Semi-Annual Progress Report for University Transportation Centers:
Center for Multimodal Mobility in Urban, Rural and Tribal Areas (CMMM)

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1. Accomplishments

What are the major goals and objectives of the program?

1. Developing more refined models of travel behavior and the factors that influence travel demand;
2. Assessing the potential for unmanned and autonomous vehicles (both ground and air) to streamline the delivery of goods and facilitate the movement of people;
3. Investigating a wide array of congestion-reduction strategies, including incentivization of public transit, and the use of toll and HOV lanes;
4. Identifying the key contributors to transportation-related inequity and presenting solutions that support mobility justice, as well as better understanding the equity implications of travel barriers, including constrained access to food, healthcare, and employment;
5. Evaluating the potential of modalities such as rideshare, vanpool and microtransit to improve mobility while meeting the ever-evolving demand for efficient, reliable transportation;
6. Exploring the feasibility and impact of infrastructure-based solutions such as "complete streets" in reducing congestion and addressing inequity;
7. Exploring innovative approaches to project finance and delivery and providing technical assistance to stakeholders.

What was accomplished under these goals?

During this reporting period, we have selected 12 core projects for funding. Additionally, we are sending out the call for proposals for our competitive grant project, which must be collaborative across departments. Our first 12 projects are finishing up their first year of funding, and our current 3 competitive grants are about midway through their first year.

In total so far**, CMMM has funded 27 projects adding up to almost $3 million.** These projects range across transportation goals including improving the mobility of people and goods, promoting safety, reducing congestion, and more. Each project reflects the values of the CMMM as well as the USDOT UTCs.

On May 6, 2024, UMD and CMMM hosted a group of USDOT representatives to discuss ongoing research and collaborative efforts. Led by Cinzia Cirillo, the event highlighted CMMM's research initiatives aimed at enhancing transportation systems locally and nationally. These initiatives align with USDOT's strategic goals in economic strength, equity, global competitiveness, and sustainability, with CMMM supporting twelve core and three competitive projects in areas like air mobility, commute equity, autonomous vehicles, and mixed-traffic safety analysis.

Key USDOT attendees, including Robert Hampshire and Caesar Singh, explored UMD's research capabilities through discussions with university leadership and presentations by faculty on their work. The event included demonstrations of cutting-edge projects, such as an autonomous vehicle ride across campus. This partnership underscores the shared commitment of UMD and USDOT to advance innovation in transportation, aiming for a more connected, sustainable, and equitable future.

Currently, we are **undergoing a rebranding process, which includes building a brand-new website** for CMMM. All of CMMM's seminars, projects, paperwork, and other information is located on the current website: www.mti.umd.edu/cmmm

Over the past year, the director of CMMM worked to engage with and establish the Center's advisory board with 12 members. This interdisciplinary list ensures a robust and active team that reflects the values of CMMM. The team will meet twice a year to foster collaboration and innovation. So far, the board has met on December 13, 2023, May 3, 2024, and there is a meeting planned for December 2024.
This reporting period, CMMM added one new board member from the Maryland Department of Transportation, Samantha Biddle.
See the list of members below:

1. Samantha Biddle
2. Marcia Argust
3. Elisabetta Cherchi
4. Christopher Conklin
5. Christian Dorsey
6. Dan Goldfarb
7. Robbyn Lewis
8. Arben Shasho
9. Neil Pedersen
10. Jason Wang
11. Richard Wu
12. Hua Xiang

The CMMM also met with the Maryland Department of Transportation (MDOT) on February 13, 2024, and the following attendees from MDOT were present: Paul Wiedefeld, William Pines, and Samantha Biddle. During this meeting CMMM established a working relationship with the MDOT in order to establish transportation needs across the state and to promote future collaboration.

What opportunities for training and professional development has the program provided?
CMMM has hosted seven educational seminars for students, faculty, and staff at the University of Maryland. Each seminar has had a Zoom link included so that consortium members as well as members of the advisory board are able to participate.

1. October 29, 2024, Dr. Pratt Herakul, Meta
   Life After Graduation: What to Expect, How to Navigate

2. September 26, 2024, Neil Pedersen, retired Executive Director, TRB
   Four Big Issues Facing Transportation: Safety, Climate, Health, Equity

3. April 25, 2024, Dr. Prateek Bansal, National University of Singapore
   Harnessing Household Travel Survey with Smartcard Data to Generate Spatiotemporally Heterogenous Activity Plans for Transit Users

4. March 25, 2024, Shari Schaftlein, Federal Highway Administration
   Serving All People, All Abilities

5. April 4, 2024, Dr. Brian Park University of Virginia
   Transformative Traffic Management Harnessed by Proactive Route Guidance

6. October 27, 2023, Dr. Neda Masoud University of Michigan
   Incentive Design for Promoting Ridesharing

7. December 5, 2023, Guangchen Zhao, University of Maryland
   Measuring Mobility in the 21st Century: What Can We Learn from Mobile Device Location Data?

One core project funded for year two of CMMM involves research on and action toward an **outreach and educational program at SJSU**. This project with introduce elementary school students to transportation concepts to foster early interest in STEM fields. By engaging students in problem solving skills and other important transportation-related concepts, CMMM will increase interest and understanding in our world.

How have the results been disseminated? If so, in what way/s?
The results have been disseminated through the website (currently being updated). The core projects, the competitive projects, the educational seminars, and more have been reflected on this page: www.mti.umd.edu/cmmm

Additionally, CMMM sent out a newsletter to all of the consortium members, their students, faculty, staff, and to members of the advisory board.

CMMM also hosted an educational booth at the Transportation Research Board 2024 conference and is currently planning on hosting a booth for the TRB 2025 conference.

What do you plan to do during the next reporting period to accomplish the goals and objectives?
CMMM plans to continue hosting their seminar series, will put out a newsletter twice a semester, will have updated branding and an updated website. We will continue to work with our collaborators to improve the mobility of people and goods.

2. Participants and Collaborating Organizations

What organizations have been involved as partners?
CMMM collaborated with the University of Maryland, Morgan State University, San Jose University, North Dakota State University, White Earth Tribal and Community College, the University of Michigan, the Federal Highway Administration, MDOT, USDOT, the University of Virginia, and the National University of Singapore.

Have other collaborators or contacts been involved?
CMMM worked with several collaborators via the competitive and core projects. These are all professors from various universities including the University of Maryland, Morgan State University, San Jose State University, and North Dakota State University.
The professors are listed here: Ali Haghani, Gang Len Chang, Paul Schonfeld, Xianfeng Yang, Mehdi Shokouhian, Celeste Chavis, Young-Jae Lee, Ahoura Zandiatashbar, Susan Shaheen, Adam Cohen, Ying Huang, Ilya Ryzhov, Anna Alberini, Di Yang, Muhid Kabir, Mansha Swami, Jean Daniels Saphores, Yaobang Gong, and Kofi Nyarco.
CMMM also worked with the industries, Transurban, Rekor-AI, and EurekaFacts.

3. Outputs

CMMM has made significant strides through its 27 supported projects, including an educational program that introduce elementary students to transportation concepts like roads and bridges. These initiatives foster early interest in STEM while developing skills such as problem-solving and critical thinking. CMMM is also preparing several potential journal papers and has hosted two seminars to share knowledge and promote collaboration.

4. Outcomes

The outcomes for this reporting period include increased understanding and awareness of transportation issues. This outcome was achieved via seven educational seminars, the review and funding of 12 new core projects, the call for proposals for our competitive, collaborative projects, and the meeting of the CMMM advisory board. We are planning to increase awareness further via a CMMM booth at TRB in January 2024.

So far, PI Cinzia Cirillo spoke at two different conferences, an Industrial AI event at the University of Maryland and the Board of Trade 2023 Capital Regional Transportation Forum.

5. Impacts

What is the impact on the effectiveness of the transportation system?
The research conducted by our students and faculty directly enhances transportation system effectiveness, addressing challenges like traffic flow, safety, and equitable access. These projects generate data-driven solutions that improve efficiency, reduce congestion, and support sustainable, resilient mobility for diverse communities.

What is the impact of technology transfer on industry and government entities, on the adoption of new practices, or on research outcomes which have led to initiating a start-up company?
1. CMMM partnered with **Transurban**, a toll operator, to enhance transportation systems through innovative tolling research and solutions.

2. CMMM collaborated with **Rekor-AI** to advance pedestrian safety, leveraging AI-driven insights for safer urban environments.

3. CMMM worked alongside **EurekaFacts** on projects related to e-bike adoption and standards, providing applied research that supports regulatory and safety standards.

What is the impact on the body of scientific knowledge?
CMMM's students and researchers are at the forefront of transportation innovation, actively contributing to solutions for complex mobility challenges through an impressive portfolio of 27 supported research projects. Their work spans critical areas such as sustainable urban mobility, autonomous vehicle integration, and commute equity, producing valuable insights that are not only advancing academic understanding but also influencing real-world transportation systems. This research is fueling numerous journal publications and supporting our students in achieving advanced degrees, all while equipping them with hands-on expertise that prepares them for impactful careers in the field.

What is the impact on transportation workforce development?
A group of researchers has been educated via our seminar series on different transportation needs and goals. One of our core projects is supporting elementary school interest in transportation, aiding in future workplace recruitment:
The Mineta Transportation Institute (MTI) has developed an educational program introducing elementary students to transportation concepts, focusing on roads and bridges to foster early interest in STEM fields. This program aims to spark curiosity and build essential skills, such as critical thinking and problem-solving, by engaging students in understanding the history, construction, design, and societal impact of transportation infrastructure. The curriculum, which includes interactive lessons on bridge-building, will undergo pilot testing to ensure it is engaging, accessible, and practical for educators. By highlighting topics like bridge design, weight distribution, and global infrastructure, MTI's lessons play a crucial role in inspiring future engineers and builders, helping students develop skills that will serve them well in school, careers, and life.

6. Changes/Problems

Nothing to report

7. Special Reporting Requirements
Nothing to report