

# 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](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

