



Dust Storms in Arizona: The Challenge to Ensure Motorist Safety

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AASHTO Extreme Weather Event Symposium

May 21, 2013

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



Photo courtesy of Mike Olbinski Photography

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

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.*

PULL ASIDE • STAY ALIVE



Will you know what to do?

ADOT



Avoid driving into or through a dust storm.

If you encounter a dust storm, **immediately check traffic around your vehicle** (front, back and to the side) and **begin slowing down**.

Do not wait until poor visibility makes it difficult to safely pull off the roadway -- do it as soon as possible. **Completely exit the highway if you can.**

Do not stop in a travel lane or in the emergency lane. Look for a safe place to pull completely off the paved portion of the roadway.

Turn off all vehicle lights, including your emergency flashers.

Set your emergency brake and **take your foot off the brake**.

Stay in the vehicle with your seatbelts buckled and wait for the storm to pass.

Drivers of high-profile vehicles should **be especially aware of changing weather conditions and travel at reduced speeds**.

- [Printable PDF file](#)
- [Español - archivo para imprimir](#)

PullAsideStayAlive.org

ADOT

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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