



UTC Semi-Annual Progress Report (SAPR) #5

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Center Director: Dr. Ming Zhang, zhangm@austin.utexas.edu, (512) 471-0139

Submitting Official: Ms. Inessa Ach, iach@austin.utexas.edu, (512) 471- 1291

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Office of Sponsored Projects
3925 West Braker Lane
Building 156, Suite 3.11072
Austin, TX 78759-5316

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Signature of Submitting
Official:

A handwritten signature in black ink, appearing to read 'Inessa Ach', is written over a light gray rectangular box.

TABLE OF CONTENTS

1. ACCOMPLISHMENTS	3
A. Goals and Objectives.....	3
B. Accomplishments under These Goals	3
i. Research Accomplishments	3
ii. Education Accomplishments	4
iii. Outreach/Engagement Accomplishments	5
iv. Administrative Accomplishments	6
C. Dissemination of Results.....	7
D. Plans for Next Reporting Period.....	7
2. PARTICIPANTS & COLLABORATING ORGANIZATIONS.....	8
A. Organizations Involved as Partners	8
B. Other Collaborators or Contacts	10
3. OUTPUTS	10
A. Publications.....	11
i. Journal Publications	11
ii. Books or other non-periodical, one-time publications.....	11
iii. Other publications, conference papers, presentations, and working papers	12
B. Websites	12
C. Methodologies, Technologies or Techniques	13
D. Inventions, patent applications, and/or licenses	13
E. Outreach activities	14
F. Courses and Workshops	14
G. Other products.....	15
4. OUTCOMES	17
5. IMPACTS.....	19
A. Impact on the effectiveness of the transportation system	19
B. Impact on the adoption of new practices, or instances where research outcomes have led to the initiation of a start-up company	20
C. Impact on the body of scientific knowledge.....	20
D. Impact on transportation workforce development.....	20
6. CHANGES/PROBLEMS	20
7. SPECIAL REPORTING REQUIREMENTS.....	20

1. ACCOMPLISHMENTS

A. Goals and Objectives

CM² is committed to advancing research, education, and technology transfer initiatives to improve mobility, promote equity, and enhance 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 partnership for freight mobility planning and operation efficiency.

B. Accomplishments under These Goals

i. *Research Accomplishments*

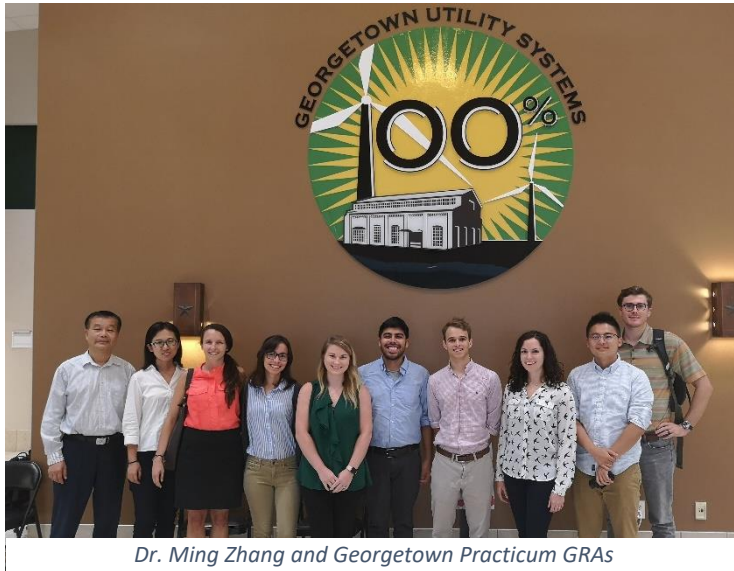
Throughout this reporting period, the grant funded 26 researchers and 58 students. Research teams were involved in a series of projects analyzing data, laws, policies, and technologies as well as developing solutions through modelling and analysis for cooperative mobility in megaregions. Table 1 outlines the projects completed by the end of this reporting period.

Table 1: Completed Projects by Partner Institutions and PIs

Project Title	Partner	Principal Investigator	Funding Year	Project Status
The Effects of Transportation Infrastructure Investments on Freight Mobility: a Megaregion Perspective	UT CTR	Michael Walton	Year 1	Complete
Incorporating Active Transport into the Regional Planning Process to Support First and Last Mile Travel	UT CTR	Michael Walton	Year 2	Complete
Identifying Organizational Changes to Facilitate MPO Megaregion Planning	UT CTR	Lisa Loftus-Otway	Year 2	Complete
Transit Operators in Metropolitan Transportation Decision Making	UT SOA	Gian-Claudia Sciara	Year 1	Complete

During project selection stage, we practiced a double-blind peer review process. CM² Executive Committee members reviewed and ranked the submitted proposals with all author information and affiliation removed. To ensure quality of the final reports, CM² researchers and external peer reviewers were invited to attend the annual CM² Fall Exhibition and the Summer Forum. They reviewed project presentations and provided comments and suggestions that offered valuable feedback and were used by research teams to refine the final project reports.

ii. Education Accomplishments



Dr. Ming Zhang and Georgetown Practicum GRAs

Several CM² GRA Student researchers received awards at the 2019 UT SOA Commencement ceremony. Sagnika Das, a Graduate Research Assistant for Dr. Sandi Rosenbloom, won the Community and Regional Planning Engaged Practice Award for her work on the Breaking Barriers: The Legacy of John Chase event. Nicole McGrath, CM² Graduate Research Assistant for Administration, won the AICP Outstanding Student Award.

Additionally, Nicole was selected as an Eno Fellow for the 2019 Transportation Leadership Development

Dr. Zhang's Practicum on the Georgetown Bicycle Master Plan won the UTSOA CRP Community Design Award for their work on the Georgetown Bicycle Master Plan. CM² GRAs in the class include Louis Alcorn, Chris Bischak, Liang Chen, Ziqi Liu, Nicole McGrath, Evan Scott, and Paulina Urbanowicz-Pollock. This project was also selected for a panel presentation at the 2019 APA Texas Chapter Conference in Waco, TX.



Sagnika Das, CRP Award Recipient



Nicole McGrath with Eno President and CEO, Robert Puentes, and former Secretary of Transportation, Mary E. Peters

Conference (LDC) program. Nicole traveled to Washington D.C. where the fellows met federal officials, business leaders, and non-profit organizations and gained a first-hand look at how national transportation policies are developed.

iii. Outreach/Engagement Accomplishments



CM² Business Meeting

On June 6-7 CM² held its annual Summer Forum event at Texas Southern University in Houston. The UTC researchers from all five institutions shared their ongoing research and program updates with CM² partners and industry stakeholders. The attendance was strong with members of the Executive Committee and the Advisory Committee, CM² Support Partner representatives, and guest speakers from the transportation industry.

Following the project presentations, attendees participated in table discussions about potential research collaborations and strategies to publicize research findings. During the second day there was an invitation-only Business Meeting to discuss the future of the UTC as well as review project proposals for Year 4 funding.

On April 16th, Assistant Director for Research, Lisa Loftus-Otway served as a panelist at the South by Southwest festival in Austin, Texas. This was a USDOT panel called “Transportation Innovation at a Crossroads.” Loftus-Otway discussed how federal investments can augment private sector tech innovation in transportation. The panel received a lot of social media buzz and the group has already started planning another panel for next year’s conference, continuing the discussion of disruption in tech and automation’s effects on the transportation industry.



Lisa Loftus-Otway during SXSW



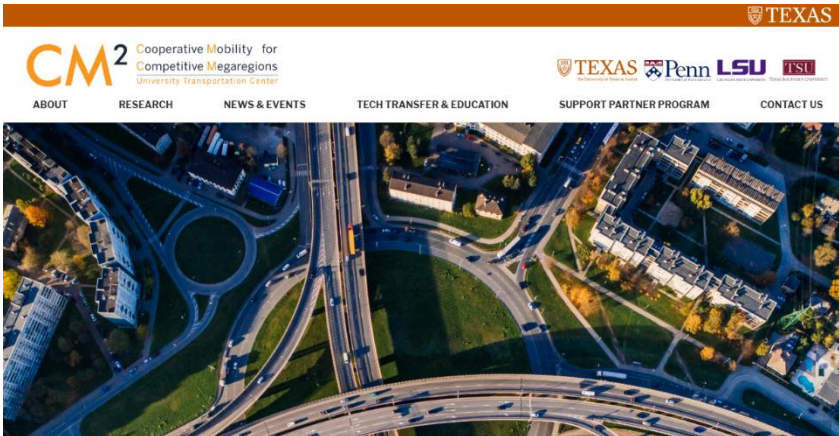
Dr. Sandi Rosenbloom at the WIIIT Conference 2019

And

Achievements of our CM² researchers were celebrated by different awards and recognitions. Dr. Erick Guerra earned Urban Design Group 2019 Book Award for his book: Beyond Mobility, Planning cities for people and places. Dr. Carol Lewis was awarded Best Poster for equity project at CM² Summer Forum 2019. Dr. Junfeng Jiao has also received UTSOA Research Excellence Award. CM² was a Gold Level Sponsor at the 6th International Conference on Women’s Issues in Transportation. Both Dr. Sandi Rosenbloom and Assistant Director for Research, Lisa Loftus-Otway, attended the conference from September 10-13. Dr. Sandi Rosenbloom gave a well-attended presentation called “42 Years of Women's Transportation Conferences” which received a lot of attention on social media.

iv. Administrative Accomplishments

The CM² administration launched the second year of the Support Partner Program (SPP), and Cox|McLain Environmental Consulting Inc. has already decided to partner with us again this year as a Small/Minority/Woman-Owned Business level supporter. We are waiting to hear back from other potential partners. The program helps support CM² research, student scholarships, and workforce development. Our support partners also attend several of our CM² events. The CM² administration and research team will continue expanding our base of Support Partners throughout the life of the grant.



Welcome!

The consortium of Cooperative Mobility for Competitive Megaregions (CM²), USDOT Tier 1 University Transportation Center, aims to advance research, education, and technology transfer initiatives to improve the mobility of people and goods in urban and rural communities of megaregions. CM²'s consortium partners include the University of Texas at Austin, Louisiana State University, Texas Southern University, and the University of Pennsylvania. [Learn More](#)

CM² Website - <https://sites.utexas.edu/cm2/>

The CM² administration and research team will continue to ensure that all activities, reports, news feeds, and articles are promptly posted to the website. They will also actively strive to bring traffic to the website to highlight center activities and engender public and private sector participation and discussion.

During this reporting period the CM² Administrative Team created a [Facebook page](#) to expand our outreach efforts across social media. The account has already reached over 200 followers and the average post reaches over 50 users. We post all of our news, updates and events on the Facebook page which has helped boost attendance at some of our guest lectures and other events.



New CM² Facebook Page

Data analytics have shown steady growth in the [CM² website](#) activity over the past six months. Audience page views showed 1038 users (an increase of 17.82% from last reporting period) with 986 new users (+17.66% from last reporting period), and 3,738 page views (+13%). While the majority of views came from the United States (77.97%), our users are located in 67 countries.

We have continued developing our [Twitter account](#) which turned one year old in June 2019. The account earned over 140,000 impressions (up by 68,000 since previous reporting period), which are defined as the number of times users saw our tweets on Twitter. Our account has 346 tweets (a 41% increase), 125 followers (a 25% increase), and 573 likes (a 41% increase). We will continue to utilize and expand this platform.

The [CM² LinkedIn company page](#) and [CM² LinkedIn Group](#) serve as a space where CM² researchers, GRAs (past and present) and 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 93 members and the company page has 94 followers. 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.

Additionally, the administration published Summer 2019 newsletter during this reporting period. Our current newsletter email list has 151 subscribers (+34%).

C. Dissemination of Results

The results of work completed to date has included **4 final project reports** disseminated on the CM² website. CM² researchers gave **12 presentations** at **conferences** and **lectures** both in the US and abroad. **7 refereed** journal papers have been published, **2 are forthcoming**, and **3 are under consideration**. Peer reviewed articles from our researchers have been cited approximately **136 times** in the reporting period according to Google Scholar. All items are explored in more detail under Section 3.

D. Plans for Next Reporting Period

The next reporting period, the CM² consortium expects to see **16 completed projects** with final reports. It is anticipated that one more Support Partner will be announced in the next reporting period. The administrative team will continue to conduct outreach and to grow this program of matching funds.

Special issue on megaregions of “Transportation Research Part D: Transport and Environment” (TR-D) received 15 proposal submissions. The accepted papers are expected to be virtually



2019 Summer Forum at TSU



The Cooperative Mobility for Competitive Megaregions (CM²) consortium held its annual Summer Forum earlier this summer at the Texas Southern University (TSU) campus in Houston, TX. Researchers from all of CM²'s partner institutions attended as did members of both the Executive Committee and the Advisory Committee, CM² Support Partner representatives, and guest speakers from the transportation industry.

[Read more about the 2019 Summer Forum](#)

CM² Summer 2019 Newsletter



Transportation Research Part D

available in Spring 2020. The center views this as an excellent opportunity to disseminate all research results thus far, and a big accomplishment in promoting the concept of megaregions in general. Below is an example of the submitted proposals:

- Chun, B., Choi, K., & Pan, Q. Statistical analysis of PM 2.5 Concentration with Land Covers and Transportation.
- Lewis, C., Goodwin, G. Megaregion Decision Making: A Case Study of Social Environmentalism for Rural and Small Urban Public Transportation.
- Oden, M., Gian-Claudia, S. (2019). The Salience of Megaregional Geographies for Inter-Metropolitan Transportation Planning and Policy Making.

The CM² partners at the University of Texas at Austin will also hold its annual Fall Exhibition during the next reporting period. The exhibition represents a unique opportunity for researchers to gather together, reflect on the research that has been done, and share findings with interested faculty, local professionals, and students in order to plan for future iterations of megaregional research.



Additionally, professors are organizing events and classes to engage students on megaregions in the next reporting period. For example, Dr. Guerra from UPenn is organizing a student led speaker series on megaregions and Dr. Chun from TSU is designing a field trip to South Korea for students in his megaregional transportation class. Dr. Jiao is teaching a class on Tokyo Water Buses and he is planning to compete in the President Global Learning Award which will involve taking students to Tokyo to study driverless car and their implications during Olympic Games.

Lisa Loftus-Otway from UT CTR is planning to collaborate with the Women's Transportation Seminar (WTS) Texas chapter to develop a day long camp for the 2020 summer period. She also plans to work with Girlstart to offer another career panel at their summer camp.

Consortium researchers will continue to share the findings of their research through conference presentations and journal publications. 10 researchers already have plans to attend several conferences including ACSP, WSTLUR, TRB, WRSA and others in the next reporting period.

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. Additionally, Table 2 presents a list of current CM² partners.

Table 2: Current CM² Partners

Organization Name	Location	Contribution
Texas Department of Transportation (TXDOT)	Austin, TX	Data Support, 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 Support, 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
Delaware Valley Regional Planning Commission	Philadelphia, PA	Data Support, 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 Support, 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	Student Support, In-kind Support
Texas APA Chapter	TX	Student Support, In-kind Support
University of Southern California	Los Angeles, CA	Research
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 (Heart of Texas 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

B. Other Collaborators or Contacts

During this reporting period, we were excited to have James Garland and Allan Rutter join our advisory committee. James Garland works at Federal Highway Administration as a Planning and Capacity Building Team Leader, and Allan Rutter serves as the Freight and Investment Analysis Division Head at Texas A&M Transportation Institute (TTI). Our Advisory Committee members are critical to guiding our research priorities, education and workforce development and our tech transfer activities. During the reporting period, Danelle Briscoe collaborated with PAGE Architects, Austin, to develop a BIM componentry that could supplement their transportation user based scenarios of that development.

The CM² team has consistently promoted multi-jurisdictional collaboration between consortium members by setting aside funds specifically for multi-institutional proposals. There are four multi-institutional projects currently in progress.

3. OUTPUTS

Table 3 summarizes output performance metrics for the reporting period, as identified in the CM² Technology Transfer Plan. Subsections A-G provide specific list of outputs.

Table 3: Output Performance Metrics

Performance Metrics: Output	Annual Target	Actual number for 10/1/18-3/31/19	Actual for 4/1/19-9/30/19	Annual Total
1. Publications, conference papers, presentations, or final project reports	10	38 (8 journal publications, 3 one-time publications, 8 final reports, 19 presentations)	19 (7 journal publications, 4 final reports, 8 presentations)	57
<i>1.1 Publications: diversity of fields/journals submitted to (e.g. engineering, modelling, law, policy, geography, economics, infrastructure, etc.)</i>	3	5 (policy, geography, economics, business, transportation)	5 (planning, sustainability, environment, economics, transportation)	8
<i>1.2 Conferences: by entity (e.g. TRB, APA, ASCE, WTS, SXSW, etc.)</i>	2	8 (SXSW, WTS, WSTLUR, WRSA, ACSA, TRB, ACSP, SRAI)	8 (CUTC Spotlight, WIT, WTC, AESOP, ICILUTM, TRB)	13
2. Workshops, seminars in collaboration with or participation of MPOs and transportation agencies	2	3	2	5
<i>2.1 Type of activity</i>	2	2	2	4
<i>2.2 Type of professional organizations involved</i>	2	2	2	4
<i>2.3 Event scales/number of attendees (small (up to 10), medium (11-29), large (30 and up))</i>	2	2	2	4

3. Web Presence	n/a	n/a	n/a	n/a
3.1 Website visits/page views	3,000	3,302	3,738	7,040
3.2 Number of impressions on Twitter	30,000	72,000	140,000	212,000
3.3 Number of additional members in LinkedIn Group	20	25	9	34

A. Publications

i. Journal Publications

- Alcorn, L. G., & Jiao, J. (2019). Bike-Sharing Station Usage and the Surrounding Built Environments in Major Texas Cities. *Journal of Planning Education and Research*. <https://doi.org/10.1177/0739456X19862854>
- Jiao, J., Bischak, C., Hyden, S. (accepted). The Impact of Shared Mobility on Trip Generation Behavior in the US: Findings from the 2017 National Household Travel Survey. *Travel Behavior and Society*.
- Jiao, J., & Bai, S. (2019). Cities reshaped by Airbnb: A case study in New York City, Chicago, and Los Angeles. *Environment and Planning A: Economy and Space*. <https://doi.org/10.1177/0308518X19853275>
- Pan, Q. (2019). The impacts of light rail on residential property values in a non-zoning city: A new test on the Houston Metrorail transit line. *Journal of Transport and Land Use*. 12:1, 241–264.
- Pang, H. and Zhang, M. (2019). Understand the multi-level effects of the built environment on trip-chaining behavior. *Transportation Research Record: Journal of the Transportation Research Board of the National Academies*. Forthcoming, accepted for publication.
- Wu, H., Chen, Y., & Jiao, J. (2019). Impact of Neighborhood Built Environments on Shopping Travel Modes in Shanghai, China. *Transportation Research Record*, 2673(8), 669–681. <https://doi.org/10.1177/0361198119844969>
- Xu, J., Zhang, M., Zhang, X., Wang, D., and Zhang, Y. (2019). How does city-cluster high-speed rail facilitate regional integration? Evidence from the Shanghai-Nanjing corridor. *Cities*, 85: 83-97.
- Yunda, J., & Jiao, J. (2019). Zoning Changes and Social Diversity in New York City, 1990 – 2015. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 12:2, 230-243. <https://doi.org/10.1080/17549175.2018.1562488>
- Zhang, Z., Wolshon, B., Herrera, N., and Parr, S. (2019). Assessment of Post-Disaster Reentry Traffic in Megaregions Using Agent-Based Simulation. *Transportation Research Part D: Transport and Environment*, 73, 307-317.

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

Nothing to Report.

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

- Bhat, C. and Zhang, M. "D-STOP for Data Science & Predictive Analytics / CM² for Megaregion Transportation Planning". Poster presentation at the 2019 Council of University Transportation Centers Spotlight Conference. Washington, D.C. May 14, 2019.
- Jiao, J. "Transportation and Food Health Access in Austin", St. David's Continuing Medical Education Invited Presentation, Austin, TX, August 20, 2019.
- Pan, Q. "Examining Megaregion Truck Movement: A Comparison Study of Texas Triangle in US and Yangtze River Delta Region in China", AESOP Annual Congress, Venice, Italy, July 9-13, 2019; World Transportation Convention, Beijing, China, June 13-16, 2019.
- Pang, H. and Zhang, M. "Understand the Multi-Level Effects of the Built Environment on Trip-Chaining Behavior". Poster presentation at the 96th TRB Annual Meeting, Washington D.C., January 8-12, 2019 (was not listed in the previous report).
- Rosenbloom, S. "Differences in Women and Men's Pedestrian Patterns and Preferences", 6th International Conference on Women's Issues in Transportation (WIIT 2019), NAS Beckman Center, Irvine, CA, September 15, 2019.
- Wolshon, B. "Hurricane Evacuation: Analysis & Lessons from Harvey, Irma", Governor's Hurricane Conference, Palm Beach, Florida, May 12-17, 2019.
- Zhang, M. "Alternative Approaches to Analyzing Demand Potential for Travel by High Speed Rail: Case Study of the Texas Triangle Megaregion". Presented at the 5th International Conference on Integrated Land Use Transport Modeling. Haikou, Hainan Province, China, May 16-19, 2019.
- Zhang, M. "Five Dimensions of Megaregional Process: A Glance at the Texas Triangle". Presented at the International Symposium on Megaregions: Research and Policy, Lincoln Institute of Land Policy, Cambridge, MA, March 6, 2019 (was not listed in the previous report).

B. Websites

The CM² website URL is <https://sites.utexas.edu/cm2/>. This website is used to disseminate any information related to the program. In addition, CM² 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. The collection contains over 27,000 print and electronic transportation-related reports from different agencies (FHWA, AASHTO, TRB, state-level transportation agencies, City of Austin, SWUTC, and more), specializing in Texas transportation. Free full-text links are provided for over 60% of the

collection, including most TxDOT research publications. Services and resources are available to students, researchers, agencies, and the public.

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/what-megaregion>), eNews (<https://mailchi.mp/utexas/february-2018-enews-1975165?e=48aa70e157>) and Facebook page (<https://www.facebook.com/UTSOA/>). All LSU program activities are disseminated through (<http://www.evaccenter.lsu.edu>).

Dr. Erick Guerra's research was highlighted in PlanPhilly ("City streets safer than suburban roads, study finds", <https://why.org/articles/study-city-driving-often-safer-than-the-burbs/>) and he was interviewed to give his professional expert opinion on transportation and socioeconomic issues of Philadelphia:

PlanPhilly: "Drivers from these gentrifying Philly neighborhoods get the most parking tickets", <https://why.org/articles/drivers-from-these-gentrifying-philly-neighborhoods-get-the-most-parking-tickets/>

The Philadelphia Tribune: "Gray Ferry Bridge is scary for cyclists and PennDOT's rebuild won't solve the problem", https://www.phillytrib.com/news/local_news/grays-ferry-bridge-is-scary-for-cyclists-and-penn-dot-s/article_8beeeec9-3c0e-5b74-8c41-bf3892c4cbfd.html

Dr. Brian Wolshon was quoted as expert in evacuation and autonomous vehicles on the following websites:

Axios: "Self-driving cars could ease future evacuations," <https://www.axios.com/self-driving-cars-could-ease-future-evacuations-bc3b74d5-8b42-44d5-aaf1-07b4202643dc.html>

The Acadiana Advocate: "LSU professor: Self-driving vehicles could curb traffic, streamline hurricane evacuations,"

https://www.theadvocate.com/acadiana/news/business/article_095a8582-cf43-11e9-9fe4-7f575ca24749.html

Dr. Junfeng Jiao talked about the result of his previous research on the following:

The Christian Science Monitor: "Car Trouble: How the symbol of freedom became a ball and chain", <https://www.csmonitor.com/Business/2019/0520/Car-trouble-How-symbol-of-freedom-became-a-ball-and-chain>

C. Methodologies, Technologies or Techniques

Dr. Danelle Briscoe is continuing to develop the new design methodology for students to work within BIM platform for transportation. The BIM design template is a resourceful tool for user-based scenarios as a starting point in the design process of an actual hub, with set relationships/groups/categories of elements. Dr. Carol Lewis developed a Composite Index Value that incorporates the percent of income spent on transportation as a variable to indicate vulnerability. Dr. Bumseok Chun developed a method of PM 2.5 estimation using satellite images over the Texas Triangle.

D. Inventions, patent applications, and/or licenses

Nothing to report.

E. Outreach activities

UT Austin CM² researchers take part in the City Forum Speaker Series at the School of Architecture to highlight their CM² research results. Topics of discussion are relevant, contemporary issues ranging from the local and regional to international. City Forum provides a space for open, critical dialogue among faculty members, students, community members, planning practitioners, and policy-makers regarding crucial planning-related issues in Austin and elsewhere. Detailed information is available at <http://soa.utexas.edu/crp/city-forum>.

CM² researchers participated in a career panel for Girlstart's 'Take it to the Streets Summer Camp at UT Austin to inspire the next generation of transportation professionals. Lisa Loftus-Otway, CM²'s Assistant Director for Research, Dr. Gian-Claudia Sciara, a CM² funded researcher, Nicole McGrath, Graduate Research Assistant for Administration, and CM² Support Partner Ashley McLain of Cox|McLain Environmental Consulting, Inc. were a part of the career panel.

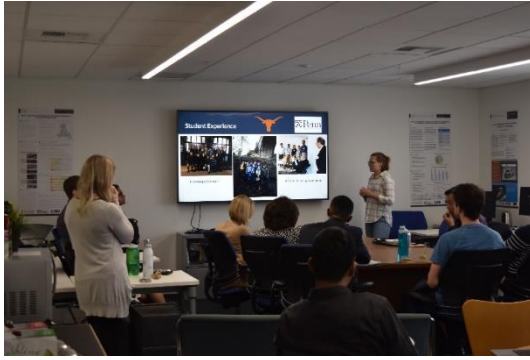
Girlstart offers STEM education across Texas with after school, summer camp, and community STEM programs for girls. The campers learned about the different types of jobs available in the transportation industry and heard about the panelists' different career journeys. The girls asked questions about the kind of education and training needed for transportation careers, what a typical workday looks like, and whether panelists had to move for their career opportunities.



CM² and WTS Panelists presenting to the campers

F. Courses and Workshops

Dr. Brian Wolshon from LSU was invited as a Guest Lecturer in the Beijing University, Beijing, China in June 2019 where he gave four lectures in a graduate seminar series on Transportation Resilience. Dr. Qisheng Pan taught a workshop to 30 students in Regional and Planning department in Zhejiang University, Hangzhou, China from May 12- June 1, 2019. Multiple classes were held by CM² researchers during the reporting period. Dr. Erick Guerra held three classes: Multimodal Transportation Planning that had 30 students, Introduction to Transportation Planning that had 30 masters' students, 2 PhD students and 3 undergraduate students and Quantitative methods of planning which had 85 masters' students. Danelle Briscoe held an Advanced Design Studio in Spring 2019 which had 13 students, both from the graduate and undergraduate level. The entire CM² project was included and was the basis of the advanced studio. The student used the library of BIM components and helped build it further. A study abroad trip was dedicated to studying exemplary multi-modal stations in Spain as well as the high speed train logistics of the Renfe system bound for Texas high speed rail.



Presentation at the Planning for Megaregions Class

Dr. Ming Zhang taught a graduate course “Planning for Megaregions” in Spring 2019. The Planning for Megaregions course was a collaborative joint teaching-research effort between The University of Texas at Austin (UT Austin) and The University of Pennsylvania (UPenn) and it was supported by CM². Each institution’s class investigated megaregional spatial inequality (with UT Austin’s team focusing on the Texas Triangle and Penn’s team focusing on the Northeast Megaregion) and explored transportation

planning and investment strategies to address the challenge. On April 3rd, UTSOA graduate students in the Planning for Megaregions class gathered in the CM² office to present their semester’s work. They shared about their experiences during their trip to Manchester, UK, where they learned more about the regional planning initiatives happening in northern England. Guests in attendance included Donny Hamilton, Jr., CM² Advisory Committee member and the Director of Finance and Administration for the USDOT Federal Highway Administration (FHWA); Anthony Jones, a Community Planner for the USDOT Federal Highway Administration (FHWA); and Ashley McLain, Principal at Cox|McLain Environmental Consulting (a CM² Support Partner).

Fourteen graduate students recently completed the UT School of Architecture’s first ever *Transportation Quest*, a day-long field trip that brought students into direct conversation with transportation leaders in many of the organizations central to keeping people and goods moving in Austin and the Texas Triangle megaregion. The tour was part of the *Urban Transportation Planning and Policy course*, a graduate class designed by CM² researcher Gian-Claudia Sciara and was intended to prepare students from across disciplines to become fluent with the fundamental transportation planning and policy challenges in today’s complex metro regions. During the field trip, students visited Capital Area Metropolitan Planning Organization (CAMPO), responsible for regional transportation plans and investments across six counties, the Central Texas Regional Mobility Authority (CTRMA), Austin Bergstrom International Airport (AUS), and Amazon’s 855,000 square-foot SAT2 Fulfillment Center in San Marcos, as well as other organizations.



“Transportation Quest” field trip participants

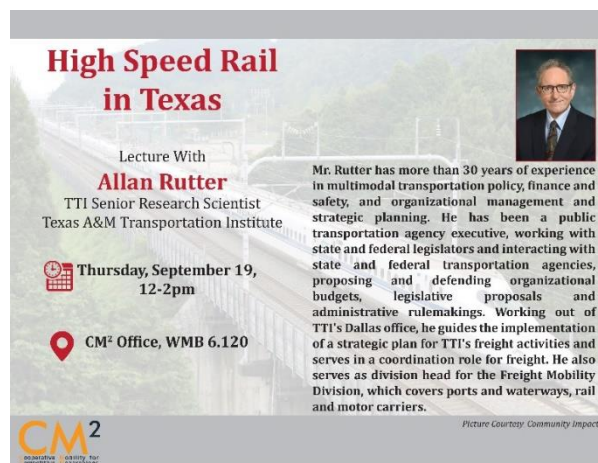
G. Other products

Each month researchers at UT Austin gather for monthly Brown Bag Lunch Discussions to present their current projects and discuss their findings with fellow researchers and students. The initiative was launched in Spring of 2018. Typically, there are two presentations per event (approximately 20 minutes each) with a discussion to follow. In addition to the center’s researchers and GRAs, a broader audience is invited to attend these meetings (students, faculty members, center partners, etc.) We share these events on social media, via email and on paper

flyers around campus. During these events, students and faculty researchers have an opportunity to share their progress on current CM² research and receive feedback on research methods and design. All materials and video recordings are available on [the Brown Bag Lunch Discussion Page of our website](#).

For our September 2019 Brownbag event, Dr. Sandra Rosenbloom presented on her research and efforts to create a Safe and Healthy Aging Lab within CM². Dr. Gian Claudia Sciara and graduate student Mashrur Rahman from UT also discussed their research on the representation of public transportation providers in Metropolitan Planning Organizations (MPOs) and the impact that representation has on regional funding decisions concerning transit.

In addition to the Brownbag events, we hosted four guest lectures during this reporting period. Guest lectures included professionals in the transportation field that came to speak with students about exciting transportation initiatives. Dr. Ray Miller Jr., Transportation Planning Coordinator for the City of Georgetown covered the history of transportation infrastructure initiatives in the Texas Triangle and current initiatives that will link the Texas Triangle anchor cities of Dallas-Ft.



Flyer for Guest Lecture with Allan Rutter

Worth, Austin, San Antonio, and Houston. Dr. Anna M. Hersperger from Swiss Federal Research Institute WSL presented on her current project where she and her team are working on a better understanding of the strategic spatial planning processes in European metropolitan regions and on the integration of spatial planning into a land change model for urban regions. Allan Rutter from Texas A&M Transportation Institute presented at the CM² center in September and drew on his rich background in transportation policy to tell the history of the High Speed Rail in Texas.

We also had a lecture with Dr. Tetsuo Shimizu from Tokyo Metropolitan University who expanded on the MaaS (Mobility as a Service) in Japan.

Several of our researchers gave presentations on their work with CM² throughout this reporting period. Dr. Carol Lewis was invited to present on AV deployment to connect Houston job centers at Texas A&M Transportation and Institute in April 2019. Dr. Qisheng Pan gave a lecture at Zhejiang University on Regional and Urban Planning in May 2019 and a presentation with IACP Scholars in Wuhan, China, at Huazhong University of Science and Technology in June 2019. Dr. Sandi Rosenbloom was a keynote speaker at the 6th International TRB Conference on Women's Travel Issues in September 2019.

Dr. Junfeng Jiao developed a Smart City Bridging Disciplines Undergraduate Program (<https://uqs.utexas.edu/bdp>) and also led the UT Good System Bridge Barrier Grand Challenge (<https://bridgingbarriers.utexas.edu/>).

Dr. Carol Lewis's graduate student, Brandon Rogers, presented a poster titled "Determining Purpose and Need for Vulnerable Communities in the Megaregion" at TEXITE Spring Meeting in San Antonio, Texas, April 18, 2019 and also at CM² Annual Meeting Houston, Texas, June 7, 2019.

4. OUTCOMES

Table 4 summarizes output performance metrics for the reporting period, as identified in the CM² Technology Transfer Plan. Subsections A-G provide specific list of outputs.

Table 4: Output Performance Metrics

Performance Metrics: Outcome	Annual Target	Actual number for 10/1/18-3/31/19	Actual for 4/1/19-9/30/19	Annual Total
1. Enlarged pool of trained transportation professionals	n/a	n/a	n/a	n/a
<i>1.1 Number of students hired by CM², broken down by degree types and levels, diversity metrics, and other social-economic measures</i>	25	32	12	44
<i>Degree type (Undergrad, Master, PhD)</i>	n/a	12.5% undergrad, 69% master, 18.5% PhD	8% undergrad, 67% master, 25% PhD	n/a
<i>Gender (male, female)</i>	n/a	65% male, 35% female	42% male, 58% female	n/a
<i>Race (Asian, Black, White, other)</i>	n/a	47% Asian, 9% Black, 44% White	67% Asian, 33% White	n/a
<i>First generation student (undergrad. or grad.)</i>	n/a	1	0	n/a
<i>1.2 Number of papers developed by students for publication</i>	2	0	7	7
<i>1.2 Number of graduates in transportation jobs</i>	15 - overall grant period	46	18	64
2. Increased cooperation by local governments and transportation agencies regarding regional and inter-regional issues	n/a	n/a	n/a	n/a
<i>2.1 Number of regional or inter-regional planning activities detailed in long, medium, and short range transportation plans</i>	1	0	1	1
<i>2.2 Development and utilization of consistent and usable planning datasets</i>	1	0	1	1
<i>2.3 Creation of megaregional forums, committees, and communications by megaregional transportation planning entities</i>	1	0	1	1

One of the major outcomes of this past reporting period has been the number of student researchers who graduated and took on jobs in the transportation industry. We are proud to have a total of 18 students enter the workforce in the past six months and start their careers in the field of transportation. This exceeds our goal of having 15 students graduate and enter transportation-related jobs during the overall grant period. Some examples of student employment following their time with the consortium include:

- Nicole McGrath (GRA for Ming Zhang) employed by CDM Smith in Austin, Texas
- Liang Chen (GRA to Ming Zhang) employed by C&M Associates, Inc. in Dallas, Texas
- Brendan Goodrich (GRA to Ming Zhang) employed by JetBlue Airways Corp. in NYC
- Evan Scott (GRA to Ming Zhang) employed by Brailsford & Dunlavey in Washington, D.C.
- Chetan Kulkarni (GRA to Danelle Briscoe) employed by Sasaki in Boston, Massachusetts
- Chris Bischak (GRA to Junfeng Jiao) employed at Noblis, Inc. in Reston, VA
- Yang Yang (GRA to Junfeng Jiao) employed at Marlin Engineering
- Paulina Urbanowicz (GRA to Lisa Loftus-Otway) employed at the Port Authority of New York and New Jersey
- Aaron Sessions (GRA to Sandi Rosenbloom) employed at Amazon HQ2
- Nelida Herrera (GRA to Brian Wolshon) employed at Arcadis at Cincinnati, Ohio

Moreover, 7 student researchers have had papers developed for publication during the reporting period, which exceeds our target of two.

In addition to our students' achievements, CM² faculty researchers across all of our institutions have increased their collaboration efforts with local governments and transportation agencies regarding regional and inter-regional issues. Dr. Walton from UT Austin will be completing a comprehensive database of MPO governance structures for researchers and professionals to use by the end of the next reporting period. Additionally, Dr. Wolshon from LSU has developed and utilized two planning datasets: 1. Various Megaregional Transportation Resilience Analysis Based on developed vehicle GPS trajectory data during the Irma evacuation in Florida in 2017; 2. Finalization of Evacuation Behavioral Analysis for Southwest Louisiana for the Army Corps of Engineers. He will use these results to develop evacuation clearance times for southwest Louisiana. Dr. Jiao has been contacted by Lyft and Lime because they are interested in his GIS data around Transit Deserts in US cities and they hope to use the data to guide their vehicle deployment. Dr. Jiao also developed a dataset around perceptions towards Transportation Network Company in Texas using an E-scooter travel dataset in Austin.

To ensure that the datasets and research are useful for their intended audience, researchers collaborate in mega regionally-focused working groups on inter-regional planning activities. Dr. Wolshon from LSU is studying all four modes of transportation in Louisiana to better understand which segments of each mode is most likely to be disrupted during disasters and assist in developing mitigation priorities to increase the overall resiliency of the different transportation modes. Additionally, Lisa Loftus-Otway is collaborating with CAMPO on a project that will look at the Evolving Texas megaregions and create an analysis for the future. She is reaching out to other Triangle MPOs to gather input for sub-tasks to begin this analysis.

5. IMPACTS

Table 5 below summarizes the impact performance metrics for the reporting period, as identified in the CM² Technology Transfer Plan.

Table 5: Impact Performance Metrics

Performance Metrics: Impact	Annual Target	Actual for 10/1/18-3/31/19	Actual for 4/1/19-9/30/19	Annual Total
1. Enhanced knowledge base	n/a	n/a	n/a	n/a
<i>1.1 Development of books/handbooks</i>	3 - overall grant period	0	0	0
<i>1.2 Journal publications in academic or professional journals</i>	5	13	7	20
<i>1.3 Special issues of academic or professional journals</i>	1	1	0	1
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	n/a	n/a
<i>2.1 Number and extensiveness of social media coverage of CM² research, education, and outreach activities</i>	1	1	3	4
3. Informed decision making on public policy and transportation infrastructure investments	n/a	n/a	n/a	n/a
<i>3.1 Number of contracted plans and projects conducted for and adapted by local and regional agencies in megaregions</i>	1	0	1	1

A. Impact on the effectiveness of the transportation system

The research findings from our consortium have already begun to have an impact on transportation system around the country. For example, The City of Philadelphia adopted Dr. Guerra's work for their Strategic Transportation Plan. The formal plan can be found here: <http://www.phillyotis.com/portfolio-item/connect-phl/>. Furthermore, Dr. Loftus-Otway's collaboration with CAMPO (and other MPOs) will develop metrics for smaller MPOs to utilize in future planning documents. This will provide insight into collaborative activities that the Texas Association of MPOs could consider for future planning activities.

Dr. Wolshon's research has the potential to improve megaregional freight planning and thereby improve operations and safety in megaregions. Similarly, Dr. Pan's research on megaregional transportation planning models can help to improve the mobility and accessibility of passengers and goods in megaregions. This has the potential to improve the operation and safety of the transportation system.

Dr. Jiao's travel dataset on E-scooters in Austin and Transportation Network Company (TNC) has provided more information around the perception of these services in major Texas Cities. This will help inform further research and technological advances.

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 on academic forums (such as conferences and journal publications) as well as through social media. This has contributed to the overall awareness of the importance of megaregional study. In September, 2019 Planetizen published an article called "Revisiting the Megaregion," which discusses how the concept of megaregions remains useful for understanding larger regional influences, despite the fact that it is often overlooked by planners and sociologists. Publications like this show how the work we are doing at CM² is part of a larger conversation around the future for transportation planning.

Now that we are in the fourth year of the grant cycle, several researchers have proposed books to make our research accessible and engaging to new audiences. Dr. Pan is planning to develop a book proposal and a special issue titled "Megaregion Truck Flow Estimation and Planning." Dr. Jiao also has a book under review on Shared Mobility.

Finally, Dr. Brian Wolshon has a book in press titled "Creating Resilient a Transportation System: Policy, Planning and Implementation."

D. Impact on transportation workforce development

CM² partner universities are preparing students to enter both the public and private sector 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. Moreover, we saw an increase in guest presentations this reporting period which is outlined in section 3G of this report. Several CM² graduates have already started working in transportation related positions across the country. They will be able to bring their knowledge from CM² and implement it in their work. In addition, the camps and outreach activities we have conducted, and continue to plan for the next reporting period, are introducing the next generation to the transportation field.

6. CHANGES/PROBLEMS

Nothing to report.

7. SPECIAL REPORTING REQUIREMENTS

Nothing to report.