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

Project Update

February 27, 2018
Project Background

- 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
Aug 2010 to Aug 2015
• 3 Fatal
• 5 Incapacitating
• 27 Non-Incapacitating
• 6 Possible
• 42 Property Damage Only

83 Crashes in 5 years
Project Infrastructure Overview

- Conduit, Pull Boxes and Fiber
- CCTV Cameras
- DMS
- Mainline Detection
- Spot Detection
- Long Range Detection
- Variable Speed Limit Signs
- Communications
Project Infrastructure Overview

Existing Technology used by ADOT
Project Infrastructure Overview

Conduit, Pull Boxes and Fiber

• Urban type of design because of many devices
• Considered direct bury fiber
• 2-3” conduits on one side of I-10

  a. 144 SMFO cable in one conduit
  b. 2nd conduit for power conductors or spare
Project Infrastructure Overview

Conduit, Pull Boxes and Fiber

• No. 9 Pull Boxes along trunkline

• No. 7 Pull Boxes
  a. Near cabinets (where required)
  b. At sawcut loop locations
Project Infrastructure Overview

CCTV Cameras

• One CCTV every 2 miles
• Provide confirmation of road conditions in the corridor
• ADOT Standard Camera
• Will be one of 3 listed in Specs
  a. Cohu
  b. Bosch
  c. WTI
Project Infrastructure Overview

CCTV Cameras
• Mounted on 55’ tall pole w/lowering device
• Provide coverage of I-10 and have view of DMS

• Additional CCTV camera on TS pole at SR 87 TI
• Will use existing CCTV camera at WB I-10 MP 217
Project Infrastructure Overview

DMS

• Procured off existing ADOT on-call contract (Daktronics)
• Walk-in DMS, Cabinet, DMS controller, and power/communications cabling installed by contractor
• Mounted on ADOT Standard ‘T’ structures
• Will use existing DMS at WB I-10 MP 217
Project Infrastructure Overview

DMS
Mainline Detection

- Sawcut loops per ADOT Standard Details
- 3 EB and 3 WB Stations
- Measures Volume, Speed, Occupancy
- Confirm conditions in the corridor
- Model 2070 controller furnished and installed by the contractor at each location
Project Infrastructure Overview

New Technology for ADOT
Project Infrastructure Overview

Spot Detection

- Forward scatter technology
- Measures visibility at a “spot” location
- Very accurate up to 1 mile
Project Infrastructure Overview

Spot Detection
- 1 installation per mile
- 1 installation per ½ mile MP 212-214
- 13 total installations
- Each sensor mounted on a pole
- Shares a cabinet with other device at most locations
Project Infrastructure Overview

• Spot Detection
• Spot Detector, Cabinet, controller, and power/comm cabling furnished and installed by contractor
• Specific Model manufactured by Vaisala
Project Infrastructure Overview

Spot Detection
Long Range Detection
- X-band radar technology
- 1 installation for the entire project
- Looks for low visibility conditions outside the corridor
- Located at the north end of the corridor because of the mountains to the south
- Range of 40 miles
Project Infrastructure Overview

Long Range Detection
Project Infrastructure Overview

Long Range Detection

• Mounted on a 20’ tall monotube structure
• Inside a radome
Project Infrastructure Overview

Long Range Detection

- Detector, Cabinet, controller, and power/comm cabling furnished and installed by contractor
- Specific Model manufactured by EEC
Project Infrastructure Overview

Long Range Detection
Project Infrastructure Overview

Variable Speed Limit Signs

• **Hybrid Type VSL**
  a. Static MUTCD compliant speed limit sign
  b. Digital display of speed limit digits
  c. **NOT** Full Matrix

• 4 VSL spaced 1000’ apart at entrance to the corridor
• Procured off existing ADOT on-call contract (Daktronics)
• Remove existing static signs
Project Infrastructure Overview

Variable Speed Limit Signs
Project Infrastructure Overview

Variable Speed Limit Signs
Project Infrastructure Overview

Variable Speed Limit Signs Example
Variable Speed Limit Signs

- VSL on each side of I-10 at each location
- One VSL controller at each location will control both VSL
- Mounted on 15’ Pole w/breakaway base
Project Infrastructure Overview

Speed Feedback Signs

• 1 per direction (EB and WB)
• Located after speed reduction sequence
• Speed Feedback Signs, controller, and power/comm cabling furnished and installed by contractor
Communications Equipment

- Ethernet communications at cabinet level
- Communications between corridor TOC via Internet connection
- A single network connection between one field cabinet and the Internet Service provider
Everything Works Together!