



**MOVING
FORWARD:
TRAFFIC
OPERATIONS AND
SAFETY RESEARCH
AT IDOT**

Traffic Engineering and Safety
Conference

October 14, 2015

OUTLINE

- Introduction to IDOT Research
- Traffic Operations and Roadside Maintenance Research
- Safety Research
- How You Can Get Involved



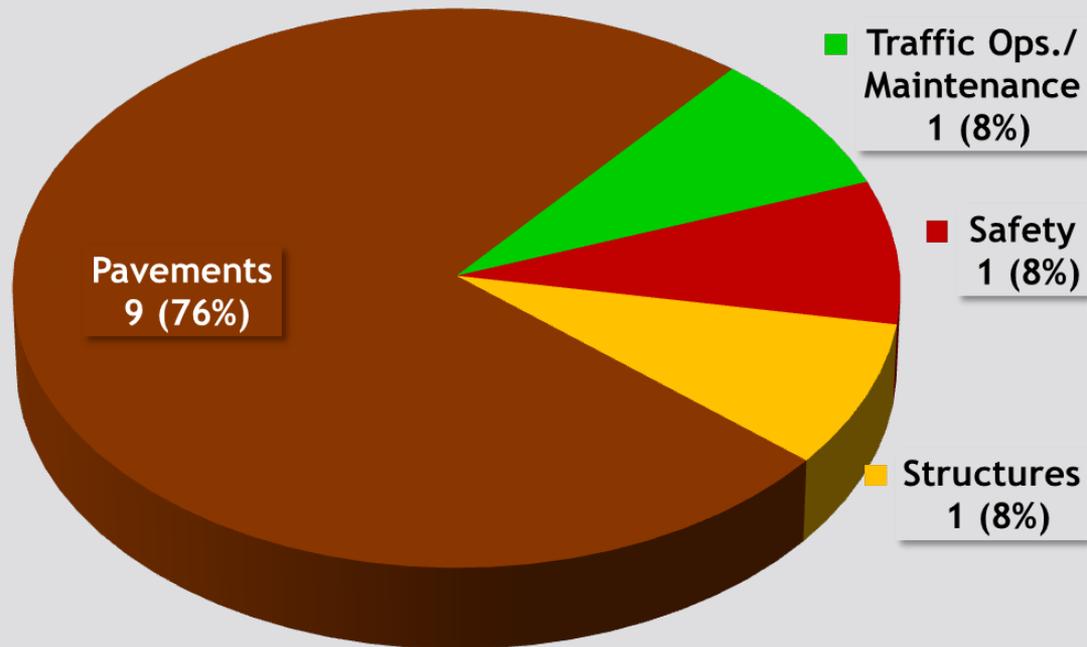
IDOT RESEARCH

Contract research is administered by the Illinois Center for Transportation (ICT) at ATREL

- Intergovernmental agreement between IDOT and University of Illinois Board of Trustees
- 3 Intergovernmental Agreements since 2005
- Current IGA is for \$33M from FY12 through FY16
- New IGA being negotiated

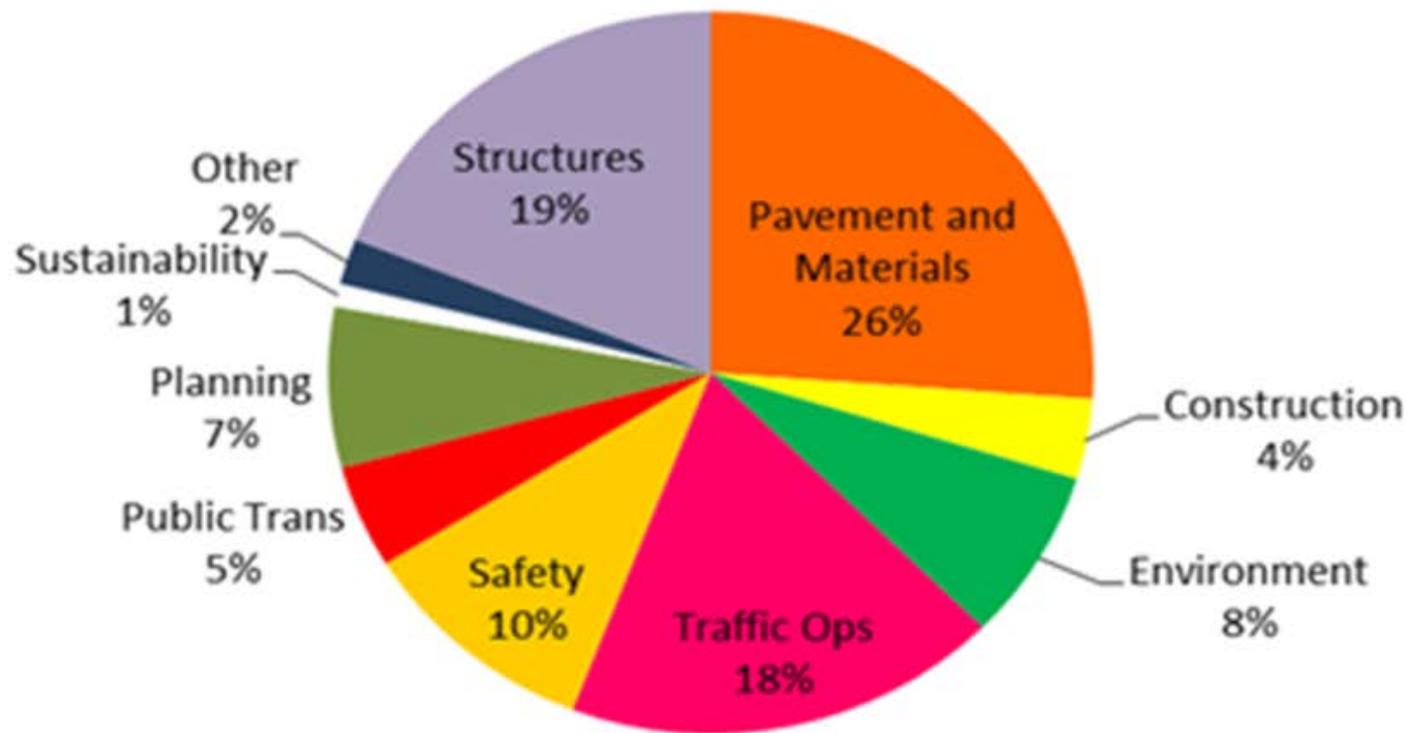
IDOT Research

THEN



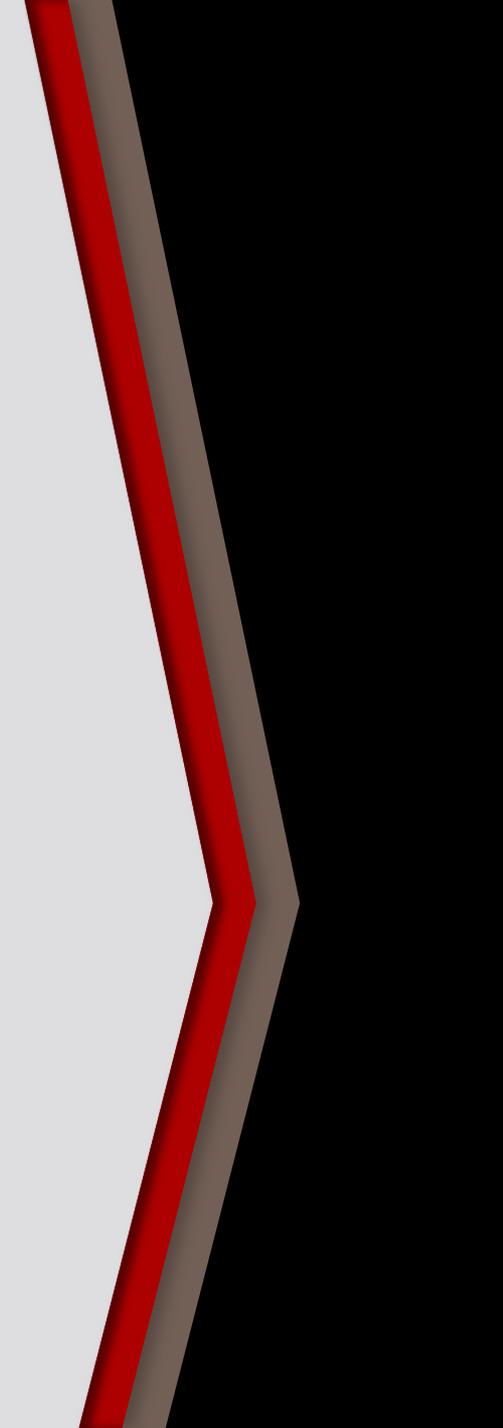
IDOT RESEARCH

NOW





Traffic Operations and Roadside Maintenance



Chloride Reduction Training

- Create training for IDOT, other agencies, and private sector snow and ice professionals
- Share best practices in winter maintenance
- Ensure safe travel is provided to the public in a sustainable manner
- Bottom line – reduce chloride loading on the environment





Chloride Reduction Training

- Topics covered
 - Purpose of winter maintenance
 - Application rates and calibration
 - Forecasts and storm tactics
- Two formats allow flexibility in approach
 - PowerPoint presentation with embedded videos
 - Series of short videos that present the information in 3- to 5-minute “learning chunks”

Chloride Reduction Training

- IDOT staff – Operations SharePoint site
- District training sessions
- Snow and Ice classes – Illinois Technology Transfer Center
 - September 18 – Libertyville
 - October 6 – Moline
 - October 13 – Schaumburg
 - October 28 – Carbondale
 - November 4 – Effingham
 - November 17 – Springfield
- Other states



Traffic Incident Management Operational and Training Guide (Phase I and II)

- Interstate crashes can result in property damage, traffic delays, and sometimes loss of life
- Loss can be compounded by secondary crashes
- Create training materials – in-class training and on-line modules - to help incident responders work more safely and effectively



Traffic Incident Management Operational and Training Guide (Phase I and II)

- In-person and online training for first responders – IDOT, Law Enforcement, Fire, Emergency Workers, Towing, Local Agencies
- Over 4,000 responders have been trained in class; nearly 500 online
- Attendees have consistently ranked training highly (4.5+ on a 5 point scale) and have ranked the instructors as highly knowledgeable (4.7+ on a 5 point scale)



Traffic Incident Management Operational and Training Guide (Phase I and II)

“Improved practices increase safety along Illinois roadways—creating quicker responses to crashes and other incidents, cutting down on lane restrictions, and reducing secondary crashes.”

Geno Koehler, Technical Review Panel Chair



Evaluating the Compatibility of Durable Pavement Markings on Pavements

- IDOT has used a wide variety of pavement marking systems – with varying success
- Evaluate the durability of various pavement markings on a variety of pavement types, traffic conditions, and snowfall events.
- Develop pavement marking installation and inspection guide including cost-benefit information



Evaluating the Compatibility of Durable Pavement Markings on Pavements

- Reference for selecting optimum pavement marking materials for different site criteria
- Provides matrices of recommended materials
- Developed procedure for inspecting the installation of markings for all marking types



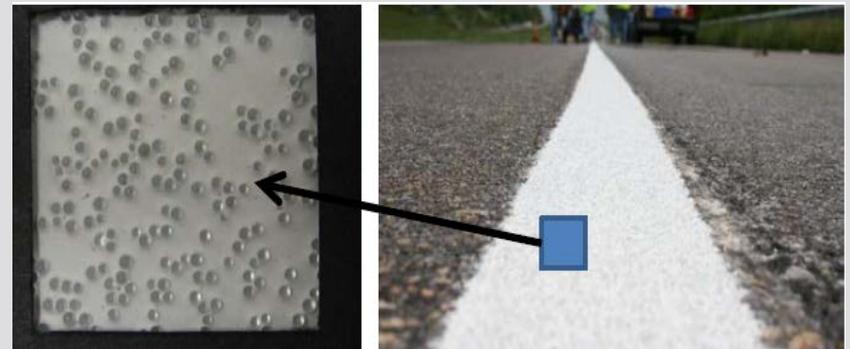
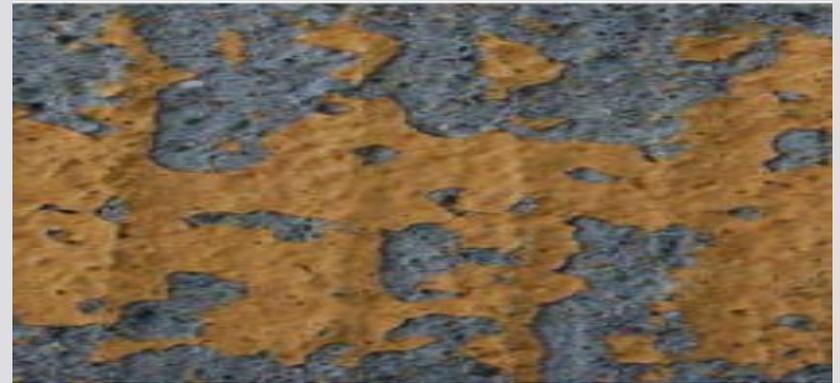
Evaluating All-Weather Pavement Markings and Lab Methods to Simulate Field Exposure

● PROBLEM

- How to recommend approval/rejection of various all-weather markings?

● SOLUTION

- Evaluate in-service all-weather pavement markings
- Develop lab tests that simulate degradation mechanisms in the field



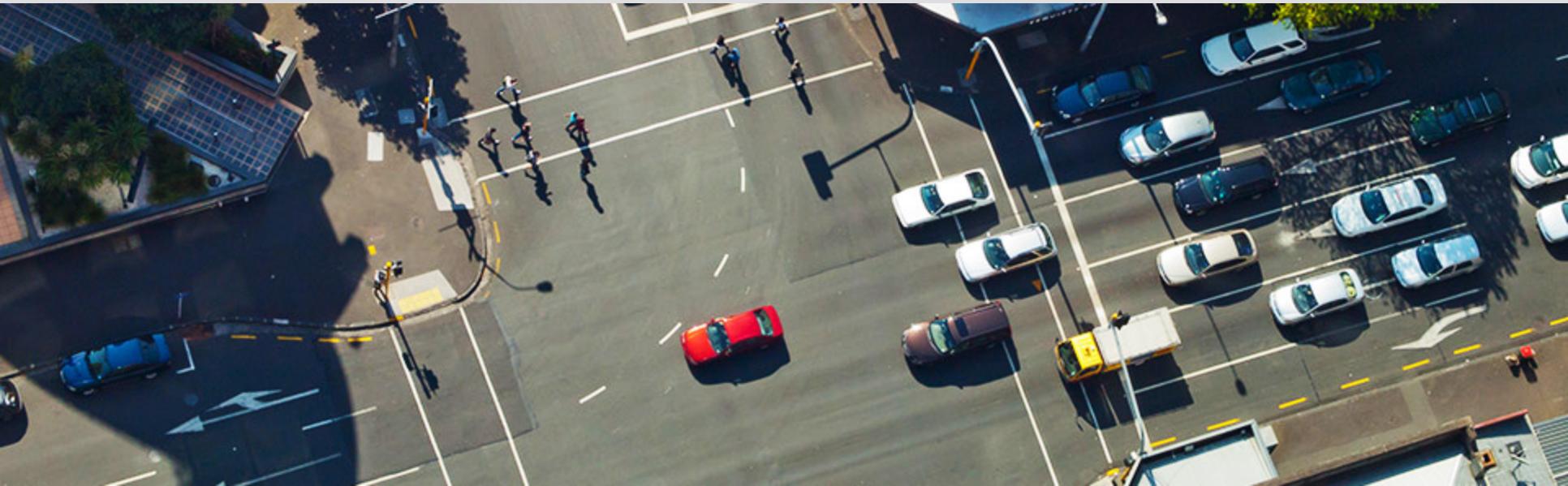


Safety and Efficiency Benefits of Implementing Adaptive Signal Control Technology (ASCT) in Illinois

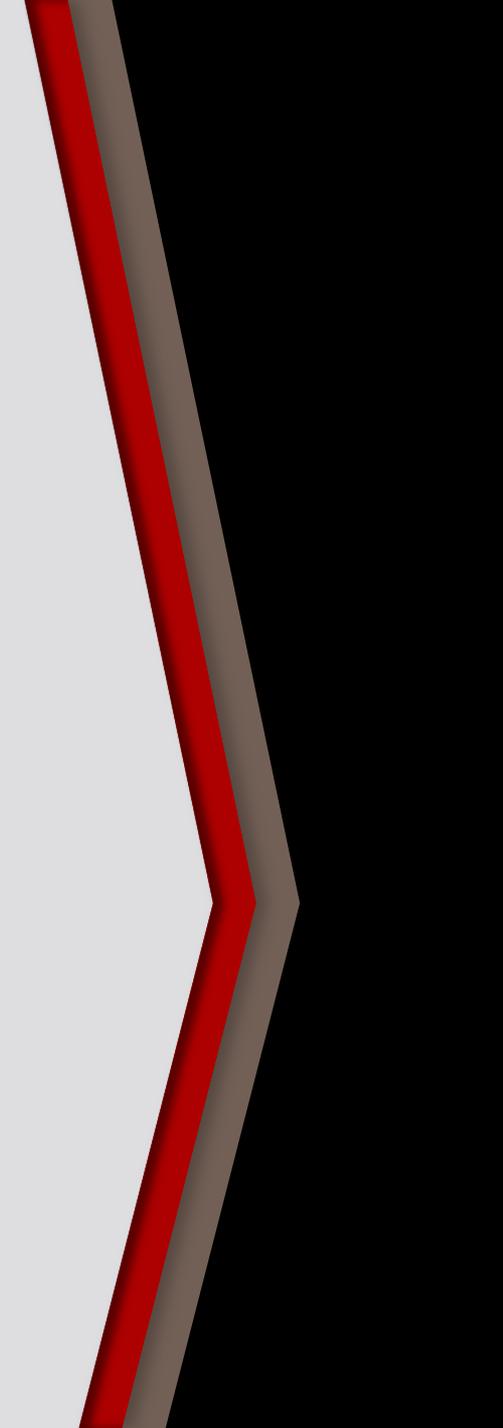
- Current coordinated signal systems have limited flexibility to adjust timings due to the changes in traffic capacity and demand
- ASCT can improve traffic flow and capacity by continuously adjusting signal timings based on the changes in traffic demand
- ASCT can also improve traffic safety
 - Reduce rear-end crashes by reducing the number of stops and promoting more consistent and uniform speeds throughout the corridor.
 - By adjusting intersection phase times to demand, angle and red-light running crashes are reduced

Safety and Efficiency Benefits of Implementing Adaptive Signal Control Technology (ASCT) in Illinois

- ASCT installed on Neil Street in Champaign
- Traffic volume, queue length, and signal timing data has been collected for “standard” traffic and special events
- Collect pre- and post-installation crash and efficiency data, and calculate crash modification factor
- Results will provide IDOT with specific information regarding the safety and efficiency benefits of ASCT



Safety Engineering



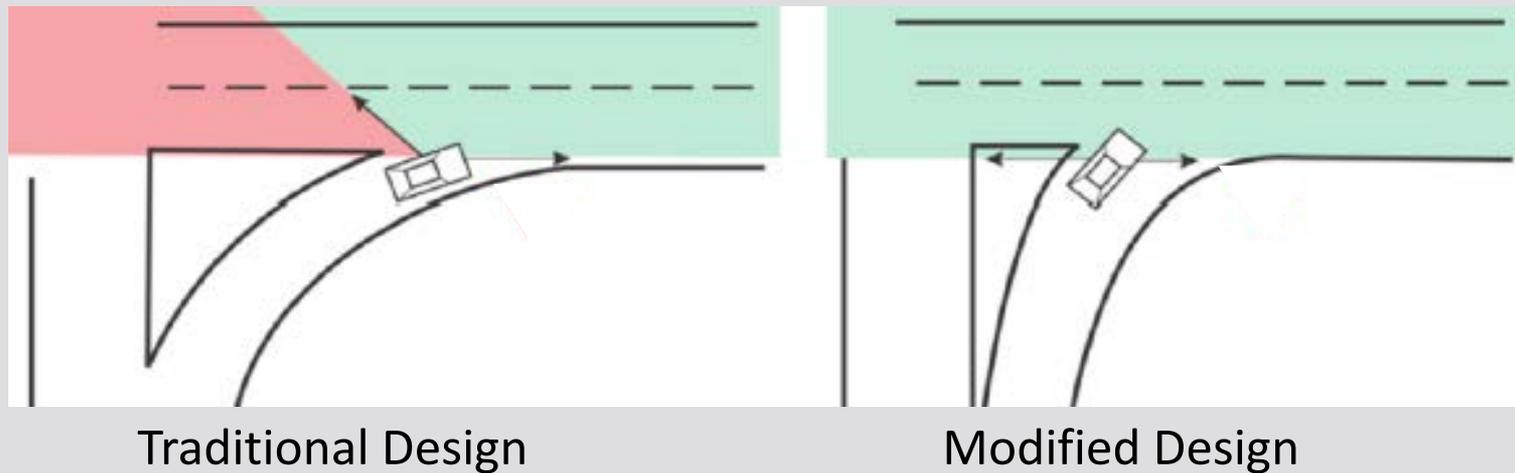
Effects of Intersection Right-Turn Lane Design & Skew on Safety & Operations

- Raised channelized islands with exclusive right-turn lanes pose problems
 - Reduced sight distance
 - Increased rear-end/turning crashes
 - Pedestrian conflicts



Effects of Intersection Right-Turn Lane Design & Skew on Safety & Operations

- Reconfigured right-hand turn lanes
 - Develop test and control sites to examine effectiveness of the right-turn lane treatment
 - Quantify crash reductions and operational improvements
 - Develop Crash Modification Factors
 - Develop Benefit/Cost analysis





Effects of Intersection Right-Turn Lane Design & Skew on Safety & Operations

- Study slated to end 6/30/2016
- Preliminary results indicate:
 - RT Related Crashes at Subject Approach - 61% Reduction
 - Intersection Injury (K,A,B,C) Crashes - 39% Reduction
- Forthcoming Research products
 - Technical Brief
 - Webinar on Right-Turn Lane Design and Skew – Stay Tuned!

Investigation of Contributing Factors Regarding Wrong-Way Driving (WWD) on Freeways (PH I and II)

● Phase I

- Identify factors that contribute to WWD
- Develop counter-measures to reduce driving errors and related crashes

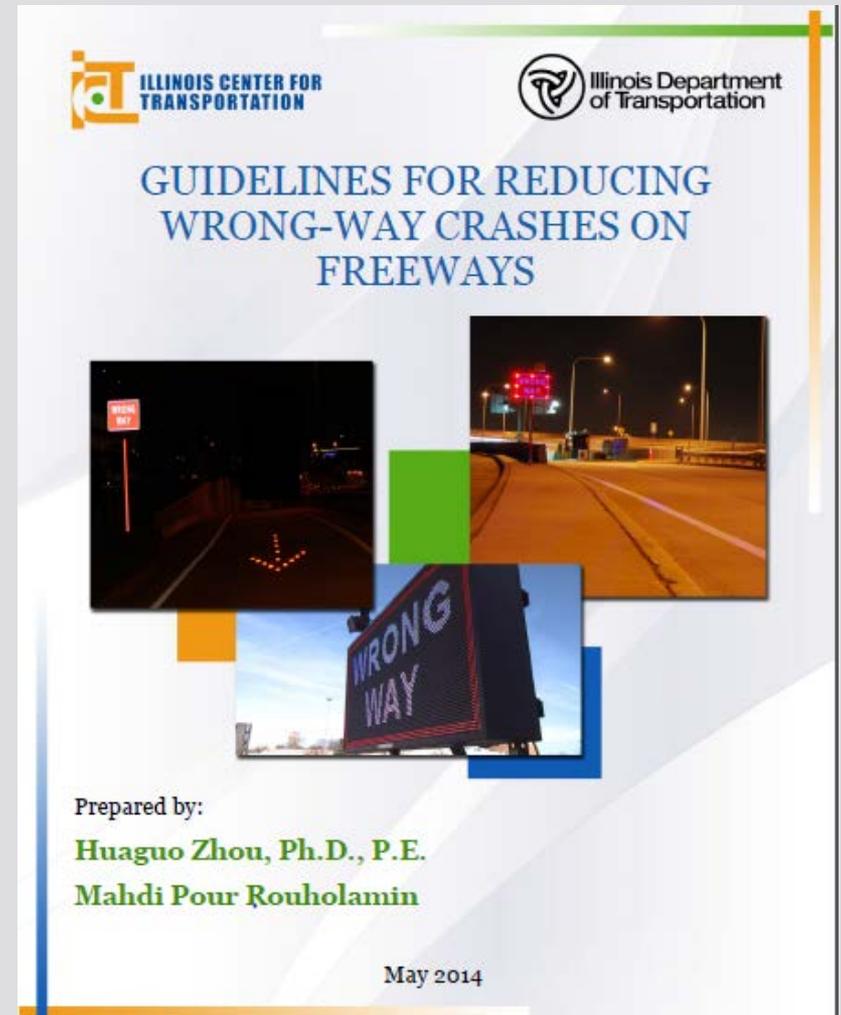
● Phase II

- Develop guidebook on WWD countermeasures
- Organize nationwide peer-to-peer workshop
- Before-and-after study showing impact of deployed countermeasures



Investigation of Contributing Factors Regarding Wrong-Way Driving (WWD) on Freeways (PH I and II)

- WWD Countermeasures Guidebook
- ATSSA Preliminary Guidebook
- National WWD Summit
- Updated details for ramp signage
- Class on new details and countermeasures
- Before/after study
 - Nearly 40% reduction in WWD crashes
 - Almost 13% reduction in WWD fatal crashes



Investigation of Contributing Factors Regarding Wrong-Way Driving (WWD) on Freeways (PH I and II)

- ***“...helped us (IDOT) better understand the contributing factors such as time of day, types of interchanges, roadway features, and behavior aspects that are over-represented in wrong way driving crashes.” “...results allowed IDOT to utilize limited safety funds and enhance the safety performance of over 300 interchanges across the state through improved pavement markings and signing.”*** Priscilla Tobias, Technical Review Panel Co-Chair
- ***“I ... know of several cases in which the summit and the WWD documents inspired other states to embark on their own initiatives to address the safety challenge. While that is certainly a testament to the value of this project, it also wouldn't have been possible without the involvement of IDOT folks at national levels. ... This is exactly the kind of state-led, nationally coordinated effort that produces positive results across the country.”*** Jeffrey Shaw, Intersections Program Manager for the FHWA Office of Safety

IDOT Research IS

- Practical: Implementation is the goal of every study
- Mission Based: Projects are narrowed down by the experts, and selected based on their impact to the Department and our mission
- Used every day at IDOT:

Clearing Snow

Seeding Specifications

Crash Reduction

Work Zone Safety

Building Bridges

Training Modules

Signalization

Testing Materials



You can...

- Get Involved!
 - Submit Research Needs to Technical Advisory Group members
 - Review the Research Needs on the ICT website and provide feedback
- Be the Expert!
 - Volunteer to be on a Technical Review Panel
 - Assist with Implementation
- Tell your Colleagues!
 - Encourage your co-workers to learn more about IDOT's Research Program

[ICT website: http://ict.illinois.edu](http://ict.illinois.edu)

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