



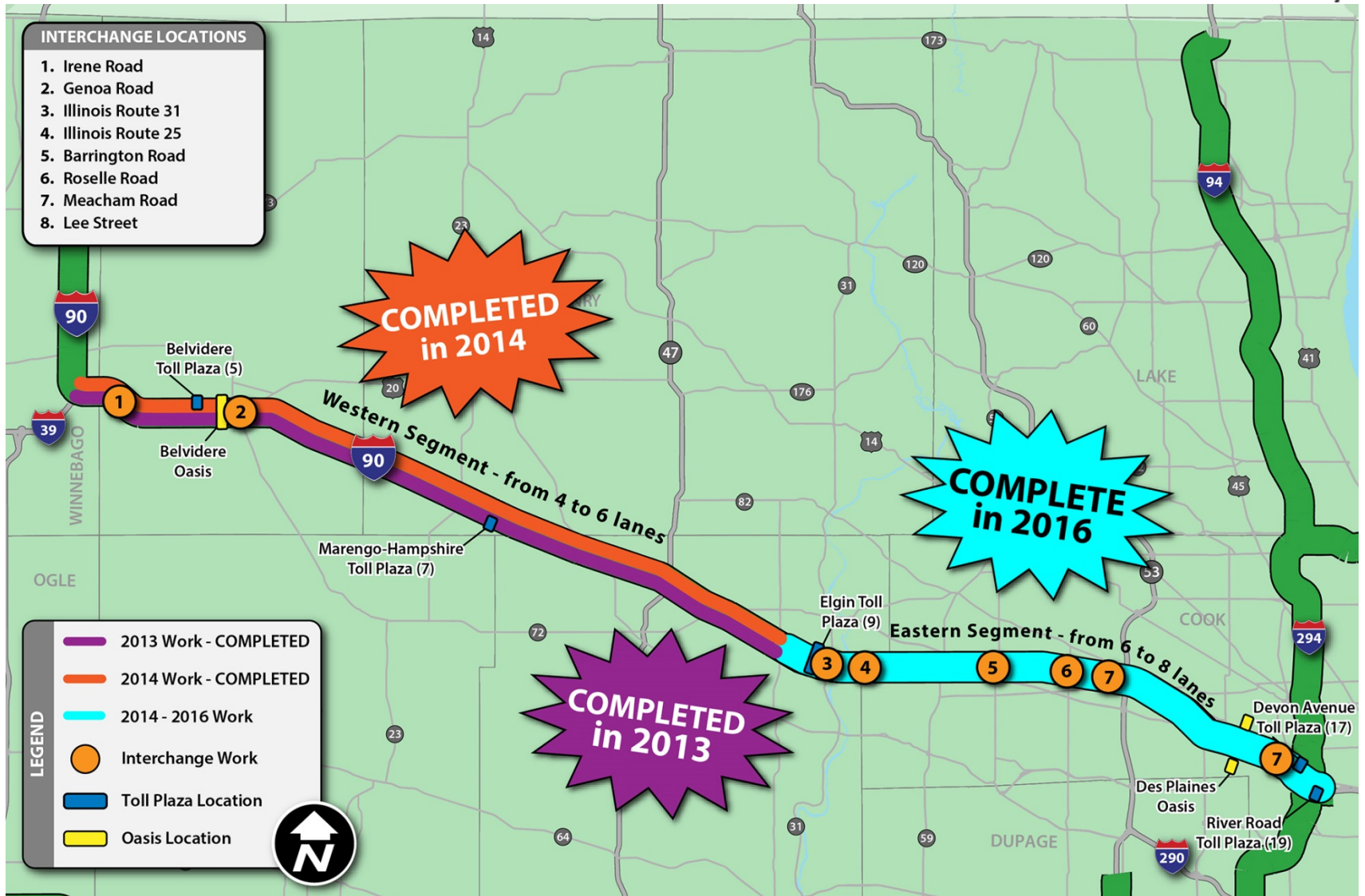
Transportation Highway Engineering Conference

February 24, 2015

Today's Agenda

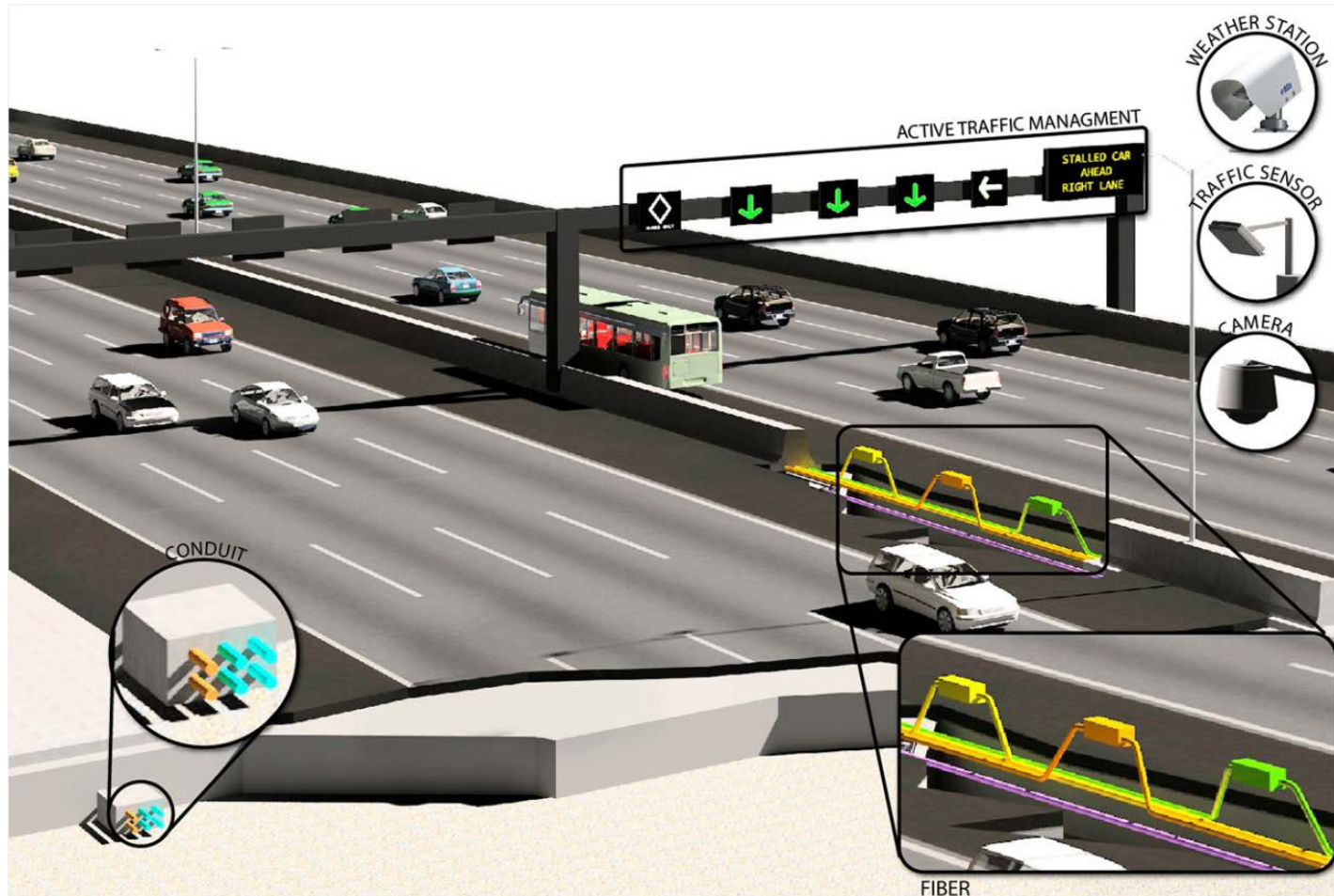
- ▶ *Move Illinois* status
- ▶ **Jane Addams Memorial (I-90) Rebuilding and Widening Project**
- ▶ **Building a 21st century corridor**
 - ▶ Incorporating Intelligent Transportation Systems (ITS)
 - ▶ Installing smart corridor elements
 - ▶ Implementing active traffic management (ATM)
- ▶ **Connected vehicles**

I-90 Rebuilding and Widening Project

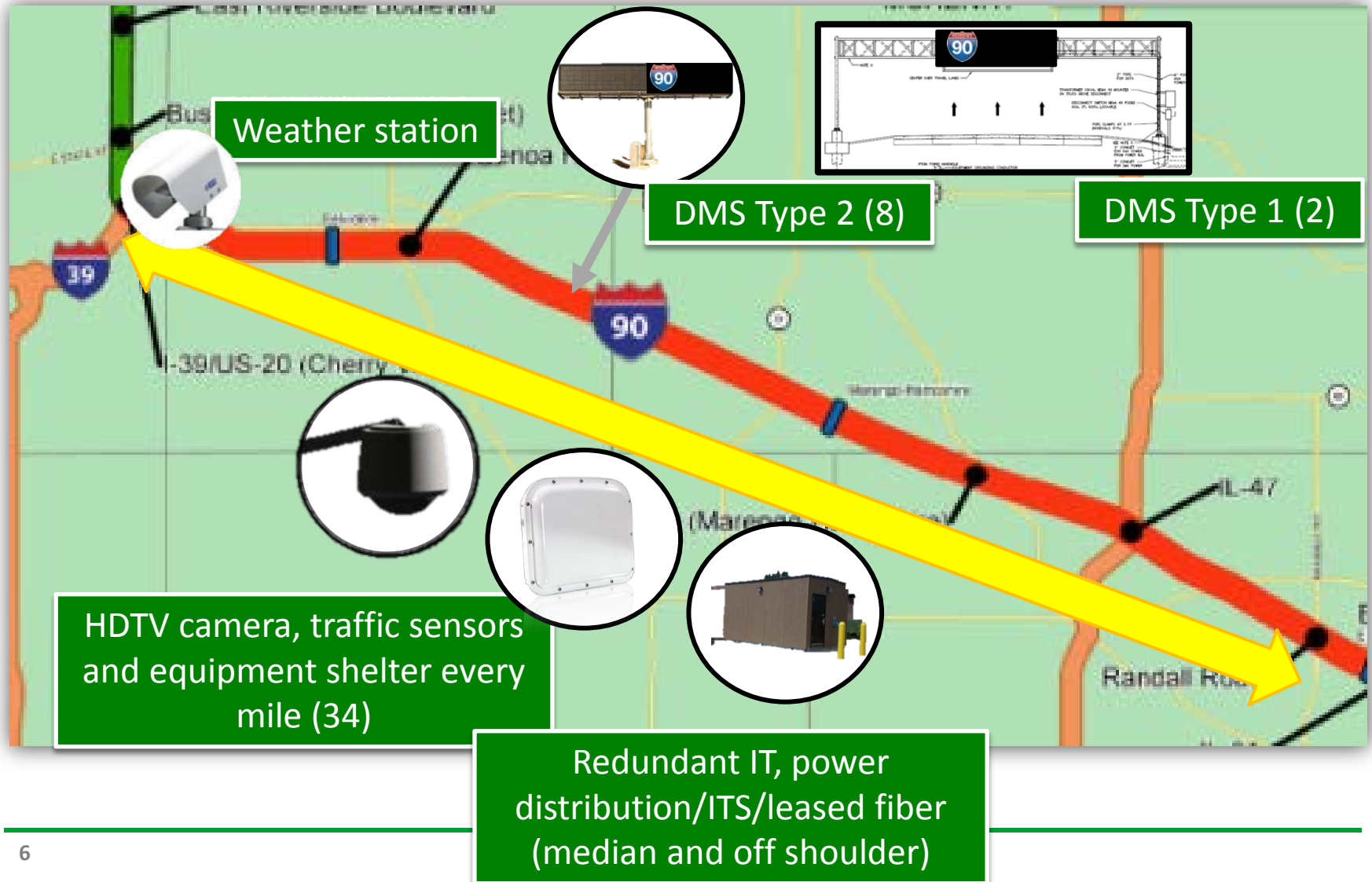


Building a 21st Century Corridor

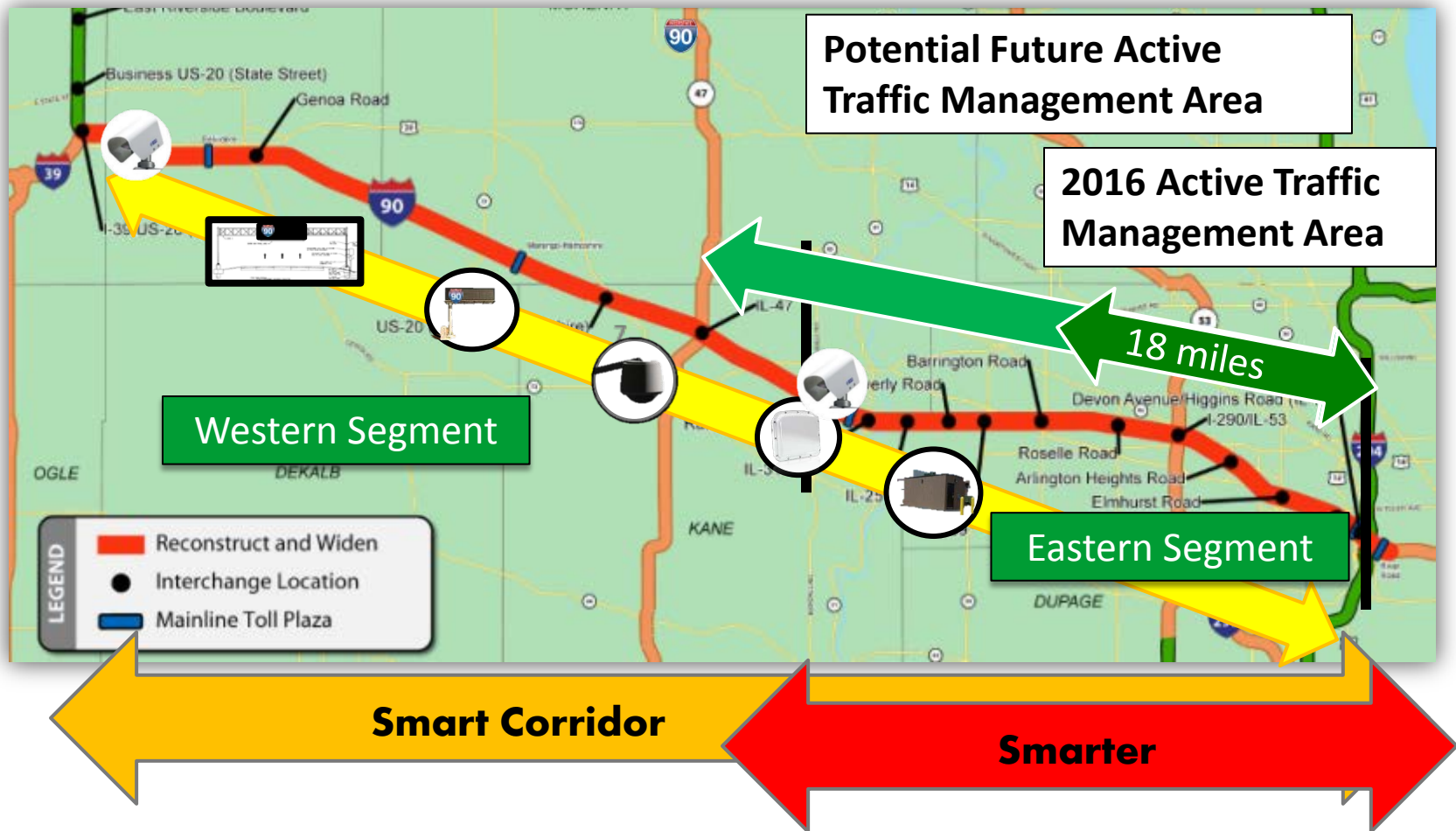
Flexible infrastructure to incorporate smart features



ITS Elements on the Western Segment



ITS Elements on the Eastern Segment



Integrated Power and Distribution Center

- ▶ **Shelter provides power and communication**
 - ▶ Roadway lighting
 - ▶ Cameras
 - ▶ Dynamic message signs (DMS)
 - ▶ Vehicle detection system
 - ▶ Active traffic management (ATM) equipment
 - ▶ Tolling equipment (if needed)



Installing Smart Corridor Elements

- ▶ **Upgraded and expanded roadway camera system**
- ▶ **Traffic sensors**
 - ▶ Microwave vehicle detection system (mainline)
 - ▶ Queue detection application (ramps)
- ▶ **New weather stations**
- ▶ **Upgraded dynamic message signs**
- ▶ **Weigh-in-motion**

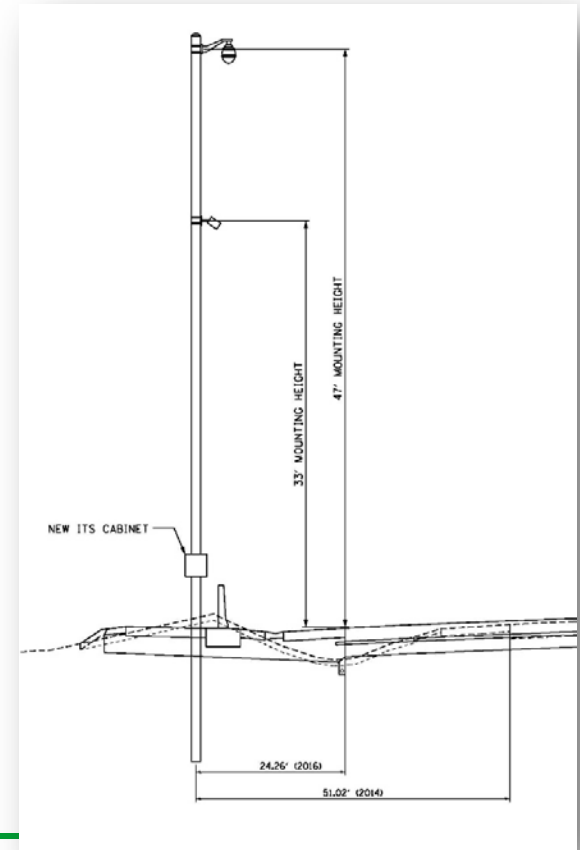
Roadway Camera System

- ▶ **11 cameras evaluated in three stages**
 - ▶ Stage one: paper analysis vs. seven criteria
 - ▶ Stage two: Traffic and Incident Management System integration
 - ▶ Stage three: hands-on video quality

High Definition Digital Camera Evaluation
for ISTHA Roadway Applications
August 26, 2013



Evaluation Team:
ISTHA, AECOM, BV&J, Delcan, SDI, TranSmart



Microwave Vehicle Detection System

- ▶ **Non-intrusive to the pavement**
- ▶ **Highly accurate and reliable (volume and speed)**
- ▶ **Mounted with little or no offset ease of calibration and setup**
- ▶ **Continuous data during construction**
- ▶ **Low susceptibility to electromagnetic interference**
- ▶ **Compatible with existing systems**
- ▶ **Interchangeable**



Queue Detection Criteria

- ▶ Signal at ramp terminal
- ▶ Terminal to mainline is less than 2,000 feet or plaza to mainline is less than 1,000 feet

- ▶ Local major traffic generator
- ▶ 2030 ramp is LOS E
- ▶ Alignment does not provide clear line of sight

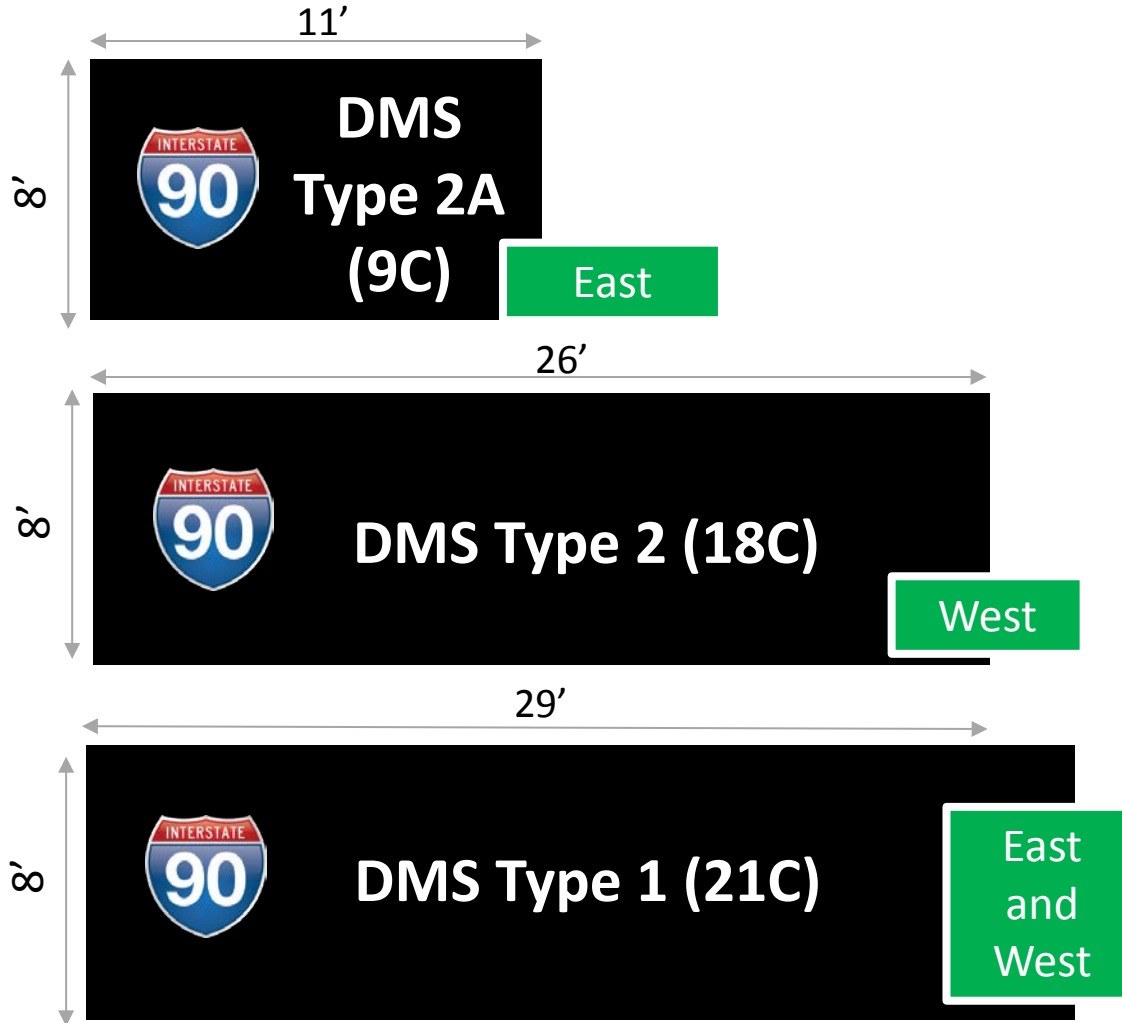
Location	Traffic Generator
Barrington Road	New Park & Rides; Hoffman Estates businesses, etc.
Meacham Road	Schaumburg Convention Center
Lee Street	O’Hare International Airport and cargo facilities; Rosemont businesses

Remote Weather Information System

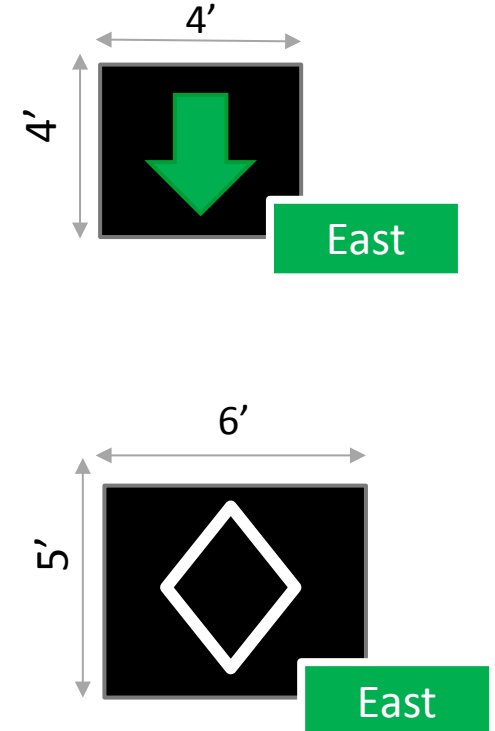
- ▶ **Field data processing unit**
- ▶ **30-foot lattice tower**
- ▶ **Air temperature/humidity sensor**
- ▶ **Precipitation/visibility sensor**
- ▶ **Subsurface temperature probe**
- ▶ **Approach (or departure) non-intrusive laser pavement sensor**
- ▶ **Bridge deck non-intrusive laser pavement sensor**



Dynamic Message Signs (DMS)

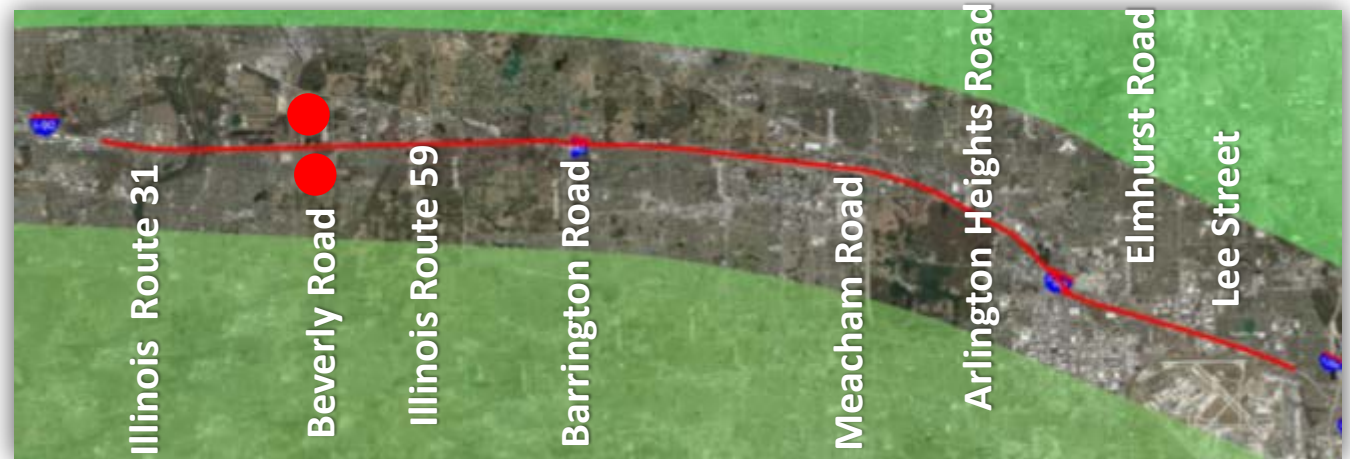


Lane Control Signs



Weigh-in-motion

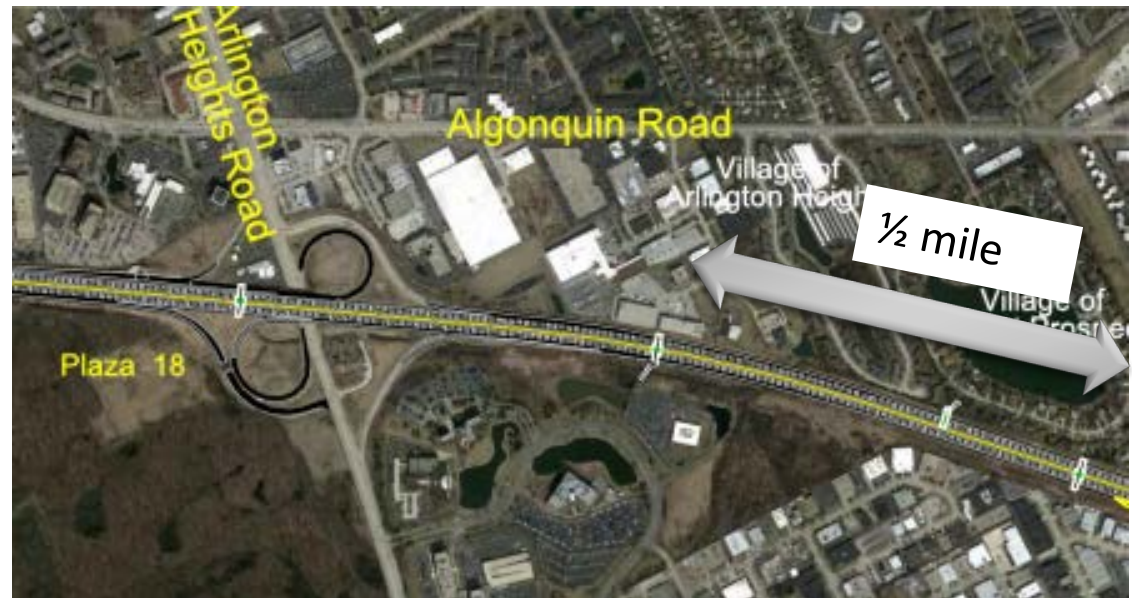
- ▶ Using performance specification
- ▶ Using bending plate technology per current success



What is Active Traffic Management (ATM)?

- ▶ **Overhead gantries placed every half mile that provide real-time information to alert drivers to:**
 - Nature and status of traffic incidents ahead
 - Ability to drive in the shoulder lanes
 - Advisory speeds
 - Proposed alternate routes
 - Real-time lane closures and traffic pattern changes

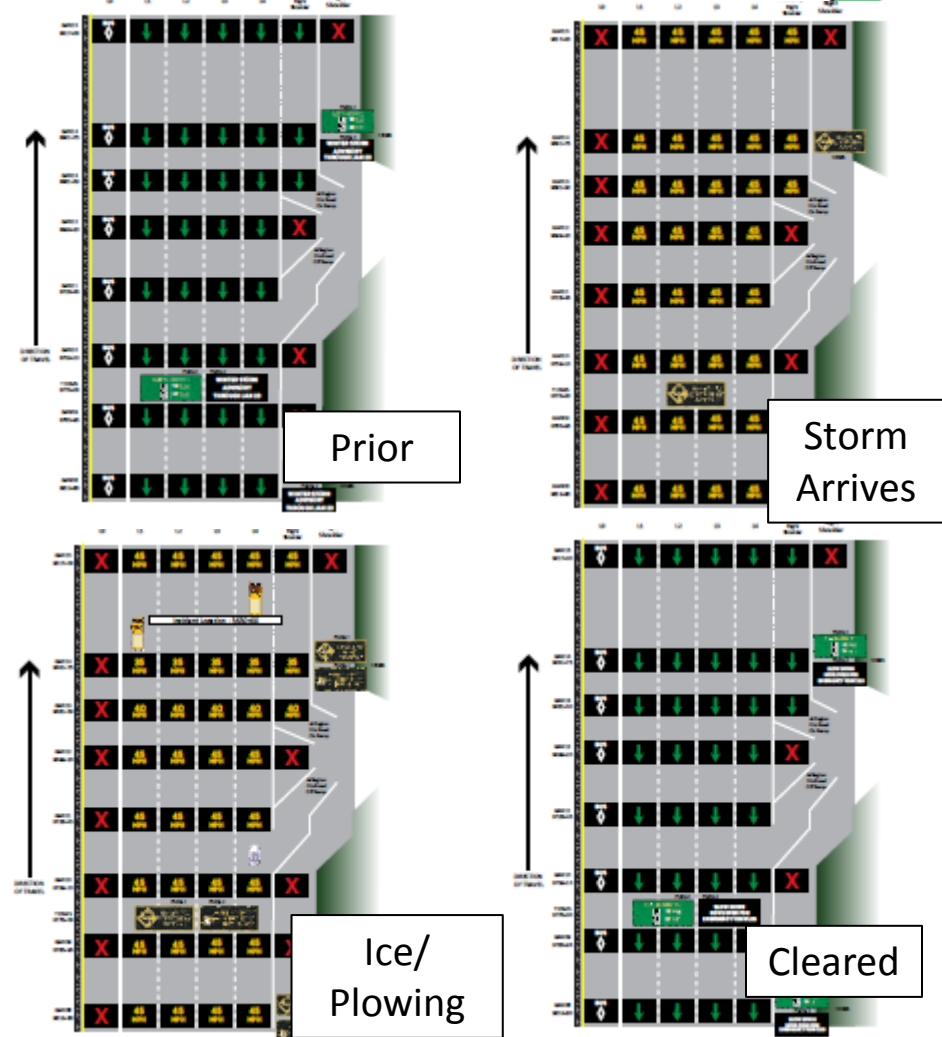
- ▶ **Helps facilitate the flow of cars to allow emergency vehicles to safely navigate the roadways and reach the incident scene more quickly**



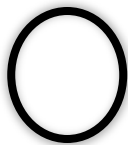
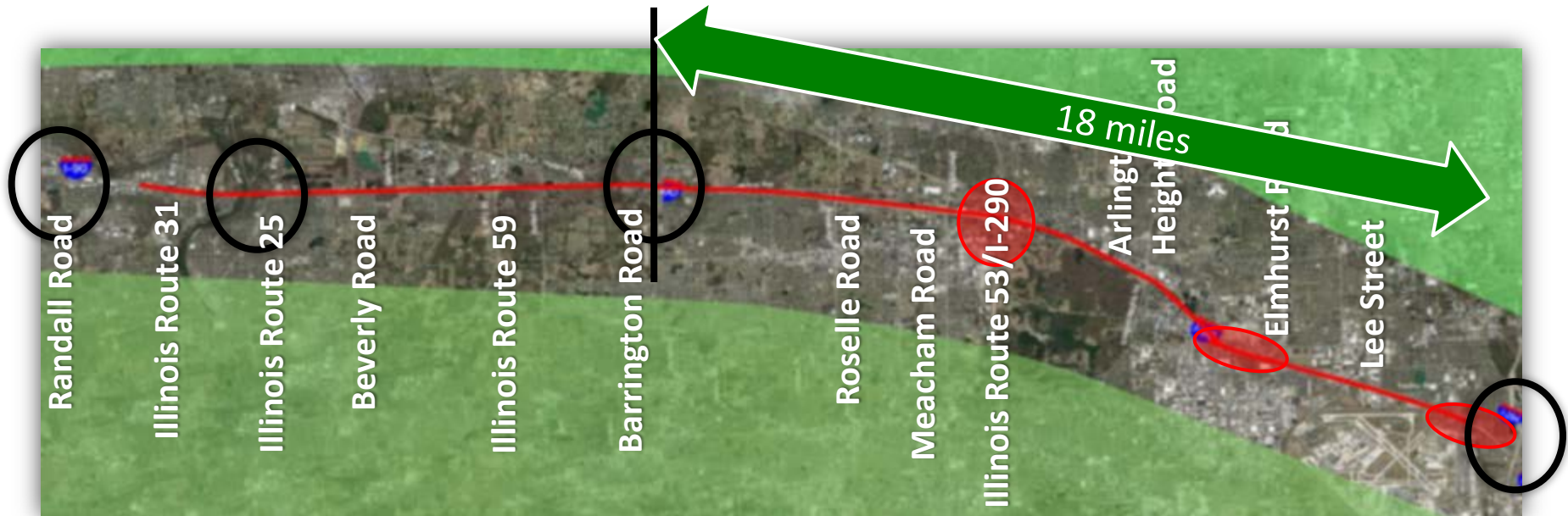
Concept of Operations

Scenarios

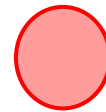
- ▶ Weather
- ▶ Minor incident
- ▶ Traffic enforcement
- ▶ Major incident
- ▶ Full closure
- ▶ Congestion
- ▶ Stationary work zone
- ▶ Rolling work zone
- ▶ Car fire
- ▶ Disabled vehicle
- ▶ Partial system failure



Why Kennedy Expressway to Barrington Road?



Park & Ride location

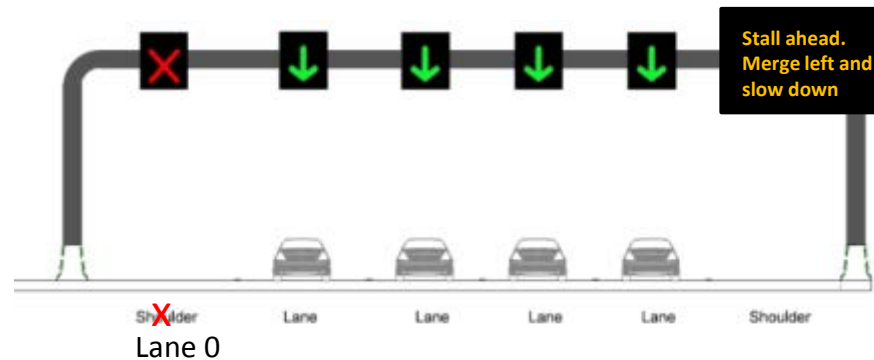
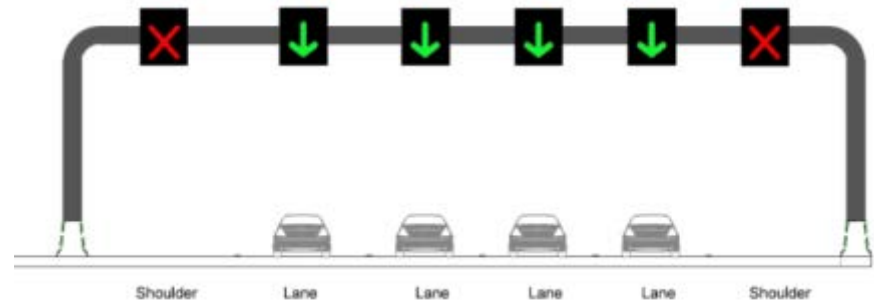


Congested areas

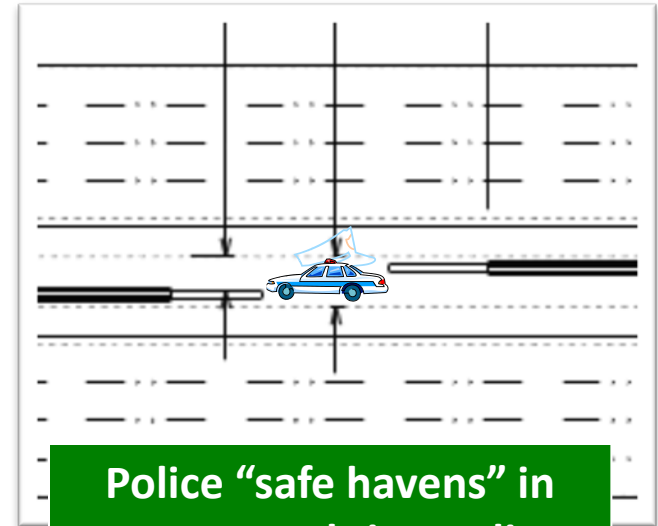
How Will We Implement ATM?

▶ Overhead gantries – every half mile

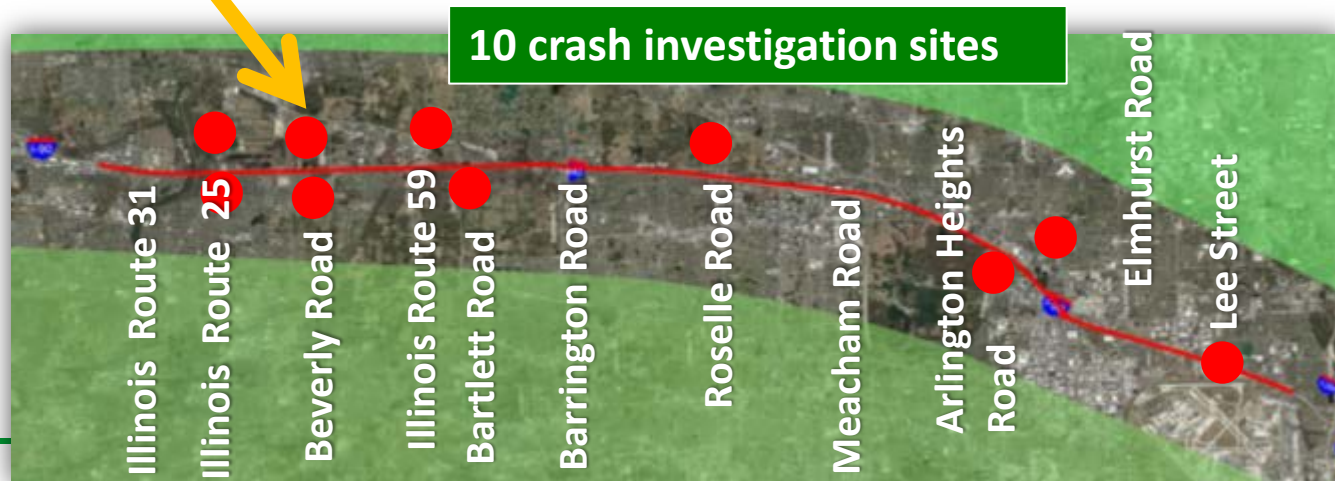
- ▶ Lane control sign over every lane
- ▶ Use of lane 0 for bus on shoulder
- ▶ DMS Type 2 every 2nd gantry (1 mile)
- ▶ Lane 0 (inside shoulder) is preferential lane
- ▶ Equipment shelter every mile
- ▶ Decision sight distance – 900 feet



Accommodating State Police and Maintenance



Police "safe havens" in turn-arounds in median



10 crash investigation sites

ATM Benefits

▶ **Improves mobility**

- ▶ 3 to 7 percent increase in average throughput during congested periods (Europe)
- ▶ 3 to 22 percent increase in overall capacity (Europe)

▶ **Enhances roadway safety**

- ▶ 3 to 30 percent decrease in primary incidents (11 percent - WashDOT)
- ▶ 40 to 50 percent decrease in secondary incidents

▶ **Integrates transit**

- ▶ Provides reliable transit travel times
- ▶ Accommodates transit options



Thank You
