

Evaluation of a Dust Detection and Communication System

ADOT-NOAA Dust Workshop

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Background

- ▶ *Communication Plan for Windblown Dust* completed in 2015
http://apps.azdot.gov/ADOTLibrary/publications/project_reports/pdf/az723.pdf
- ▶ ADOT Research Center project
Dianne Kresich, project manager
Tim Tait, ADOT Communications, project sponsor
- ▶ Explored other states' practices in detection and communication of roadway visibility issues
- ▶ Surveyed drivers to better understand driving behaviors, information sources, communication preferences

Background

- ▶ *Communication Plan for Windblown Dust*
- ▶ Recommendations included:
 - Modify “Pull Aside, Stay Alive” messaging to clarify instructions to drivers, provide reasons for tips
“Why should I turn my lights off?”
 - Tailor communication to audience demographic: consider media preferences, seek new methods
 - Inform out-of-state drivers of dust hazards
 - Consider increasing number of DMS on I-10
 - Support research on dust detection and communication

New research study

- ▶ *Evaluation of a Dust Detection and Communication System*
- ▶ ADOT Research Center project
Dianne Kresich, project manager
- ▶ Sponsored by ADOT Traffic Systems Management and Operations, and the ADOT Tucson District
Brent Cain, Sponsor
Rod Lane, Champion

New research study

- ▶ *Evaluation of a Dust Detection and Communication System*
- ▶ Technical Advisory Committee includes representatives of:
 - ADOT TSM&O Communications
 - Southeast District State Engineer's Office
 - Southcentral District FHWA
- ▶ Will call upon technical experts for input
- ▶ Will update dust stakeholders

New research study

- ▶ Why conduct this study?

ADOT wants to inform drivers about windblown dust hazards in real-time so that drivers can make decisions to enhance their safety.

What devices/technology may help us achieve this?

Are any devices/technology feasible for field testing?

Research team

- ▶ University of Arizona

Dr. Eric Betterton, Atmospheric Sciences

Dr. Ricardo Valerdi, Systems and Industrial Engineering

Dr. Hongki Jo, Civil Engineering – Engineering Mechanics



Research scope: Literature review

- ▶ Literature review

What can we learn from existing research, manufacturer's literature, other sources?



What is already known?

What are the gaps in our understanding?

Research scope: Evaluation

- ▶ Develop criteria for the evaluation of dust detection devices:

Accuracy

Reliability

Installation needs

Sensitivity

Longevity under desert conditions

False alert rate

Principle of operation

Ability to communicate with ADOT systems in real time

Compatibility of devices with existing ADOT infrastructure

Research scope: Evaluation

- ▶ Identify and evaluate devices
- ▶ Determine if devices are appropriate for field testing
 - Field testing would be performed in a separate study
- ▶ Estimate system cost



Next steps

- ▶ Begin study May 2016
- ▶ Final report expected within a year

