



Illinois Center for Transportation  
University of Illinois at Urbana Champaign



# Update

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March 1, 2017



*"Where Excellence and Transportation Meet"*

# ICT's Impact

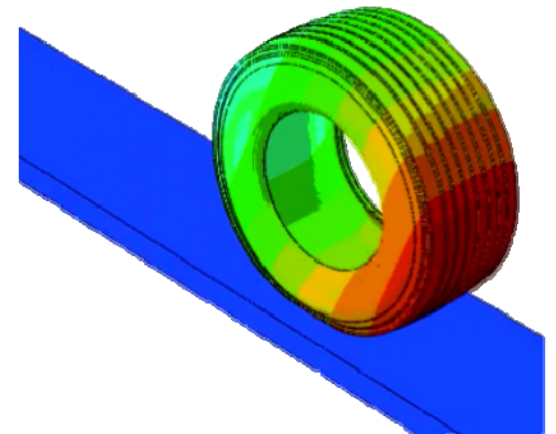
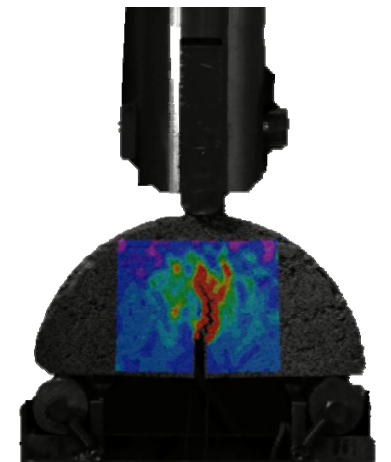
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- **Implementable research with focus on sustainability, performance, social and cost efficiency**
  - Return-on-investment to the sponsors
- **Innovation: regional, national and international recognition**
  - Website – 835,000 hits monthly
- **Inclusive of universities, industry, and other agencies**
- **Training: offer courses, seminars, and conferences**
- **Proactive response to IDOT requests**



# Research

- **Transportation Infrastructure Health Monitoring**
- **Advanced Laboratory and Full-Scale Accelerated Testing**
- **Hazardous Mitigation and Risk Assessment**
- **Advanced Pavement/ Bridge Modeling and Technologies**
- **Transportation Geotechnics & NDE**





# New Research Areas

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- **Autonomous and Connected Vehicles**
- **Innovative and Safe Multimodal Transportation**
- **Freight Optimization and Economics**
- **Sustainability**





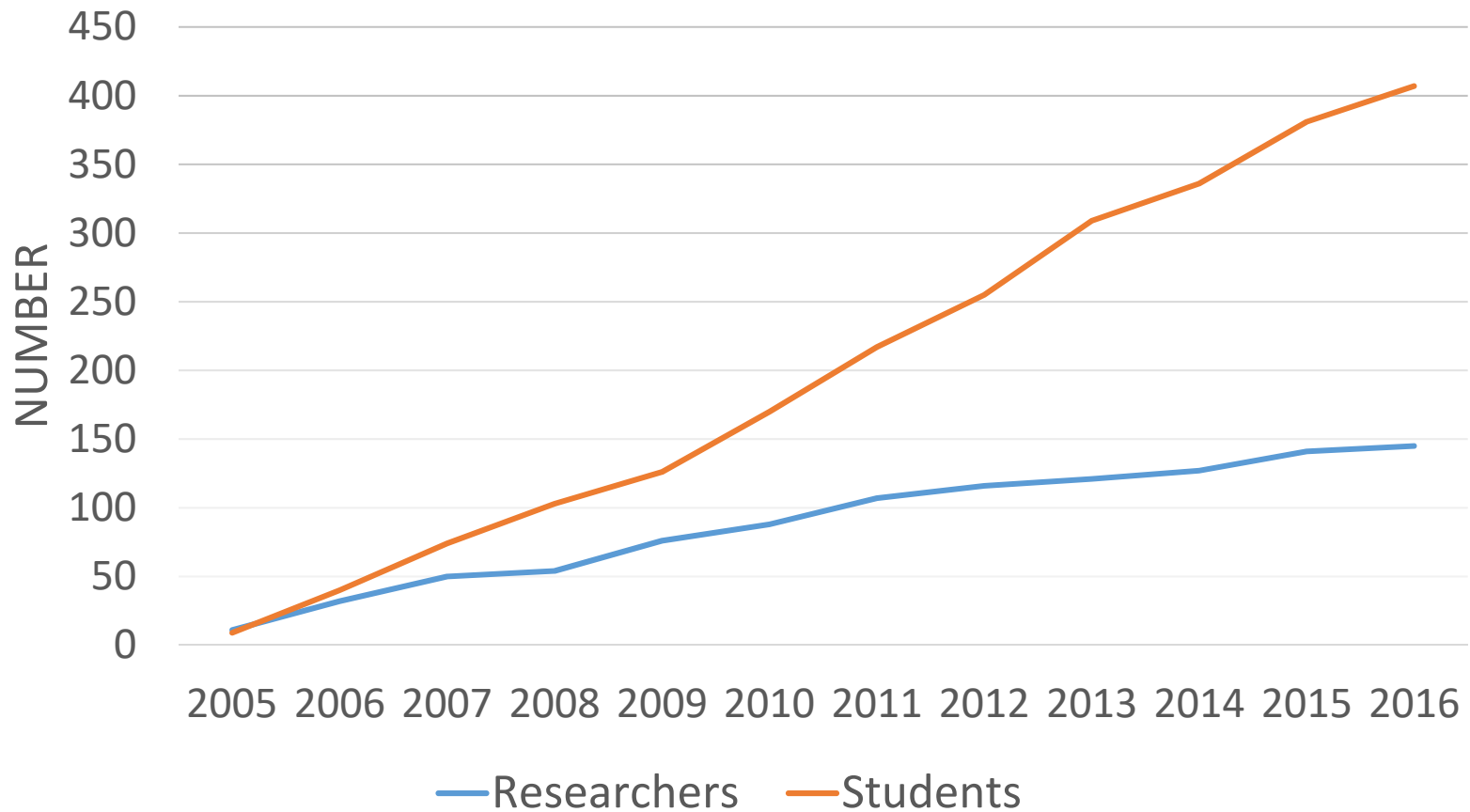
# IDOT-ICT Partnership in a Decade

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- **212 Total Projects Approved to Date**
  - *179 Regular Projects*
  - *33 Special Projects*
- **179 Projects Completed**
  - *149 Regular Projects*
  - *30 Special Projects*
- **33 Active ICT Projects**
  - *30 Regular Projects*
  - *3 Special Projects*
- **199 FHWA/IDOT Reports Published**
- **145 Researchers Contributing**
- **407 Graduate Students Supported**
- **26 Universities Participating**



# Impact of IDOT/ICT Research





# Research Project Participants





# Conferences & Training

- **2016 Bituminous Conference**



- **Erosion Control Training**

- **295 participants in 2016**

- **Documentation Training**

- **927 participants in 2016**

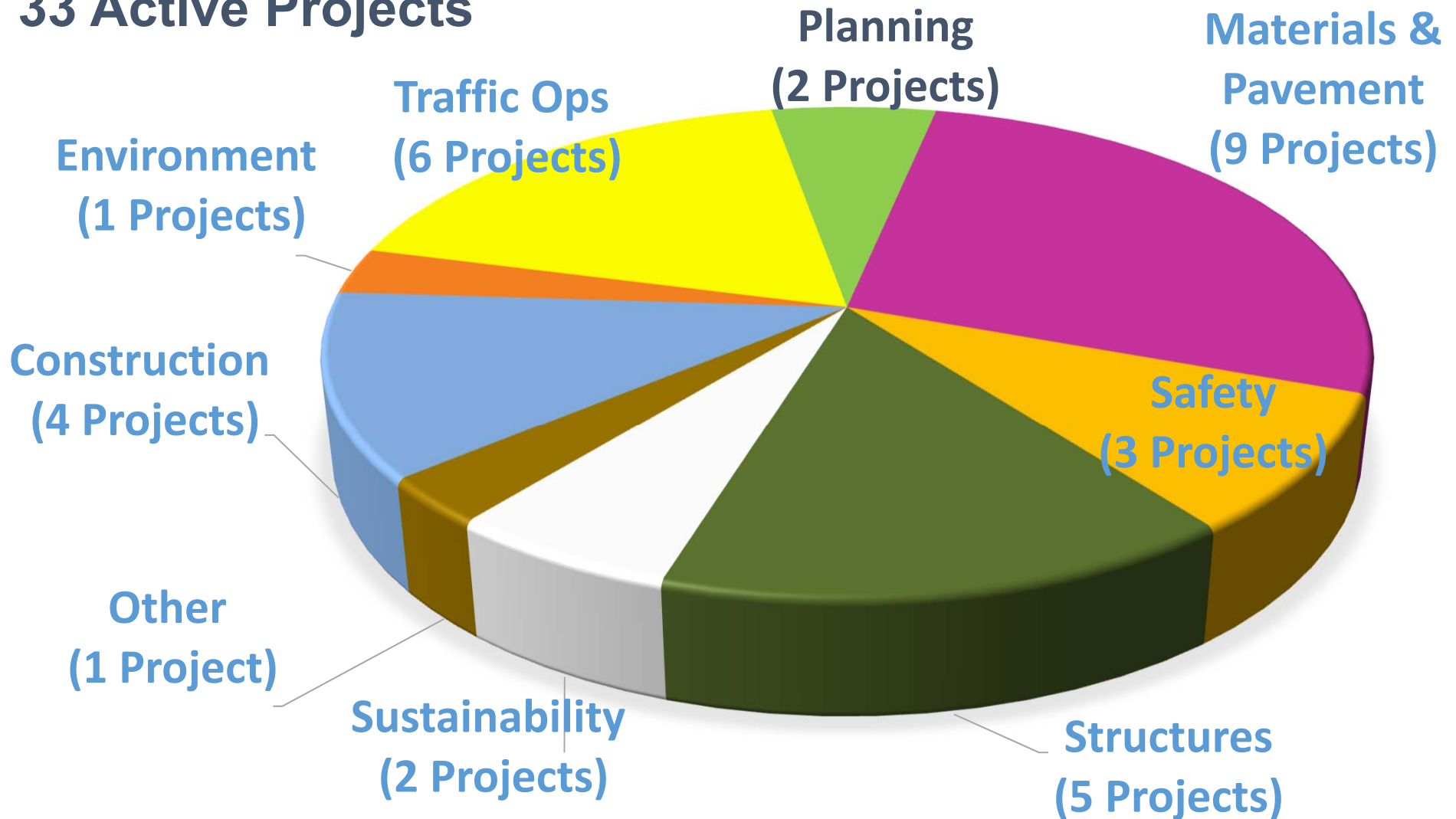






# Active Projects by TAG

**33 Active Projects**



# Research Impact - Environment

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## Tree Establishment in Response to Hydrology at IDOT Wetland Mitigation Sites



Jeffrey W. Matthews and Geoffrey E. Pociask  
University of Illinois at Urbana-Champaign

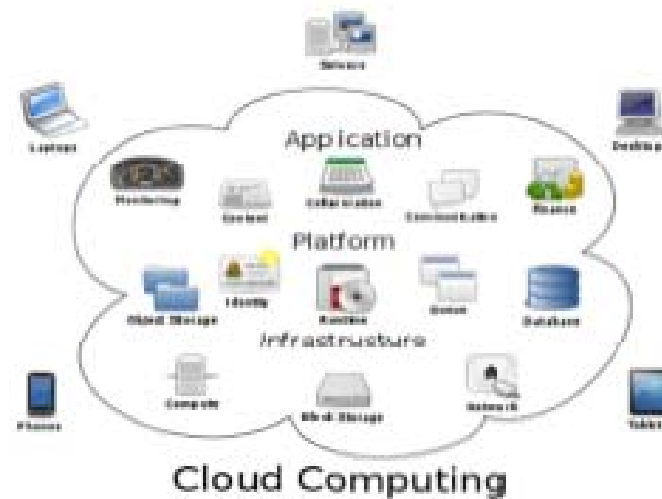
### Outcomes:

- Improved survival rate of trees at mitigation wetlands
- Site-specific mitigation performance standards



# Research Impact - Construction

## Options & Recommendations for Web Database of Material & Construction Inspection



Constance A. Kelly  
University of Illinois at Chicago

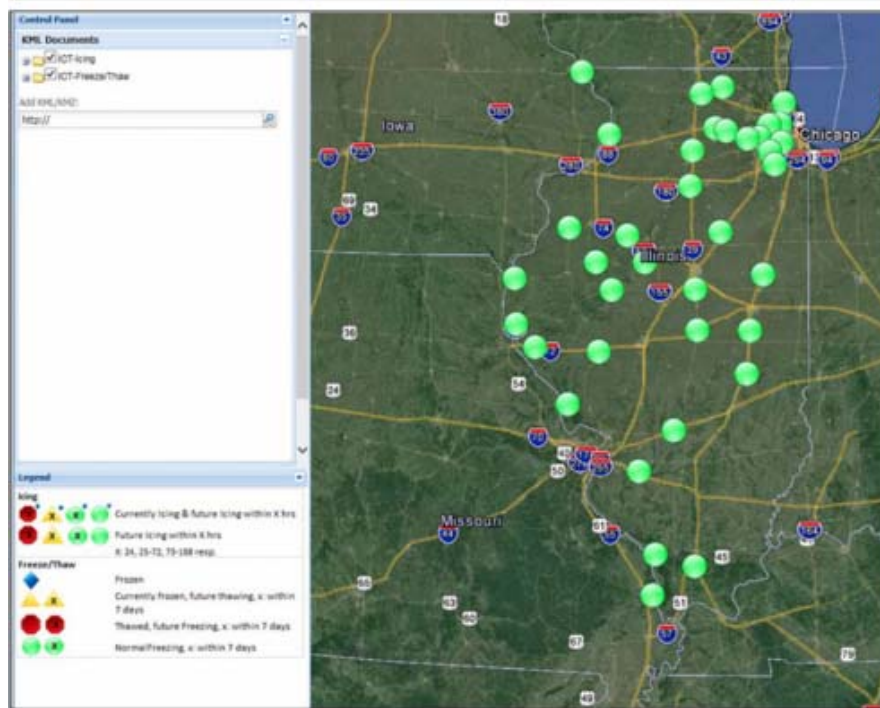
### Outcome:

- Improved software options for use in materials and construction project management



# Research Impact – Operations

## Evaluation of Software Simulation of Road Weather Information System



Real weather and pavement data become a simulation of road conditions throughout the state.

### Outcomes:

- New weather dataset combines weather forecast data with pavement models
- Improved pavement temperature prediction for winter maintenance operations

W.R. Vavrik, C.E. Dwyer, W.C. Brink, G. Larson  
Applied Research Associates (ARA)

# Research Impact – Pavements/Materials

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## Bridge Decks: Mitigation of Shrinkage Cracking (Phase 2)

### Outcome:

- Identification of mixture additives and curing methods that improve bridge deck performance (reducing concrete shrinkage cracking)



P. Mondal et al.  
University of Illinois at Urbana-Champaign



# Research Impact - Planning

## Revised Condition Rating Survey Models to Reflect All Distresses

### Outcomes:

- More realistic and up-to-date life expectancy of interstate and noninterstate pavements
- Condition prediction models for pavement preservation treatments





# Research Impact – Public & Intermodal Transportation

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## Trip Chaining Behavior of Senior Travelers & Applications to Public Transportation Planning



K. Mohammadian, M. Frignani, J. Auld  
University of Illinois at Chicago

### Outcomes:

- Planners can design more efficient transit services for senior travelers.
- Help improve attitude of senior travelers toward public transportation and increase use by that demographic.



# Research Impact - Safety

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## Speed Harmonization – Design Speed vs. Operating Speed



Z. Jiang, K. Jadaan, Y. Ouyang  
University of Illinois at Urbana-Champaign

### Outcomes:

- Excel-based program for selecting appropriate design elements and safety countermeasures to reduce number and severity of crashes
- The tool can also perform economic analysis to quantify cost-benefit ratio of various strategies





# Research Impact – Structures

## Development & Implementation of Updated Regional Flood Frequency Equations for Illinois

### Outcomes:

- Updated flood frequency equations for use in computing peak discharges for flood-risk analysis in design of bridges, culverts
- Improved efficiency and savings in engineering time; more reliable output



T. Over, R. Saito, A. Veilleux et al.  
U.S Geological Survey



# Project Spotlight

## Development of Low-Water Crossing Design Guidelines for Very Low ADT Routes in Illinois

### Outcome:

- Guidelines for selection and design of low-water crossings at rural sites in Illinois with low ADT
- Supports IDOT's best management practices for sustainability by minimizing the effects of roadway construction on streams, human safety, and aquatic health



R. Bhattarai, P. Kalita, S. Gautam et al.  
University of Illinois at Urbana-Champaign