



CALENDAR

FY 2017 PROGRAM KEY DATES

March 23, 2016—Pre-proposal meeting. RTI Conference Room WebEx.

April 14, 2016—Request for proposal deadline, 4:00 p.m. Central Time.

May 31–June 3—RTI notifies universities of project awards.

June 6–Aug 18—Project agreements are prepared and signed by university and TxDOT.

Sept. 1, 2016—Project execution.

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Message from the Section Director

I believe that with your support, research at TxDOT will lead the nation. So in 2016, we will increase our efforts to engage and communicate more frequently with you, our TxDOT Districts, Divisions, Offices (DDOs), and university partners.

We are excited about this outreach effort! We are scheduling our visits throughout the state during the approaching months in hopes of reinforcing our network. As part of the visits to DDOs, we will provide an overview of the Research Program and meet with staff to encourage participation on TxDOT Research Project Teams. The expertise of DDO staff serving on the teams contributes to the success of the project. The university outreach also includes an overview of the Research Program and allows for open discussions related to their university projects.

We are committed to improving the program and funding the transportation research projects that make a difference to TxDOT and our customers.

Thank you for your continued support.



Functional Area Committee Evaluates Research

New Tools to Simplify Rainfall Intensity Estimation for Hydraulic Design

State and county hydraulic engineers and designers must have accurate estimates of the average rainfall intensities of an area in order to design and install effective storm water drainage systems. A Texas Tech research team recently completed project 0-6824 to simplify the necessary rainfall intensity estimation. The team updated the *EBD* values (now called 2015-*EBD* values) and incorporated them into a re-designed, but well-used tool (EBDLKUP-2015.xlsx). They also built a companion tool to facilitate the use of hydrologic modeling software (HEC-HMS).

The new tools will substantially reduce time required for design storm estimation. The 2015 values complete a hydrologic method update for Texas that will serve the hydrologic design community for decades.

To facilitate immediate implementation and deployment, researchers built training materials suitable for insertion into existing TxDOT training curriculum in the workforce development program. Each of the tools has a 5–7 minute training

video/tutorial on its use. The spreadsheet tool is expected to require 1/4-hour effort to produce a table of design rainfall intensity suitable for engineering design documentation.

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According to Dr. Ted Cleveland, the Texas Tech project supervisor, “Our new data address the fact that rainfall intensities have gone up and down in different areas of the state over the last 15 years, and these updated tools will also be very helpful to smaller counties that rely heavily on the state method to design their structures due to limited resources.”

The estimated economic value of the research is about \$400,000/year in reduced time to estimate and document design storms for design of our transportation infrastructure’s hydraulic components.

For more details, contact Theodore G. Cleveland, Ph.D., P.E., at ted.cleveland@gmail.com or Wade Odell, P.E., at Wade.Odell@txdot.gov.

Rainfall Intensity-Duration-Frequency Coefficients for Texas

Based on United States Geological Survey (USGS) Scientific Investigations Report 2004-5041
"Atlas of Depth-Duration Frequency of Precipitation Annual Maxima for Texas"

1. Select English or SI Units

English

2. Select or Enter a County

Lubbock

3. Enter a Time of Conc. Select Units

3

hr

Coefficient	50% (2-year)	20% (5-year)	10% (10-year)	4% (25-year)	2% (50-year)	1% (100-year)
e	0.8204	0.8195	0.8223	0.8227	0.8239	0.8284
b (in)	38.36	53.82	66.27	83.14	99.21	119.69
d (min)	8.82	9.62	10.70	11.81	12.71	13.71
Intensity (in/hr)	0.52	0.73	0.88	1.10	1.30	1.53

(Spreadsheet Revised: July 30, 2015)

Figure 1 is a screen capture of the interface to the new tool, EBDLKUP-2015.xlsx.

Studies Support Search for Solutions to Wrong-Way Driving Problem

TxDOT engineers in TxDOT's largest districts are making progress in their efforts to prevent wrong-way crashes through countermeasures grounded in TxDOT's research program.

Though not common, wrong-way crashes are usually fatal.

"While they're a small segment of the crash population," says Texas A&M Transportation Institute (TTI) Research Engineer Melisa Finley, "because they're so severe they get a lot of media attention, and a lot of people want something done about the problem." Finley led a recent research effort that developed guidelines for TxDOT districts where wrong-way driving is a problem.

Some of the most promising ideas have been implemented in San Antonio, where the death of a police officer at the hands of a wrong-way driver put a spotlight on the problem in 2011. Soon after that tragedy, TxDOT joined with the San Antonio Police Department, Federal Highway Administration, Bexar County, and other agencies to form a task force.

The Department also called upon researchers from TTI to analyze 911 reports and employ GIS mapping to look for any patterns in the location of the crashes. TTI staff discovered that most of the crashes were happening along the U.S. 281 corridor. There's no clear reason why, although it's possible that ramp configurations near the San Antonio International Airport may present challenges to visitors unfamiliar with the area.

Dale Picha, the District's Traffic Operations Manager, notes that the research illustrated a clear pattern of impaired driving as a primary cause for the crashes, nearly all of which happen late at night. TxDOT staff and TTI researchers explored their options and settled on a series of steps to address the problem in San Antonio, primarily consisting of lowering Wrong Way - Do Not Enter signs and illuminating the outside edge of the signs for better visibility. The engineering steps were combined with policy changes in how wrong-way driver reports were



WRONG WAY Sign with Red Flashing LEDs around the Border.

handled, a result of strong teamwork by the task force members.

The results have been encouraging, with the San Antonio area estimating a 30 percent reduction in reported wrong-way driving events since countermeasures were put into place in 2012.

In addition to the San Antonio-based research, wrong-way driving is also a priority in TxDOT's Innovative Projects Program, as one of 13 visionary research efforts "exploring and evaluating state-of-the-art ideas and next-generation technologies to address the infrastructure needs of our growing population," according to RTI Director Dana Glover.

That effort, also led by Finley, will test connected vehicle applications that can help detect wrong-way drivers, notify law enforcement and TxDOT staff of the events, and send alerts to the wrong-way driver as well as other drivers who find themselves in harm's way.

For more information contact Melissa Finley, P.E., at m-finley@tamu.edu or Darrin Jensen at Darrin.Jensen@txdot.gov.

FY 2016 Project Awards for Second-Round Traditional RFP

Project Number and Project Title	University	Project Supervisor	TxDOT Division Sponsor	Project Manager	Contract Specialist
0-6906—Chemical Solutions to Durability Problems	UT-CTR	Kevin Folliard	Construction/Maintenance	Chris Glancy	Annette Trevino
0-6916—Seismic Vulnerability and Post-Event Actions	UT-CTR	Patricia Clayton	Bridge	Joe Adams	Annette Trevino
0-6919—Evaluation of Structural Cracking in Concrete	UT-CTR	Trevor Hrynyk	Bridge	Chris Glancy	Annette Trevino
0-6922—Evaluating Long-Term Durability/Performance of Prestressed Concrete Beam with Extensive Surface Cracking	UT-CTR	Raissa Ferron	Construction	Chris Glancy	Annette Trevino
0-6920—Proactive Traffic Signal Timing and Coordination for Congestion Mitigation on Arterial Roads	Lamar	Xing Wu	Traffic Operations	Darrin Jensen	Patti Dathe
0-6910—Development of Proper Overlay Type and Designs for PCC Pavement	Tech	Moon Won	Construction/Maintenance	Sonya Badgley	Patti Dathe
0-6911—Development of Systemic Large Truck Safety Analyses	TSU	Yi Qi	Traffic Operations	Wade Odell	Patti Dathe
0-6915—Project Selection Criteria for Work Zone ITS	TSU/UTEP	Mehdi Azimi	Traffic Operations	Darrin Jensen	Patti Dathe
0-6904—Develop New Methods for Material Acceptance on Design-Build Projects	TTI	John Walewski	Strategic Project	Joe Adams	Patti Dathe
0-6907—Communicating Information for Traveling on Managed Lane Networks	TTI	Nick Wood	Traffic Operations	Darrin Jensen	Patti Dathe
0-6908—Comparative Analysis of Tack Coat, Underseal Membrane, and Underseal Technologies	TTI	Bryan Wilson	Construction/Maintenance	Sonya Badgley	Patti Dathe
0-6912—Innovative Tools and Techniques in Identifying Highway Safety Improvement Projects	TTI	Ioannis Tsapakis	Traffic Operations	Darrin Jensen	Patti Dathe
0-6913—MASH Test Level 2 (TL-2) Short Radius Guardrail Treatment for Texas Roadways	TTI	Akram Abu-Odeh	Design	Wade Odell	Patti Dathe
0-6905—Performance of Skewed Reinforcing in Inverted-T Bridge Caps	UH	Y. L. Mo	Bridge	Chris Glancy	Patti Dathe
0-6914—Non-contact Splices at Drilled Shaft to Bridge Column Interface	UH	Y. L. Mo	Bridge	Joe Adams	Patti Dathe
0-6917—Synthesis of Concrete Bridge Piles Prestressed with CFRP Systems	UH/UT-Tyler	Abdeldjelil Belarbi	Bridge	Chris Glancy	Patti Dathe
0-6921—Use of Lasers for Laboratory Measurements of Aggregate Shape, Angularity, and Texture	UTA/TTI	Roger Walker	Construction/Maintenance	Joe Adams	Annette Trevino
0-6903—Assess Deflection-Based Field Testing for Project Acceptance	UTEP	Soheil Nazarian	Construction	Sonya Badgley	Annette Trevino
0-6909—Designing for Deck Stress over Precast Panels in Negative Moment Regions	UT-CTR	Todd Helwig	Bridge	Joe Adams	Annette Trevino