



**CENTER FOR CONNECTED  
AND AUTOMATED  
TRANSPORTATION**

# 2022 Funding Opportunity

**The USDOT Midwest Region 5 Center for Connected and Automated Transportation (CCAT) is pleased to announce a funding opportunity for research that can significantly influence the next generation of transportation systems.**

**Due Date: November 29, 2021 5:00 PM**

**Award Date: January 28, 2022**

**Funding Amount: \$1,000,000**

## **Center for Connected and Automated Transportation (CCAT) Overview:**

The University of Michigan at Ann Arbor (UM), in partnership with Purdue University, University of Illinois at Urbana-Champaign (UIUC), University of Akron (UA), Central State University (CSU), and Washtenaw Community College (WCC), established the USDOT Region 5 University Transportation Center: Center for Connected and Automated Transportation (CCAT) in December 2016 under the FAST Act. The FAST Act research priority area for CCAT is promoting safety; CCAT focuses its efforts in the field of comprehensive transportation safety, and congestion management by taking advantage of connected vehicles, connected infrastructure, and automated vehicles. CCAT has been named the University Transportation Center (UTC) for focused research on connected and automated transportation, as designated by Office of the Assistant Secretary for Research and Technology. It is more important than ever to deliver research with outputs, outcomes, and impacts that will significantly shape the future of transportation.

**CCAT Vision:** Maintain regional and national leadership in connected and automated transportation system research, education, and training.

**CCAT Mission:** Significantly impact the evolution of the U.S. next-generation transportation systems with emerging technologies on safety, mobility, and sustainability. Provide national and





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regional leadership for connected and automated transportation research, science, education, training, and deployment.

## **CCAT Research Thrusts:**



## **Funding Overview and Goals:**

CCAT has conducted \$13M in research since it was created in 2016, and even during the pandemic we granted \$2.6M in research projects. Each year CCAT research is presented at our global symposium which is attended by industry partners, as well as sponsors in state and federal government. Last year we had over 900 attendees.

We invite and encourage our existing and future CCAT PIs to implement their research in the real world. To maximize impact, we will fund those research projects that are cutting-edge, impactful,





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and geared towards implementation and deployment. Or in the words of Dr. Robert Hampshire, Deputy Assistant Secretary and Chief Science Officer of USDOT, “deploying the firepower of UTC research.”<sup>1</sup>

The following topics will be of particular interest in the area of connected and automated transportation, in alignment with USDOT goals to accelerate novel, not incremental, research projects in the areas:

- Equity
- Climate Change/sustainability
- Education
- Safety

Because this is the last year of CCAT’s current contract, we will only be awarding projects with a 1-year duration, and a limit of \$200,000 per project.

Collaboration and partnership are critical to achieving CCAT’s goals. Working with CCAT partners can lead to more impactful projects by drawing from the partner’s funding and not just that of UM. Each CCAT partner has their own overall budget, but by collaborating, those funds can be pooled. Working with other organizations outside of CCAT provides opportunities for additional funding as cost share. Both forms of collaboration and partnership can lead to larger, more impactful projects and is highly encouraged. Key CCAT partner contacts (<http://ccat.umtri.umich.edu/about/>) include:

- Purdue: Sam Labi (labi@purdue.edu)
- UIUC: Imad Al-Qadi (alqadi@illinois.edu)
- WCC: Al Lecz (alecz@wccnet.edu)
- UA: Ping Yi (pyi@uakron.edu)
- CSU: Krishna Kumar Nedunuri (knedunuri@centralstate.edu)

Additional details about CCAT and currently funded research projects can be found at [ccat.umtri.umich.edu](http://ccat.umtri.umich.edu).

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<sup>1</sup> <https://mycutc.org/events/summer-meeting-2021/>





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### **Program Structure:**

- The University of Michigan CCAT Director and Managing Director will first review proposals. The proposals that align with CCAT's vision and mission will be forwarded to the CCAT Technology Advisory Board (TAB) for further review. TAB members will assess the proposals using the proposal evaluation criteria found in Appendix A. The CCAT Director and the Managing Director will select projects based on the TAB assessments.
- Both Tenured/Tenure track faculty and research faculty (research scientists and research professors) at any rank at the University of Michigan (all campuses) are eligible to apply.
- Proposals led by multiple University of Michigan PIs, multiple units (departments and colleges), and CCAT partner institutes are strongly encouraged. Teams are encouraged to include researchers from CCAT partner organization. However, funds will be dispersed only to the University of Michigan faculty. You will be responsible for any subcontracts.
- Proposals are required to have an industry or government principal (champion). This ensures sound foundation for technology transfer (reference the CCAT Technology Transfer Plan attached).

Please send your questions to Henry Liu ([hernyliu@umich.edu](mailto:hernyliu@umich.edu)) and Debby Bezzina ([dbezzina@umich.edu](mailto:dbezzina@umich.edu)).





## Funding Proposal Instructions

Create a single PDF file with the cover sheet and the required proposal elements and submit electronically to:

Debby Bezzina ([dbezzina@umich.edu](mailto:dbezzina@umich.edu))

In the email, clearly state that the CCAT data management plan (DMP) has been reviewed and the project will be in compliance, noting any deviations from the plan. Also include whether an IRB is required.

### Required Proposal Elements:

1. Coversheet: Complete the proposal coversheet (Appendix B) and include it as the first pages of the project proposal.
2. Project Abstract: Concise summary of the project.
3. Proposal Description
  - a. Introduction
  - b. Technical Approach, including any challenges
  - c. Proposal Tasks
  - d. Schedule
4. Letter of commitment from the industry or government principal.
5. Appendix A: Response to Evaluation Criteria – write a **paragraph or less** on each of the following, pulling from your proposal description as necessary. Use the headings as written below (the part in bold). If the section is not applicable to your proposal, under the heading write n/a.
  - i. **Technical Quality.** Describe the project attributes that contribute to the quality of the research.
  - ii. **Technical Feasibility.** Describe why the research is feasible.
  - iii. **Uniqueness and Innovation.** What makes this project unique, including any preliminary research review results?
  - iv. **Outputs:** list the type and quantity. OST-R defines outputs as any new or improved process, practice, technology, software, training aid, or other tangible product resulting from research and development activities. They



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are used to improve the efficiency, effectiveness and safety of transportation systems. Examples:

1. Publications, conference papers, and presentations
  2. Policy Papers
  3. Website(s) or other Internet site(s)
  4. New methodologies, technologies or techniques
  5. Inventions, patents, and/or licenses
  6. Other products, such as data or databases, physical collections, audio or video products, application software or NetWare, analytical models, educational aids, courses or curricula, instruments, equipment, or research material
- v. **Research Champion Involvement.** Will your champion be actively involved in the research? If so, how? Does your Champion have plans to implement the research results if the project is successful?
- vi. **Collaboration.** Will you be working with any other CCAT organizations? Will you be working with any other industry or government organizations other than your project Champion? Are you implementing an advisory board? If yes to any of these questions, provide a description of the organization(s) and their planned involvement.
- vii. **Outcomes:** List the type and description of the outcome that your research may enable. OST-R defines outcomes as how research outputs will be used to create expected or actual outcomes with the understanding that outcomes can sometimes take a significant amount of time to realize. Examples:
1. Increased understanding and awareness of transportation issues or increases the body of knowledge by presenting at conferences or other venues
  2. Passage of new policies, regulation, rulemaking, or legislation
  3. Improved processes, technologies, techniques and skills in addressing transportation issues
  4. Enlargement of the pool of trained transportation professionals
  5. Adoption of new technologies, techniques or practices





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- viii. **Impacts:** List the type and description of the impact that your research may enable. OST-R defines impacts as the effects of outcomes on the transportation system or society in general, such as reduced fatalities, decreased capital or operating costs, community impacts, or environmental benefits. The taxpaying public and its representatives deserve a periodic assessment to show them how the investments they make benefit the nation. The resulting impacts are what makes the case for continued UTC funding. Examples:
1. Improves the operation and safety of the transportation system
  2. Increases the body of knowledge and technologies;
  3. Enlarges the pool of people trained to develop knowledge and utilize new technologies and put them to use; and
  4. Improves the physical, institutional, and information resources that enable people to have access to training and new technologies.
- ix. **Research Deployment.** Will you be deploying your research in the real world and are the tasks clearly defined?
- x. **Matching funds.** Do you have any funding from sources other than CCAT? If so, identify the source.
- xi. **Curriculum.** Will you integrate your research into class curriculum?
- xii. **Students.** Will students be working on your research?
- xiii. **Equity.** How do you demonstrate your commitment to social equity?
- xiv. **CCAT Past Performance.** List patents or invention disclosures, field implementation, policy changes, papers, attracting additional funding, etc. that was the result of past CCAT funded projects.

6. Appendix B: Itemized Budget and budget justification.

- a. Budget Justification. Describe level of effort to perform the tasks in the project description.
- b. Hiring plan for students and/or faculty. Preference will be given to projects that will be able to produce candidates for the UTC Student of the Year award.
- c. Itemized budget:
  - i. Faculty and Staff Salaries, with fringe benefits broken out
  - ii. GSRA Salaries, with fringe benefits broken out
  - iii. GSRA Tuition





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- iv. Supplies/Materials
  - v. Travel
  - vi. Equipment
  - vii. Other
  - viii. Total Direct Cost Amount
  - ix. Indirect Cost Amount
  - x. Total amount requested
  - xi. Cost share
  - xii. Total project cost
7. Appendix C: Resumes. Short bios of the PIs: no more than **two** pages for each primary researcher. Bios should include pertinent links including LinkedIn, Twitter, Reserachgate, Google Scholar, personal website, etc.





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## Notes to prospective PIs

*Reporting: CCAT PIs are required to report the following:*

1. Completed UTC form upon award (same as coversheet).
2. Data Management Plan upon award (attached).
3. High-resolution headshot of the PIs, preferably in .png upon award.
4. Updated UTC form semiannually due 4/15, 10/16.
5. Status Report semiannually due 4/15, 10/16 for input into the UTC semi-annual progress reports.
6. Implementation plan (template to be provided), that is updated after each meeting with the advisory panel.
7. Content U.S. DOT sponsored articles or reports as requested.
8. Performance indicators annually 10/16 (attached).
9. Meet with industry and/or government principals and implementation committee 2-3 times per year.
10. Research Review at the Annual CCAT Global Symposium when requested.
11. Presentation at a bi-monthly research review as requested.
12. Engage CCAT students in the meetings with industry/government partners, quarterly briefings and research reviews.
13. Final Research Report 45 days after project completion.
14. Final project outputs, outcomes and impacts within 45 days after project completion.





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## *Student Support*

Grant funds may be used to provide funding to students attending institutions of higher education who participate in activities necessary to the fulfillment of the UTC's research, education, and technology transfer programs. Funding provided to a student, which may be in the form of wages or tuition support, must be compensation for work performed within the UTC Program. Such work must be used to fulfill a part of the student's degree program. This type of funding to students is considered to be compensation paid as, or in lieu of, wages for work as described in § 200.466 "Scholarships and student aid costs" of the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.

In addition to the type of student funding described above, scholarships and summer internships utilizing UTC funding may be offered to students attending institutions of higher education studying within an academic program that is relevant to the UTC Program's purpose.

Students who are non-citizens can be paid wages for work on the Grant as those wages are "work-related" compensation. In addition, if the tuition waiver is based on a student's work on the Grant then this type of financial support is work-related compensation and can be given to a non-citizen student.

## *Foreign Travel*

1. U.S. DOT approval is required for foreign travel.
2. Submit request for foreign travel to the Managing Director (Debby Bezzina) **before** making travel arrangements and at least **6 weeks** prior to planned departure. Include:
  - a. The need for the proposed travel and the value to be gained by the Center
  - b. Written justification that states the name and relationship of the traveler to the UTC,
  - c. Description of how the travel will further the goals of the UTC Program,
  - d. A detailed itinerary (i.e., travel dates, location, lodging) and breakdown of planned expenses (i.e., airfare cost, lodging cost, ground transportation, and per diem) with a final total cost, and
  - e. The endorsement of the Center Director (Henry Liu).

## *Program Management*

1. Attend bi-monthly PI meeting.





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# Appendix A: Proposal Evaluation Criteria (preliminary)





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Evaluation Criteria	Scale	Weighting
Technical Quality of the proposed research	1=Poor 2=Fair 3=Good 4=Very Good 5=Excellent	7
Technical Feasibility of the proposed research	1=Poor 2=Fair 3=Good 4=Very Good 5=Excellent	7
Innovation and/or uniqueness in terms of methodology, technology or integration	1=Poor 2=Fair 3=Good 4=Very Good 5=Excellent	6
OUTPUTS A: Disseminate research results through publications, conference papers, and policy papers	0=final report only 3= 1 or 2 papers/publications 5= More than 2 papers/publications	10
OUTPUTS B: Develops inventions, new methodologies or other products	0=not likely 3= actively seeking patents 5=actively seeking licensing and/or start up	10
Research Champion Strength	1=Poor, champion is not likely to implement the research results 3=Very Good, champion will actively engage in the research 5=Excellent, industry champion engaged and partially funding	5
Collaboration Strength	1=no collaboration except the champion 3=some outside collaboration 5=advisory board	5
OUTCOMES: research leads to passage of new policies, or other outcomes	0=not likely 3= actively seeking outcomes in at least one area 5=actively seeking outcomes in at least 3 or more areas	10





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Evaluation Criteria	Scale	Weighting
IMPACTS: Reduces fatalities, decreases capital or operating costs, improves the community, positively impacts the environment	0=not likely 3= actively seeking impacts in at least one area 5=actively seeking impacts in at least 3 or more areas	10
Research Deployment Viability & Deployment Tasks	0=not likely 3=strong potential 5=specific project goal	5
Funding from sources other than UTC (matching funding)	0=none 1=10% 2=25% match 3=50% match 4=75% match 5=100% match	5
Integrates research into class curriculum	0=no curriculum will be developed 3=1 or more course module will be developed 5=course modules include hands-on work or guest speakers	7
Commitment to hiring students to work on the project	0=no students required to complete project goals 3=at least one student will work on the project 5=3 or more students will work on the project	7
Commitment to social equity	0=no DEI plan 3=in development 5=demonstrates hiring plan through an equity lens	6





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# Appendix B:

# Proposal Coversheet





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Project Title		
PIs	PI	Co-PIs (bullet list if more than one)
Telephone #		
E-mail:		
Institution:		
Department:		
Industry or Government Principal, organization, and contact information		
Most relevant CCAT research thrusts (choose all applicable)	<input type="checkbox"/> Enabling Technology <input type="checkbox"/> Policy and Planning <input type="checkbox"/> Human Factors <input type="checkbox"/> Infrastructure Design and Management <input type="checkbox"/> Control and Operations <input type="checkbox"/> Modeling and Implementation	
Funding Request		
Matching Funds and Source (if any)		
Total Project Cost		
Contract Number	69A3551747105	
Project start/end dates		
Project Abstract		





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High-level implementation plan	
Project Metrics	
Web Links: [leave blank until project approval]	<a href="http://ccat.umtri.umich.edu">ccat.umtri.umich.edu</a>

