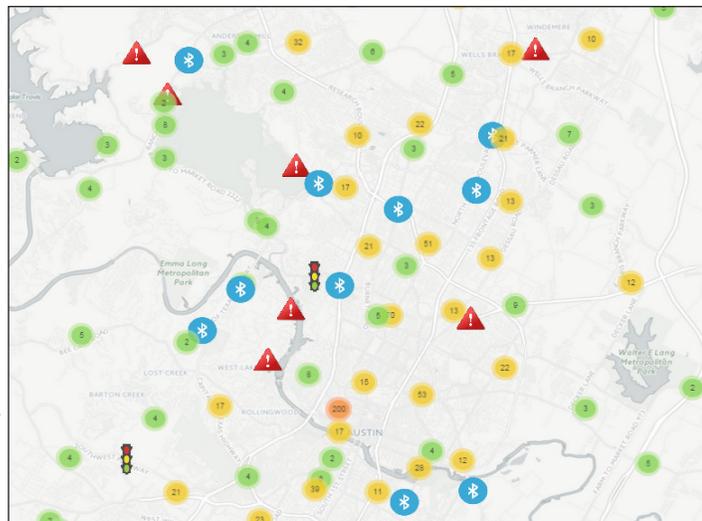




Transportation Data Discovery Environment

The Data-Supported Transportation Operations & Planning Center (D-STOP), a Tier 1 University Transportation Center housed at The University of Texas at Austin, is working to transform how “Big Data” is used in transportation decision-making. While much of the recent research in this area has been on providing improved information to travelers, a focus of new work will be on providing improved information to agency staff and decision-makers.

- Gaining a better understanding of travel demand patterns across all modes to support travel demand management;
- Supporting environmental studies by sourcing accessible, up-to-date field data;
- Exploring causes of vehicle crashes by drawing relationships with other data sources, such as weather patterns and levels of congestion; and,
- Providing a framework for collecting and analyzing data to facilitate the adoption of connected vehicles.



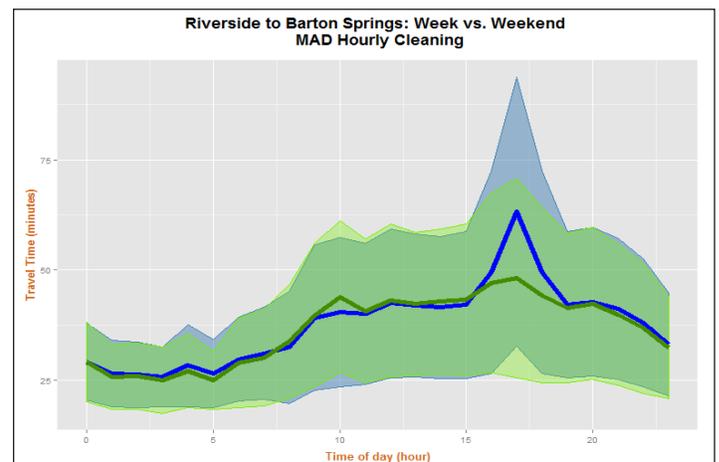
Dr. Natalia Ruiz Juri, D-STOP

Figure 1. Examples of the various data types collected in the Data Rodeo (crashes, locations of Bluetooth readers, locations of count data, signal locations).

D-STOP’s data discovery environment, branded as the “Data Rodeo,” will explore innovative uses of transportation data, from both traditional and novel sources, to solve transportation problems and facilitate inter-agency collaboration. Here are a few example applications of the Data Rodeo:

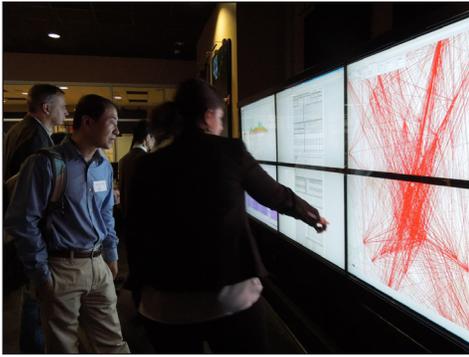
- Assessing transportation system reliability by analyzing data, such as vehicle travel times, over time;
- Providing better and updated data to improve traffic predictions used for planning;

Secure, customized access to a dynamic set of data sources and analysis tools will be provided through a web interface and application programming interfaces (APIs). The framework will allow researchers, as well as others from the private and public sectors, to share prototype data analysis and modeling tools with decision makers, promoting a faster technology transfer. In the longer term, the Data Rodeo will become a platform to promote transferable, scalable, and replicable research, facilitating the use of large data sources, such as those generated by autonomous and connected vehicles, and accelerating their impact on the transportation system.



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Figure 2. Travel time variability by time of day created by selecting two of the Bluetooth readers from the Figure 1 map.



Natalia Ruiz Juri demonstrates an analysis of signal timing data acquired to a visiting scholar and private sector attendee.

The team has started building the Data Rodeo for the Central Texas region, in collaboration with the City of Austin. Central Texas is one of the fastest growing regions in the country, but

its transportation infrastructure is far from equipped to handle the population explosion, creating some of the worst traffic congestion in the country. While this research will not fix the problem, it can help the community find the best ways to manage the problem.

The first steps of building the Data Rodeo are to create more meaning from existing data sources. The tool currently contains data from several area agencies on traffic signals, Bluetooth data for vehicle travel times, and traffic counts. It is being expanded to include transit data, including ridership and automated vehicle location. As the project progresses, it will grow to include more novel data sources and methods. One goal of the project is for it to be open for crowd-sourcing certain types of data. For instance, local agencies could ensure the information on the number of lanes on their roadways is kept up-to-date, and the public could be engaged to highlight problem areas in the transportation system.

While the research will have a strong focus on technical aspects, the team will explore institutional concerns including data access, governance, and privacy, and will leverage existing technologies to implement appropriate protocols. The Data Rodeo will provide a flexible framework that will be continuously extended through

academic research and contributions from other public and private parties.

Dr. Natalia Ruiz Juri (one of two principal co-investigators) showcased the Data Rodeo concept at the 2015 National Association of City Transportation Officials (NACTO) “Designing Cities Conference” in Austin, Texas, in a standing-room-only session titled “Harnessing Big Data for Transportation Decision-Making.” The session, moderated by Dr. Jennifer Duthie (the second principal co-investigator), also featured perspectives from the private sector and other public sector entities making strides toward using data for decision-making and to facilitate public involvement.



Local agency representative Daniel Yang discusses one of the data displays with a student.

D-STOP students also showcased posters detailing their efforts related to the Data Rodeo as part of a “Better Streets Week” event

hosted at CTR in the week leading up to the NACTO conference. This event—also at capacity attendance—had a diverse and engaged audience composed of community advocates, transportation professionals, and researchers.

Data Rodeo research is being conducted by a multi-disciplinary team from UT’s Center for Transportation Research and its Texas Advanced Computing Center. This project began in January 2015 and will continue through August 2018. Funding from multiple sources will be leveraged to support the extension and enhancement of the D-STOP Data Rodeo.

About This Project

D-STOP is a collaborative initiative by researchers at The University of Texas at Austin’s Center for Transportation Research (CTR) and the Wireless Networking and Communications Group (both groups are programs of the UT Austin Cockrell School of Engineering, a top-ranked epicenter of engineering education, and knowledge creation and distribution). Dr. Chandra Bhat (bhat@mail.utexas.edu) directs D-STOP. The project’s principal co-investigators are Dr. Jennifer Duthie (jduthie@utexas.edu), Director of CTR’s Network Modeling Center, and Dr. Natalia Ruiz Juri (nruizjuri@mail.utexas.edu), Assistant Director of the Network Modeling Center.



This newsletter highlights some recent accomplishments and products from one University Transportation Center (UTC). The views presented are those of the authors and not necessarily the views of the Office of the Assistant Secretary for Research and Technology or the U.S. Department of Transportation.

