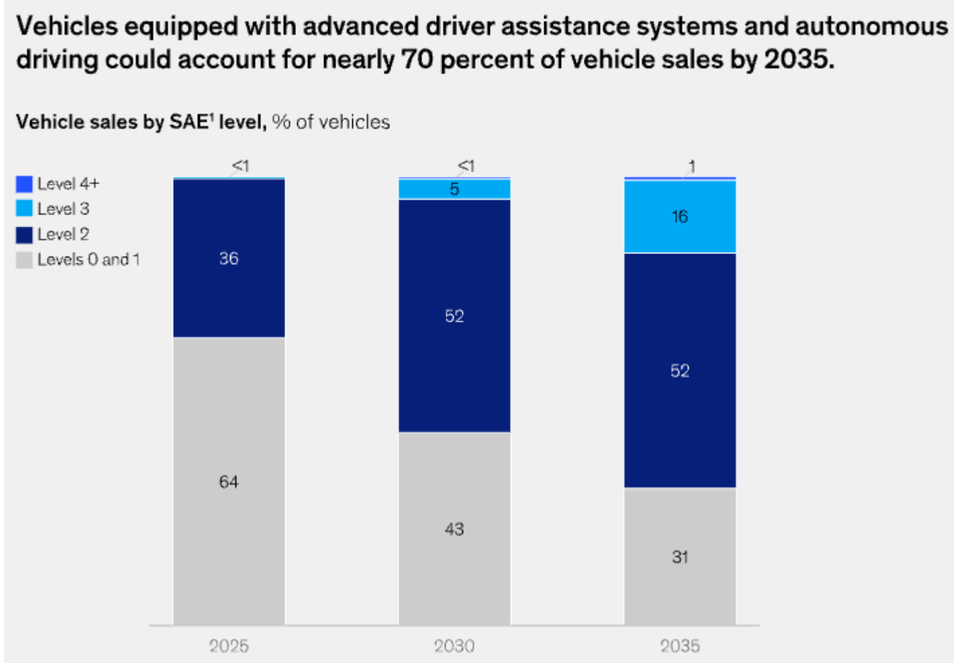
ADAS & ADS – an evolving landscape



From *McKinsey & Company 2016*



From *McKinsey & Company 2026*

Automated driving systems will reduce crashes overall, but they also change
how crashes occur,
how occupants are positioned,
and what safety systems must protect against.

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How crashes occur

Autonomous Vehicle Accidents: Legal Challenges and the Future of Injury Claims

Created by Carl Williams
Published: Feb 20 2025, 20:02 PM EST

Who is to blame for 'self-driving car' deaths?

21 May 2018

Share Save Add as preferred on Google

Theo Leggett
Business correspondent, BBC News

Who Is Responsible for Self-Driving Car Crashes?

The Rabin Law Firm Feb. 4, 2025

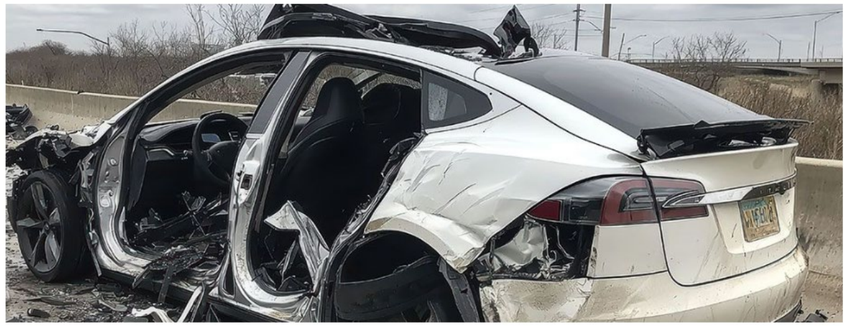
In recent years, autonomous vehicles (AVs) have taken to the roads in many parts of the country. These vehicles promise to revolutionize the way we think about transportation, offering the potential for fewer accidents, reduced traffic congestion, and more efficient travel.

However, as self-driving vehicles become increasingly common, the question of responsibility in t more challenging involved in an ac car, understandir challenging, and

Video shows Google self-driving van accident in Arizona

Elizabeth Weise USA TODAY
May 4, 2018 | Updated May 5, 2018, 2:06 p.m. ET

A Waymo self-driving van was involved in a car accident Friday afternoon in Chandler, Ariz. The self-driving van is not believed to be at fault, but this incident is still under investigation. *USA TODAY*



When Autonomous Vehicle Technology Fails: Legal Issues in Self-Driving Car Accidents

Can You Sue a Robocar?

A pedestrian killed by a self-driving Uber in Tempe shows that the legal implications of autonomous cars are as important, if not more so, than the technology.

By Ian Bogost

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How crashes occur

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In the last year, there have been 800 incidents reported in the SGO dataset, with 6 involving a serious injury or fatality

more challenging
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car, understandir
challenging, and

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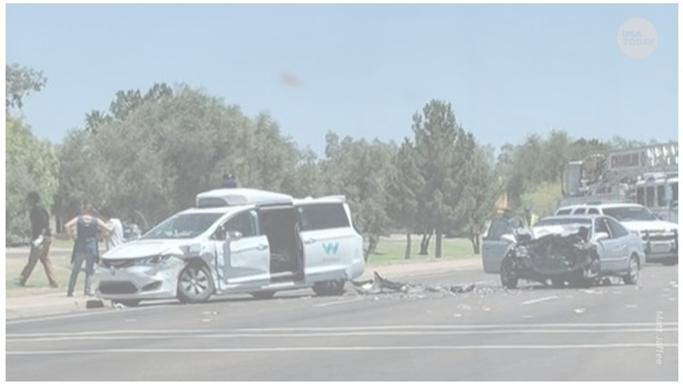

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How occupants are positioned

From *FORVIA 2026*

From *Automated Driving Systems 2.0: A Vision for Safety*

Forman et al. 2019

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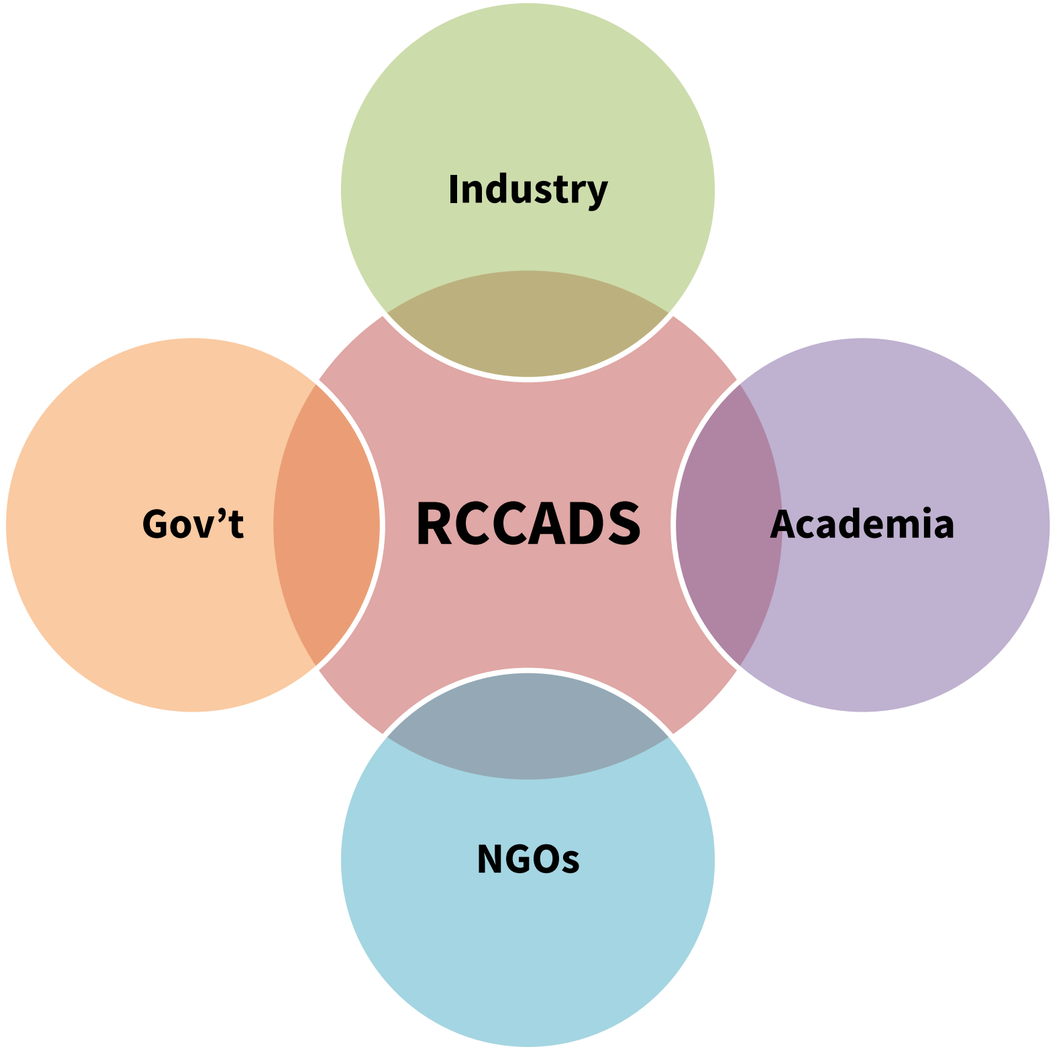
RCCADS Mission

To collaboratively develop a **foundation of information** that will inform interested parties who seek to develop validation methods for **automated driving systems**.

The mission is to be accomplished through **pre-competitive research** engaging industry, trade associations, NGOs, government, and academia.



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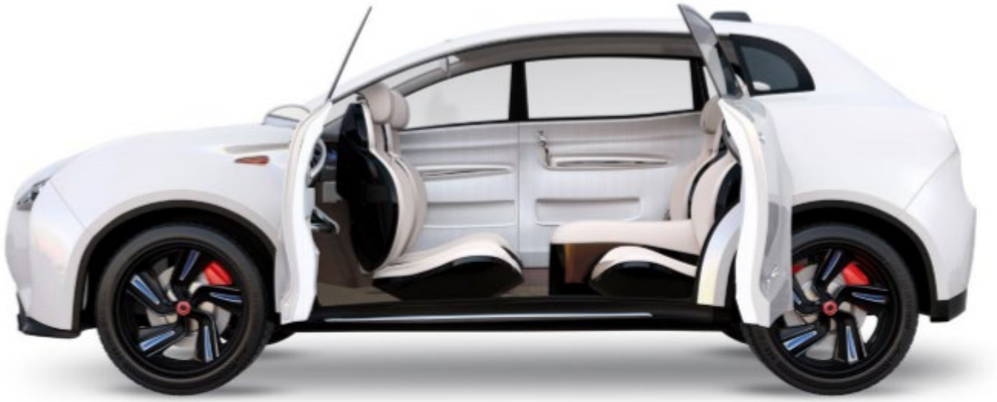
Research Areas

From *Östling et al., 2019*

- Future crash modes
- Non-standard seating and restraints
- Biomechanical data
  - Define injury risk
  - Evaluate, update, & develop tools



From *Automated Driving Systems 2.0: A Vision for Safety*

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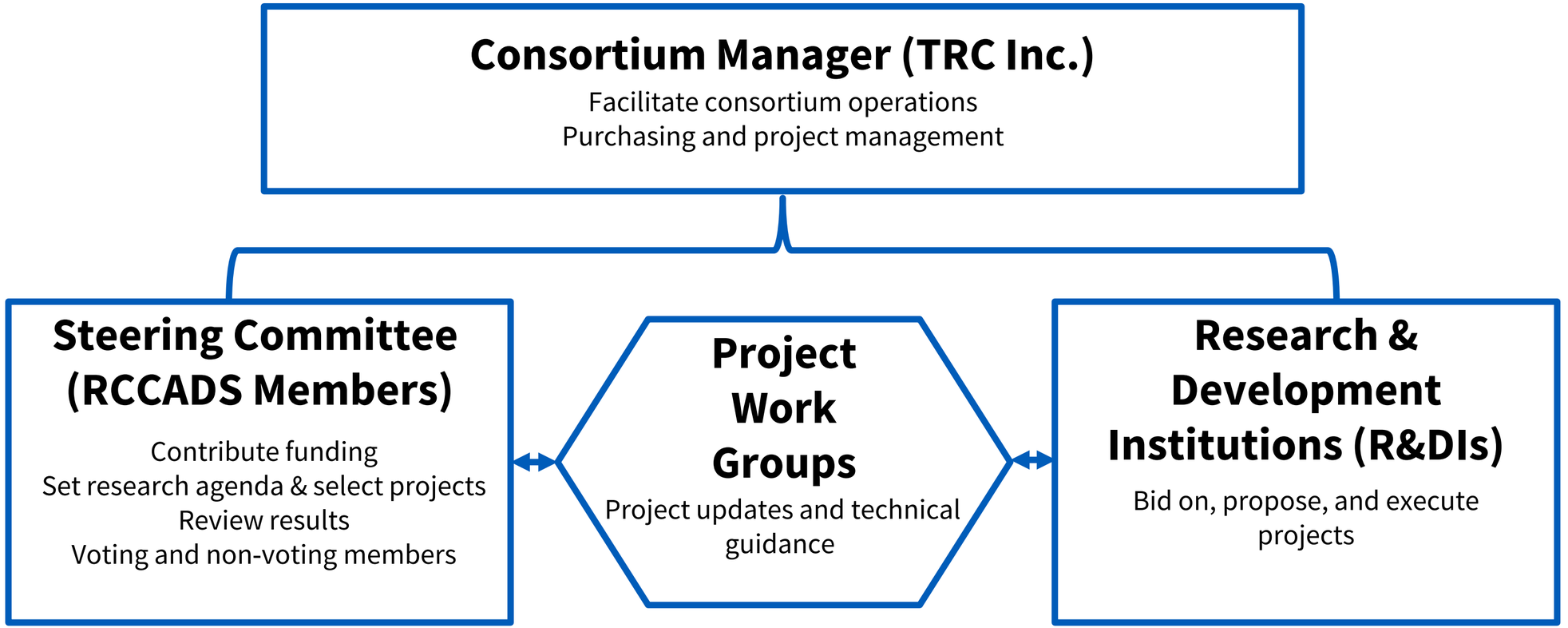
Consortium Structure



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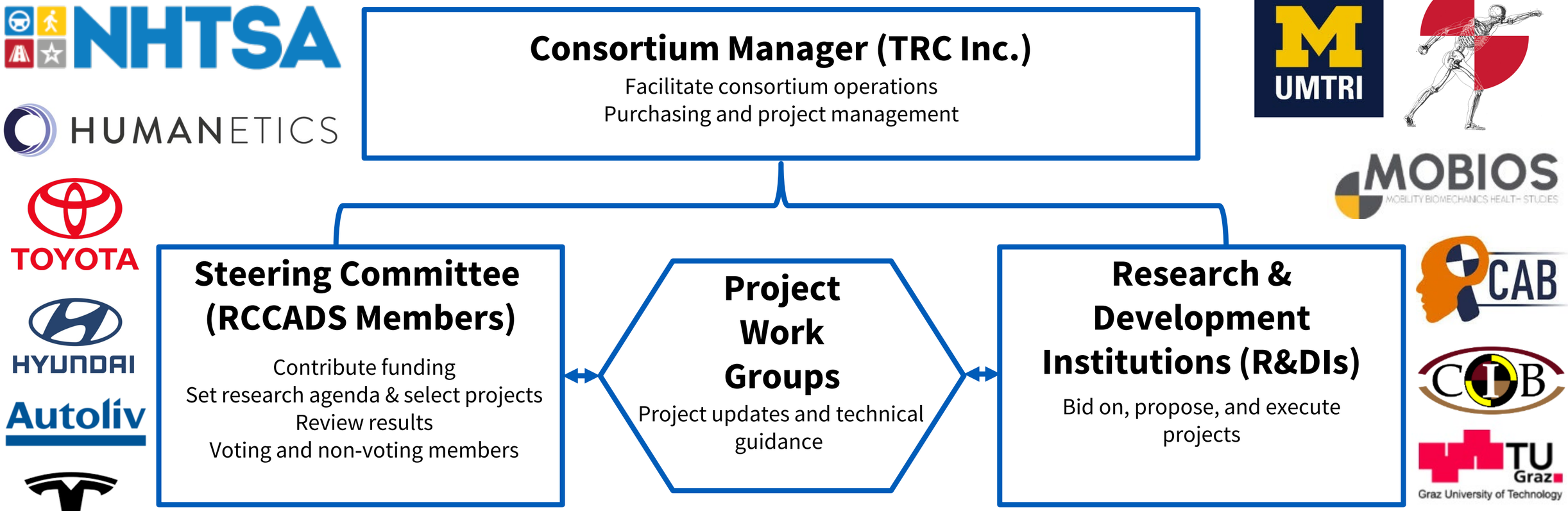
Members & R&DIs



NHTSA
HUMANETICS
TOYOTA
HYUNDAI
Autoliv
TESLA
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Injury Biomechanics Research Center
UMTRI
MOBIOS
Mobility Biomechanics Health Studies
CAB
CIB
TU Graz
Graz University of Technology
Wake Forest School of Medicine
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Return on Investment

On average, access to ~6 times the amount of research paid for!

Year	Project	Project Cost	Total Annual Project Cost	Member ROI
2019	Project 1	$ 136,000.00	$ 136,000.00	**2.7**
2020	Project 1	$ 95,000.00	$ 214,000.00	**4.3**
	Project 2	$ 69,000.00		
	Project 3	$ 50,000.00		
2021	Project 1	$ 117,000.00	$ 511,000.00	**10.2**
	Project 2	$ 99,000.00		
	Project 3	$ 295,000.00		
2022	Project 1	$ 120,000.00	$ 345,000.00	**6.9**
	Project 2	$ 135,000.00		
	Project 3	$ 90,000.00		
2023	Project 1	$ 151,000.00	$ 260,000.00	**5.2**
	Project 2	$ 109,000.00		
2024	Project 1	$107,503.00	$ 177,503.00	**3.6**
	Project 2	$70,000.00		
2025	Project 1	$174,512.50	$ 292,497.00	**5.8**
	Project 2	$117,984.50		

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Previous RCCADS Projects

2019

- Supporting the Development of **Pelvis** Injury Criteria

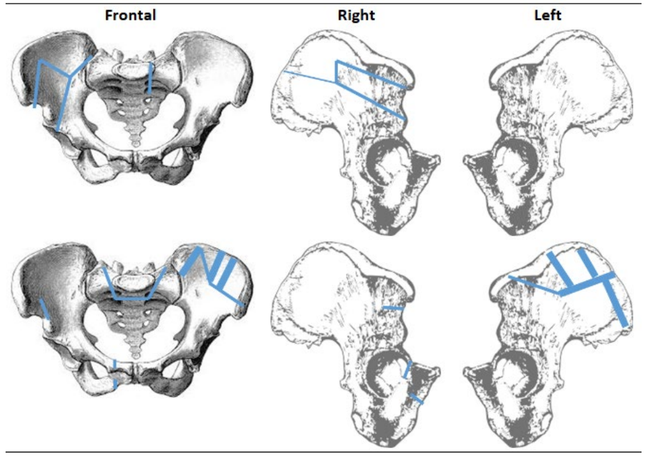
2020

- Characterization of Subcutaneous **Pelvic** Adipose Tissue for Enhancement of Human Surrogate Models
- Evaluating **Biofidelity** of THOR-50M in a **Reclined** Frontal-Crash Sled Tests
- Validation of FE Model during **Ramping up** in Rear-Loading Conditions

2021

- PMHS Responses and Injuries in a Continuous **Rear-Facing** Seat Condition at a High-Speed Frontal Impact
- Critical Factors Influencing **Pelvis** Motion and **Lap-Belt to Pelvis** Interaction for Occupants of Automated Vehicles
- **Lumbar Spine** Mechanical Response to Combined Flexion/Compression: PMHS and THOR

From *Automated Driving Systems 2.0: A Vision for Safety*



Moreau et al. 2021

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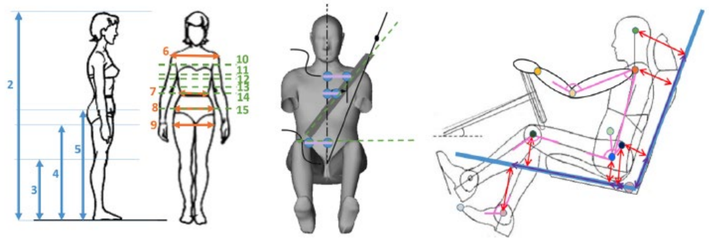
Previous RCCADS Projects

2022

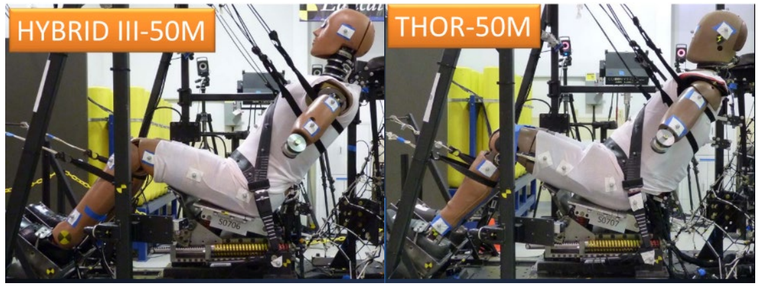
- Continuing Refinement of THOR for Reclined **Postures** – Testing to Evaluate Prototype Pelvis Modifications
- The effects of sex, body shape, posture, and **belt tension** on **belt fit** relative to the skeleton – continuing volunteer data collection with Open MRI
- **Submarining** and Rib Fracture Prediction Thresholds



Vakiel et al. 2023

2023

- Understanding of Non-Standard **Seating** Loadcases
- Tensile and Compressive **Material Properties** of Human Pelvic Cortical Bone



Kerrigan et al. 2022

2024

- Investigation of **submarining** risk in **reclined postures**
- State of Knowledge on **Upper Extremity** Injury Causation and Injury Prediction

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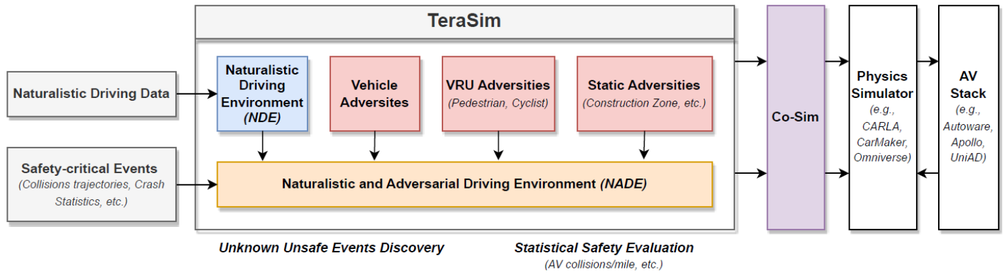
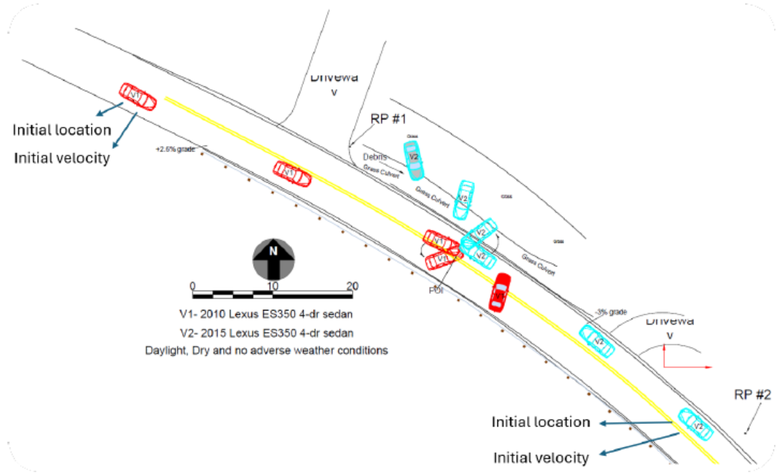
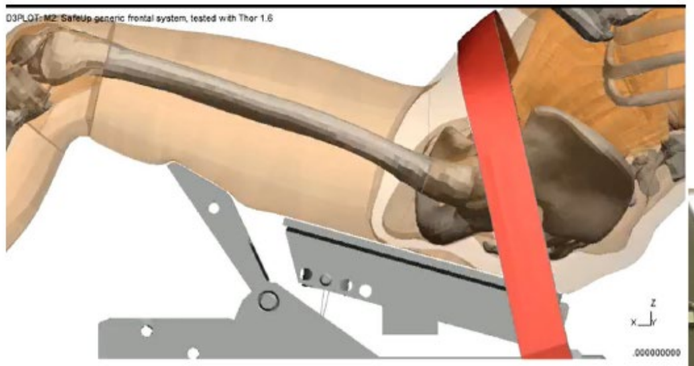
Current Projects

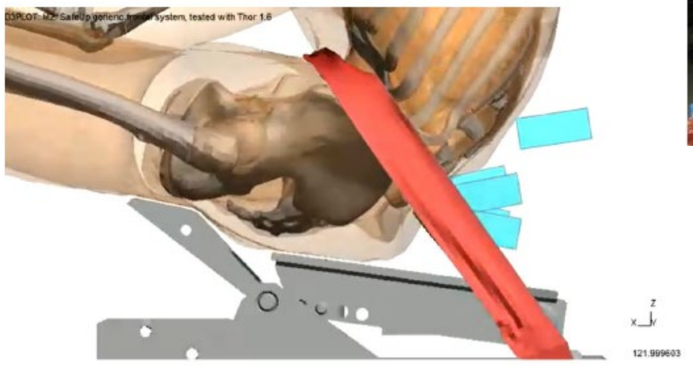
2025

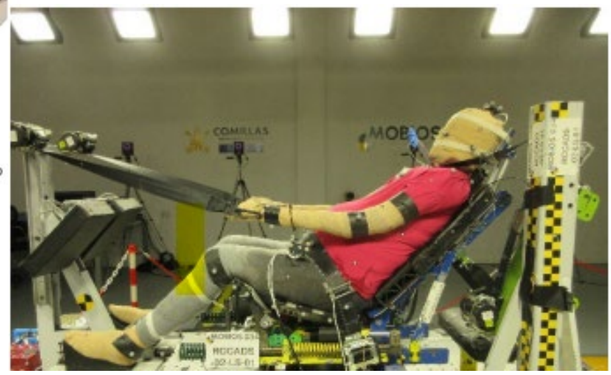
- Exploring effects of **ADS on crash injury distribution** through integration of field data, **pre-crash and crash simulations**
- Investigation of **submarining risk in average females** through experimental and computational modeling











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Agenda

SESSION 1 - 12:30 PM

12:30 PM **Research Progress and Application Exploration of C-IASI Virtual Testing Methods**
Linwei Zhang, PhD | China Automotive Engineering Research Institute

1:00 PM **Exploring effects of ADS on crash injury distribution through integration of field data, pre-crash and crash simulations****
Wenbo Sun, Ph.D | University of Michigan Transportation Research Institute

1:30 PM **Exploratory Injury Assessment of Thoracic Spine Loading in Deep Reclined Seating Using the SAFER HBM**
Krystoffer Mroz, MSc | Autoliv Research

2:00 PM **Res[illegible] facili[illegible]**
Yun[illegible]

SPECIAL ANNOUCMENT!

SESSION 2 - 3:00 PM

3:00 PM **Preliminary Material Properties of Human Pelvic Cortical Bone****
Devon Albert, PhD | University of Michigan Transportation Research Institute

3:30 PM **Predicting Lumbar Spine Injuries with ATDs**
Zhaonan Sun, PhD | Toyota Collaborative Safety Research Center

4:00 PM **Kinematics of reclined female Post Mortem Human Subjects under different restraint conditions****
Francisco J. Lopez-Valdez, PhD | MOBIOS Lab, Universidad Pontificia Comillas

4:30 PM **Updates on Research in Population Variability**
Jason Forman, PhD | University of Virginia Center for Applied Biomechanics

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Session 1

Linwei Zhang
Senior Research Engineer

Wenbo Sun
Assistant Research Scientist

Krystoffer Mroz
Senior Researcher

Yun Seok-Kang
Associate Professor

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2026 RCCADS Workshop Break

BREAK 2:30 – 3:00pm (ET)

Please mute your microphone and turn off your video.

The chat function can be used for any questions.

Wifi Network: UVA Guest

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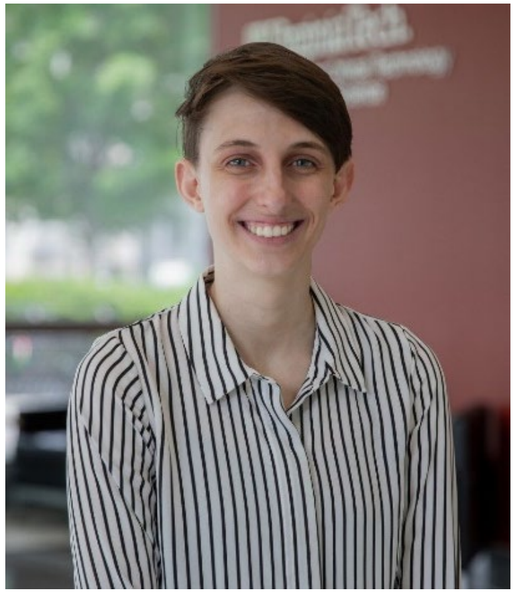
Session 2



Devon Albert
Research Assistant Professor

UMTRI

Francisco Lopez-Valdes
Director of MOBIOS Lab

COMILLAS
UNIVERSIDAD PONTIFICIA
ICAI

Zhaonan Sun
Principal Scientist

CSRC
Collaborative Safety Research Center
TOYOTA

Jason Forman
Associate Professor
& Executive Director

University of Virginia

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2026 RCCADS Workshop Closing Remarks & Special Announcement!

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RCCADS Members include:

HYUNDAI | KIA | Autoliv | TOYOTA

NHTSA | HUMANETICS | TESLA

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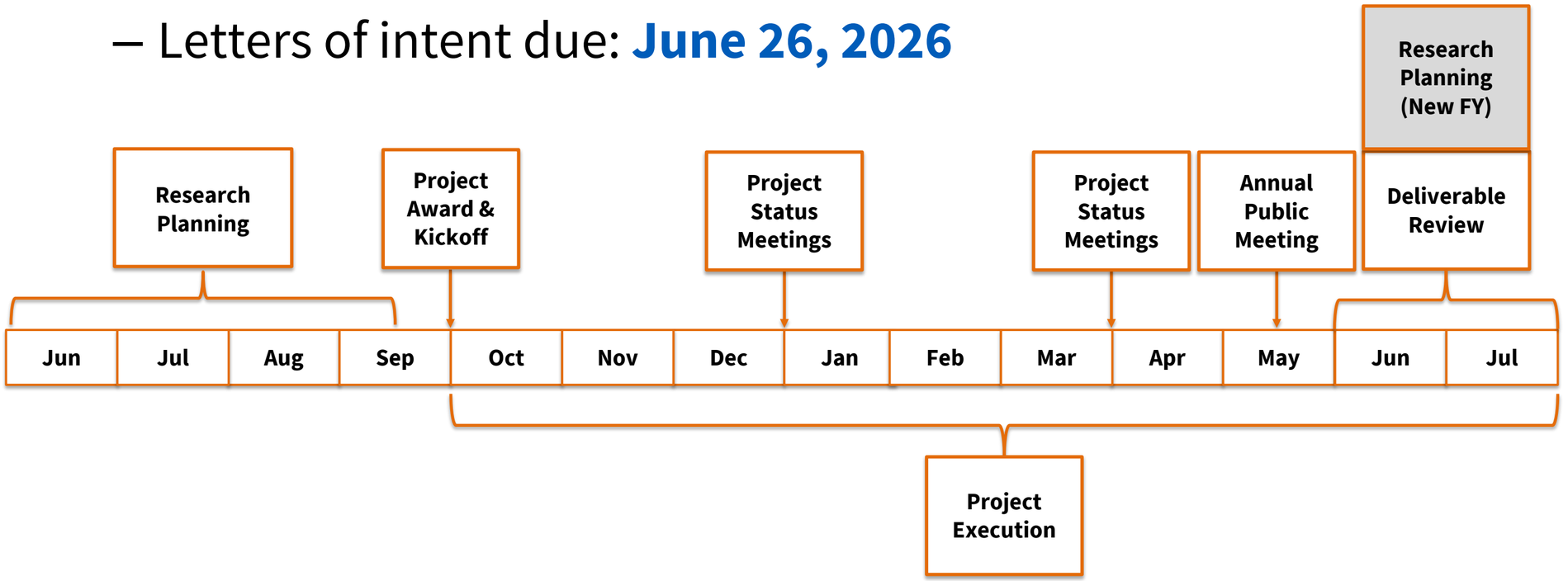
Future RCCADS Projects

Project proposal and selection process will begin in June!

- Application to be added as an RCCADS R&DI Due: **June 5, 2026**
- Request for letters of intent: **June 15, 2026**
- Letters of intent due: **June 26, 2026**



For more information, contact **Michelle Fowler:** fowlerm@trcpg.com

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THANK YOU!

Thank you to today's speakers!

And, thank *you* for attending the 2026 RCCADS Workshop!

We want to hear from you – a survey link will be emailed next week

If you have questions, or want to learn more about TRC, contact:

Michelle Fowler: fowlerm@trcpg.com

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