



Courtesy of the Vermont Agency of Transportation

From Research to Reality

University Transportation Centers As Technology Transfer Hubs

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A lone car crosses the Sandhill Bridge in scenic East Middlebury, Vermont. Innovations pioneered by university transportation centers, such as the accelerated construction methods used to rapidly replace this vital span's 1924 predecessor (complete with a prefabricated arch), are transforming construction and repair practices nationwide.

Innovation in the transportation sector can be transformative, improving efficiency and equity while reducing social and environmental harm. Recent work completed by congressionally mandated university transportation center (UTC) programs has made meaningful progress toward attaining these goals.

For more than 36 years, the U.S. Department of Transportation (U.S. DOT) has invested in the country's transportation future through its UTCs [University Transportation Centers] Program. The initiative supports consortia of nonprofit two- and four-year academic institutions in focusing on federally designated research priorities. With renewed authorization under the 2021 Infrastructure Investment and Jobs Act (also known as the Bipartisan Infrastructure Law), U.S. DOT is now administering \$435 million in funding for nearly three dozen competitively selected UTCs through FY 2026 (1).

The UTC program focuses on technology transfer, ensuring that transportation

research investments result in patents or changes to regulations or practices. U.S. DOT identifies technology transfer as a strategic priority in its *Research, Development, and Technology Strategic Plan (FY 2022–2026)*.¹ The plan notes that UTCs serve as a high-impact mechanism to leverage and deploy federal investments in transportation research.

Translating research projects into improvements in the transportation sector, as U.S. DOT envisions, requires innovation, collaboration, and communication. These are areas in which UTCs excel. Institutional expertise and cross-disciplinary partnerships enable UTCs to identify urgent research questions that have real-world applications. With scientifically sound research findings in hand, UTCs engage government, industry, and community partners to ensure that results reach intended

¹ Review U.S. DOT's *Research, Development, and Technology Strategic Plan* at <https://www.transportation.gov/rdtstrategicplan>.

audiences. The cycle of outreach, research, translation, and dissemination can encompass a broad range of tools and activities. These may include—but are not limited to—convening expert panels, hosting public and private workshops, conducting interviews, engaging with the media, writing and distributing policy briefs, and providing expert testimony at legislative hearings.

The centers within the UTC program are diverse, ranging in scope and scale to reflect varying research focus areas and geographies. Current Bipartisan Infrastructure Law grantees include five national centers, 10 regional centers, and 20 competitive Tier 1 centers comprising major research institutions.² The following sections highlight representative examples of the types of technology transfer activities being undertaken by national, regional, and Tier 1 centers.

Rural Carshares

The National Center for Sustainable Transportation (NCST), which provides national leadership in advancing environmentally sustainable transportation, specializes in cutting-edge research, direct policy engagement, and education of the country's future leaders. It is led by the Institute of Transportation Studies at the University of California, Davis (ITS-Davis), in partnership with California State University, Long Beach; Georgia Institute of Technology; Texas Southern University; the University of California, Riverside; the University of Southern California; and the University of Vermont.

Preserving the environment is one of the Bipartisan Infrastructure Law's research priorities. To effect rapid and substantial change in this area, the NCST's research program is working toward equitable decarbonization of the transportation sector. The center has several high-priority projects that inform policy in the public and private sectors and address the needs of diverse communities.

² See the list of UTCs and their research focus areas at <https://www.transportation.gov/utc/bil-centers-and-grantees>.



Courtesy of Miocar

A family in California's rural Central Valley unloads groceries from a rented electric Miocar after a trip to the store. This sustainable carshare service, which costs as little as \$4 per hour and lets members reserve, unlock, and lock the vehicle via a smartphone app, grew out of a UTC research project.

The work of Caroline Rodier, an NCST researcher based at ITS-Davis, provides a salient example. Since 2019, her team has evaluated an electric vehicle carsharing pilot project named Miocar that serves marginalized rural communities in California's Central Valley. Miocar vehicle hubs initially were established in affordable housing complexes in eight rural communities in Tulare and Kern counties. The program has since expanded to two cities in other counties—Stockton, in the San Joaquin Valley, and Richmond, outside of San Francisco—and deploys a fleet of about 40 vehicles. Rodier's evaluations of the carshare service have shown that users benefitted from access to flexible transportation options and that some reduced their reliance on gas-powered vehicles. NCST has shared the Miocar project's success story with legislators at the California State Capitol in Sacramento and with congressional leaders in Washington, DC.

Communication and Outreach

An example of effective technology transfer activities at the regional scale can be found at the Pacific Southwest Region (PSR)—also known as

Region 9—UTC. Led by the University of Southern California's METRANS Transportation Consortium, the PSR UTC includes nine partners: California State University, Long Beach; Northern Arizona University; Pima Community College; the University of California, Berkeley; the University of California, Davis; the University of California, Irvine; the University of California, Los Angeles; the University of Hawaii; and the University of Nevada, Las Vegas. The PSR UTC conducts a multidisciplinary program of research, education, and technology transfer aimed at advancing the Bipartisan Infrastructure Law research priority of improving the mobility of people and goods in the region.

The PSR UTC's technology transfer program puts research into practice with timely and relevant research, policy briefs, and monthly newsletters. It also publishes key research findings and policy implications in *Transfers* magazine³ and funds research projects that involve partners from the earliest stages to accelerate technology transfer. An example of this

³ Browse the magazine at <https://transfersmagazine.org/>.

effective collaboration is a Míocar research initiative conducted with affordable housing providers and other community partners to scale up the number of car-sharing programs.

PSR UTC's signature events include an annual State of the Trade and Transportation Industry Town Hall, the biannual International Urban Freight Conference, and several symposia and summits. These events—which have included experts from the World Bank,

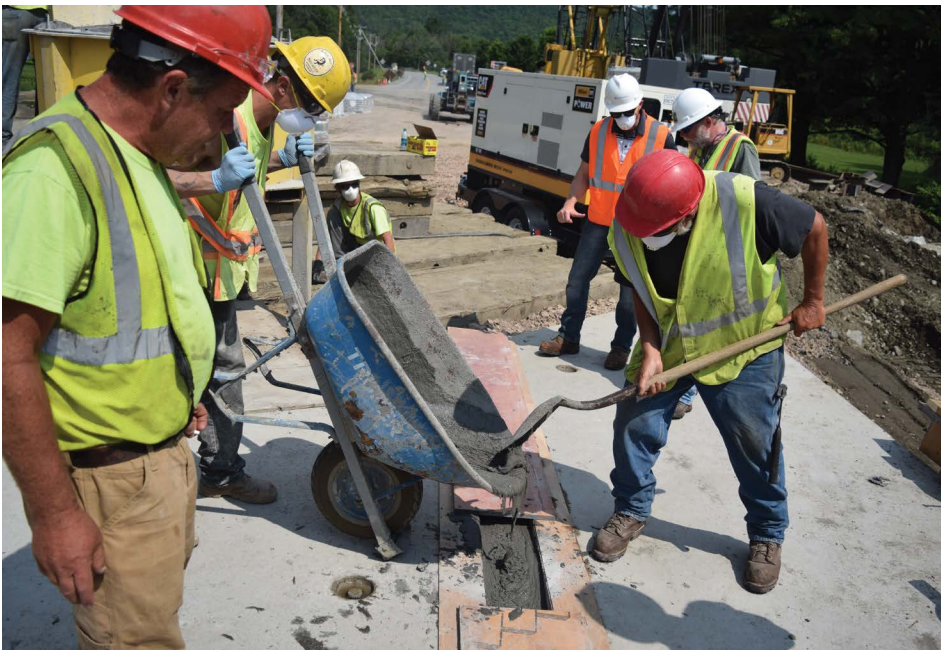
California port authorities, air quality regulators, and labor groups—bring partner networks together to discuss how research can inform policy and practice.

High-Performance Materials

The Innovative Bridge Technologies/ Accelerated Bridge Construction UTC at Florida International University is a Tier 1 UTC. Research, education, and technology transfer activities have made it a focal

point for the U.S. bridge engineering industry for more than a decade. High-impact activities include the development of open-source ultra-high-performance concrete and effectively sharing knowledge with the broader transportation industry about how to use it for bridge repairs. This was achieved through workshops and presentations held during its conferences⁴—which typically attract more than 700 bridge professionals—and through monthly webinars that have been held without interruption since 2013. In February 2023, the UTC added “Innovative Bridge Technologies” to its name to not only reflect its expanded scope in the latest funding round but also its focus on making the U.S. bridge industry the best in the world through innovation and the development of advanced technologies.

With their dedication to generating real change in the transportation sector, UTCs have proven to be one of the country's leading conduits for bringing research to policy and practice—for the benefit of all members of society.



Courtesy of the Vermont Agency of Transportation

A construction worker shovels ultra-high-performance concrete into a joint between prefabricated bridge parts in Waitsfield, Vermont. A nonproprietary version of this advanced material—10 times the compressive strength of traditional concrete—was developed by UTC researchers and reduced the cost of such projects.

⁴To see highlights of past conferences, including workshops, visit <https://abc-utc.fiu.edu/conference/archives/>.

REFERENCE

1. University Transportation Centers Program. 2022 BIL UTC Competition. U.S. Department of Transportation, Washington, DC, February 21, 2023. <https://www.transportation.gov/utc/2022-bil-utc-competition>.

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