

ECOOCAR

INNOVATION CHALLENGE

DRIVING THE FUTURE

INFORMATIONAL WEBINAR
NOVEMBER 6, 2025 | 4:00 PM ET

WELCOME

Managed by
Argonne
NATIONAL LABORATORY



Kristen Wahl

Director, Strategic Transportation Education & Partnerships

Director, Advanced Vehicle Technology Competitions

Argonne National Laboratory



INFORMATIONAL WEBINAR AGENDA

What to Expect in Today's Webinar

Hear from Headline Sponsors about their vision for the new four-year **Advanced Vehicle Technology Competition (AVTC)** series, explore the vehicle tracks, learn about MathWorks tools, and get an overview of the RFP, proposal process, and key deadlines — with time to ask questions.

AVTC & EcoCAR Innovation Challenge Introduction – Kristen Wahl, ANL

General Motors Remarks – Bill Cawthorne, GM

Stellantis Remarks – Jon Darrow, Stellantis

MathWorks Remarks – Connell D'Souza, MathWorks

Product Innovation Track – Lucas Shoults, ANL

RFP Overview & Proposal Guide – Jesse Alley, ANL

Looking Ahead – Kristen Wahl, ANL

Q&A – Kristen Wahl, ANL

ADVANCED VEHICLE TECHNOLOGY COMPETITIONS



North America's premier collegiate automotive engineering competitions

Unparalleled educational experience and real-world training ground for the next generation of automotive engineers

Managed by Argonne in partnership with the auto industry



111 educational institutions
37+ years of AVTC history

14 unique competition series
32k alumni and counting!

2026 - 2030

INTRODUCING: ECOCAR INNOVATION CHALLENGE

New AVTC series represents a bold U.S. commitment to innovation, harnessing **Artificial Intelligence**, **advanced engineering**, and **entrepreneurial thinking** to develop a next-generation workforce that is future-ready to drive innovation across the mobility and tech sectors.

20 University Mock Start Up Teams

10 teams compete in each vehicle track



Level-4 CAV
Propulsion System

OR



Battery
Powertrain

AND

All 20 teams compete head-to-head in:

Product Innovation Track

Vehicle-inspired innovation, product development & entrepreneurship; Project Management & MarComm



Domain areas executed by students

- Battery Engineering
- Powertrain Engineering
- Connected & Automated Vehicles
- Artificial Intelligence ✨
- Entrepreneurship / Commercialization
- Marketing Communications
- Project Management
- Innovation / Product Development

GM Track



Bill Cawthorne

Global Chief Engineer

Current Production Renewal Energy Storage System

General Motors

WHY DOES GENERAL MOTORS SPONSOR ECOCAR?



1 Workforce Development

We give students **hands-on** experience with GM's newest vehicles to help them learn teamwork, perseverance, and **real-world engineering**.

2 Future Technologies

GM builds **cutting-edge tech**, and EcoCAR lets us explore future mobility with advanced **propulsion** and **autonomy**.

3 It's FUN!

We **love** supporting collegiate competitions—it's rewarding to help your **education** and **career growth**.



GENERAL MOTORS TRACK HIGHLIGHTS



Advance Propulsion Innovation

- Integrate a student-designed rear propulsion system into a production AWD BEV, using the stock front system as a reliable baseline.
- Optimize range, regen braking, and drive quality to balance performance and consumer appeal, while showcasing improved dynamics.

Team Innovations

- Replace just the rear drive unit to allow higher design risk
- Enable teams to explore advanced options: controllable differential, multi-speed systems
- Include HV/LV wiring, thermal systems, and mechanical mounts
- Replace propulsion control module with custom software and cybersecurity integration

Testing Events

- Energy efficiency (consumption)
- Performance (acceleration, handling)
- Overall evaluation (ride quality, consumer experience)

Connected & Automated Vehicle Capabilities

- Develop and demonstrate advanced connected and automated vehicle capabilities, including V2X communication, energy-aware perception, and automated driving.
- Focus on high-level automation in moderately complex environments, optimizing safety, energy efficiency, and traffic flow.

Team Innovations

- Enable self-driving in limited ODD with safety driver
- Implement CACC, lane centering, dynamic routing, and intersection navigation
- Integrate V2X

Testing Events

- Simulation for development and validation
- Dynamometer for energy consumption analysis
- Track testing for performance, navigation, and consumer experience





Stellantis Track



Jon Darrow

Vice President

North America Technical Centers for Propulsion Systems

Stellantis



STELLANTIS TRACK HIGHLIGHTS



What the Teams Get

EMPOWER | Innovation

Innovation drives progress and solves complex challenges for a changing world.

- Research opportunities with funding and technical support
- Professional development through mentorship and technical expertise

EMBRACE | Motor City Culture

Experience the freedom and creativity that define automotive culture.

- Off-roading adventures
- Heavy propulsion system modification flexibility
- Creativity for performance enhancements

EXPLORE | Technical Diversity

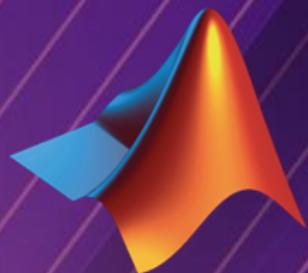
Dive into real-world engineering challenges and cutting-edge technology.

- Real-world propulsion and vehicle testing
- Leveraging the capabilities of artificial intelligence

JOIN | Stellantis

Step into the heart of innovation and accelerate your career journey.

- Hands-on experience at world-class proving grounds and our tech centers
- Opportunities to enter the career pipeline



MathWorks®

Accelerating the pace of engineering and science

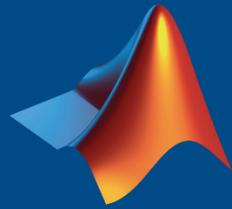
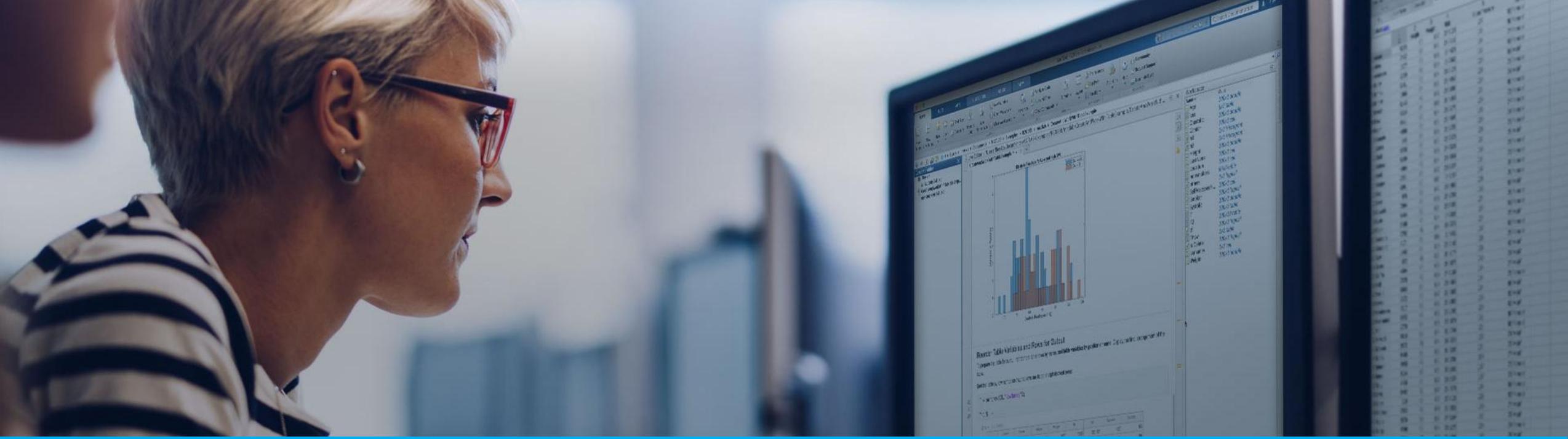


Connell D'Souza

Manager, Education Programs

MathWorks





MathWorks®

Accelerating the pace of engineering and science

The leading developer of mathematical computing software for engineers and scientists

- MATLAB
- Simulink
- 130+ add-on products



Millions of engineers and scientists worldwide use MATLAB and Simulink.



5 million +
users in over 180
countries



100,000 +
organizations



6,500 +
colleges and
universities

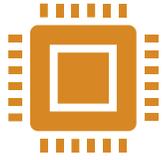


92%
of the Worldwide
Top 300 Engineering
schools



7 million +
students, educators,
and researchers have
access

Why does MathWorks Sponsor EcoCAR?



Introduce Students to Model-Based Design



Workforce Development



Foster Innovation and Collaboration



Product Innovation Track



Lucas Shoultz

Technical Project Manager

Strategic Transportation Education & Partnerships

Argonne National Laboratory

MISSION – WHAT WE WILL ACHIEVE

An Evolution of AVTCs



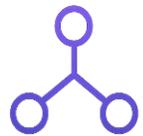
1. Transform EcoCAR into **the premier engineering challenge across the automotive industry** and an innovation incubator
2. Equip future engineers, entrepreneurs, and innovators to bridge **technical expertise with commercial strategy**
3. Enable students to **become industry IP engines**—
ideating, prototyping, and refining AI-driven mobility solutions that shape the future of North America’s automotive and technology sectors



VALUE PROPOSITION – WHY IT MATTERS



Workforce Development: Produces graduates who are not just engineers but can bring **entrepreneurial thinking to any organization**



Technology Pipeline: Sponsors gain visibility into **novel student-developed products**, prototypes, and AI applications



Startup Culture: Students trained to operate and lead in **lean and agile environments**, accelerating the pace of innovation



Immediate Impact: Skills **directly transferrable** to OEM and supplier innovation groups

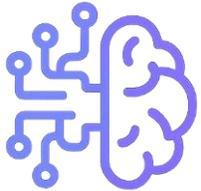


OVERVIEW AND CORE OBJECTIVES

What Teams Do

Conceive, develop, and validate their **innovation portfolio** (*product, process, or methodology*) related to their vehicle and the automotive/technology sectors

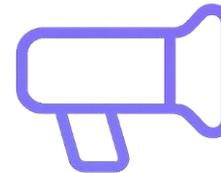
What They Focus On



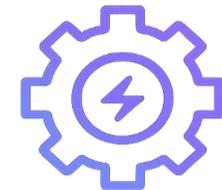
Applied AI & Data
Driven Innovation



Entrepreneurship &
Commercialization



Product Storytelling &
Stakeholder Engagement



Operations &
Leadership

 **Success** = demonstrated capability and process quality, not just a market-ready product



INNOVATION DEVELOPMENT STRATEGY

From Foundations to Phase Gates

Year 1 – Foundations

- **Orient** all teams to the competition framework and expectations
- **Introduce** core methods: innovation process, Lean Startup/I-Corps, MarComms basics, AI/LLM tools, and automotive context
- **Equip** teams with baseline skills, tools, and templates so they can execute consistently
- **Align** teams on evaluation standards (progress reviews, rubrics, deliverables)



Years 2-4 – Phase Gates

- Concept → prototype → validation → market assessment
- Teams may **pivot** or discontinue ideas—mirrors real innovation cycles



INNOVATION FRAMEWORK – TRAINING AND SUPPORT



EcoCAR Frameworks



Provide **structure, evaluation philosophy,** and **repeatable innovation** processes

LMS: asynchronous and just-in-time learning modules on **innovation, AI, entrepreneurship,** and **communications**

University Collaboration



Contributes **real-time insights, training modules,** and **shared lessons**

Each university will co-develop and upload training materials to the LMS - creating a **shared knowledge base**

Expert Feedback



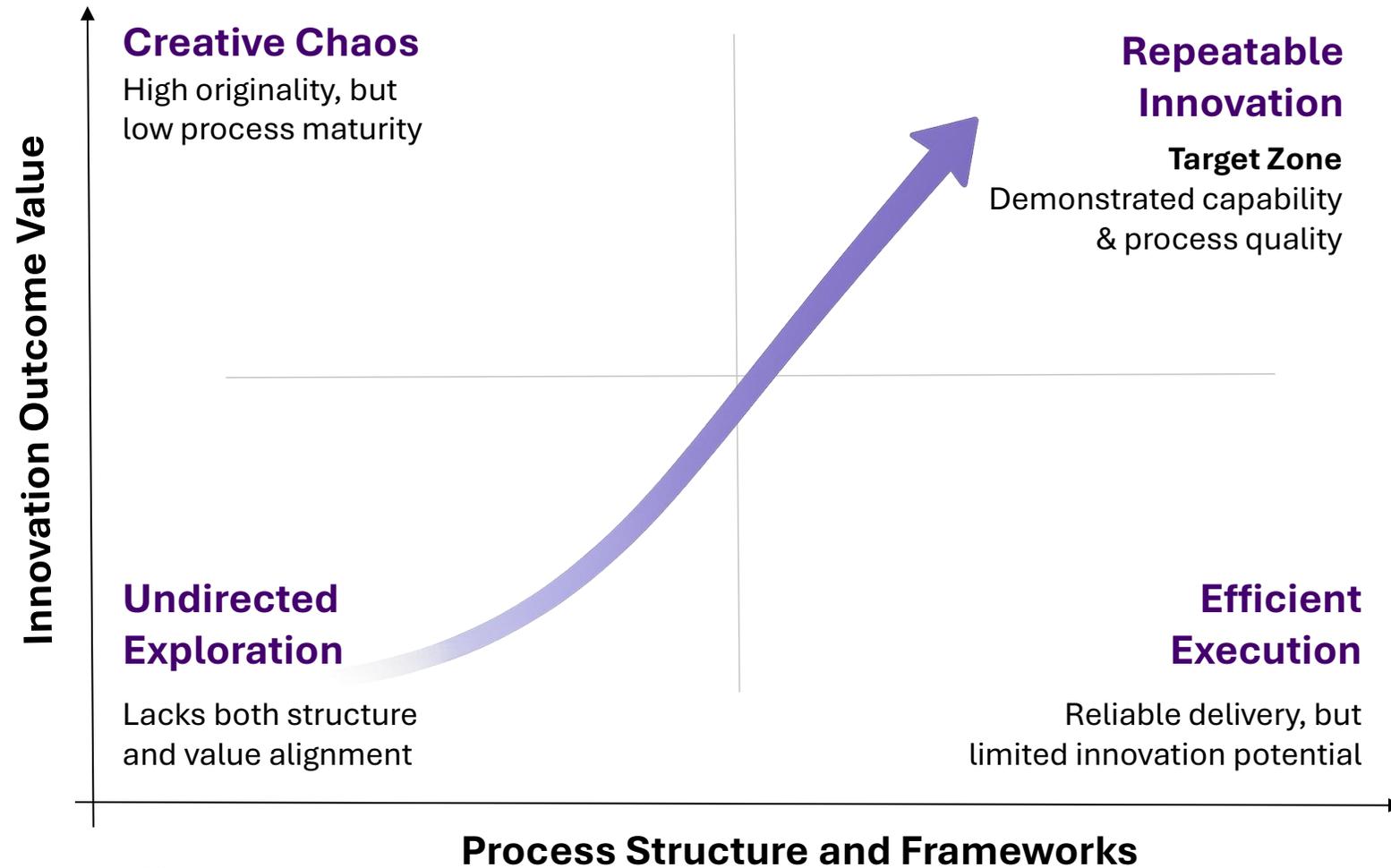
Aligns frameworks with **emerging technologies** and **real-world market needs**

In-person workshops, webinars, investor pitching, and annual innovation portfolio evaluations with **leaders in the mobility, automotive,** and **technology sectors**



INNOVATION SCORING – SO WHO WINS?

Balancing Innovation Freedom and Structured Evaluation



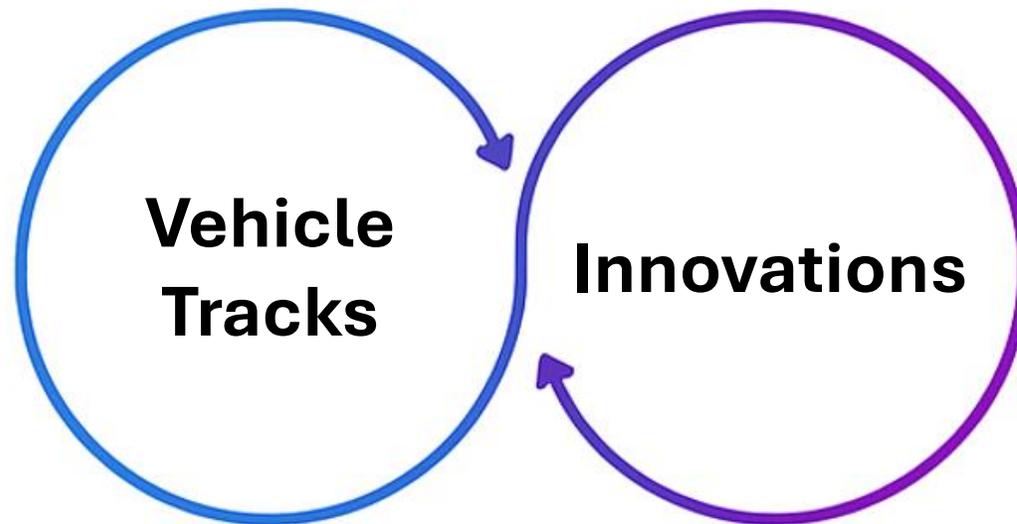
Success is a **repeatabe innovation capability**, *not a one-time invention*



INTEGRATION WITH VEHICLE TRACKS

Enhancing The Vehicle Development Mission

Every innovation must **relate to the automotive domain**, even if not part of the vehicle hardware



Encourages **cross-collaboration** between vehicle and product teams for integrated learning



MOVING FORWARD – NEXT STEPS

Building the Product Innovation Track Ecosystem



Organizers

Title sponsor(s) will lead further development of track structure

Secure donated **tools, resources, and support** for AI/ML, exascale computing, secure data storage, etc.

Establish an **ecosystem of innovation experts** in AI/ML, entrepreneurship/intrapreneurship, and private equity to provide track thought leadership



Interested Teams

Recruit students from engineering, business, entrepreneurship, and communications programs to build **cross-disciplinary teams**

Engage faculty advisors beyond engineering, **especially** from business, entrepreneurship, and communications disciplines.

Highlight opportunities for students to gain experience in **AI, commercialization, and product storytelling** to attract broader participation



PRODUCT INNOVATION – TL;DR

WHAT IT IS



A structured framework that teaches innovation as a process, **linking product development with the vehicle tracks** to blend AI, entrepreneurship, and engineering into real, validated solutions

WHY IT MATTERS



Elevates student learning from **project execution to innovation leadership**, enabling evidence-based design, creative problem solving, and systems thinking

WHY YOU MATTER



Your engagement turns this framework into a **living classroom**, shaping the methods, sharing lessons, and preparing students to lead innovation long after the challenge ends

RFP Overview



Jesse Alley

*Program Director, EcoCAR EV Challenge
Strategic Transportation Education & Partnerships*

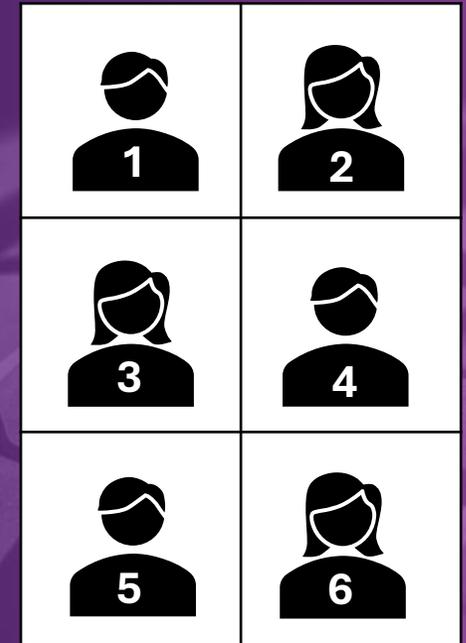
Argonne National Laboratory

SELF-DEFINED STUDENT LEADERSHIP TEAM

Student Leadership Team Functions
Team Leadership and Administration
Project Management & Team Operations
Vehicle Track Technical Leadership
Vehicle Track Domain Expertise
Innovation Product Entrepreneurship & Commercialization
Innovation Product Development
Marketing & Communications
Artificial Intelligence

8 core functions
with
6 funded positions

Funded Student Leadership Team



Goal: Allow maximum flexibility to align with **institutional strengths** and **develop a strategic approach** to team structure

SELF-DEFINED STUDENT LEADERSHIP TEAM

Bounding Requirements

1	2	3	4	5	6
Must be fully-funded graduate students				Can be undergraduate students	
Graduate degree path: Masters or PhD, any Engineering major				Major: Comms/PR (or similar)	Any major Any degree (team choice)
Undergrad degree: STEM major		Undergrad degree: any major			
Role dedicated to vehicle track		Role assigned to any track (or matrixed)			

Students in Project Management roles: **Must be** a grad student

Current degree: Engineering
Undergrad degree: any field

OR

Current degree: non-engineering
Undergrad degree: engineering

RFP STRUCTURE & ORGANIZATION

At-a-glance document overview

Section A About the Challenge

What will you ***do***

- Technical scope
- Scoring structure
- Annual events
- Student roles & competencies

Section B Support for Accepted Teams

What will you ***get***

- Commitments for EcoCAR-provided cash and in-kind support

Section C University Commitments

What must you ***give***

- Requirements for university-provided cash and in-kind support

Section D Proposal Process & Requirements

How to apply

- Requirements for proposal content & formatting

UPDATES FOR REVISION B

Reference the change log for details

Revision	Section	Date	Notes
A	All	9/30/2025	Initial release
B	A-5.2	10/22/2025	Clarified expected design envelope for CAV feature development
B	A-6.2.2	10/22/2025	Clarified requirements for majors of students filling MarCom & project management roles
B	C-7.1 C-7.3 Appendix D Appendix E	10/22/2025	Access to closed-course testing facilities and DC fast charger clarified as “recommended” not “required”. These resources will be a competitive factor in the team-selection process, but universities are encouraged to apply even if they are unable to secure all needed testing facilities at the time of proposal submission.
B	D-1	10/22/2025	Clarification: universities are eligible to apply even if not all RFP requirements are met
B	D-1.1	10/22/2025	Reformatted proposal submission requirements for clarity
B	D-1.2	10/22/2025	Reformatted vehicle track selection requirements for clarity
B	D-1.3	10/22/2025	Added information about Launch Workshop in Spring 2026
B	D-2, D-3, D-4, D-5	10/22/2025	Initial release of content and formatting requirements for proposal & letters of support

UPDATES FOR RFP REVISION B

Section A-6.2.2 – Majors for students filling MarCom roles

★ Clarification:

The listed of majors are ideal sources for students to fill MarCom roles
Students from other backgrounds or majors will only be considered on a case-by-case basis

TABLE 10: BOUNDING REQUIREMENTS FOR SELF-DEFINED STUDENT LEADERSHIP TEAM POSITIONS

Requirement	Additional Notes
<p>A minimum of 1 position must be filled by a student currently enrolled in one of the following majors:</p> <p>Communications</p> <ul style="list-style-type: none">• Public Relations• Strategic Communications• Organizational Communication• Visual Communications• Journalism	<p>If a university does not offer an appropriate Communications degree program, it may, as an exception, partner with a neighboring institution to identify and recruit a suitable candidate</p>

UPDATES FOR RFP REVISION B

Section A-5.2 - CAV design envelope for GM vehicle track

★ Clarification:

List of team-developed CAV features is ***tentative*** and subject to revision based on available resources

Connected and Automated Vehicle System Design Envelope

Teams will be challenged with developing CAV features, **tentatively** targeting SAE Level 4 driving automation. CAV features will be tested with a safety driver present in limited closed-course conditions across a variety of city and highway operational design domains (ODD) of moderate complexity. **The following list illustrates some potential CAV features that may be included in the scope of the EcoCAR Innovation Challenge. A detailed list of confirmed CAV features and vehicle testing events will be released to selected teams at a later date and may be tailored to the capabilities of selected universities and sponsor support available to selected teams.**

- Cooperative Adaptive Cruise Control (CACC) evaluated for energy consumption impacts
 - Vehicle to Vehicle (V2V) connectivity
- Intersection and corridor optimization and navigation evaluated for energy consumption impacts
 - Connected & unconnected intersections
 - Straight and left/right turns
 - Infrastructure to Vehicle (I2V) and Vehicle to Infrastructure (V2I)
- Lane centering
- Route planning and navigation with turns (including dynamic routing for energy efficiency)
- Interoperability of V2X communication
- Direct C-V2X (PC5) communication & indirect (Uu) communication for latency tolerant applications

UPDATES FOR RFP REVISION B

Section C-7.1 – Requirements for closed-course vehicle testing facilities

★ Clarification:

Vehicle testing facilities are ***recommended*** (and strongly encouraged), but not required to apply

Closed-Course Testing Facilities

Closed-course vehicle testing will be an integral component of the EcoCAR vehicle development process for both GM and Stellantis vehicle tracks. In prior AVTC series, teams that lacked access to testing space were at a significant competitive disadvantage. Therefore, universities are **strongly encouraged** to secure abundant access to an area where the team may regularly conduct closed-course dynamic vehicle testing at low-cost or no-cost to the team. Teams may adapt parking lots or roadways to accommodate testing needs (as long as the area can be closed for testing). See Appendix E: Closed Course Testing Facilities for recommendations to consider when evaluating potential test sites. Universities are also **strongly encouraged** to secure a method to transport vehicles to and from test sites (EcoCAR-donated vehicles must be trailered and may not be flat-towed or dolly-towed).

While these closed course testing facilities and vehicle transportation resources are an important asset to EcoCAR teams, **they are not required to apply**. Vehicle testing resources will be a heavily weighted competitive factor during the team-selection process and proposals that meet or exceed the testing facilities defined in this RFP will be the most competitive. However, **universities are encouraged to apply even if they are unable to secure all needed testing facilities at the time of proposal submission**.

UPDATES FOR RFP REVISION B

Section C-7.3 – Requirements for DC fast charging and CAV testing facilities

★ Clarification:

Access to DC fast charger is ***recommended***, but not required to apply

Access to CAV testing environments is ***recommended***, but not required to apply

Recommended Facilities

- **DC Fast Charging:** Teams must have free access to a DC Fast Charger (100 kW or greater). This can be on-site or off-site (public), but the University must support the cost of all team charging sessions. SAE J3400 NACS connector (or SAE J1772 CCS to SAE J3400 NACS adapter) preferred. GM provided vehicles will have an SAE J3400 NACS inlet.
- **CAV Testing Environments:** Access to facilities suitable for CAV feature testing with lane lines and painted intersections present (or ability to be easily added). See Appendix E: Closed Course Testing Facilities for more details

UPDATES FOR RFP REVISION B

Section D-1 – Requirements vs. eligibility to apply

★ Clarification:

Universities are still encouraged to apply even if some requirements are not met

D-1 Proposal Process & Timing

Universities wishing to apply for the EcoCAR Innovation Challenge must submit a proposal with letters of support, as described in this section. The requirements for accepted universities defined in this RFP were developed based on long-running best practices of successful teams and with the goal of providing the support necessary to field a successful team. **Submissions that meet or exceed the requirements defined in this RFP will be the most competitive, but universities are still encouraged to submit a proposal even if they are not able to meet some of the requirements.** Where requirements cannot be met, proposers should provide an explanation, along with a backup solution or mitigation strategy where possible (i.e., if a required facility is not currently available but can be secured by Year 2, Fall 2027).

RFP PROPOSAL REQUIREMENTS

PROPOSAL PROCESS AT A GLANCE

- **Deadline:** December 18
- **Submission:** [AVTC website](#)
- **Proposal Materials:**
 -  PowerPoint Proposal (required)
 -  University Support Letter (required)
 -  Additional Support Letters (optional)

Vehicle Track Selection

May apply to **both** vehicle tracks



&

STELLANTIS

Selected into **only one** vehicle track



or

STELLANTIS

UNIVERSITY POWERPOINT PROPOSAL

Structure / organization for proposal requirements sections

Each proposal section includes three elements:

Why It Matters

Why this content is included in the proposal and how reviewers may view it

Requirement

What content proposers needs to include

Proposer Response

How proposers should communicate the required content

UNIVERSITY PROPOSAL – WHY POWERPOINT?

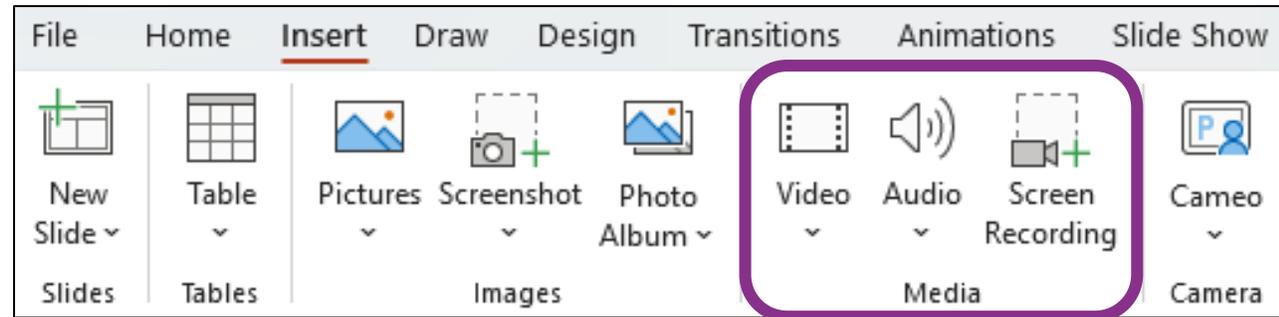
Enable the inclusion of dynamic multimedia content, which adds depth to the proposal and enables a more robust assessment of team capabilities



UNIVERSITY POWERPOINT PROPOSAL

Recommendations for audio/video content

Embed audio & video **directly** into the PowerPoint file

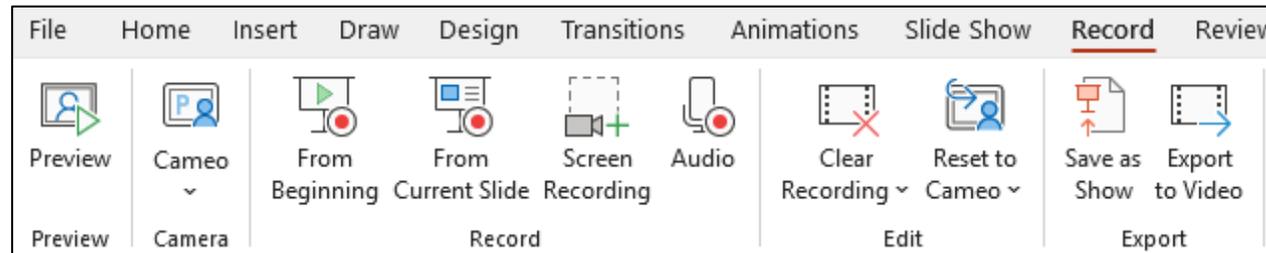


- Audio & video must be playable without external downloads
- Do not upload standalone video files
- Proposers may post video content to YouTube and include links in the proposal **as a backup** (not a replacement for embedded media)

UNIVERSITY POWERPOINT PROPOSAL

Recommendations for audio/video content

((())) Make use of the PowerPoint “Record” features to capture video or audio



- RFP was written with cell-phone video and PowerPoint “Record” feature in mind
- Production quality **will not** be a competitive factor
- Use of professional audio/video production services is permitted, but discouraged

UNIVERSITY POWERPOINT PROPOSAL

Recommendations for audio/video content

Be mindful of formatting limits

- **1 GB maximum**
(use file compression)
- See **Table 16** for requirements
 - Slide & video limits vary by section – read carefully!
- **Note:** Title slides and section headers are exempted from slide count

TABLE 16: POWERPOINT PROPOSAL OUTLINE AND FORMATTING REQUIREMENTS

Section	Slide Limits	Recording Limits	Audio/Video
1. University Case for Selection (Team Pitch)	2 Slides	1 recording Up to 3 minutes	Required: embedded standalone MP4/MP3 file or slide narration
2. Faculty Support	1 Slide per Faculty	1 recording per faculty 3 minutes per recording	Required: embedded standalone MP4/MP3 file or slide narration
3. Additional Faculty & Staff Support	1 Slide per individual	1 recording per individual 3 minutes per recording	Allowed: embedded standalone MP4/MP3 file or slide narration
4. Team Funding & Budgeting	4 Slides	1 recording per slide 3 minutes per recording	Strongly encouraged: embedded standalone MP4/MP3 file or slide narration
5. Team Organization, Structure, and Recruiting	10 Slides	1 recording per slide 3 minutes per recording	Strongly encouraged: embedded standalone MP4/MP3 file or slide narration
6. Research & Industry Partnerships	1 Slide	1 recording 3 minutes per recording	Allowed: embedded standalone MP4/MP3 file or slide narration
7. University Facilities	2 Slides per facility	1 video per facility 5 minutes per video	Required: embedded standalone MP4 video file and/or slide narration
8. Safety Preparedness	5 Slides	1 recording per slide 3 min per recording	Allowed: embedded standalone MP4/MP3 file or slide narration

UNIVERSITY POWERPOINT PROPOSAL

Proposal PPT Guide

■ Purpose:

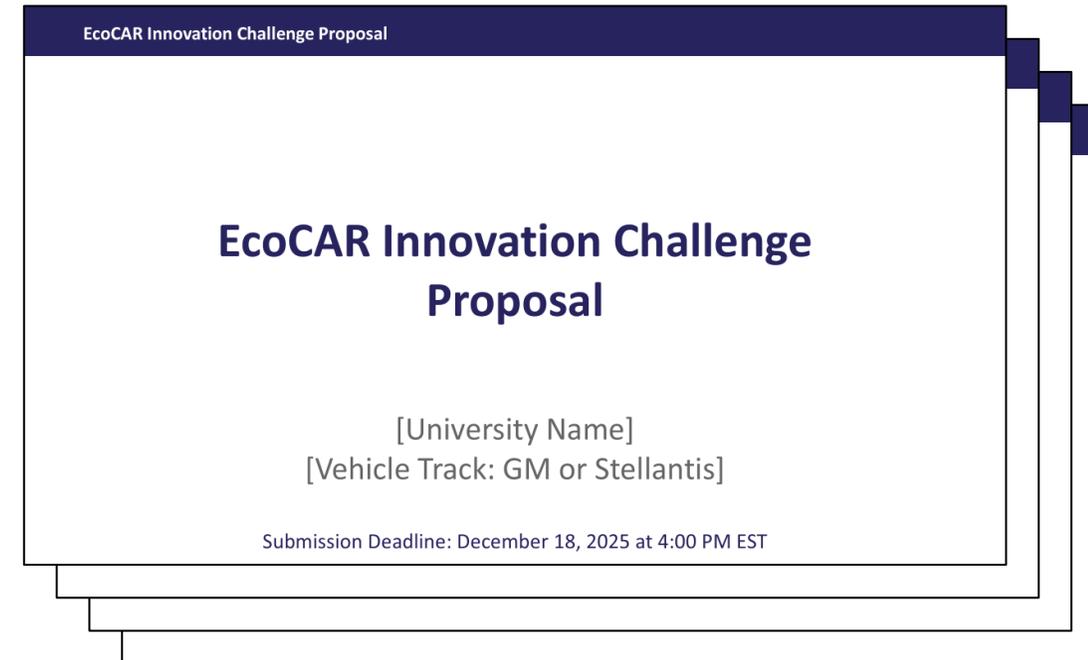
- Illustrate how RFP requirements translate into an actionable proposal
- Provide guidance on preferred formats for conveying information

■ Caveats:

- Refer to the RFP for all requirements (RFP is the master document)
- Universities should customize colors, fonts, branding



Proposal guide available for download from the AVTC website



UNIVERSITY ADMINISTRATION SUPPORT LETTER

- Admin support letter is **critically** important
 - Confirms institutional support for proposal
 - Confirms university resource commitments over all four years of the program
- **Requirements:**
 - Letters **must** use university letterhead
 - Letters **must** be signed by a senior university official with authority to make commitments (ex: Dean)

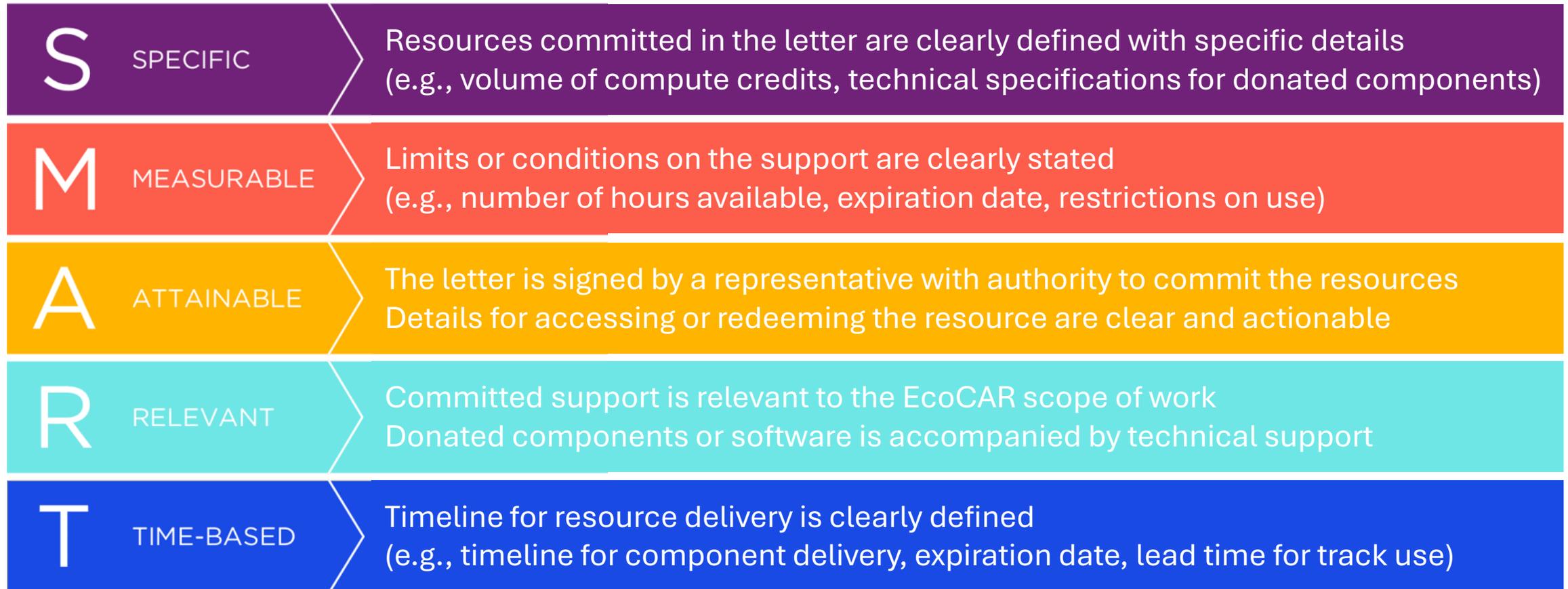
Deadline: Dec 18 (extensions can be requested)

Required Content

-  Cash support
-  Support for faculty/staff
-  Course credit
-  Facilities commitments
-  Commitment to safety

ADDITIONAL OPTIONAL LETTERS OF SUPPORT

Best practices for support letters – think SMART



LOOKING AHEAD

TIMELINE

**Proposals
Due**

**Notification
of
Acceptance**

**Launch
Workshop**

**EcoCAR
Innovation
Challenge
Begins**

December 2025

March 2026

April 2026

Fall 2026

Q&A

SUBMITTED QUESTIONS

Q: GRAs: what is the minimum and what would be competitive (in terms of university matching funding)

A: A minimum is 4 fully funded GRAs. If school are able to secure more funding for more GRAs they will be more competitive.

Q: Will facilities count as "cost share"?

A: The \$75k cost share requirement listed in the RFP is really focused on funded student positions. That said, facilities are an important part of the proposal process so bringing to bear more & better facilities for EcoCAR team use will make for a more competitive proposal

Q: How much university-provided travel funding should we expect to budget for?

A: The RFP states universities should expect to contribute 30%-40% above EcoCAR-provided travel funding. That estimate is based on estimates from the current AVTC series. The variability in university-provided travel funding is largely driven by team choices (how many extra students to send, how many students to a room, etc.).

OPEN Q&A SESSION



Use the **Chat** to share your question

OR

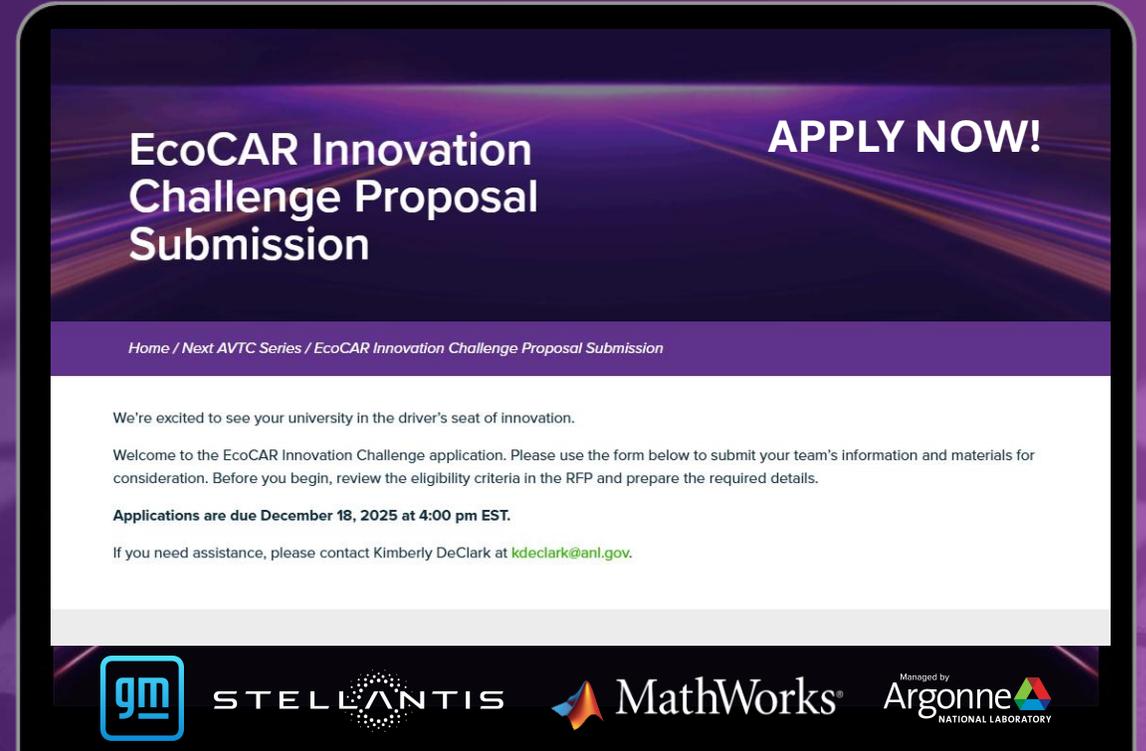


Use the **Raise Your Hand** feature to be called on to speak live

ECO CAR

INNOVATION CHALLENGE

Put your students in the driver's seat & apply to the EcoCAR Innovation Challenge!



Looking for More Information?
Visit avtcseries.org



Questions between now and Dec. 18?
Contact Kimberly DeClark @ kdeclark@anl.gov