Dust Detection and Warning System
I-10 Sunshine Blvd to Picacho Peak Rd

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Dust Storms in Arizona

- October 2013 – dust storm related crash on I-10, **kills three people**
- Since 2000, dust has contributed to **1,207 collisions** resulting in **40 fatalities** and **1,136 injuries**.
- The ‘Season’ for dust storms in Pinal County is usually associated with the summer monsoons, but has been extending into the fall
Dust Related Crashes on I-10

Aug 2010 to Aug 2015

- 3 Fatal
- 5 Incapacitating
- 27 Non-Incapacitating
- 6 Possible
- 42 Property Damage Only

83 Crashes in 5 years
Dust Related Crashes on I-10
MP 213.6 and 214.1

- 43 of the 83 crashes occurred between MP 213.6 and 214.1
Project Background

- ADOT received federal funds to design and construct a dust warning system on I-10.
  1. HSIP
  2. Fast Lane Grant

- This project is part of larger project to realign and widen I-10 in this area.
  1. Will be Combined with the SR 87 Interchange Reconstruction Project
  2. Designed separately but will be combined and advertised as 1 project
Project Schedule

This project is on an accelerated schedule

- Clearances anticipated mid-April
- Bid Ready plans set anticipated late-May
- Advertisement in Mid June
Project Objectives

- Detect dust conditions in the corridor
- Provide advance warning of blowing dust approaching the corridor
- Disseminate real-time information to motorists
  1. In the corridor
  2. Approaching the corridor
- Trigger the VSL to lower speed limit
- Provide real-time video to the TOC and DPS to confirm conditions
Project Description (MP 209-219)

Dynamic Message Signs

- Make use of existing DMS
- Roadside mounted signs and overhead mounted signs
- Provide advance notification of visibility approaching the corridor
- Can use of other purposes at other times
Project Description (MP 209-219)

Dynamic Message Signs

CCTV

- One CCTV every 2 miles
- Provide confirmation of road conditions in the corridor
Project Description (MP 209-219)

Dynamic Message Signs
CCTV
Long Range Dust Detection

- 1 installation for the entire project
- Looks for dust and low visibility conditions within the corridor
- Located at the north end of the corridor because of the mountains to the south
- Range of 40 miles
Dynamic Message Signs
CCTV
Long Range Dust Detection
Visibility Sensors in the Corridor

- 1 installation per mile
- 1 installation per ½ mile MP 212-214
- 13 total installations
- Forward scatter technology
- Measures visibility at a “spot” location

Project Description (MP 209-219)
Project Description (MP 209-219)

Dynamic Message Signs
CCTV
Long Range Dust Detection
Visibility Sensors in the Corridor
Loop Detection

- 3 EB and 3 WB Stations
- Volume, Speed, Occupancy
- Confirm conditions in the corridor
Dynamic Message Signs
CCTV
Long Range Dust Detection
Visibility Sensors in the Corridor
Loop Detection
**Variable Speed Limits**

- Full Matrix
- Capable of alternate text for alerts
- 3 Speed Conditions (Normal, 65, 35)
- Some Dark When Not Used
Systems Operation Overview

- New software automates system functions in response to detected weather conditions
- Example: If spot visibility detectors detect visibility below set threshold, it will automatically:
  - Send an alert to the TOC other agencies (NWS; Pinal County; DPS; etc.)
  - Display CCTV feeds on video wall;
  - Lower speed limit with VSL
  - Display pre-defined message on DMS.
Next Steps

- Finalized Project Assessment and 30% plans
- Complete all clearances, 95% and final plans
- Project to be advertised in 2017
- Project part of SR 87 Interchange Project
- Construction anticipated FY 2018