UTC Semi-Annual Progress Report (SAPR) #12

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1. ACCOMPLISHMENTS

A. Goals and Objectives

CM^2 is committed to advancing research, education, and technology transfer initiatives to improve mobility, promote equity, and enhance the economic competitiveness of urban and rural communities in megaregions.

- We aim to become a leading Tier 1 center specialized in megaregion mobility research. Our goal is to offer advice on strategic transportation planning, smart infrastructure investments, and informed policy-making.
- We provide high-quality transportation education and workforce development and work to connect research with practical actions.
- We promote multimodality ranging from HSR to slow-moving transportation such as walking and bicycling for diverse populations and communities. We facilitate public-private partnerships for freight mobility planning and operation efficiency.

B. Accomplishments under These Goals

i. Research Accomplishments

Throughout this reporting period, the grant funded 12 researchers and 12 students. Research teams were involved in a series of projects analyzing data, laws, policies, and technologies as well as developing solutions through modeling and analysis for cooperative mobility in megaregions. While no projects were completed during the reporting period, researchers and students were actively working towards completion of remaining projects within the overall grant period.

ii. Education Accomplishments

Several CM2 researchers and students were recognized for their work during the reporting period. Texas Southern University's (TSU) Valencia Stewart received the Consortium's Outstanding Student award, which included scholarship funding and a sponsored trip to the 2023 Transportation Research Board Annual Meeting in January. Dr. Bumesok Chun, TSU, and his students received the award for the best graduate student poster at the 2023 Association of American Geographers Annual Meeting in March. Dr. Junfeng Jiao, University of Texas at Austin (UT), received a Distinguished Lecturer Medal from the UT School of Undergraduate Studies. Dr. Frederick Steiner, University of Pennsylvania (UPenn), received the Outstanding Alumni Award from his alma mater, the University of Cincinnati. Dr. Chandra Bhat, UT, along with students and colleagues, received the TRB Pyke Johnson Award for the paper entitled *"The Influence of Mode Use on Level of Satisfaction with Daily Travel Routine: A Focus on Automobile Driving in the United States."* This award is

Figure 1: 2022 UTC Outstanding Student of the Year Nominee Valencia Stewart

given annually by the Transportation Research Board for the best paper in the area of planning and environment.

iii. Outreach/Engagement Accomplishments

During this reporting period, CM2 staff and researchers attended a variety of regional and national-level conferences. Many researchers attended the TRB 2023 annual meeting in Washington, DC, in January, including Dr. Carol Lewis, TSU; Dr. Brian Wolshon, Louisiana State University (LSU); Dr. Chandra Bhat, UT; Dr. Bumseok Chun, TSU; Dr. Junfeng Jiao, UT; Dr. Erick Guerra, UPenn; and Dr. Ming Zhang, UT. Drs. Bhat, Chun, and Guerra all presented papers at the meeting. As mentioned above, Dr. Chun also attended the 2023 AAG Annual Conference in Denver, CO, in March, along with Dr. Jiao. Drs. Sandra Rosenbloom, UT, and Jiao attended a meeting of the Association of Collegiate Schools of Planning in Toronto, in November of 2022. Dr. Zhongjie Lin, UPenn, attended the 2022 ACC (Asia Culture Center) International Academic Symposium, which included over 100 attendees. In addition to the TRB meeting, Dr. Guerra also attended and presented research at the 2023 Vision Zero PHL Conference, in Philadelphia, PA. Dr. Michael Oden, UT, attended an interactive seminar in November hosted by S.R.D. Consulting, LLC. Dr. Jiao also attend the 2023 HRI (Human-Robot Interaction) meeting in Stockholm, Sweden in March. Lastly, Dr. Zhang presented research at the 62nd Annual Meeting of the Western Regional Science Association, in Big Island, HI, in February.

One notable upcoming event is the CM2 annual Summer Forum event, a collaborative research event when PIs from all partner institutions are invited to come and share their recent research and findings with the consortium. This year's summer forum will be hosted by UT Austin in Austin, TX, and will be an opportunity for researchers to share an overview of everything they have accomplished during their time with CM2.

iv. Administrative Accomplishments

Data analytics have shown a growth in the CM^2 website activity over the past six months. Audience page views showed 2,491 users with 2,474 new users visiting the website, and 4,220 page views. Over half of the CM2 website audience are users from the United States (53.8% users), while the remaining user demographics hail from a variety of countries including China, Australia, Canada, and France.

We have continued developing our Twitter account to disseminate news and information about CM2 related events. The account earned over 1,588 new impressions, which is defined as the number of times users saw our tweets on Twitter. Our account has 235 followers. We will continue to utilize and expand upon this platform.

The CM^2 LinkedIn company page and the CM^2 LinkedIn Group serve as a space where CM^2 researchers, students (past and present), and transportation industry partners can connect with each other, share recent developments in research, mention professional accomplishments, and

list awards. At submission of this report, the LinkedIn Group has a total of 103 members, while the LinkedIn company page has increased from 213 members to 255 members over the past six months.

Additionally, the CM^2 administration team published the Fall 2022 newsletter during this reporting period. Our current newsletter email list has 213 subscribers (+13%). The CM2 administration and research team will continue to focus on growing our social media base by regularly posting current and interesting content that crosses disciplines and reflects the mission of CM2.

We will continue to utilize and expand our social media platforms, including engagement of the CM^2 LinkedIn company page, CM^2 LinkedIn Group, and our Facebook page.

C. Dissemination of Results

The results of work completed during this reporting period does not include any final project reports, as our research team is still completing their CM^2 outstanding projects. CM^2 researchers gave twenty-five presentations at conferences and lectures both in-person in the US, and online for virtual and international events. Twelve refereed journal papers have been published during the past six months. Peer-reviewed articles from our researchers have been cited approximately 2,113 times during the reporting period according to Google Scholar. All items are explored in more detail under Section 3.

D. Plans for Next Reporting Period

During the next reporting period, the CM^2 consortium expects to see twenty-nine completed projects with final reports. Consortium researchers will continue to share the findings of their research through conference presentations and journal publications. As of this report publication, five researchers already have plans to attend at least nine conferences in-person or virtually including IACP, WCTR, TRB, CUTC, and others in the next reporting period. The CM2 administrative team will continue to conduct outreach activities in-person and virtually, including potentially a Fall 2023 CM2 Guest Speakers Series.

On May 18th and 19th, CM^2 is hosting its annual (and final) 2023 summer forum event at the University of Texas at Austin. The 2022 summer forum was postponed and combined with the 2023 summer forum as a means to allow CM^2 researchers and students to share final results and celebrate consortium-wide accomplishments after seven successful years focused on collaborative megaregional transportation research.

Figure 2: CM2 2023 Summer Forum Announcement

This summer forum involves two packed days of guest speakers, seminars, and student presentations from CM^2 researchers and CM^2 adjacent guests.

Finally, we are excited to see how our researchers will find creative ways to adapt, stay connected, and close out their research in the final stage of CM^2's lifespan with regards to the ever evolving nature of post COVID-19 pandemic society.

2. PARTICIPANTS & COLLABORATING ORGANIZATIONS

A. Organizations Involved as Partners

The members of the consortium include The University of Texas at Austin, Louisiana State University, Texas Southern University, and the University of Pennsylvania. Table 2 presents a list of current CM^2 partners.

Table 2: Current CM^2 Partners

Organization Name	Location	Contribution
Texas Department of Transportation (TXDOT)	Austin, TX	Data, In-kind Support
City of Austin (Austin Transportation Department)	Austin, TX	Data Support, Research
City of Houston (City Planning Department)	Houston, TX	Data Support
City of Dallas	Dallas, TX	Data Support
City of Austin Senior Centers	Austin, TX	Facilities, In-kind Support
Austin Asian- American Resource Center	Austin, TX	Facilities, In-kind Support
San Antonio Senior Sections	San Antonio, TX	Facilities, In-kind Support
City of Georgetown	Georgetown, TX	Data, In-kind Support
Houston Metro	Houston, TX	Data Support
City of Philadelphia: Office of Transportation, Infrastructure, and Sustainability	Philadelphia, PA	Data Support
Southern Pennsylvania Transportation Authority (SEPTA)	Philadelphia, PA	Data Support, Teaching support
Delaware Valley Regional Planning Commission	Philadelphia, PA	Data, In-kind Support
Alamo Area Metropolitan Planning Organization	San Antonio, TX	Data Support
North Central Texas Council of Governments (NCTCOG)	Dallas, TX	Data Support
Houston Galveston Area Council (H-CAC)	Houston, TX	Data, In-kind Support
Capital Area Metropolitan Planning Organization (CAMPO)	Austin, TX	Data Support
Capital Metro- Austin Public Transit	Austin, TX	Data Support, Research
Houston APA Chapter	Houston, TX	Data, In-kind Support
Texas APA Chapter	TX	Student, In-kind Support
University of Southern California	Los Angeles, CA	Research
Florida Department of Transportation	Tallahassee, FL	Data support

Center for Transportation; Smart City Lab, University of Texas at Austin	Austin, TX	Research
Stephenson Disaster Management Institute at Louisiana Emerging Technology Center	Baton Rouge, LA	Facilities, Technical Contributions
Clemson University	Clemson, SC	Research
Embry-Riddle Aeronautical University	Randolph AFB, TX	Research, Technical Contributions
WTS (HoT Chapters, South West Region)	TX, OK, NM, AL, AK	In-Kind Support
Girlstart	TX	In-Kind Support
Georgia Institute of Technology	Atlanta, GA	Research
Jewish Community Center	Austin, TX	Facilities, In-kind Support
Tokyo Government	Tokyo, Japan	Student Support, Research
Tokyo Olympic Game Committee	Tokyo, Japan	Student Support, Research
Tokyo Metropolitan University	Tokyo, Japan	Student Support, Research
City of Austin Traffic Management Center	Austin, TX	Student Support
Austin Bergstrom International Airport	Austin, TX	Student support
Central Texas Regional Mobility Authority	Austin, TX	Student Support
Amazon SAT-2 Distribution Center	San Marcos, TX	Student Support
Lincoln Institute of Land Policy	Cambridge, MA	Research, Publishing Support
UT Good Systems Grand Challenge; University of Texas at Austin	Austin, TX	Research
Florida State University	Tallahassee, FL	Research
City of Arlington, Tarrant County	Arlington, TX	Data Support
Trinity Metro, Fort Worth	Fort Worth, TX	Data Support
Austin Transit Partnership Architecture and Engineering Committee	Austin, TX	Research
Johns Hopkins University	Baltimore, MD	Research
Area Agency on Aging of the Capital Area	Arlington, TX	Research, Technical
Fort Bend Transit Authority	Fort Bend, TX	Data, In-Kind Support
City of Austin Sustainability Office	Austin, TX	Research
Southeastern Pennsylvania Transportation Authority	Philadelphia, PA	Research, Technical

B. Other Collaborators or Contacts

Throughout the life-cycle of the CM2 consortium, the researchers of the CM^2 team have consistently promoted multi-jurisdictional collaboration between consortium members by setting aside funds specifically for multi-institutional proposals. Presently, there is one multi-institutional project currently in progress: *"Utilize Crowd-Sourced Data and Machine Learning Technology to Enhance Planning for Transportation Resilience to Flooding"* from Ming Zhang and Qisheng Pan.

3. OUTPUTS

Table 3 summarizes output performance metrics for the reporting period, as identified in the CM^2 Technology Transfer Plan. Subsections A-G provide a specific list of outputs.

Table 3: Output Performance Metrics

Performance Metrics: Output	Annual Target	Actual for 10/1/22 -3/31/23
1. Publications, conference papers, presentations, or final project reports	10	**21** (10 journal publications, 0 final reports, 11 presentations)
1.1 Publications: diversity of fields/journals submitted to (e.g. engineering, modeling, law, policy, geography, economics, infrastructure, etc.)	3	**6** (Planning, Transportation, Travel Behavior, Modeling, Environment, Infrastructure)
1.2 Conferences: by entity (e.g. TRB, APA, ASCE, WTS, SXSW, etc.)	2	**6** (ACSP, HRI, TRB, ISCTSC, Vision O PHL,)
2. Workshops, seminars in collaboration with or participation of MPOs and transportation agencies	2	11
2.1 Type of activity	2	2
2.2 Type of professional organizations involved	2	2
2.3 Event scales/number of attendees (small (up to 10), medium (11-29), large (30 and up))	2	3
3. Web Presence	n/a	n/a
3.1 Website visits/page views	3,000	4,220
3.2 Number of impressions on Twitter	30,000	28727
3.3 Number of additional members in LinkedIn Group	20	0 (42 new members on LinkedIn company page)

A. Publications

i. Journal Publications

• Bhat, C.R. and Mondal, A. (2022). "A New Flexible Generalized Heterogeneous Data Model (GHDM) with an Application to Examine the Effect of High Density Neighborhood Living on Bicycling Frequency." Transportation Research Part B, Vol. 164, pp. 244-266.

• Chun, B., Aghazadeh, E., and Anh, N. (2023). "Spatial patterns of bike ridership on bike-sharing program in Houston, Texas."

• Cole, G., Wolshon, B., and Schmidt, J. (2022). "Incident Diversionary Routing: Survey of Influences and Decisions." Transportation Research Record: Journal of the Transportation Research Board, acknowledgment of federal support.

• Dong, X., Guerra, E., Daziano, R.A., Chatterjee, P., and Kovalova, N. (2022). "Investigating the Preferences between Shared and Non-Shared Ride-Hailing Services across User Groups." Case Studies on Transport Policy 10(4), 2290–99. https://doi.org/10.1016/j.cstp.2022.10.010.

• Dong, X., Guerra, E., and Daziano, R.A. (2022). "Impact of TNC on Travel Behavior and Mode Choice: A Comparative Analysis of Boston and Philadelphia." Transportation 49(6), 1577–97. https://doi.org/10.1007/s11116-021-10220-5.

• Fu, B., Ye, Y., and Lin, Z. (2022). "Analyzing the Interactive Relationship between Urban Compactness and Cycling Activities: A Case Study of Suzhou." Journal of Human Settlements in West China, No. 5, 119-124. DOI: 10.13791/j.cnki.hsfwest.20220517.

• Kang, J., Kong, H., Lin, Z., and Dang, A. (2022). "Mapping the Dynamics of Electric Charging Demand within Beijing's Spatial Structure." Sustainable Cities and Society, 76, 103507. DOI: 10.1016/j.scs.2021.103507.

• Majumdar, S. and Chun, B. (2023). "Fracking and Traffic Crashes in Eagle Ford Shale of Texas." Public Works Management & Policy, Vol. 28(2), https://doi.org/10.1177/1087724X221100559.

• Seong, K., Jiao, J., and Mandalapu, A. (2023). "Evaluating the Effects of Heat Vulnerability on Heat-Related Emergency Medical Service Incidents: Lessons from Austin, Texas." Environment and Planning B: Urban Analytics and City Science, 50, 776–795. https://doi.org/10.1177/23998083221129618.

• Shapouri, M., Fuller, J.D., Wolshon, B., and Herrera, N. (2022). "Disruptions in Megaregional Network Evacuations: Identifying and Assessing Critical Links." Transportation Research Record: Journal of the Transportation Research Board, acknowledgment of federal support (yes).

• Steiner, F.R. (2022). "Reflective Socio-Ecological Practice." Socio-Ecological Practice Research, 4, 417–429.

• Renne, J., Pande, A., Wolshon, B., Murray-Tuite, P., & Kim, K. (2022). "Creating Resilient a Transportation System: Policy, Planning and Implementation". Elsevier Press.

ii. Books or other non-periodical, one-time publications

Nothing to Report

iii. Other publications, conference papers, presentations, and working papers

Another University of Texas researcher, Dr. Junfeng Jiao, presented a panel entitled 'Ethical AI and Our Future' within the University of Texas' Urban Info Lab. Here, Dr. Junfeng Jiao argues that given the potentially disruptive consequences of AI systems, humanity cannot afford to wait until problems arise to consider their impacts on society. Additionally, Dr. Jiao also presented at an interactive workshop entitled 'Save Your City, Design the Future' at the South by Southwest conference in March.

University of Pennsylvania's Dr. Zhonjie Lin was quoted in the New York Times article titled *"Here's How Slowly New York City Is Moving on Electric Vehicles*" on April 5, 2022. In addition, CM^2 director Dr. Zhang published a paper titled "*Distributive economic impacts of the Bipartisan Infrastructure Law: A Case study of Texas with an application of the computable general equilibrium (CGE) model*" and presented it at the 62nd Annual Meeting of the Western Regional Science Association in Big Island, HI from February 15 to 18, 2023. Furthermore, the Washington Post recently quoted one of Dr. Zhang's CM2 studies in their article entitled *"'I'll call an Uber or 911': Why Gen Z doesn't want to drive'*. The paper quoted was Dr. Ming Zhang's and Yang *Li's 'Generational travel patterns in the United States: New insights from eight national travel surveys'*.

B. Websites

The CM^2 website URL is https://sites.utexas.edu/cm2/. This website is used to disseminate any information related to the program. In addition, CM^2 has a Twitter account (https://twitter.com/CM2_UTC), LinkedIn group (https://www.linkedin.com/groups/12134034/) LinkedIn company page (https://www.linkedin.com/company/cooperative-mobility-for-competitive-megaregions-cm2/), as well as a company Facebook page (https://www.facebook.com/CM2page/).

All final project reports are also disseminated through the TxDOT Research Library website operated by the Center for Transportation Research Library at the University of Texas at Austin (UT Austin). The TxDOT Research Library serves as the official depository of the Texas Department of Transportation (TxDOT) Cooperative Research Program and supports the information needs of the Research and Technology Implementation Division of TxDOT.

UT Austin's School of Architecture helps disseminate research results and the work of our center through the school's website (https://soa.utexas.edu/headlines/cm2-researchers-launch-new-book-exploring-megaregions), eNews (https://mailchi.mp/utexas/february-2018-enews-1975165?e=48aa70e157), Twitter (https://twitter.com/UTSOA), and Facebook page (https://www.facebook.com/UTSOA/). Additionally, UT Austin's School of Architecture YouTube channel disseminates recordings of CM2 outreach activities such as our monthly Brown Bag sessions, guest lecture series, workshops and seminars (https://www.youtube.com/channel/UCJS9a_AUbsZfhRYBXojeu-Q).

CM^2 related research activities from the University of Pennsylvania are disseminated through the Weitzman School of Design website (https://www.design.upenn.edu/), the weekly e-newsletter (https://www.design.upenn.edu/subscribe-design-weekly-news-weitzman) and Twitter (https://twitter.com/WeitzmanSchool). All LSU program activities are disseminated through (http://www.evaccenter.lsu.edu).

C. Methodologies, Technologies or Techniques

In regards to the development of new methodologies, technologies, or techniques, Dr. Junfeng Jiao has been developing reinforcement learning and computer vision tequniques as a means of enhancing safety measures for autonomous vehicles. Furthermore, his team has learned Multi-Dimensional Measure of Trust (MDMT) measurement scale, which is designed to address the need for valid measurement tools related to human-robot trust. Dr. Chandra Bhat has developed a new travel demand model that considers bidirectional relationship between attitudes and travel behavior.

D. Inventions, patent applications, and/or licenses

Nothing to report.

E. Outreach activities

Nothing to report

F. Courses and Workshops

Professor Ming Zhang taught two courses for the Fall 2021 and Spring 2022 academic calendar "Transit Oriented Development" and "Metropolitan Transportation Studies", both for the Community and Regional Planning (CRP) Program at UT Austin. Researcher Junfeng Jiao taught two (2) courses related to his work with CM^2. The first course, CRP 386, was an Urban GIS course, and the second another CRP 386 course titled Urban GIS.

Dr. Zhonjie taught "Site Planning" at the University of Pennsylvania during the academic year 2022-2023, with a class size of 13 students. At the University of Texas at Austin, Dr. Jiao taught two courses related to his work with CM^2: "Smart City: Case Studies in Machine Learning" during the Fall semester of 2022 and "Smart City: Ethical AI - Good Systems" during the Spring semester of 2023. In addition, Dr. Jiao gave a Herbert Family Talk titled "Ethical AI & Our Future," which was a guest lecture hosted by the University of Texas at Austin. Dr. Lewis taught a module on megaregions in the Fall 2022 Fundamentals of Transportation class and another module in the Spring 2023 Urban Transportation Planning class. The Fall Fundamentals class had 12 students, and the Spring Urban class had 9 students. Dr. Stiener taught a studio focused on the Philadelphia to Baltimore corridor, while Dr. Wolshon gave an invited lecture entitled "Overview of Evacuation, Planning, Management, and Operation - Research and Practice" at the Urban Planning graduate school at the University of Hawaii in October 2022. Dr. Guerra taught three courses: "CPLN 655 Multimodal Transportation" with 40 students, "CPLN 550 Intro to Transportation Planning" with 35 students, and "Planning Studio One" with 70 students. Finally, Dr. Chun taught "Transportation Land-Use Modeling & Policy" with a class size of 4 students.

G. Other products

Nothing to report

OUTCOMES

Table 4 summarizes output performance metrics for the reporting period, as identified in the CM^2 Technology Transfer Plan. Subsections A-G provide a specific list of outputs.

Table 4: Output Performance Metrics

Performance Metrics: Outcome	Annual Target	Actual for 10/1/22-3/31/23
1. Enlarged pool of trained transportation professionals	n/a	n/a

1.1 Number of students hired by CM², broken down by degree types and levels, diversity metrics, and other social-economic measures	25	12
Degree type (Undergrad, Master, PhD)	n/a	0% undergraduate 75% master, 25% PhD
Gender (male, female)	n/a	58% male, 42% female
Race (Asian, Black, White, other)	n/a	58% Asian, 25% White, 17% Black, 0% Other
First-generation student (undergrad. or grad.)	n/a	0
1.2 Number of papers developed by students for publication	2	10
1.2 Number of graduates in transportation jobs	15 -overall grant period	29
2. Increased cooperation by local governments and transportation agencies regarding regional and inter-regional issues	n/a	n/a
2.1 Number of regional or inter-regional planning activities detailed in long, medium, and short-range transportation plans	1	1
2.2 Development and utilization of consistent and usable planning datasets	1	1
2.3 Creation of megaregional forums, committees, and communications by megaregional transportation planning entities	1	1

While most of our student researchers graduate during the April - September reporting period, we are proud to have a total of 29 students enter the workforce in the past six months and start their careers in the field of transportation. This makes the overall total of 103 graduates in transportation jobs, which exceeds our goal of having 15 students graduate and enter transportation-related jobs during the overall grant period.

Moreover, several student researcher had ten papers developed for publication during the reporting period, which already meets our annual target of two.

In addition to our students' achievements, CM² faculty researchers across all of our institutions have maintained their collaboration efforts with local governments and transportation agencies regarding regional and inter-regional issues throughout the lifetime of the research consortium. To ensure that the datasets and research are useful for their intended audience, researchers collaborate in megaregionally-focused working groups on inter-regional planning activities. Many researchers met at the TRB conference in January 2023 and came together at the megaregional sub-committee meeting to talk about mega-regionally focused transportation projects.

4. IMPACTS

Table 5 below summarizes the impact performance metrics for the reporting period, as identified in the CM^2 Technology Transfer Plan.

Table 5: Impact Performance Metrics

Performance Metrics: Impact	Annual Target	Actual for 10/1/22-3/31/23
1. Enhanced knowledge base	n/a	n/a
1.1 Development of books/handbooks	3 - overall grant period	1
1.2 Journal publications in academic or professional journals	5	11
1.3 Special issues of academic or professional journals	1	0
2. Increased societal awareness beyond transportation sector of megaregional passenger and freight transportation challenges facing megaregion constituents today and, in the future,	n/a	n/a
2.1 Number and extensiveness of social media coverage of CM^2 research, education, and outreach activities	1	5
3. Informed decision making on public policy and transportation infrastructure investments	n/a	n/a
3.1 Number of contracted plans and projects conducted for and adapted by local and regional agencies in megaregions	1	2

A. Impact on the effectiveness of the transportation system

The ongoing research findings from our consortium have already had an impact on transportation system around the country.

Presently, Dr. Erick Guerra (University of Pennsylvania) is working with the City of Philadelphia on evaluating speed cameras on Roosevelt Blvd, the outcome of which will be used to build a pilot project to help increase safety at traffic intersections. Furthermore, researcher Junfeng Jiao is currently working on the Mobility Hub Project, which is a long-range transportation plan aimed at improving transportation and mobility in the area.

B. Impact on the adoption of new practices, or instances where research outcomes have led to the initiation of a start-up company

Nothing to report.

C. Impact on the body of scientific knowledge

The research projects and findings from the consortium are shared at academic forums, conferences, and in journal publications, as well as through social media. This has contributed to the overall awareness of the importance of megaregional study. Furthermore, researchers have

utilized cutting edge technology for instructional and research purposes, such Dr. Jiao's use of Chat-GPT API for Building OpenCityAI in his coursework and research.

D. Impact on transportation workforce development

CM^2 partner universities are preparing students to enter both the public and private sectors with expertise in planning, design, project delivery, and financing strategies. Our classes engage students with experts who work on the implementation of the transportation and infrastructure projects they study. Several CM^2 graduates have already started working in transportation-related positions across the country. They will be able to bring their knowledge from CM^2 and implement it in their work.

5. CHANGES/PROBLEMS

Even though COVID-19 has slowed down and many areas of the country have eased restrictions, it's important to note that the pandemic has permanently changed the way we conduct research and outreach. In addition to reduced face-to-face time with students and limited in-person outreach activities, the impact of COVID-19 also made it difficult for researchers to conduct interviews with people in person. Dr. Rosenbloom noted that it was impossible to interview people face-to-face, and Dr. Chun had to cancel multiple trips to conferences, including WRSA, TRB, and ACSP. However, despite these challenges, Consortium member institutions were able to adapt to the changes brought about by the pandemic, and many turned to virtual communication platforms such as Zoom and YouTube to continue their research dissemination and outreach efforts. As the pandemic continues, it is likely that virtual communication platforms will continue to play an important role in the way research is conducted and disseminated.

6. SPECIAL REPORTING REQUIREMENTS

Nothing to report.