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Competitive Megaregions (CM²)

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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Recipient Organization: The University of Texas at Austin
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 the signature line.

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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 32 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
Evaluation and Analysis of Post-Disaster Re-Entry in Megaregions: A Pilot Study	LSU	Brian Wolshon	Year 1	Complete
Assessment of Post-disaster Re-Entry in Megaregions: A Pilot Study	LSU	Brian Wolshon	Year 2	Complete
The Rise of Long-Distance Trips, in a World of Self-Driving Cars: Anticipating Trip Counts and Evolving Travel Patterns Across the Texas Triangle Megaregion	UT CTR	Kara Kockelman	Year 2	Complete
Identifying Organizational Changes to Facilitate MPO Megaregion Planning	UT CTR	Lisa Loftus-Otway	Year 1	Complete
The Right Structure for the Right Incentives: Multimodal Transportation in America's Growing Megaregions	UT CTR	Lisa Loftus-Otway	Year 2	Complete
Megaregion (MR) Freight Mobility: Impact of Truck Technologies	UT CTR	Robert Harrison	Year 1	Complete
Beyond Political Boundaries: Constructing Network Models for Megaregion	UT CTR	Stephen Boyles	Year 2	Complete
Understanding Transportation Related Infrastructure Access in 52 Major US Cities	UT SOA	Junfeng Jiao	Year 2	Complete

ii. Education Accomplishments

Ms. Nicole McGrath, a Master's student in the Community and Regional Planning program at the University of Texas at Austin and a CM² GRA for Administration, was selected as an Eno Fellow for the 2019 Transportation Leadership Development Conference (LDC) program. Nicole will travel to Washington D.C. where the fellows will meet federal officials, business leaders, and non-profit organizations and gain a first-hand look at how national transportation policies are developed. It is worth mentioning that this is the second year in a row that a CM² GRA has been selected for this very prestigious and highly competitive award. Last year, Paulina Urbanowicz-Pollock, GRA to Lisa Loftus-Otway, traveled to D.C. as an Eno fellow.



Nicole McGrath, Eno Fellow

In addition, Nicole McGrath received a 2018 UT Austin Rebecca Carreon Boot Scholarship, which recognizes students for their organizational involvement and contributions to the



Chris Bischak, UTC Student of the Year

University. Paulina Urbanowicz-Pollock was selected as a Leadership Fellow for the Port Authority of New York and New Jersey. The Port Authority's Leadership Fellow Program is a distinguished program for leadership and public service in the New York/New Jersey Metropolitan region. Chris Bischak, GRA to Junfeng Jiao, was selected for 2018 UTC Student of the Year Award for his academic and research achievements over the previous year. Olivia Posner, a CM² GRA for Administration for 2017-2018, received the WTS Heart of Texas Chapter's Maggie Walsh Legacy Leadership

Scholarship. Needless to say, our center is very proud of our current and former student's achievements.

iii. Outreach/Engagement Accomplishments

On October 24-25th, Paulina Urbanowicz-Pollock presented a poster on "Creating a Roadmap for MPO Megaregional Planning" at the 6th Annual Southeastern Region UTC annual conference at Clemson University.

On November 2nd, CM² with WTS Southwest Region hosted a webinar on the "Evolving Challenges in Regional and Megaregional Planning" with presentations from CM² researchers Lisa Loftus-Otway, Dr. Carol Lewis, Dr. Gwendolyn Goodwin, and Dr. Brian Wolshon as well as the Deputy Executive Director of the Maricopa Association of Governments in Phoenix, AZ, Amy St. Peter. CM² Assistant Director for Research, Ms. Lisa Loftus-Otway,

organized and exceeded the event. With about 80 participants in total, CM² and WTS consider this webinar a rousing success and a great kick-starter for future webinars.

CM² researchers at the University of Pennsylvania hosted a Workshop on Megaregional Modeling on November 9th. The workshop focused on the development of a Northeast Megaregion (NEMR) Travel Demand and Investment Model covering the area between southern Maine and central Virginia along the I-95 corridor. Representatives from MPOs as well as city and state transportation planning offices participated and expressed interest in incorporating some of the results into their work.



The WTS/CM² Webinar

The UT Austin team of faculty and student researchers gathered on Friday, December 7th, to present their ongoing CM² research projects at Fall Exhibition 2018. In addition to our faculty and student researchers, representatives from our Support Partner Program sponsors as well as



UT Austin Fall 2018 Exhibition

members from the CM² Advisory Committee were invited. Our researchers received a lot of great feedback from our expert guests.

Also in February, two teams of Master's degree and PhD candidates from UT Austin and Penn, led by Dr. Ming Zhang, Ms. Lisa Loftus-Otway, and Dr. Robert Yaro, participated in a week-long Charrette in Manchester, England. The Charrette was hosted by the UK 2070 Commission (an independent commission being led by Lord Kerslake), which is

investigating similar trends in the United Kingdom. This charrette provided a unique opportunity for CM² researchers and students from multiple institutions to learn from international initiatives that address megaregional mobility as well as conduct technology transfer of current CM² research at a global scale.

On March 12th, a Dutch Delegation met with UT Austin researchers (including CM² researchers Dr. Junfeng Jiao and Dr. Ming Zhang), professors, and administrators in the CM² office to discuss developments in SMART cities, digital health, and value data provides cities. The Dutch delegation included guests from the Brainport International Programme and the City of Breda in the Netherlands. In addition, Lisa Loftus-Otway was a panelist at the USDOT "Transportation Innovation at Crossroads" Panel Discussion at the South by Southwest (SXSW) festival on March 11th. The panel discussed how USDOT's research portfolio is evolving to harness the promise of

new technologies. The consortium was excited by the opportunity to highlight the work done by CM² at such a high-profile international event.

iv. Administrative Accomplishments

The CM² administrative team has released Call for Proposals for Year 4 projects and activities. As we enter Year 4 of the grant, the proposal submission process and budgeting strategy focuses on output to ensure the goals of the tech transfer plan are being met.

During this reporting period, our center launched the Support Partner Program (SPP) and our first supporter's (Cox|McLain Environmental Consulting Inc.) check was cashed in September. SPP has multiple levels of support and we received our first Bronze level supporter (Jones|Carter Engineering) in November. The program helps support CM² research, student scholarship, and

workforce development and our support partners have attended several CM² events. The CM² administration and research team will continue expanding our base of Support Partners throughout the life of the grant.

In December, CM² published its center brochure just in time to highlight the center's research activities at the Annual Meeting of the Transportation Research Board. In March, the center published its compilation of Executive Summaries for all current research projects. Executive summaries of our research projects allow us to share our research projects with advisory committee members and industry professionals in a succinct and visually appealing manner. Both the brochure and the executive summaries are available on our website.



Executive Summary Example

Audience page views showed 889 users (an increase of 65.5%) with 846 new users (+65.8%), and 3302 page views (+47%). While the majority of views came from the United States (80%), our users are located in 50 countries. 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 stride to bring traffic to the website to highlight center activities and engender public and private sector participation and discussion.

The CM² administration and research team has also focused activities on developing their Twitter and LinkedIn page. Since the CM² [Twitter account](#) opened in June 2018, our account earned nearly 72,000 impressions (up by 50,000 since previous reporting period), which are defined as a number of times users saw our tweets on Twitter. Our account shared 245 tweets (nearly 4 times the previous amount), has 100 followers (double the previous amount) and 406 Likes (4 times the previous amount), and is following 356 users (a 68% increase).

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 exciting developments in research, professional accomplishments, awards, etc. At submission of this report, the LinkedIn Group has 84 members (25 new members since the last reporting period) and continues to grow. For any item that is tweeted or placed on LinkedIn, it is cross-linked to the other platform. This maximizes social media data sharing. The CM² administration and research team will focus on growing our Twitter following and our LinkedIn group membership by regularly posting current and interesting content that crosses disciplines and reflects the mission of CM². Additionally, the administration published a Fall 2018 newsletters during this reporting period. Our newsletter email list currently has 112 subscribers (+33%).

C. Dissemination of Results

The results of work completed to date has included 8 final project reports disseminated on the CM² website. CM² researchers presented their work at 6 different conferences. 8 refereed journal papers and 3 one-time publications have been published. Peer reviewed articles from our researchers have been cited approximately 220 times in the reporting period according to Google Scholar. All of these 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 31 completed projects with final reports. It is anticipated at writing of this update that 2 more Support Partners will be announced in the next reporting period. The administrative team will continue to conduct outreach to grow this program of matching funds.

The CM² consortium will also hold its annual Summer Forum during the next reporting period, hosted at Texas Southern University in Houston, TX. The forum represents a unique opportunity



CM² Summer Forum Invitation Photo

for the consortium to gather, share research results with interested faculty and local professionals, and plan for future iterations of megaregional research. This year's theme is "Megaregions: Rethinking our Ideas About Communities" and will feature keynote speakers from agencies such as USDOT's FHWA, TxDOT, and Houston-Galveston Area Council (H-GAC) as well as Georgia Tech.

The CM² Consortium, under the guidance of Dr. Sandra Rosenbloom, will be a Gold Level Patron for the 6th Annual Women's Issues in Transportation conference that will take place in September in Irvine, CA. The conference focuses on women's issues related to all aspects of travel and transportation, with this year's theme being "Insights, Inclusion, and Impact: Framing the Future for Women in Transportation".

Of course, consortium researchers will continue to share the findings of their research through conference presentations and journal publications. 5 researchers already have plans to present at 11 conferences in 5 countries and 5 US states.

In addition to conference presentations, many of our researchers anticipate journal publications in the next reporting period resulting from their CM² research projects. In total, our researchers are planning for at least 24-26 publications. In response to the Call for Proposals for Year 4, several researchers are preparing book chapter drafts.

Additionally, the editors of “Transportation Research Part D: Transport and Environment” (TR-D) approved Dr. Zhang’s proposal for a special issue on megaregions. TR-D announced this special issue with a Call for Papers, with Dr. Zhang acting as a guest editor for all non-CM² proposals. The final submission deadline will occur over the next reporting period and many of our researchers anticipate sharing their CM² research project findings in this special issue. The center views this opportunity as an excellent opportunity to disseminate all research results thus far.



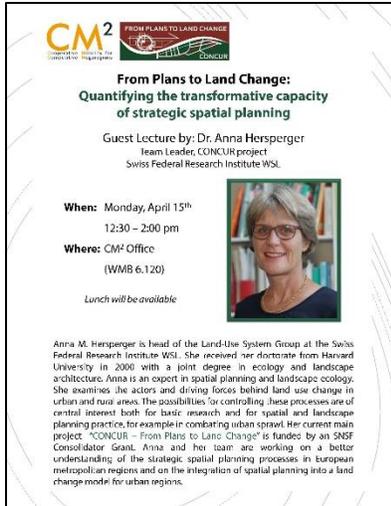
Transportation Research Part D

Following the success of their first workshop, TSU’s Drs. Carol Lewis and Gwendolyn Goodwin plan to host a 2nd workshop to further develop their vulnerable community rubric to additional megaregional corridors. Similarly, Dr. John Landis from Penn will host a second workshop on his Northeast Megaregion Travel Demand and Investment Modeling (NEMRTD&IM) research with transportation planners from agencies throughout the Northeast Megaregion.

Dr. Brian Wolshon and Ms. Herrera will hold another Transportation Engineering Summer Camp during summer 2019, which will include a session of hands-on activities for the Recruiting into Engineering High Ability Multicultural Students (REHAMS) summer camp. This summer camp is offered every year to rising 11th and 12th grade students and provides an opportunity to explore, create, and compete in a variety of engineering and college preparatory activities to encourage interest in STEM.

Ms. Lisa Loftus-Otway, Ms. Inessa Ach, and GRA Ms. Nicole McGrath are developing a weeklong camp focused on megaregions to be held at UT Austin in summer 2019. The camp will host approx. 25 students and have multiple activities including seminars, hands-on activities, field trips, and guest speakers. In addition, GirlStart (with whom CM² collaborated in the summer 2018) have asked CM² and WTS to conduct activities and two career panels at their *Take it to the Street Camps* that will be held in Buda and Kyle in June and July 2019.

In addition to conference events, publications, and other outreach activities, the CM² office will continue to coordinate informative guest speakers for our research faculty and students. Examples of such events in the upcoming reporting period include lectures by Ray Miller, Jr., AICP (Transportation Planning Coordinator for the City of Georgetown, TX) on Inter-regional



Flyer for Dr. Hersperger event

transportation planning initiatives in Texas and by Dr. Anna Hersperger of the Swiss Federal Research Institute WSL on quantifying the transformative capacity of strategic spatial planning.

Between the different institutions, faculty researchers anticipate hiring approximately 20 student research assistants through direct and matching funds, including 1 undergraduate student and 1 PhD student.

The CM² administration will continue to share the center’s activities on all social media platforms and grow our follower base, thereby continuing the dialogue around megaregion and multi-jurisdictions issues. The CM² administration will continue to follow and track all analytical data related to our online presence.

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, with affiliates at Cornell University and Rutgers University. Additionally, Table 2 presents a list of current CM² partners.

Table 2: Current CM² Partners

Organization Name	Location	Contribution
City of Austin (Austin Transportation Department)	Austin, TX	Data Support
City of Houston (City Planning Department)	Houston, TX	Data Support
Houston Metro	Houston, TX	Data Support
Baltimore Metropolitan Council	Baltimore, MD	Data Support
City of Philadelphia: Office of Transportation, Infrastructure, and Sustainability	Philadelphia, PA	Data Support
Central Transportation Planning Staff	Boston, MA	Data Support
Delaware Valley Regional Planning Commission	Philadelphia, PA	Data Support
Alamo Area Metropolitan Planning Organization	San Antonio, TX	Data Support
Metropolitan Washington Council of Governments	Washington, DC	Data Support
North Central Texas Council of Governments (NCTCOG)	Dallas, TX	Data Support
New York Metropolitan Transportation Council (NYMTC)	New York City, NY	Data Support
Houston Galveston Area Council (H-CAC)	Houston, TX	Data Support
Rhode Island Division of Statewide Planning	Providence, RI	Data Support
Capital Area Metropolitan Planning Organization	Austin, TX	Data Support
Capital Metro	Austin, TX	Data Support

Texas Department of Transportation (TxDOT)	Austin, TX	Data Support
Connecticut Department of Transportation	Newington, CT	Data Support
Connecticut Department of Economic & Community Development	Hartford, CT	Data Support
Pennsylvania Department of Transportation (PennDOT)	Harrisburg, PA	Data Support
Southeastern Pennsylvania Transportation Authority (SEPTA)	Philadelphia, PA	Data Support
City of Hartford	Hartford, CT	Data Support
Centro de Investigación en Ciencias de Información Geoespacial	Mexico City, Mexico	Data Support, Research
University of Texas at Austin: Center for Transportation Research's Freight Modelling Lab; Urban Information Lab; Department of Computer Science; School Information.	Austin, TX	Facilities, Research
Stephenson Disaster Management Institute at LSU	Baton Rouge, LA	Facilities, Technical Contributions
WTS (HOT and Houston chapters, South West Region)	TX, OK, NM, AL, AK	In-Kind Support
Girlstart	TX	In-Kind Support
Texas, Houston, New England APA Chapters	TX	In-Kind Support
Eno Center for Transportation	Washington, DC	In-Kind Support
Connecticut Capitol Region Council of Governments	Hartford, CT	Research
Lincoln Institute or Land Policy	Cambridge, MA	Research
Texas Central Railways	Houston, TX	Research
Embry-Riddle Aeronautical University	Daytona Beach, FL	Technical Contributions

B. Other Collaborators or Contacts

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. Dr. Zhang, Dr. Lewis, and Dr. Pan continue to collaborate on the CM² Summer Forum to be held at the Texas Southern University on June 6-7, 2019. Additionally, Dr. Jiao has collaborated with UT Austin's Department of Computer Science and the School Information.

Texas Central High Speed Rail V.P. Stephanie Nellons-Paige (who also serves on the CM² Advisory Committee) is serving as an advisor to the student paper in the TMGT 890 class (spring 2019) taught by Dr. Lewis.

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

Output: performance metrics	Annual Target	Actual number for 10/1/18-3/31/19
1. Publications, conference papers, presentations, or final project reports	10	38 (8 journal publications, 3 one-time publications, 8 final reports, 19 presentations)
<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)
<i>1.2 Conferences: by entity (e.g. TRB, APA, ASCE, WTS, SXSU, etc.)</i>	2	8 (SXSU, WTS, WSTLUR, WRSA, ACSA, TRB, ACSP, SRAI)
2. Workshops, seminars in collaboration with or participation of MPOs and transportation agencies	2	3
<i>2.1 Type of activity</i>	2	2
<i>2.2 Type of professional organizations involved</i>	2	2
<i>2.3 Event scales/number of attendees (small (up to 10), medium (11-29), large (30 and up))</i>	2	2
3. Web Presence	n/a	n/a
<i>3.1 Website visits/page views</i>	3,000	3,302
<i>3.2 Number of impressions on Twitter</i>	30,000	72,000
<i>3.3 Number of additional members in LinkedIn Group</i>	20	25

A. Publications

i. Journal Publications

- Liu, X., Q. Pan, L. King, and Z. Jin; "Analyzing the Changes of Employment Subcenters: A Comparison Study of Houston and Dallas"; Urban Studies; 2018; 1-17; online published first <https://doi.org/10.1177%2F0042098018789554>
- Pan, Q.; "The impacts of light rail on residential property values in a nonzoning city: A new test on the Houston METRORail transit line"; Journal of Transport and Land Use; Vol. 12, No. 1; 2019; 1-25.
- Zhao, X., Chen, P., Jiao, J., Chen, X., & Bischak, C. (2019). How Does 'Park and Ride' Perform? A Longitudinal Evaluation. Journal of Transport Policy. 74:15-23.
- Griffin, G., & Jiao, J. (2019). The Geography and Equity of Crowdsourced Public Participation for Active Transportation Planning. Transportation Research Record: Journal of the Transportation Research Board. <https://doi.org/10.1177/0361198118823498>.

- Jiao, J. (2018). Investigating Uber Price Surges during a Special Event in Austin, TX. Research in Transportation and Business Management. <https://doi.org/10.1016/j.rtbm.2018.02.008>
 - Griffin, G., & Jiao, J. (2018). Crowdsourcing Bike Share Station Locations: Evaluating Participation and Placement. Journal of the American Planning Association. 84(3).
 - Guerra, E., Caudillo C., Monkkonen P., & Montejano, J. (2018). Urban form, transit supply, and travel behavior in Latin America: Evidence from Mexico's 100 largest urban areas. Transport Policy 69 (October): 98–105.
 - Reina, V., Wegmann, J., & Guerra, E. "Location Affordability and Fair Housing on a Collision Course?" Cityscape Volume 21, Number 1. (Special Issue: "The Fair Housing Act at 50.") Pages 1025-142. <https://www.huduser.gov/portal/periodicals/cityscape/vol21num1/ch5.pdf>
- ii. Books or other non-periodical, one-time publications*
- Jiao, J. 2018 "Transit Deserts USA" *Platform*, University of Texas at Austin, School of Architecture
 - Oden, M. 2018 "Whither Regionalism: The Salience of Megaregional Geographies for Inter-Metropolitan Planning and Policy Making". *Platform*, University of Texas at Austin, School of Architecture
 - Zhang, M. 2018 "Toward Cooperative Mobility for Competitive Megaregions". *Platform*, University of Texas at Austin, School of Architecture
- iii. Other publications, conference papers, presentations, and working papers*
- Pan, Q. "Megaregion Truck Flow Estimation Model," the 4th International Symposium on Land Use, Transport Infrastructure, and Sustainable Development, Shanghai, China, December 12, 2018.
 - Pan, Q. "Megaregion Truck Flow Estimation Model", the 2019 WRSA Annual Meeting, NAPA, California, Feb. 12, 2019.
 - Zhang, M. "A model for corridor TOD land use plan optimization: Concept and Implementation", the 4th International Symposium on Land Use, Transport Infrastructure, and Sustainable Development, Shanghai, China, December 12, 2018.
 - Zhang, M. "Building the theory of megaregional process: A glance at the Texas Triangle", 2018 International Conference on Future Urban Development: Sustainable City-Region Governance, Shenzhen, China, December 15, 2018.
 - Briscoe, D. "Multi-Modal Mingling: Queering BIM through Transportation Hub Design and Networks" BLACK BOX: Articulating Architecture's Core in the Post-Digital Era 2019 ACSA 107th Annual Meeting , Pittsburgh, PA, March 28-30, 2019
 - Rosenbloom, S. Effects on Aging Populations. The 98th Transportation Research Board (TRB) Annual Meeting, January 13-17, 2019, Washington, DC.
 - Loftus-Otway, L. Identifying Organizational Changes to Facilitate MPO Megaregion Planning. Poster Session at the 98th Transportation Research Board (TRB) Annual Meeting, January 13-17, 2019, Washington, DC.
 - Loftus-Otway, L. USDOT "[Transportation Innovation at Crossroads](#)". SXSW, Austin, Texas March 11th 2019.
 - Griffin, G., & Jiao, J. (2019). The Geography and Equity of Crowdsourced Public Participation for Active Transportation Planning. Paper, the 98th TRB Annual Meeting, January 13-17, 2019, Washington, DC.

- Bischak, C., & Jiao, J. (2019). Understanding the Spatial Distribution of Transit Captive Populations in 52 Major US Cities. Paper, the 98th TRB) Annual Meeting, January 13-17, 2019, Washington, DC.
- Jiao, J. (2018). Transit Deserts USA—What We Found in 52 Major US Cities. Paper presented at the 58th Association of Collegiate Schools of Planning (ACSP) Conference, October 25-28, 2018, Buffalo, NY.
- Tian, G., Jiao, J., & Izadi, M. (2018). What Do We Know about Bike sharing Systems in The United States? Findings from Four US Regions. Paper presented at the 58th Association of Collegiate Schools of Planning (ACSP) Conference, October 25-28, 2018, Buffalo, NY.
- Wu, H., Jiao, J., & Chen, Y. (2018). The Impact of Neighborhood Built Environments on Walking and Shopping Activities in Shanghai, China. Paper presented at the 58th Association of Collegiate Schools of Planning (ACSP) Conference, October 25-28, 2018, Buffalo, NY.
- Guerra, E., Caudillo C., Monkkonen P., & Montejano, J. Urban form, transportation technology, and travel behavior in Latin America: Evidence from Mexico’s 100 largest urban areas. University of Southern California, 3/1/2019.
- Guerra, E., Caudillo C., Monkkonen P., & Montejano, J. Urban form, transportation technology, and travel behavior in Latin America: Evidence from Mexico’s 100 largest urban areas. Harvard Graduate School of Design, 3/7/2019.
- Kockelman, K., Huang, Y. How Will Self-Driving Vehicles Affect Megaregion Traffic? The Case of the Texas Triangle. Poster, TRB Annual Meeting, 2019, Washington, D.C.
- Kockelman, K., Huang, Y. How Will Self-Driving Vehicles Affect Megaregion Traffic? The Case of the Texas Triangle. Poster presented at the 66th Annual North American Meetings of the Regional Science Association International (RSAI), November 7-10, 2018
- Wolshon, B. Effect of Shadow Evacuation on Megaregion Evacuations. Poster presentation at the 98th TRB Annual Meeting, January 13-17, 2019, Washington, DC.
- Wolshon, B. Effect of Post-Disaster Reentry in Megaregions. Poster presentation at the 98th TRB Annual Meeting, January 13-17, 2019, Washington, DC.

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/>) and LinkedIn company page (<https://www.linkedin.com/company/cooperative-mobility-for-competitive-megaregions-cm2/>).

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>) and via eNews (<https://mailchi.mp/utexas/february-2018-eneews-1975165?e=48aa70e157>). All LSU program activities are disseminated through <http://www.evaccenter.lsu.edu>.

Dr. Junfeng Jiao's website www.transitdeserts.org demonstrates the findings of Dr. Jiao's research project on transit deserts. In addition, Dr. Jiao's research was circulated on the following websites:



Dr. Jiao's Transit Desert research website

- The Conversation: <https://theconversation.com/chicago-new-york-discounted-most-public-input-in-expanding-bike-systems-107426>
- Citylab: <https://www.citylab.com/transportation/2019/01/chicago-new-york-public-input-bikeshare-transit-planning/580321/>
- Chicago Tribune: <https://www.chicagotribune.com/news/opinion/commentary/ct-perspec-divvy-bike-share-docking-stations-public-input-0115-20190114-story.html>
- Salon: https://www.salon.com/2019/01/20/chicago-new-york-discounted-most-public-input-in-expanding-bike-systems_partner/
- The Nation: <https://www.thenation.com/article/transit-deserts-extreme-commuters-inequality/>
- The Atlanta Journal-Constitution: <https://www.myajc.com/news/local-govt--politics/transit-lifeline-low-income-metro-atlantans-eager-for-expansion/M9FfRq2txuZdX7vPJgZPEP/>

C. Methodologies, Technologies or Techniques

Dr. Qisheng Pan developed the Megaregion Transportation Planning Model by extending a metropolitan planning model.

Dr. John Landis continued development of the Northeast Megaregion Travel Demand and Investment Model (NEMR TD&IM), the nation's first multi-modal, mega-regional travel demand model. Dr. Yaro's studio is exploring strategies to utilize inter-city and high-speed rail networks to underpin a broader economic development strategy for "left behind" cities and regions.

Dr. Danelle Briscoe's projects draws critical relationship between BIM-based design template for a multimodal transportation hub vis-a-vis user-based scenarios related to functional aspects of the hub. The BIM design template is therefore a resourceful tool for the said user-based scenarios as a starting point in the design process of an actual hub, with set relationships/groups/categories of elements.

Dr. Jiao is working on new methods to identify transit deserts at the Block Group level using different GIS data sets, Google Transit Feeds, and Open street maps. Dr. Wegmann is exploring

combining H+T (housing plus transportation cost) data, affordable housing inventory, and racial/ethnic demographic data at the tract-level on the nationwide scale.

D. Inventions, patent applications, and/or licenses

Nothing to report.

E. Outreach activities

CM² hosted and presented at a webinar “Evolving Challenges in Regional and Megaregional Planning” for the WTS South West Region (comprised of chapters from Oklahoma, New Mexico, Texas, Louisiana and Arkansas) in November 2018. Panelists included CM² researchers Lisa Loftus-Otway, Carol Lewis, Gwendolyn Goodwin, and Brian Wolshon. Lisa Loftus-Otway reached out to Amy St. Peter at the Maricopa Council of Governments in Arizona who have a Megaregions strategy to present on how they developed this policy/strategy.

CM² researchers from the University of Pennsylvania and the University of Texas at Austin, along with 21 students, took part in a Charrette in Manchester UK In February 2019 with the UK 2070 Commission, which is conducting an inquiry into regional inequalities in the North of England and is developing a framework for action. The CM² researchers presented on our work to invited speakers and guests at this week-long charrette. The two groups of students outlined their class activities and how this collaboration would foster innovation on the first day of the Charrette, and on the last day presented their perspective on the week’s speakers and activities and how this would impact their class output.



UT Austin & Penn studio teams at UK Charrette

Other outreach activities included CM²’s monthly brown bags, presentations at multiple conferences including a USDOT Panel on *Transportation Innovation at a Crossroads* at SXSW where Lisa Loftus-Otway discussed the importance of investing in research for future innovation and the importance of UTCs.

F. Courses and Workshops

Qisheng Pan taught a workshop to 30 students on Urban and Regional Economic Impact Analysis, East China Normal University on January 4, 2019, Shanghai, China.

UT Austin’s Dr. Junfeng Jiao was one of the leading Principle Investigators (PI) for a university-wide Campus Engagement Workshop under the Bridging Barriers initiative that took place on September 14th. Bridging Barriers brings together experts from across the 40 acres to address pressing problems facing Texas, the nation, and beyond. CM² Director, Dr. Ming Zhang also participated in the workshop.

J. Landis conducted a 1-day travel demand workshop on November 9, 2018 for transportation planning modelers from the Boston, Providence, New York City, Philadelphia, Baltimore, and Washington, D.C. MPOs and regions.

Dr. Bob Yaro held a day-long workshop in Hartford, CT on March 22 on the implications of the proposed New England Rail plan for economic development in Downtown Hartford. More than 20 high level representatives from the City of Hartford, State of Connecticut, and other institutions participated in this event.

Multiple classes were held during the reporting period. Danelle Briscoe held an Advanced Design Studio in Spring 2019 which had 13 graduate and undergraduate students. Junfeng Jiao held two graduate courses on that were co-listed with the LBJ School of Public Policy: Smart City had 25 students and Urban GIS had 35 students. Erick Guerra: held two classes Introduction to transportation planning that had 25 students and Multimodal transportation planning that had 30 students. Brian Wolshon held two classes: Principles of Highway and Traffic Engineering and Geometric Design of Highways and Airports

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 their fellow researchers. During these events, student and faculty researchers have an opportunity to share their progress on current CM² research and receive feedback on research methods and design. All presentation materials used for the Brown Bag Lunch Discussions are available on [the Brown Bag Lunch Discussion Page of our website](#). Additionally, due to a high number of attendees and an increasing interest, the Brown Bag Lunch Discussions will now be video recorded and available online.

Dr. Junfeng Jiao was invited to talk on Transit Access and Transit Deserts in the US—Lessons from 52 Major Cities at the Department of Geography and Planning, The University of Toronto, November 2018, Toronto, Canada. (Invited by Assistant Professor Michael J. Widener); Big 12 Fellowship Talk at the School of Public Affairs & Administration, The University of Kansas, September 2018, Lawrence, KS. (Invited by Prof. Stacey Swearingen White); UT Austin and United Kingdom Academic Enrichment Fellowship Talk, Center for Advanced Spatial Analysis, University of College London, August, 2018, London, UK. (Invited by Prof. Michael Batty); Invited Talk at the Department of Architecture, University of Cambridge, August, 2018, Cambridge, UK. (Invited by Dr. Ying Jin); and Goldsmith Talk at the School of Architecture, The University of Texas at Austin, TX, February 7, 2018, Austin, TX.

Dr. Carol Lewis's graduate student, Brandon Rogers, presented a poster at Texas Southern University Research Week on *Determining Purpose and Need for Vulnerable Communities in the Megaregions* on March 26, 2019.

On February 1, 2019, Dr. Zhang presented at the City Forum lecture series, which is a planning and urban issues speaker series hosted by the Community and Regional Planning Program (CRP) at the University of Texas at Austin. Dr. Sandra Rosenbloom was the keynote speaker at the Rockefeller Brothers Foundation, New York Texas State Older Driver Conference in Austin Texas

on February 28, 2019 on Senior Mobility. Ms. Rosenbloom was also on a panel presentation on the role of societal trends in transportation, UT Arlington, on February 5, 2019. On February 8, 2019 Dr. Gian-Claudia Sciara spoke at the UTSOA Center for American Architecture and Design Friday Lunch Forum on “Reinventing Institutions for Regional Transportation”.

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

Outcome metric	Annual Target	Actual number for 10/1/18-3/31/19
1. Enlarged pool of trained transportation professionals	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
<i>Degree type (Undergrad, Master, PhD)</i>	n/a	12.5% undergrad, 69% master, 18.5% PhD
<i>Gender (male, female)</i>	n/a	65% male, 35% female
<i>Race (Asian, Black, White, other)</i>	n/a	47% Asian, 9% Black, 44% White
<i>First generation student (undergrad. or grad.)</i>	n/a	1
<i>1.2 Number of papers developed by students for publication</i>	2	
<i>1.2 Number of graduates in transportation jobs</i>	15*** for overall grant period	46
2. Increased cooperation by local governments and transportation agencies regarding regional and inter-regional issues	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
<i>2.2 Development and utilization of consistent and usable planning datasets</i>	1	0
<i>2.3 Creation of megaregional forums, committees, and communications by megaregional transportation planning entities</i>	1	0

One of the major outcomes of this past reporting period has been the elevation of the consortium’s profile with industry professionals through the formation and expansion of the Advisory Committee. Our local advisory committee members as well as Support Partners have

been active in attending our growing number of special presentations and lectures we have curated over the past reporting period.

In addition, 6 student researchers have had papers developed for publication during the reporting period, which exceeds our target of 2. Several of our student researchers have already entered the industry or have employment offers pending graduation this year, ensuring that the consortium is on target to meet or exceed its goal of 15 students in transportation-related jobs during the overall grant period. Examples of student employment following their time with the consortium include:

- Jermaine Potts (GRA to Dr. Carol Lewis) joined the Metropolitan Transit Authority of Harris County as a Service Evaluation Analyst.
- Stephanie Levine (GRA to Lisa Loftus-Otway) joined the Chicago Metropolitan Agency for Planning as a Policy Analyst.
- Roxanne Lin (URA to Lisa Loftus-Otway) will be joining Ernst & Young as an Economic Analyst.
- Efe Tuncer (GRA to Dr. Brian Wolshon) joined KLD Engineering, PC as a Traffic Engineer.
- Brendan Goodrich (GRA to Dr. Ming Zhang) will be joining the JET Graduate Rotational Program at JetBlue.
- Paulina Urbanowicz (GRA to Lisa Loftus-Otway) will be joining the Port Authority of New York and New Jersey's Leadership Fellow Program.

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. Our researchers are developing 2 datasets for use by industry professionals. Dr. Walton of UT Austin is working on a comprehensive database of MPO governance structures for use by researchers and professionals. Additionally, Dr. Landis (Penn) has continued the development of a Trans CAD-compatible passenger and freight demand and travel and network datasets for the Northeast Megaregion.

To ensure that the datasets and research are useful for their intended audiences, researchers developed megaregionally-focused working groups and communications. For example, Dr. Landis intends to create a Northeast Megaregion Travel Modeling Working Group. The Working Group will build upon the previous discussions held during the November workshop and will coordinate further development and use of the NEMR TD&I Model. Additionally, Dr. Yaro's megaregion studio class contributed to "Rebooting New England", an independent effort to promote creation of a high-performance inter-city rail network in New England and New York.

5. IMPACTS

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

Table 5: Impact Performance Metrics

Impact metric	Annual Target	Actual number for 10/1/18-3/31/19
1. Enhanced knowledge base	n/a	n/a
<i>1.1 Development of books/handbooks</i>	3*** for overall grant period	0
<i>1.2 Journal publications in academic or professional journals</i>	5	13
<i>1.3 Special issues of academic or professional journals</i>	1	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
<i>2.1 Number and extensiveness of social media coverage of CM² research, education, and outreach activities</i>	1	1
3. Informed decision making on public policy and transportation infrastructure investments	n/a	n/a
<i>3.1 Website visits/page views</i>	1	3302 page views
<i>3.2 Number of contracted plans and projects conducted for and adapted by local and regional agencies in megaregions</i>	1	0

A. Impact on the effectiveness of the transportation system

Already the research findings resulting from our center have already begun to have an impact on transportation systems around the country. For example, Capital Metro as well as City of Austin’s Transportation Department requested Transit Desert maps, developed under Dr. Jiao’s research project, for local transit demand and supply estimation. Since Dr. Jiao’s research targeted 52 major U.S. cities, the findings of this research can potentially positively affect major U.S. cities and improve the residents’ quality of life. This can help allocate transportation resources better within the megaregions, and improve its mobility.

Dr. Pan’s research on megaregion transportation planning model can help improve the mobility and accessibility of passenger and goods movement in megaregions, which has potential to improve the operation and safety of the transportation system.

Ms. Briscoe’ work with a BIM Revit template and User based Scenarios will be used by all users of the Autodesk Revit software, which include architects, landscape architects, structural engineers, MEP engineers, designers and contractors. Dr. Walton’s work under CM², particularly his development of a comprehensive database of MPO governance structures, has the potential to ease planning practices that would allow for more efficient transportation systems. Dr. Yaro’s design studio and collaboration with “Rebooting New England” will advance the economic development rationale for regional and intercity rail projects in megaregions across the country.

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 increase in completed research projects and research findings shared through academic forums (such as conferences and journal publications) as well as through social media awareness have contributed to the overall increasing awareness of the importance of megaregional study. In November of 2018, the Transportation Research Board named megaregions as a critical issue in their publication, "Critical Issues in Transportation 2018," saying "As metropolitan areas grow into megaregions spanning multiple states, questions arise about institutional reform, as well as models of successful cross-agency coordination." Clearly, the work happening at the consortium is helping fuel this larger conversation in the transportation world.

Because of the growing base of research findings over the course of the past 3 years, a number of CM² researchers are preparing to propose a book or a book chapter for Year 4 funding cycle, making our center's research accessible to new audiences. Dr. Pan is planning to develop a book proposal titled "Megaregion Truck Flow Estimation and Planning". Dr. Landis is working on developing a handbook on megaregional travel demand modeling. Dr. Briscoe will be working on development of a Transportation BIM book. Dr. Jiao prepares to write a book on shared mobility and transit deserts.

D. Impact on transportation workforce development

CM² partner universities are preparing our students to enter both the public and private sector with expertise in planning, design, project delivery, and financing strategies. Our classes engage extensively with noted experts who work daily on the implementation of transportation and infrastructure projects. This reporting period saw an increase in the number of workshops, studios, and transportation classes offered. As outlined in Section 4, several CM² graduates have already gone on to work in transportation agencies and consulting firms across the country, implementing the lessons learned through CM² in their work. In addition, the camps and other outreach activities we have conducted are introducing the next generation to the potential avenues of a career in transportation.

6. CHANGES/PROBLEMS

Nothing to report.

7. SPECIAL REPORTING REQUIREMENTS

Nothing to report.