Dust Storms in Arizona: The Challenge to Ensure Motorist Safety

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Dust Storms in Arizona
An Overview

- Arizona Dust Storm Phenomenon
- Motorist Safety
- Extreme Weather Event:
  Oct. 4, 2011 Interstate 10 dust storm
- Lessons Learned
- Best Practices
Arizona Dust Storm Phenomenon

What
- Cloud of loose soil kicked up by straight-line and downdraft winds
- Wall of dust miles long extending 5,000 feet above the ground
- Similar to a Middle Eastern *haboob* (Arabic for “blast”)

Where
- Especially in areas of flat land, agricultural fields and dry riverbeds

When
- Primarily during spring winds and summer monsoon storms

Photo courtesy of Mike Olbinski Photography
Dust Storms in Arizona
Unsafe for Drivers

- Blowing dust is unpredictable and appears with little warning
- Visibility reduced to near zero in seconds
- Dust storms combined with high-speed interstate freeway traffic is recipe for multi-car collisions and fatalities
- Too many motorists risk driving through a dust storm
- Proper actions taken by motorists critical for their safety
Dust Storms on Highways
Deadly to Motorists

- Blowing dust has been a contributing factor in more than 1,000 vehicle crashes in Arizona since 2000

2000 – 2011
Collisions: 1,207
Fatalities: 40
Injuries: 1,136
A Driver’s-Eye View of a Dust Storm
Extreme Weather Event:
Dust Storm — Oct. 4, 2011
Interstate 10 between Phoenix and Tucson

- Dust storm engulfed a heavily traveled freeway corridor
- Three separate, multicar collisions involved more than 25 vehicles
- One fatality and multiple critical injuries
- Freeway closed for emergency response, cleanup and incident investigation
Lessons Learned

- Motorists require more dust storm safety education
  - “Pull Aside, Stay Alive” public outreach campaign

- Partnering with other agencies necessary
  - Dust Storm Workshop
  - Federal assistance with roadside alert systems
Lessons Learned

- Utilize all alert mechanisms
  - 5-1-1 traffic information system (online and phone)
  - Overhead electronic message boards
  - Twitter and Facebook
  - Wireless Emergency Alerts
  - Dust storm alert mobile app
  - Real-time roadside alert system testing
  - Others developed in the future
Best Practices
Motorist Education

- “Pull Aside, Stay Alive” public outreach safety campaign
- “Haboob Haiku” writing challenge

Most popular haiku submission:

Dust blows, swirls and grows
Roadways become danger zones
Pull over, lights off.
PullAsideStayAlive.org
Public Service Announcement
Best Practices
Incident Debriefing

- Perform a debriefing session after a statewide major roadway incident and full road closure in Phoenix area
- Participants are ADOT, DPS, towing company, county DOT
- “Lessons Learned” discussions
- Coordinate interagency processes to efficiently manage incidents and open roadways more quickly
- Immediate and tangible improvements to incident management are achieved through debriefing
Best Practices

Dust Storm Workshop

- Annual collaboration with experts and stakeholders
  - More than 50 participants from local air quality, public safety and transportation agencies
  - Discuss dust storm impact mitigation
  - Set goals for public outreach, monitoring and alerts
Best Practices

Overhead Message Boards

- More than 160 message boards on highways throughout the state

- Dust storm advisory and warning messages:
  - “Dust Storm Ahead”
  - “Limited Visibility, Blowing Dust”
  - “Watch for Dust Storm Ahead”
Best Practices

5-1-1 System and Travel Alerts

- ADOT’s 5-1-1 travel/traffic information features phone and online system
- Used to inform drivers about dust storm activity
- Road condition media alerts and Twitter/Facebook alerts 20 hours a day/365 days a year
- “Floodgate” message on 5-1-1 phone system draws priority attention to extreme events
Best Practices

DUST Monitoring System

- Pilot test program with FHWA
- DUST = Dual Use Safety Technology

- Weather monitoring stations trigger warning signs that direct motorists to radio alerts
Best Practices

Wireless Emergency Alerts

- Created by FCC in 2012
- Alerts sent automatically via all major wireless providers to most newer smartphones
- Text message from National Weather Service will alert citizens in the area of a dust storm
Best Practices

Dust Storm Mobile App

- Developed by University of Arizona with ADOT assistance
- Dust storm watches and warnings available based on phone’s geographic location
- Includes ADOT’s “Pull Aside, Stay Alive” driving safety messages
- Designed for iPhone; Android version to follow
Best Practices

Climate Study Pilot Project

- One of 19 pilot studies awarded by FHWA in April 2013
- 18-month study
- Seeks to further determine the impact of extreme weather and climate on transportation infrastructure
- Data will contribute to better dust storm early warning and motorist education
Conclusions

- Utilize social media for public outreach and education
- Implement best available alert technology
- Debrief with partner agencies on incident response
- Study the natural environment to develop better extreme weather event prediction methods
May I provide more information?

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