

E-VII

Arizona's

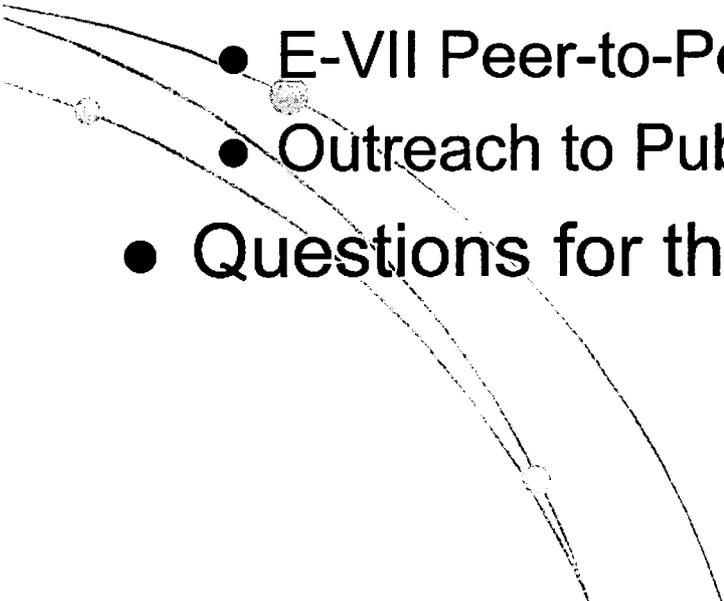
Emergency

VII Program

T3 Webinar

October 23, 2008

Today's Webinar Focus

- National Perspective on VII
 - Update on Michigan and California VII Activities and Initiatives
 - Arizona's E-VII Program Overview
 - Concept Development and Applications
 - E-VII Peer-to-Peer Exchange
 - Outreach to Public Safety Community
 - Questions for the Webinar Presenters
- 

Today's Presenters

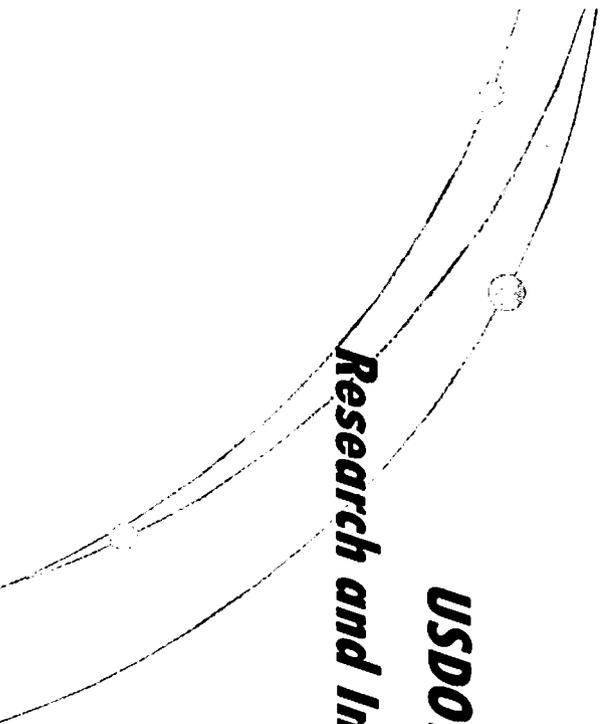
- Valerie Briggs
 - ITS JPO/RITA, VII Policy Program Manager
- Greg Larson
 - Caltrans, SAFETRIP Program Manager
- Faisal Saleem
 - Maricopa County DOT, E-VII Program Manager
- Larry Head
 - University of Arizona, E-VII Application Development
- Lisa Burgess
 - Kimley-Horn and Associates, E-VII Program Support

National VII Program Overview

Valerie Briggs

USDOT, ITS Joint Program Office

Research and Innovative Technology Administration

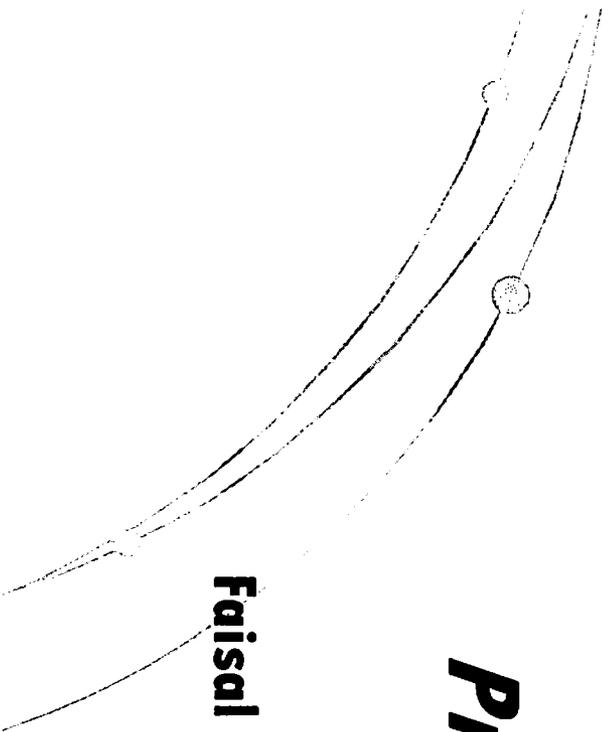




**Arizona Emergency
Vehicle Infrastructure
Integration
(E-VII)**

Program Overview

Faisal Saleem, Maricopa County DOT



Arizona Crash Facts

Time...Lives...Money

- ***In 2006 alone in Arizona***
 - 3 people killed in crashes every day
 - 1 person injured in a crash every 7 minutes
 - More than 82% of crashes were in urban areas
 - Motor vehicle crashes cost AZ \$3.67 billion
 - In Maricopa County, crashes had a \$2 billion impact to the region's economy

Safety is the motivation for E-VII

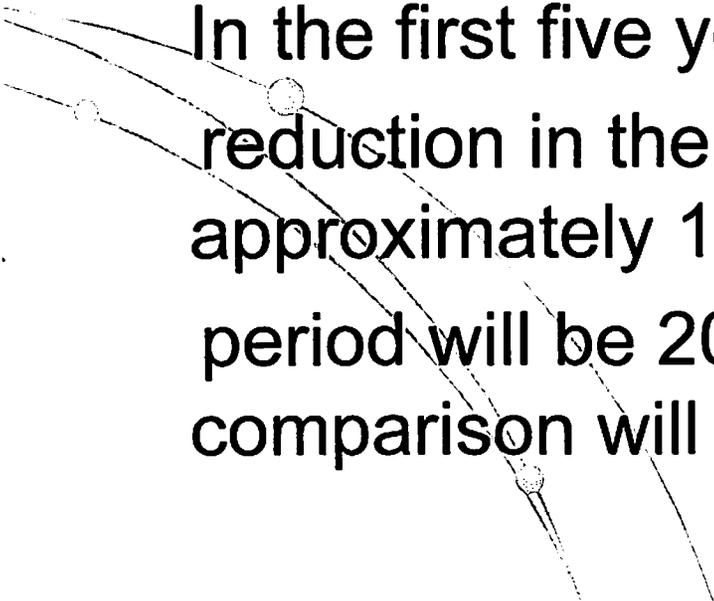
Arizona Safety Vision & Goal

- VISION:

“Zero fatalities on Arizona roads, your life depends on it”

- GOAL:

In the first five years, this goal requires a reduction in the number of fatalities of approximately 12 percent. The first five year period will be 2008–2012, and the base year of comparison will be 2007.



E-VII Driving Force

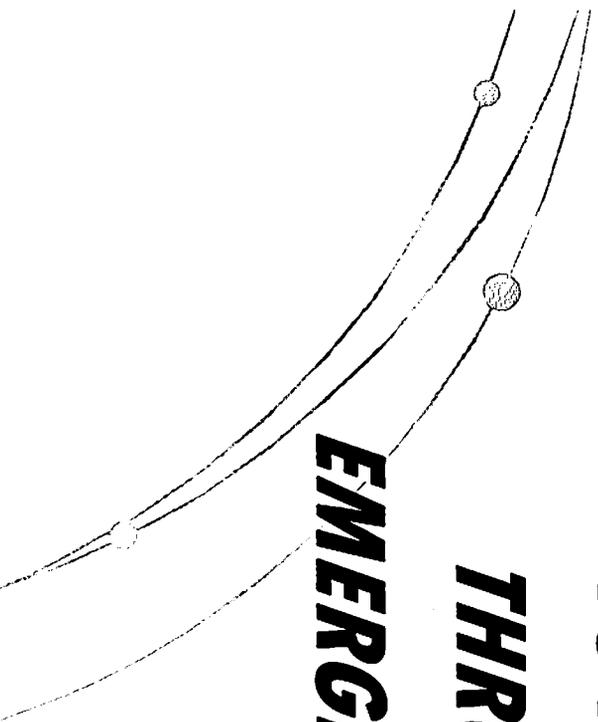
VII TECHNOLOGY

HAS SIGNIFICANT POTENTIAL

TO ADVANCE SAFETY

THROUGH ENHANCED

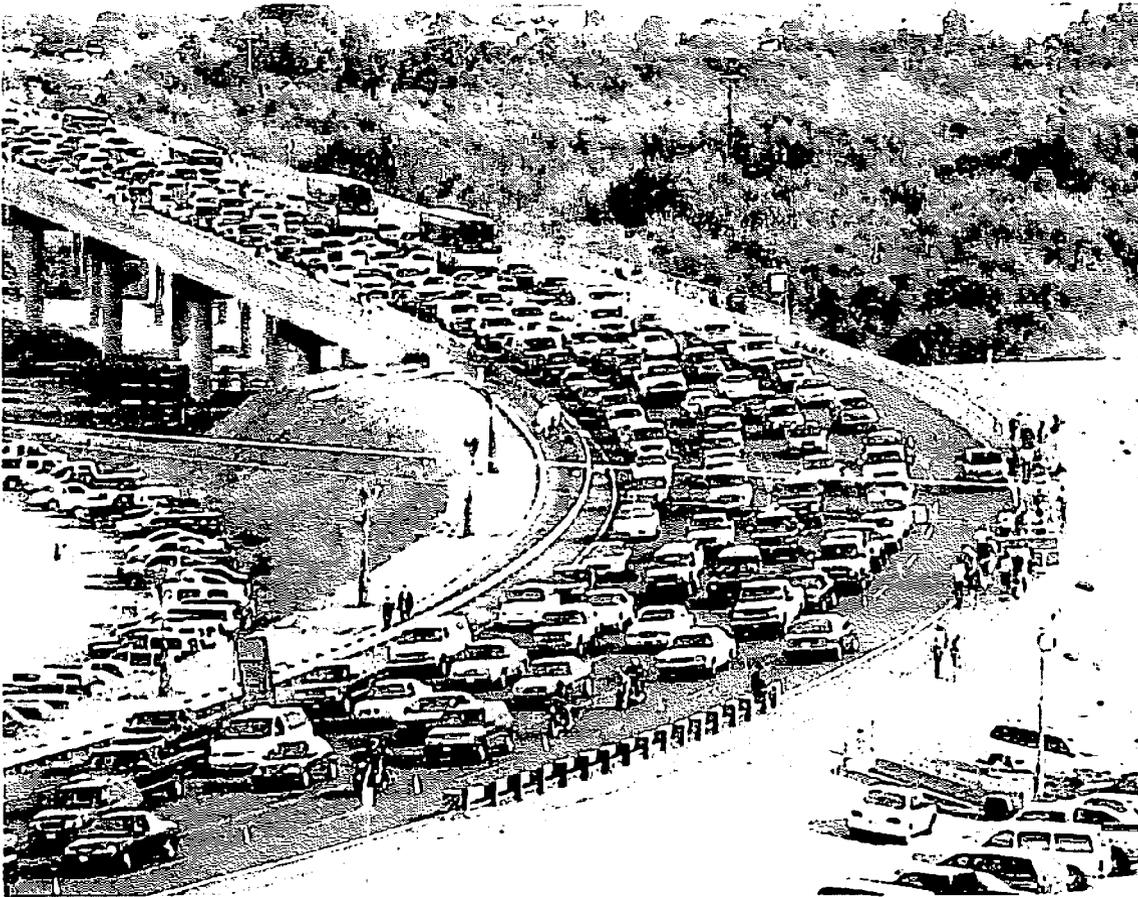
EMERGENCY MANAGEMENT



Key Emergency Response Issues

- **Average response time** in urban areas from notification to arrival of Emergency response vehicle at hospital is about **35 minutes** (For incidents that specifically involve vehicular accidents)
- **Outcomes** associated with injury trauma are **time-dependent**.
- In some cases **saved time may be the difference between life and death** or less damage to property.
- **20% - 25% of firefighter fatalities** result from vehicle crashes
- **Intersections are mostly likely locations** for Emergency Vehicle to involve in crash

What is the Potential for VII?



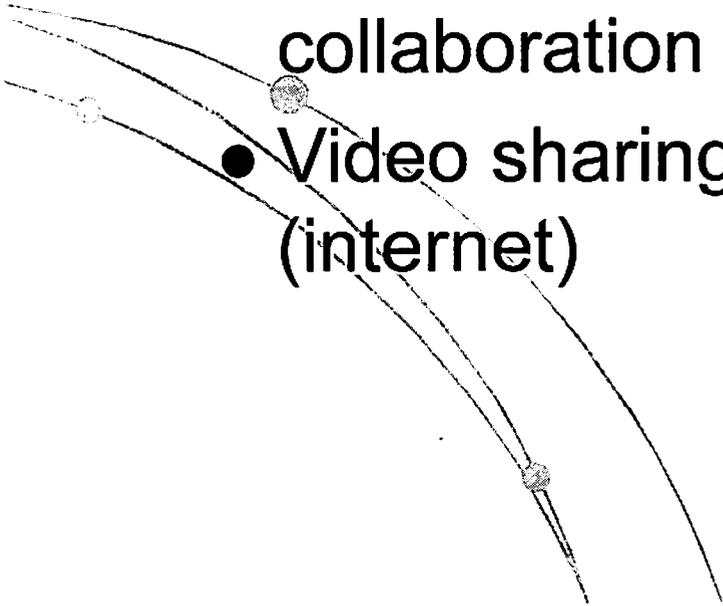
- Reduce time for responders to reach incident scene
- Optimize Incident responder routing
- Improve safety for responders and for traveling public
- Streamline the different public safety/law enforcement platforms
- Advance the current technology

Arizona E-VII Partnership

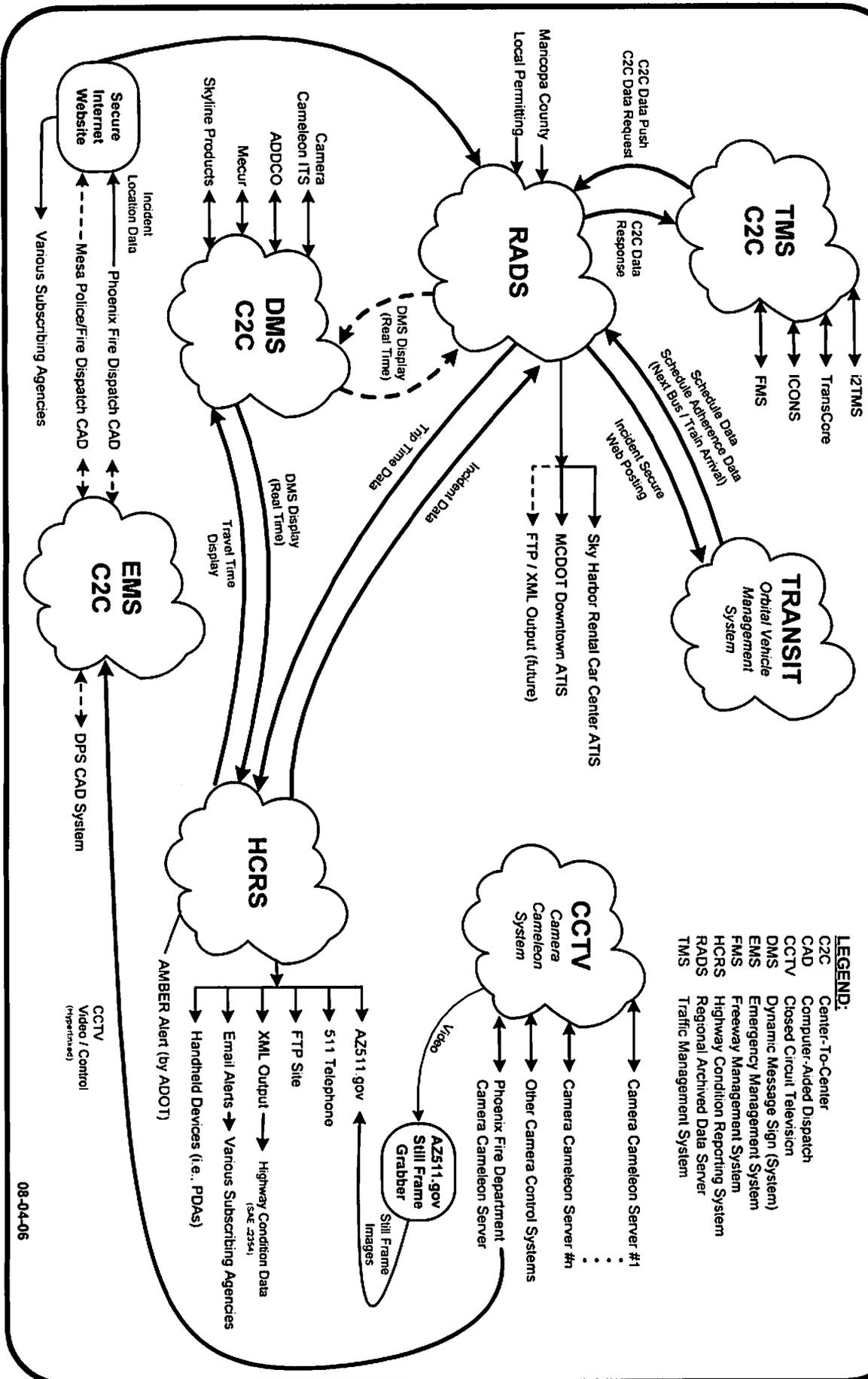
FHWA	Oversight and national liaison
Arizona DOT	Arizona VII Program leadership and representation at National VII Coalition
Maricopa County DOT	Arizona VII Program leadership and development, funding support, VII implementation, and program expansion
Univ. of Arizona	Application research and development
Arizona State Univ.	E-VII Evaluation
Kimley-Horn	Program Support for Phase 1 and 2
Econolite	Equipment and field deployment support
OZ Engineering/ Shel Leader	Integration and field deployment support
Savari Networks	Equipment and field deployment support
AZTech™ Partners	Guidance and technical direction

E-VII Builds on Strong Public Safety and Transportation Partnerships

- CAD feed from DPS, Phoenix Fire to transportation
- ALERT, REACT, Freeway Service Patrol collaboration
- Video sharing system with public safety (internet)



AZTech System Diagram

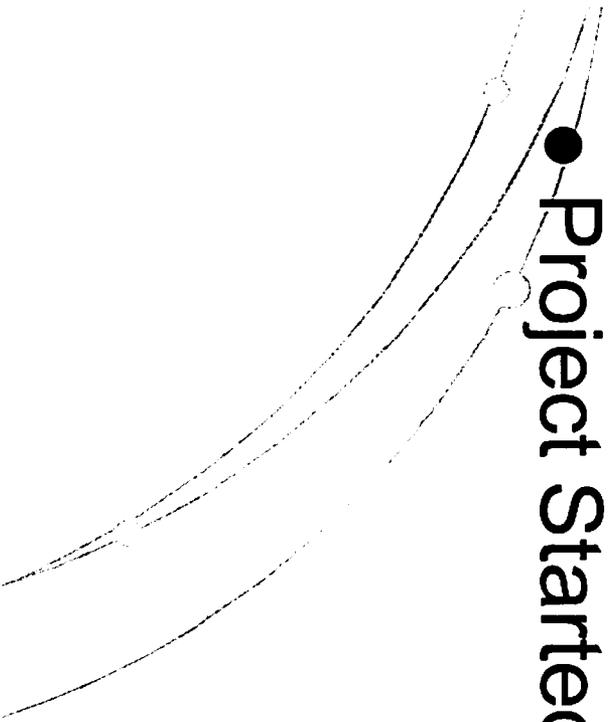


LEGEND:

- C2C Center-To-Center
- CAD Computer-Aided Dispatch
- CCTV Closed Circuit Television
- DMS Dynamic Message Sign (System)
- EMS Emergency Management System
- FMS Freeway Management System
- HCRRS Highway Condition Reporting System
- RADS Regional Archived Data Server
- TMS Traffic Management System

Initial E-VII Development

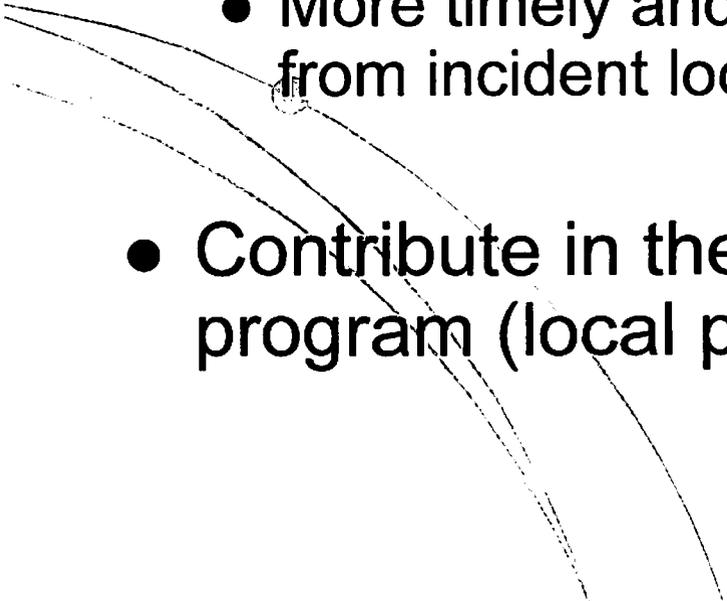
- AZTech™ / ATRC / MCDOT funding
- Established local E-VII Coalition
- E-VII Proof of Concept selected in competitive process for ATRC funds
- Project Started Sept. 2007

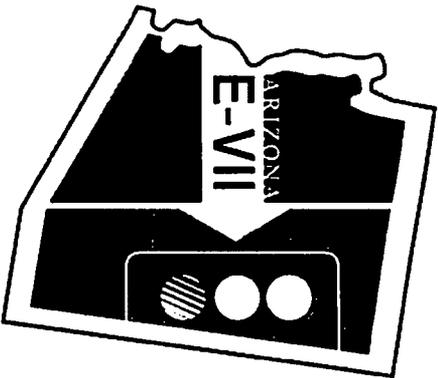


Current Program Activities

- Review of other VII programs
- Developed concepts for Four capabilities
- Workshop with Public Safety and Peers
- Develop applications (V2V and V2I)
- 'Parking Lot' demonstration
- Evaluation
- Plan for next steps / broader deployment
- Study Dynamic Routing Requirements

Benefits and Anticipated Outcomes

- Unique Incident Management focus
 - Reduce response times
 - Enhance safety (responder, public)
 - Establish ad-hoc communications network at incident site
 - More timely and accurate traveler information directly from incident location
 - Contribute in the development of national VII program (local proving ground)
- 

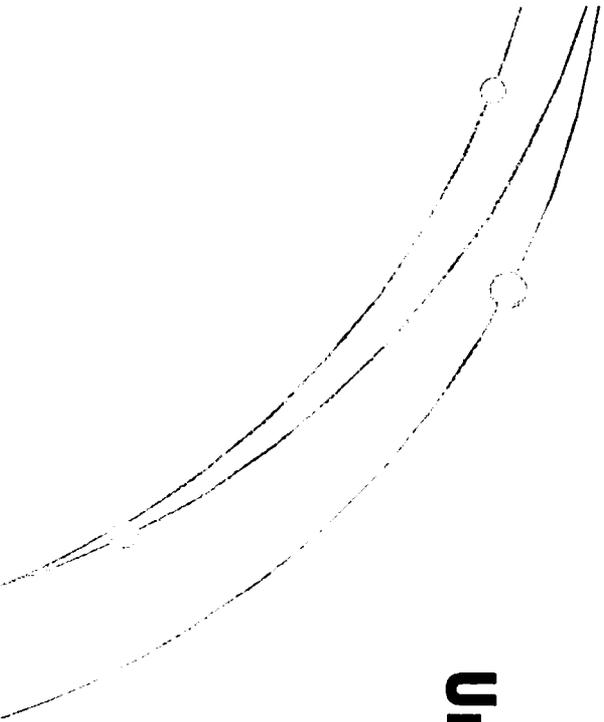


E-VII

**Applications
Development**

Larry Head

University of Arizona

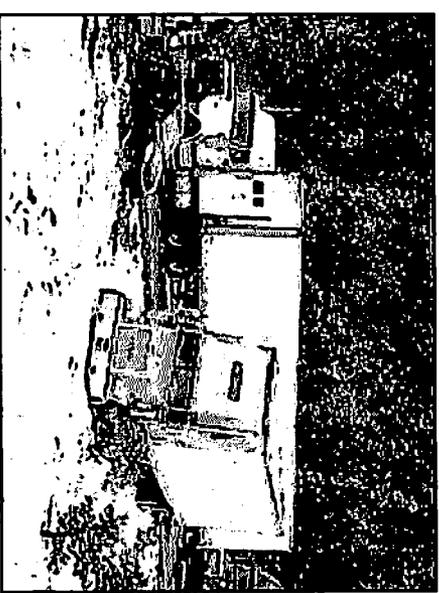


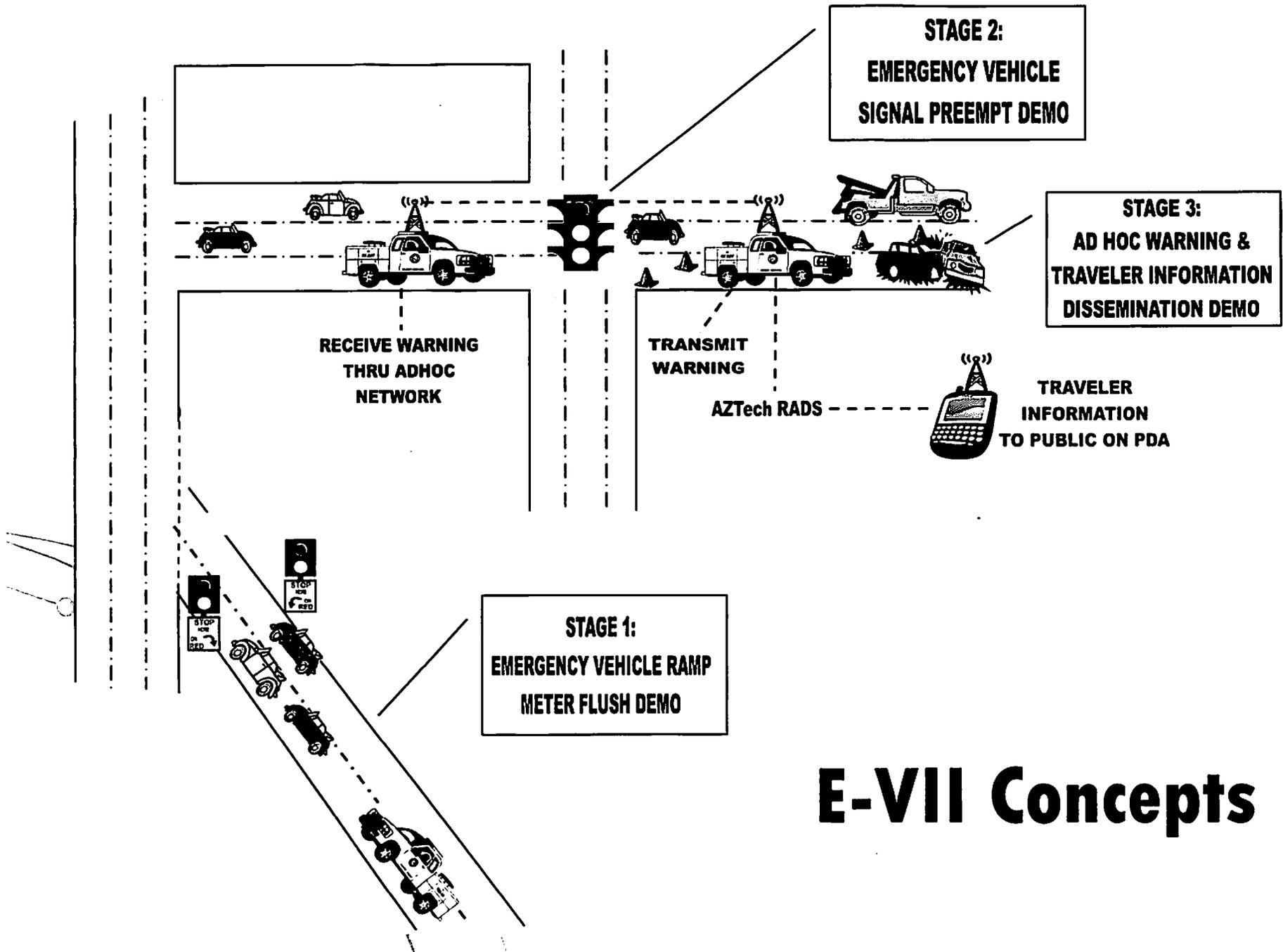
VII “101” – A Quick Reference

- **RSU – Roadside Unit**
- **RSE – Roadside Equipment**
- **OBU – On-Board Unit**
- **OBE – On-Board Equipment**
- **GID – Geographic Intersection Description**
- **RADS – AZTech™ data server**

E-VII Pilot Applications

- Ramp meter priority / queue flushing
- Traffic signal preemption / priority
- Mobile incident warning (vehicle-vehicle)
- Transmit incident details back to center and other incident responders

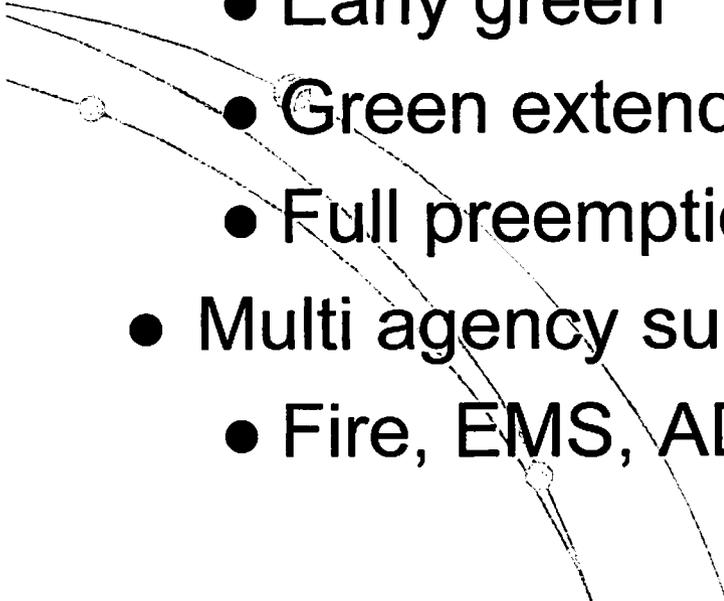




E-VII Concepts

E-VII Capability 1 and 2:

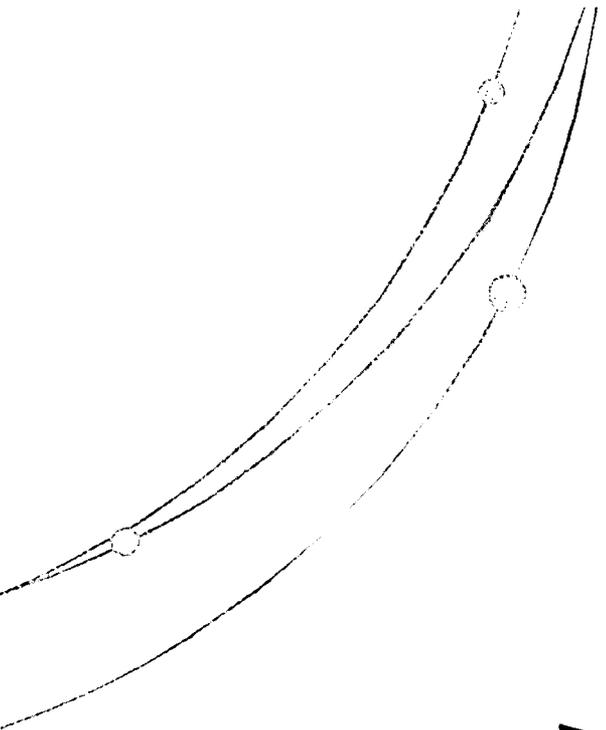
Preemption and Priority Operations at Intersections and Ramp Meters

- Secure preemption capability
 - Support for multiple, simultaneous preemptions/priority requests
 - Early green
 - Green extend
 - Full preemptions
 - Multi agency support
 - Fire, EMS, ADOT, MCDOT
- 

View

Stage 1 and Stage 2

Animations

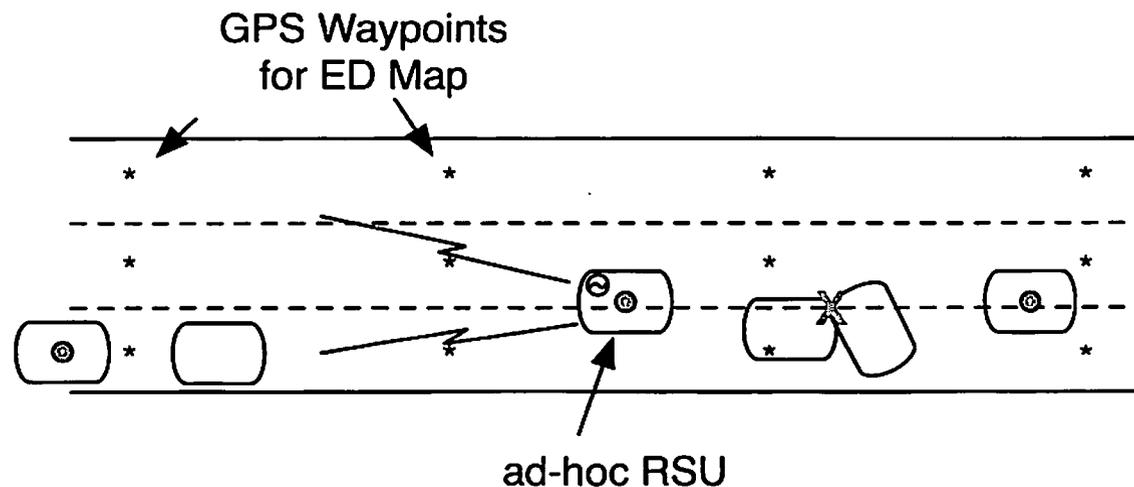


E-VII Capability 3:

Vehicle-to-Vehicle Warning and Ad Hoc Network

- Units on board EV become transmitters, establishes an ad-hoc network
- Near-term - sends incident details to other responders:

- Location
- Severity
- Special requirements

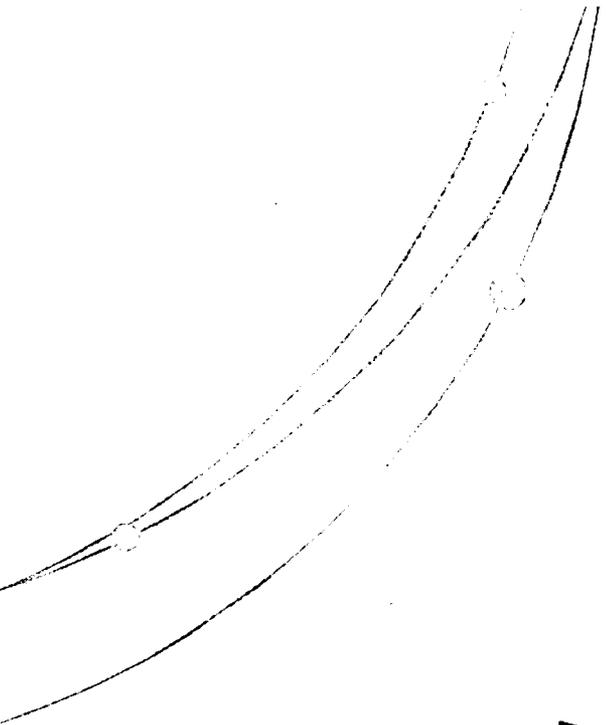


- Future – communicate details to other VII equipped vehicles

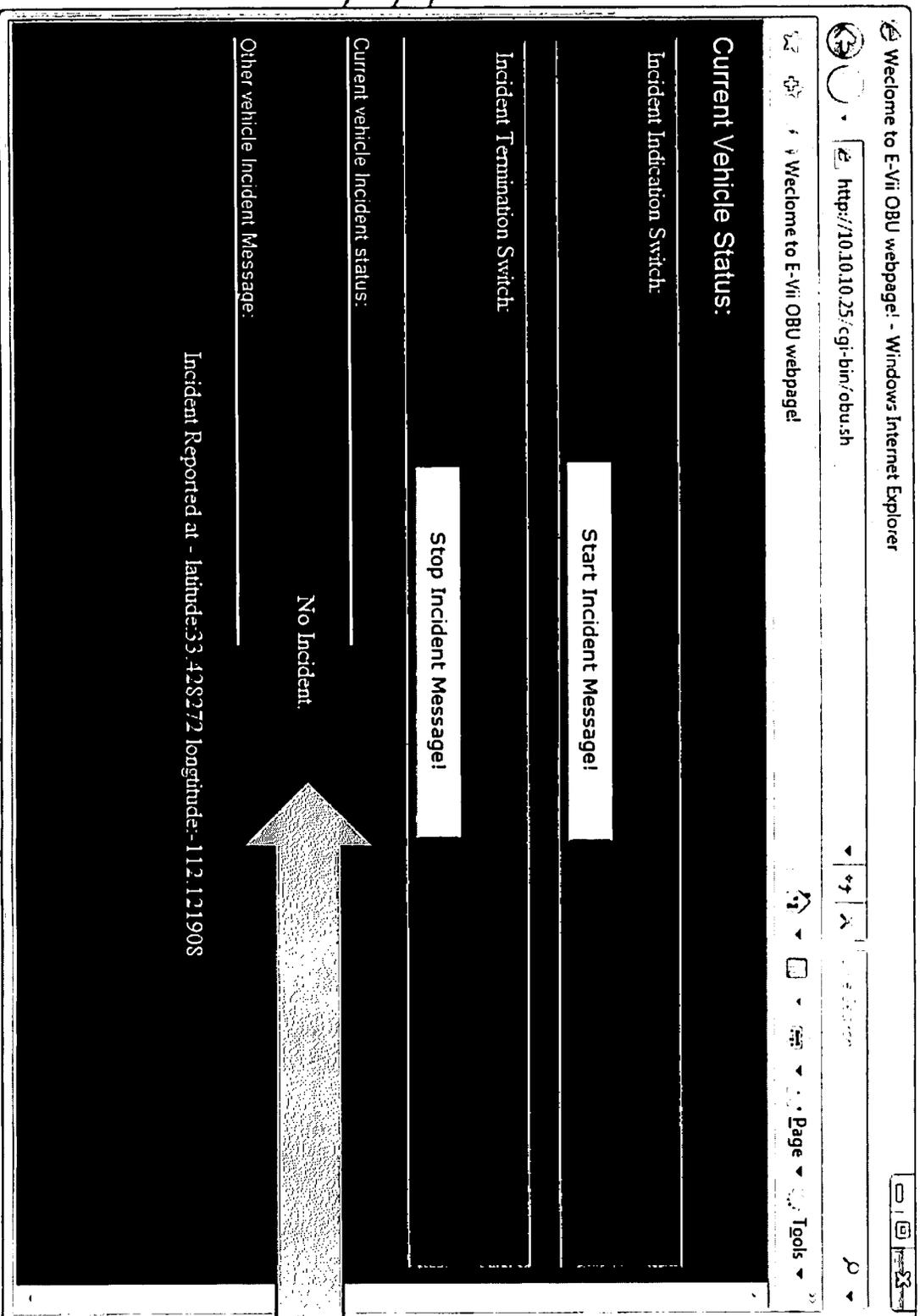
View

Stage 3

Animations



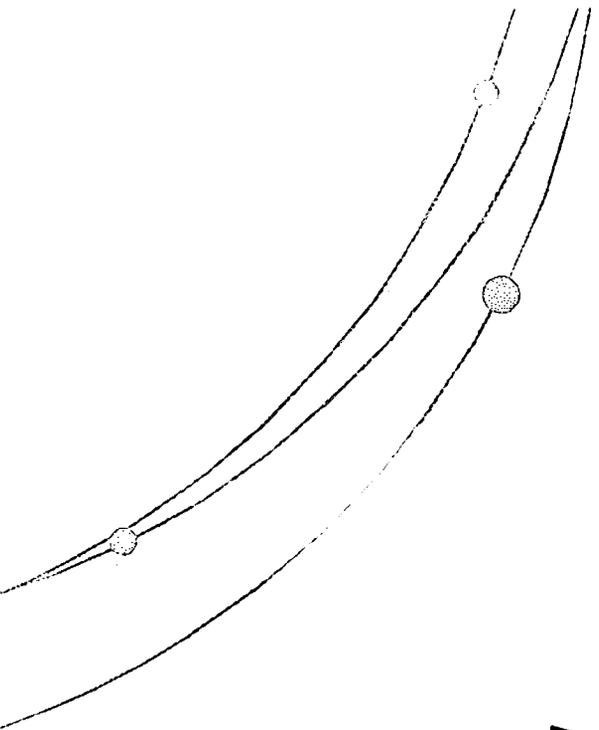
Demo E-VII on-board display



View

Stage 4

Animations



Demo E-VII traveler info incident status display

E-VII - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://itsradsaz.org/eviidev/evii_map.jsp

Arizona E-VII Initiative:
Proof of Concept and Operational Testing

511

Event Id 887766
Description Accident Ahead. Lane Closed
Starting 9/5/2008 12:30 PM
Est End 9/5/2008 1:25 PM
Notes event number 2

Map Satellite Hybrid

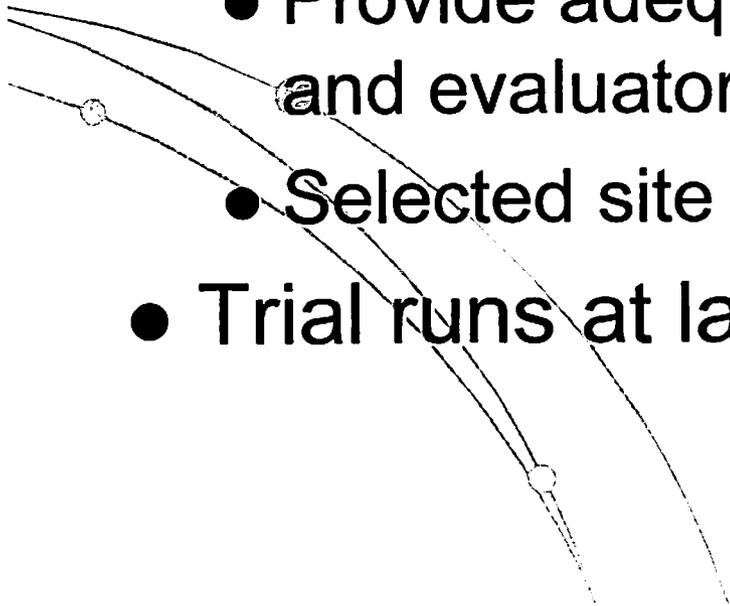
200 ft
50 m

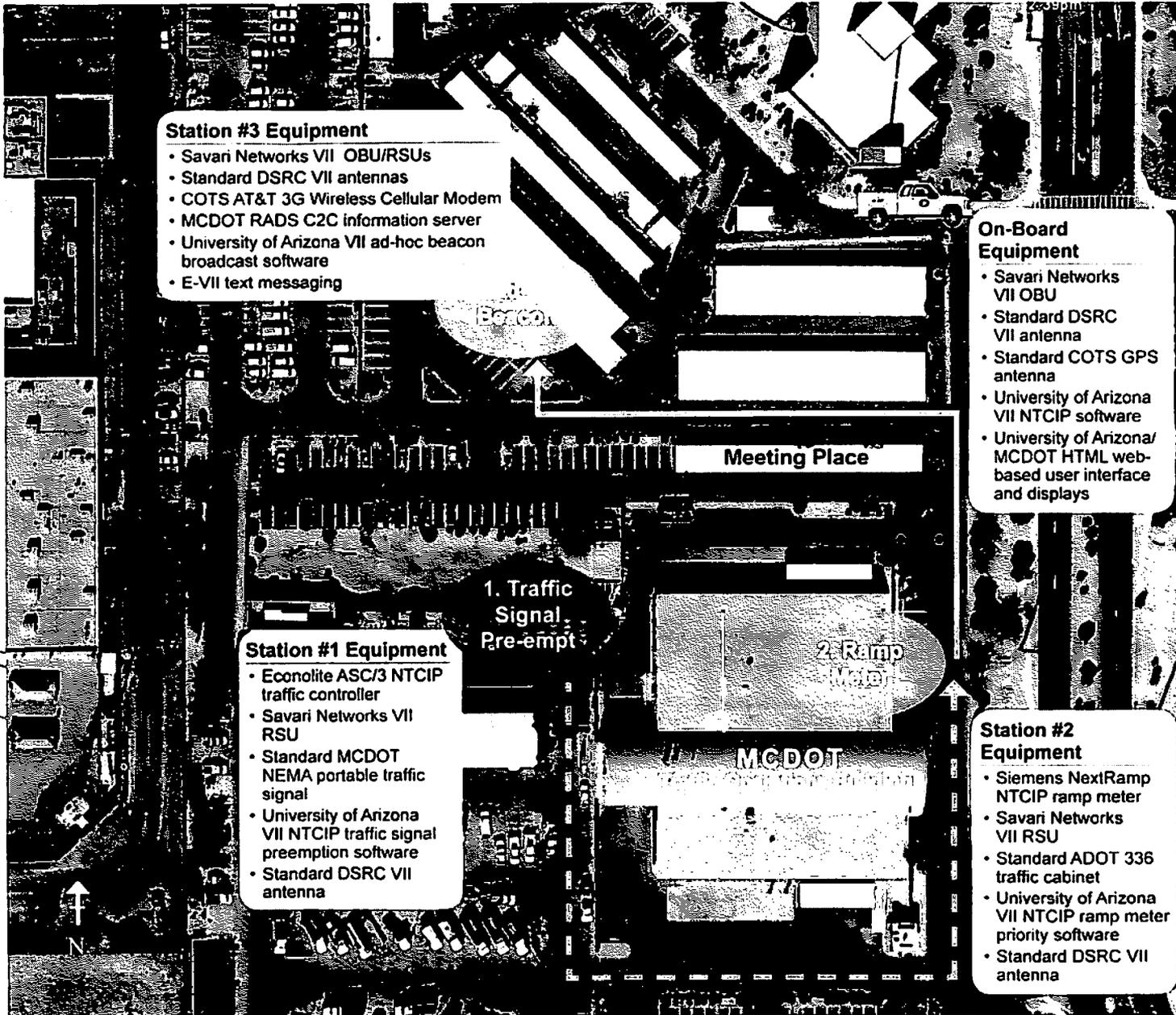
Imagery ©2003 DigitalGlobe, GeoEye, Earthstar, etc.

Done

From Lab to Field

- Evaluated potential sites for field deployment test
 - Controlled environment
 - Limit interference of radio equipment
 - Provide adequate accessibility to test drivers and evaluators
 - Selected site on MCDOT property
- Trial runs at lab at Univ. of Arizona





Station #3 Equipment

- Savari Networks VII OBU/RSUs
- Standard DSRC VII antennas
- COTS AT&T 3G Wireless Cellular Modem
- MCDOT RADS C2C information server
- University of Arizona VII ad-hoc beacon broadcast software
- E-VII text messaging

On-Board Equipment

- Savari Networks VII OBU
- Standard DSRC VII antenna
- Standard COTS GPS antenna
- University of Arizona VII NTCIP software
- University of Arizona/MCDOT HTML web-based user interface and displays

Station #1 Equipment

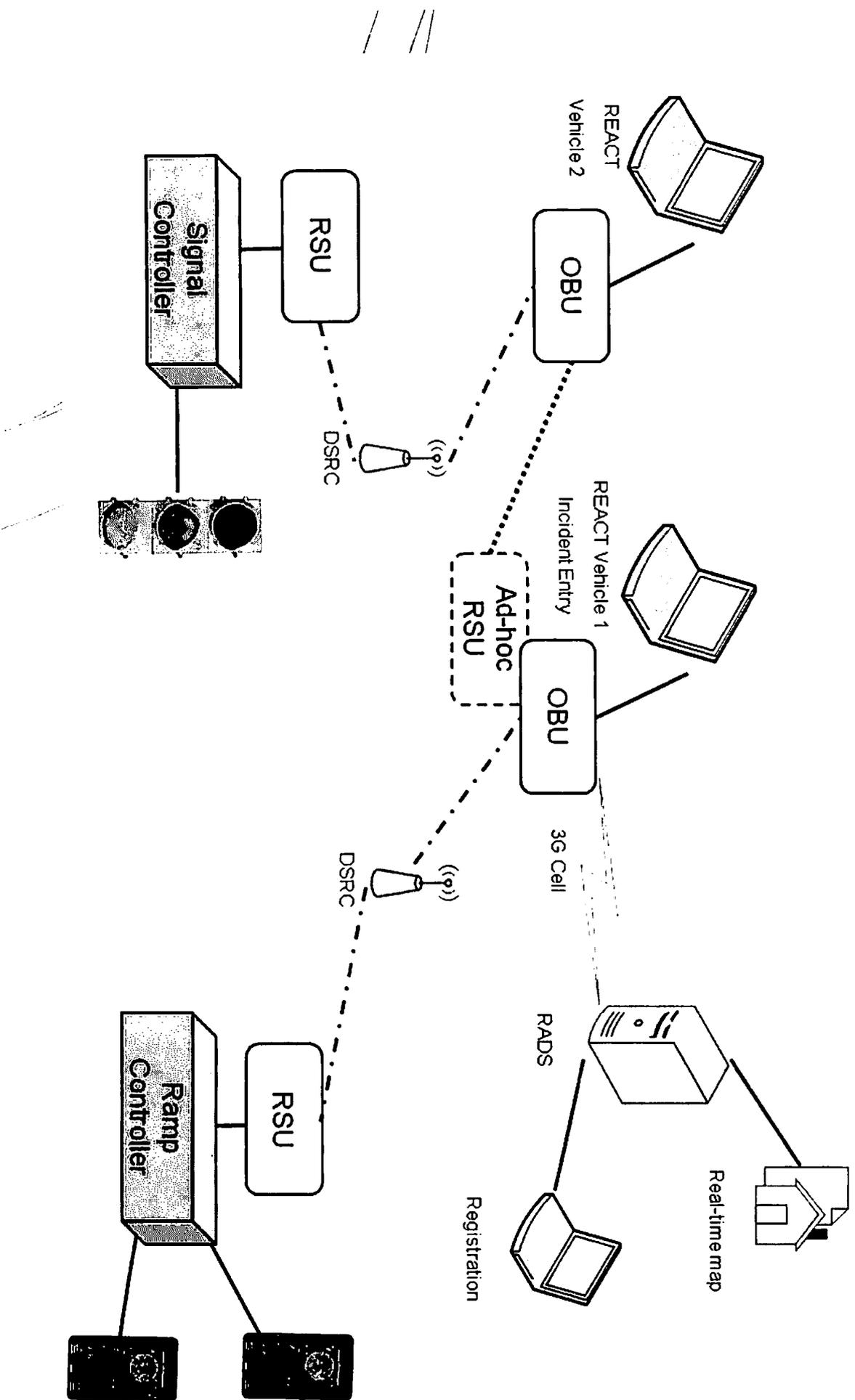
- Econolite ASC/3 NTCIP traffic controller
- Savari Networks VII RSU
- Standard MCDOT NEMA portable traffic signal
- University of Arizona VII NTCIP traffic signal preemption software
- Standard DSRC VII antenna

Station #2 Equipment

- Siemens NextRamp NTCIP ramp meter
- Savari Networks VII RSU
- Standard ADOT 336 traffic cabinet
- University of Arizona VII NTCIP ramp meter priority software
- Standard DSRC VII antenna

E-VII Field Demo location

E-VII Demo System Architecture



E-VII

Field

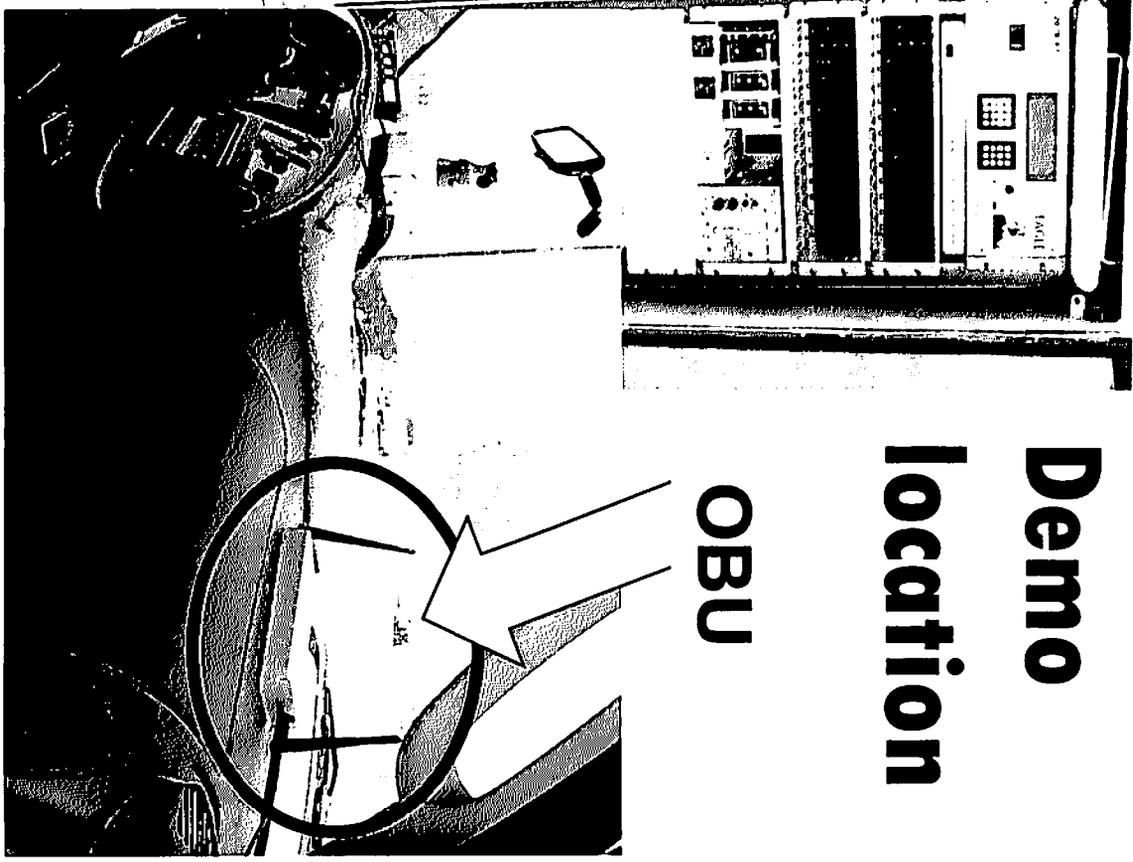
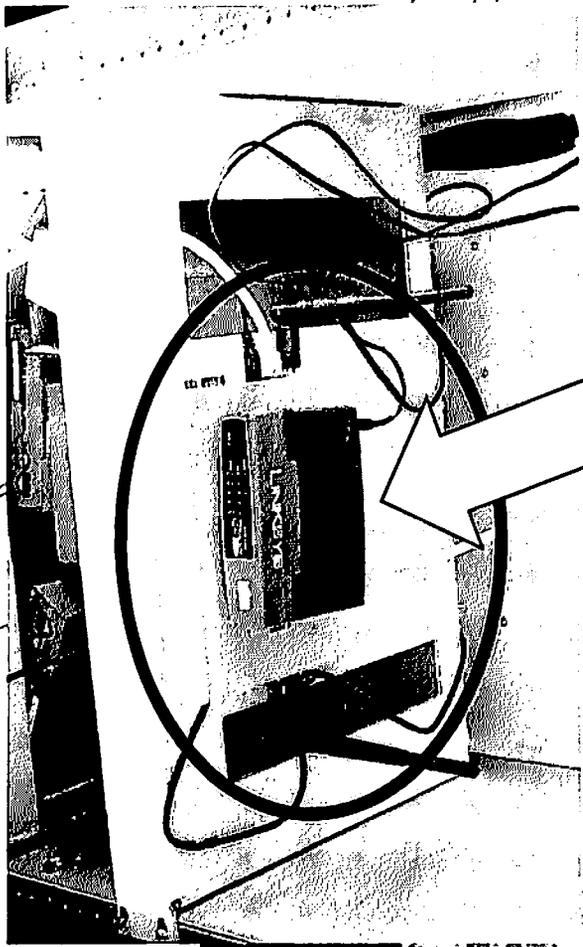
Demo

location

OBU



RSU



Signal Preempt Demo



E-VII

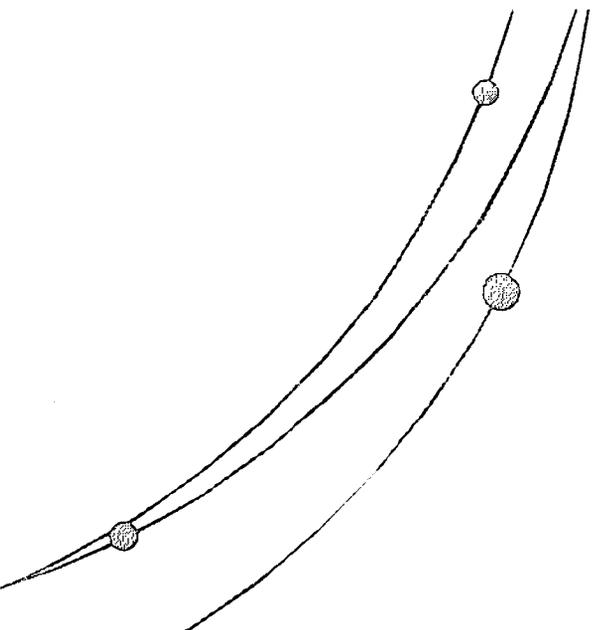
Field

Demo

Location



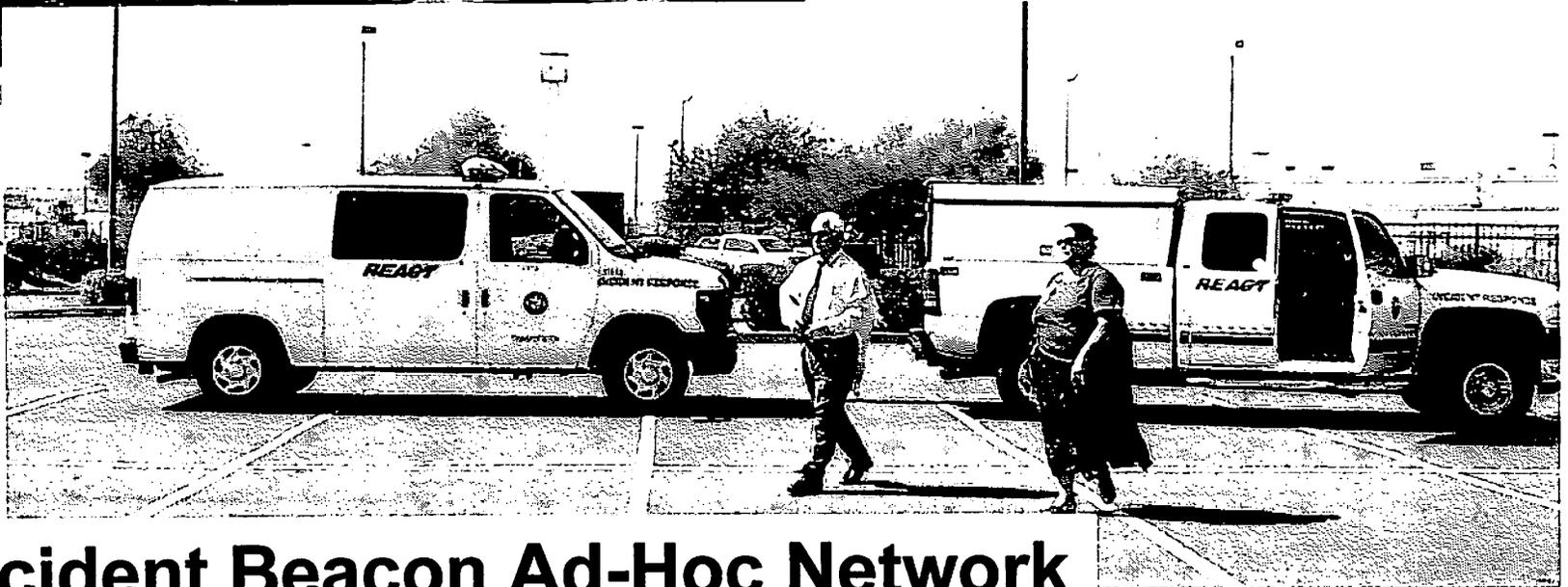
Ramp Meter Priority Demo



Incident Warning Alert



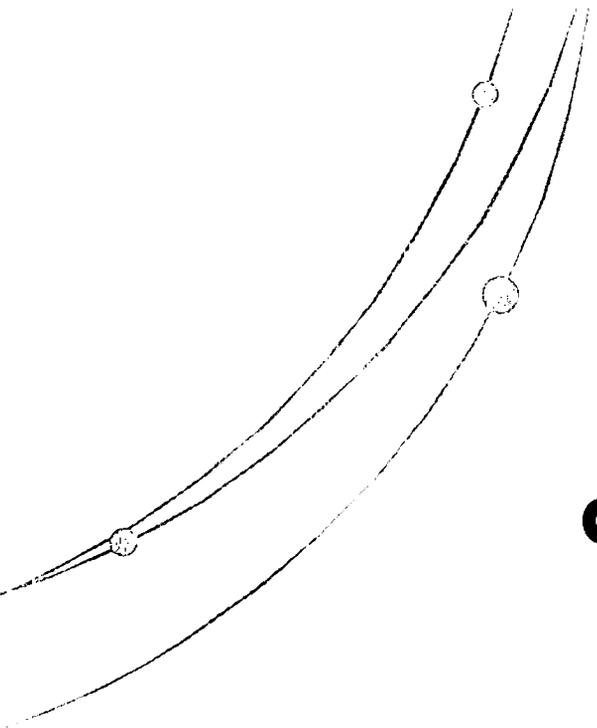
E-VII Field Demo Location



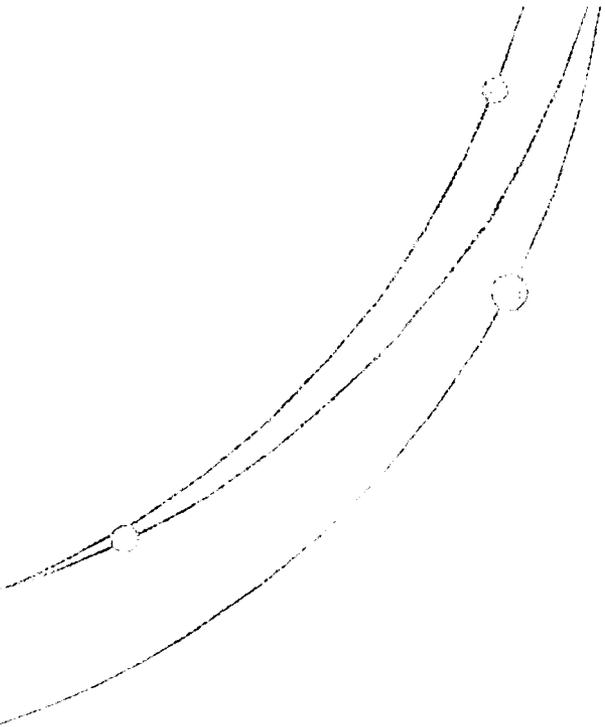
Incident Beacon Ad-Hoc Network

E-VII Field Demo

Signal Pre-Emption Video



E-VII Field Demo Ramp Meter Video

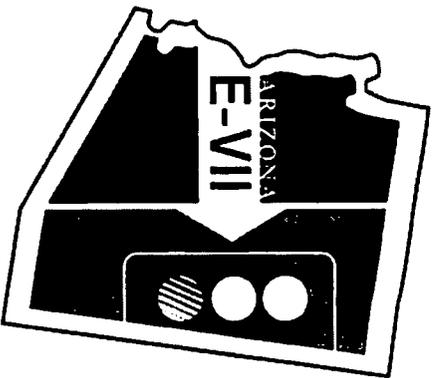


What E-VII Provides...

- Direct communications path to other response vehicles in the area
- Advances the mapping capabilities for emergency responders
- Reduces illegal preempts through more secure technology
- Automates the interaction between public safety and transportation networks
- Proof of Concept looks at integration with legacy systems – what is the readiness of current networks/systems to support VII?

E-VII Evaluation Focus

- Issues/difficulties in implementing E-VII
 - Cost-benefit analysis
 - Potential delay savings
 - Faster incident response (improved access at intersections, on-ramps and freeways)
 - More effective signal phasing and timing for the vehicles affected by pre-emption
 - Real-time dissemination of incident information to motorists
 - Safety
 - Perspective of emergency response personnel on safety and operations
- 

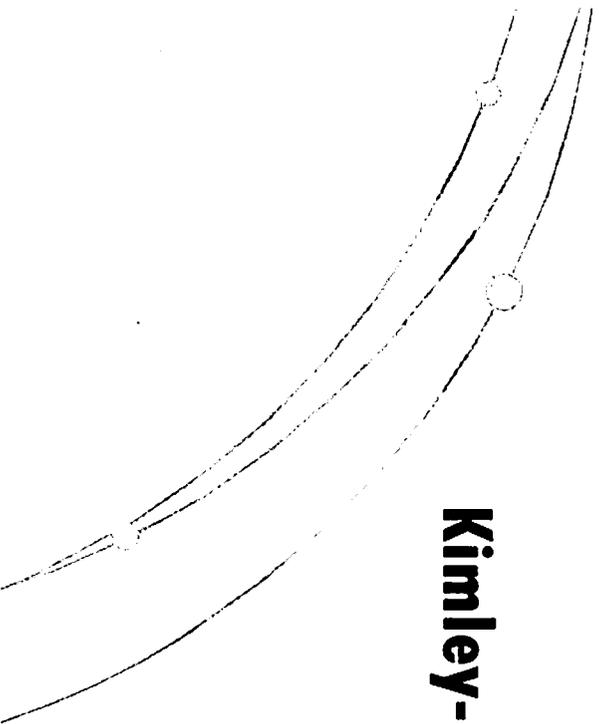


E-VII

**Peer-to-Peer and
Public Safety Forum**

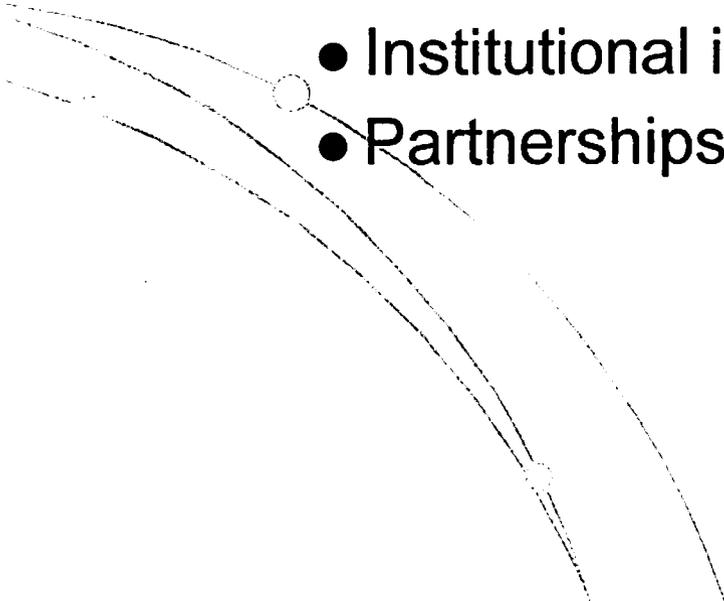
Lisa Burgess

Kimley-Horn and Associates, Inc.



Leverage Partnerships – Key Goal of E-VII

- E-VII wants to complement and learn from other VII deployers
 - Unique incident management focus of E-VII
 - Lessons learned from experienced deployers
 - Technology
 - Institutional issues
 - Partnerships



April 24, 2008 – Peer Exchange Forum

- Invited Michigan, California and USDOT
- Local public safety community
 - Comm center managers, PSAP dispatchers
 - Field responders – Fire, EMS, Police/Law Enforcement
- Morning – public safety forum and breakout groups
- Afternoon – VII Peer Exchange Meeting

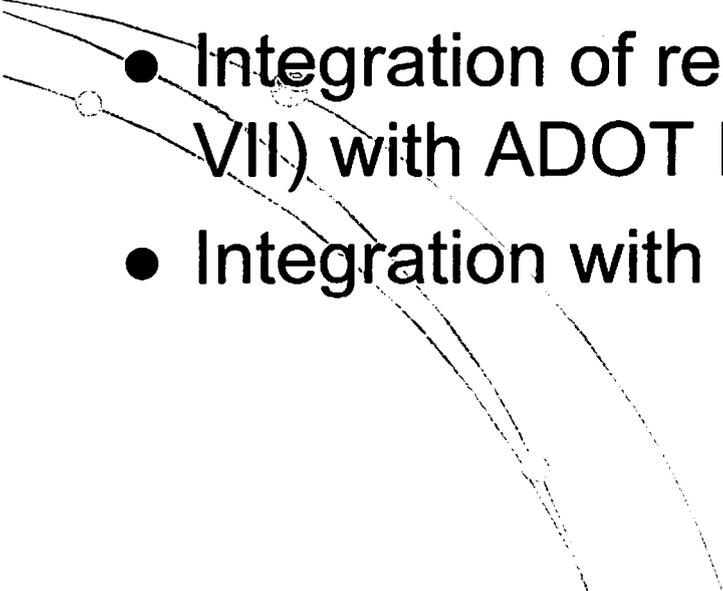
Public Safety Input

- Overall, very positive about E-VII potential
- Could provide valuable dynamic routing info
- Critical gap are specifics about road/travel conditions on arterials
 - Exact lane restrictions, work zones, one-way streets, LRT crossings, actived RR crossing
- Integrate with current dispatch and vehicle
- Look at potential for providing on-scene details (video snapshots)
- Intersection warning capability (Code3)
- Communications interoperability a challenge – E-VII can bridge that gap

Peer-to-Peer Discussion

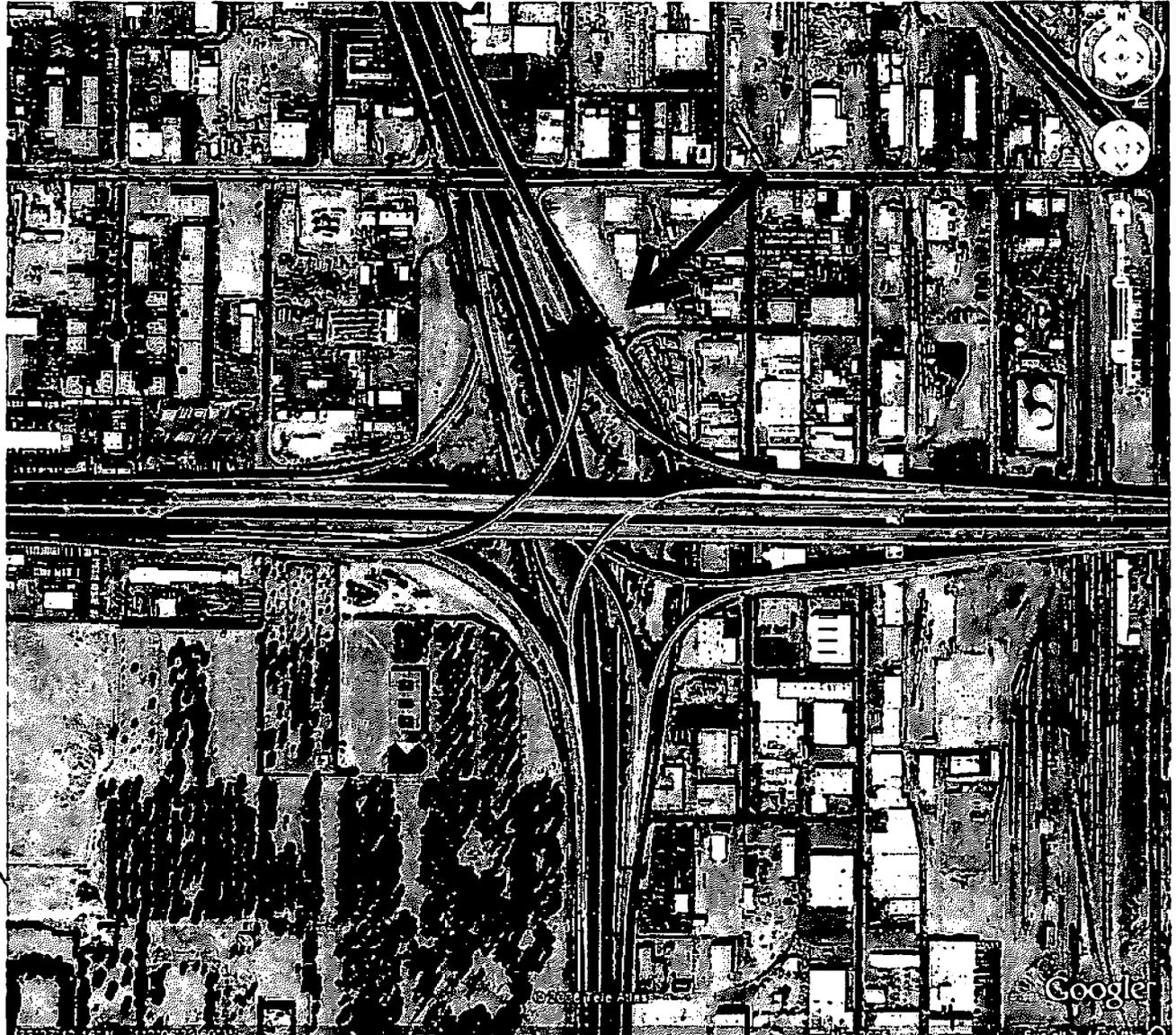
- Focus on applications first, field deployment later
- Engage cities/field equip owners early – state DOT cannot do it alone
- Leverage standards development in MI, CA, national activities
- IM is a niche focus – other states eager to follow progress, look for ways to partner

E-VII Next Steps – Dynamic Routing

- Outcome from public safety forum
 - Responder information needs
 - Field responder
 - Dispatch/communications
 - How best to deliver info to responders en-route
 - Integration of real-time vehicle network data (E-VII) with ADOT HCRS and RADS
 - Integration with public safety CAD
- 

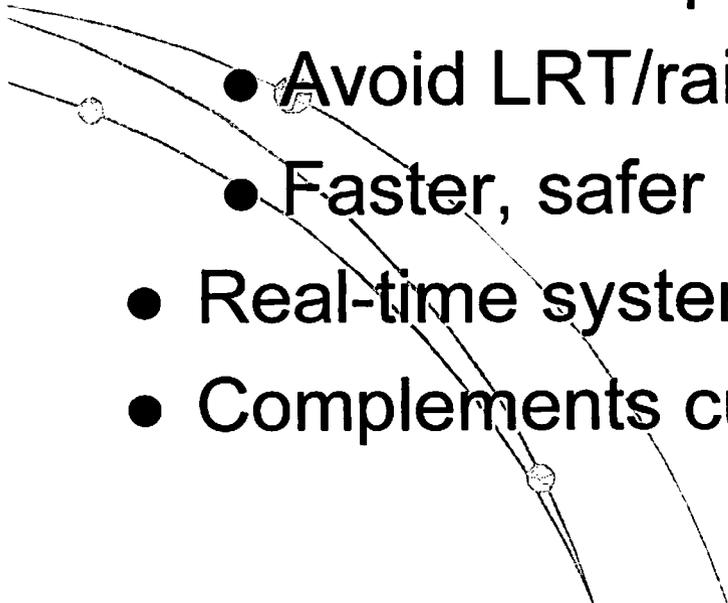
Routing Challenges for Emergency Vehicles

- Incident location reporting
- Precise routing details and info
- Geographic identifiers
- VII standards



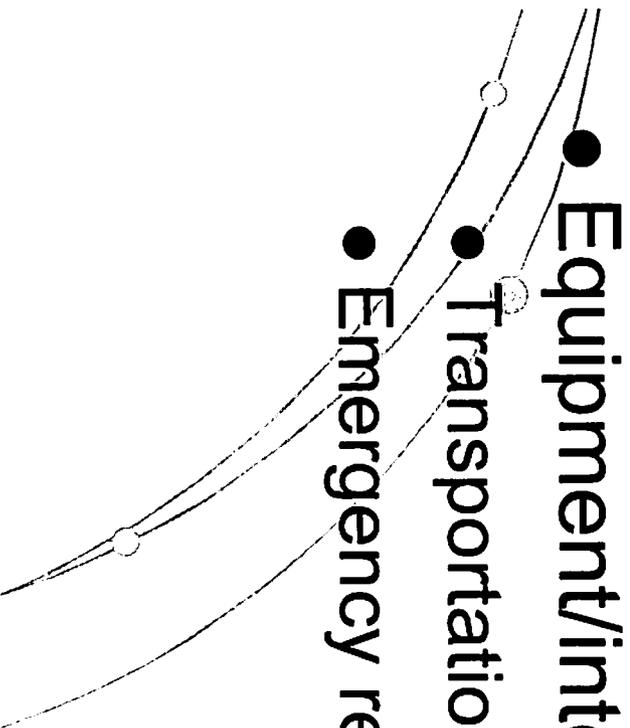
Dynamic Routing Project Moving Forward

- Accepted for ADOT FY09 Research Funding
- Concept plan for how to deliver real-time routing information to responders
 - Avoid congestion
 - Precise ramp and lane restrictions
 - Avoid LRT/rail conflicts
 - Faster, safer response to incidents
- Real-time system for day-to-day use
- Complements current ADOT evac planning



How will E-VII Shape the Future?

- Advance and automate the transportation/public safety interface
- Operational safety for emergency responders
- Equipment/interface requirements
- Transportation management
- Emergency response vehicles



E-VII Updates and Information

- Faisal Saleem, Maricopa County DOT
 - faisalsaleem@mail.maricopa.gov
- Scott Nodes, Arizona DOT
 - snodes@azdot.gov
- Larry Head, University of Arizona
 - larry@sie.arizona.edu