
National Rural ITS Conference 2006

Session E2: Public Safety Integration – Examples and Best Practices

Integration of Collision and Emergency Medical Services Data to Improve Response to Automobile Collisions in the State of Alabama

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14 August 2006



Alabama ACN Project Partners

Sponsor:

USDOT / Federal Highway Administration (FHWA) / Alabama DOT

Project Partners:

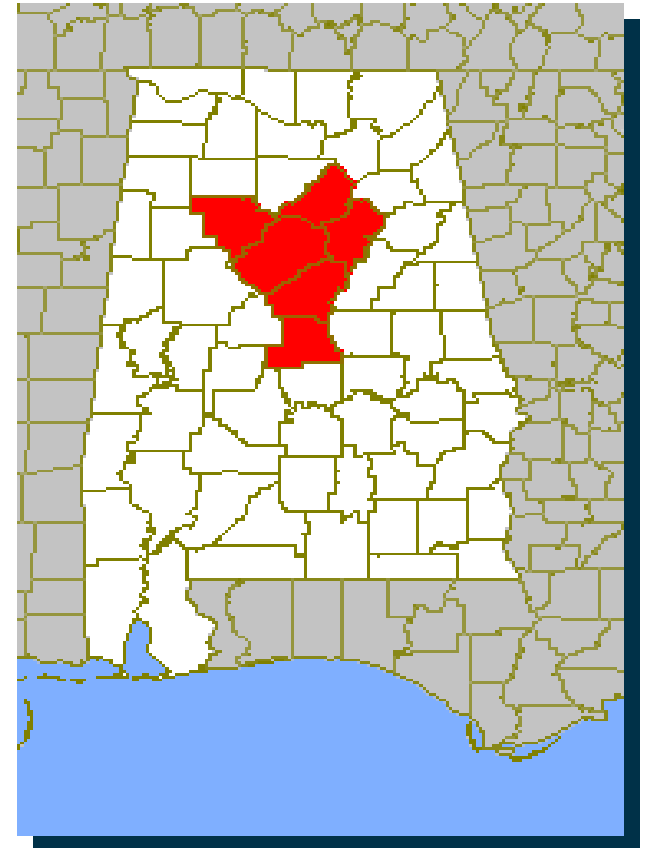
- University of Alabama at Birmingham (UAB) (Center for Injury Sciences)
- Birmingham Regional Emergency Medical Services System (BREMSS) Trauma Control Center (TCC)
- General Dynamics – Advanced Information System (GD-AIS)
- Alabama PSAPs
- OnStar
- CUBRC (Calspan – University at Buffalo Research Center) Center for Transportation Injury Research (CentTIR)

Topics

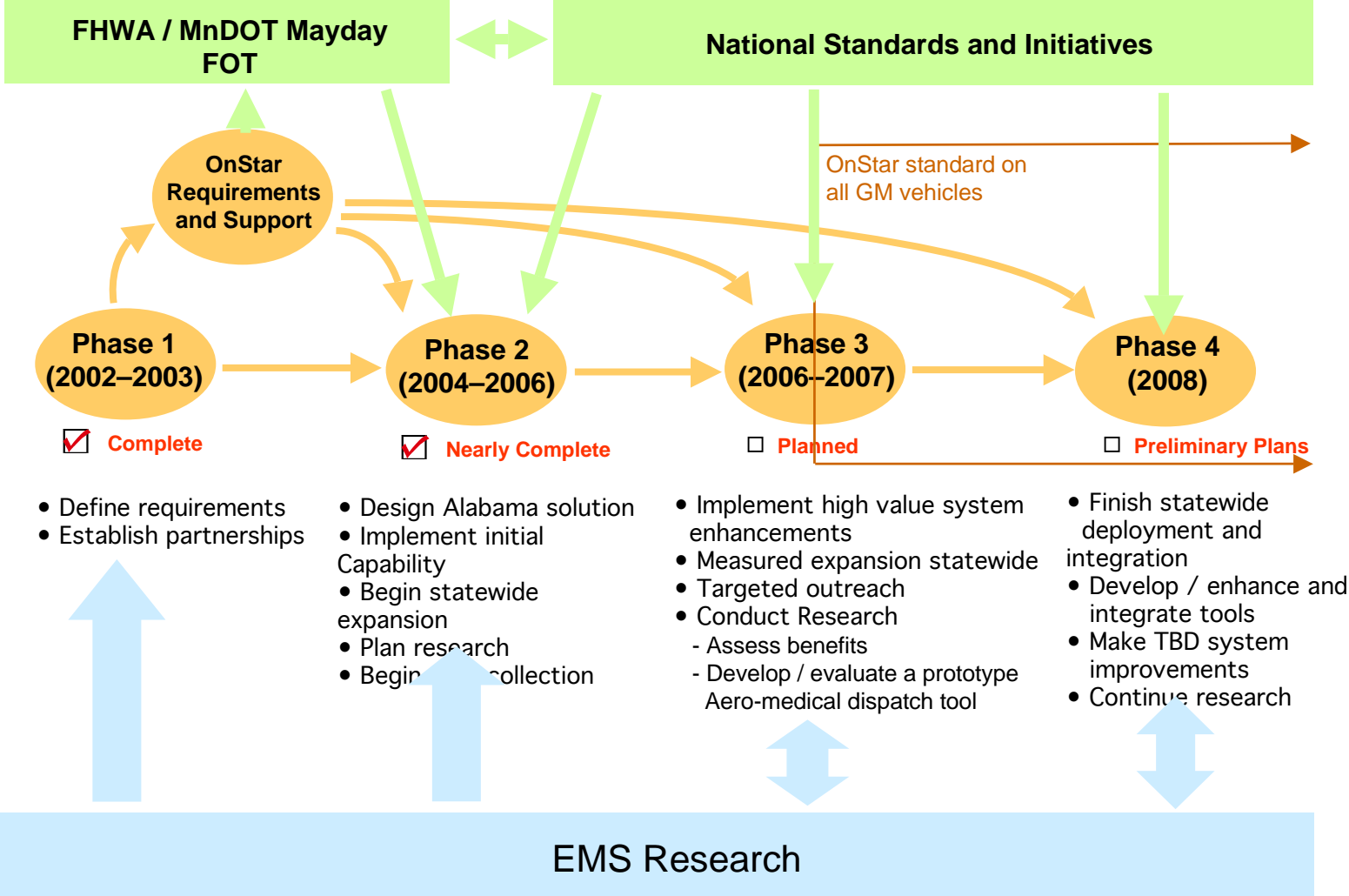
- **Program Overview**
- Deployment Challenges Being Addressed
- Experience to Date
- Future Potential

Alabama ACN Project Objectives

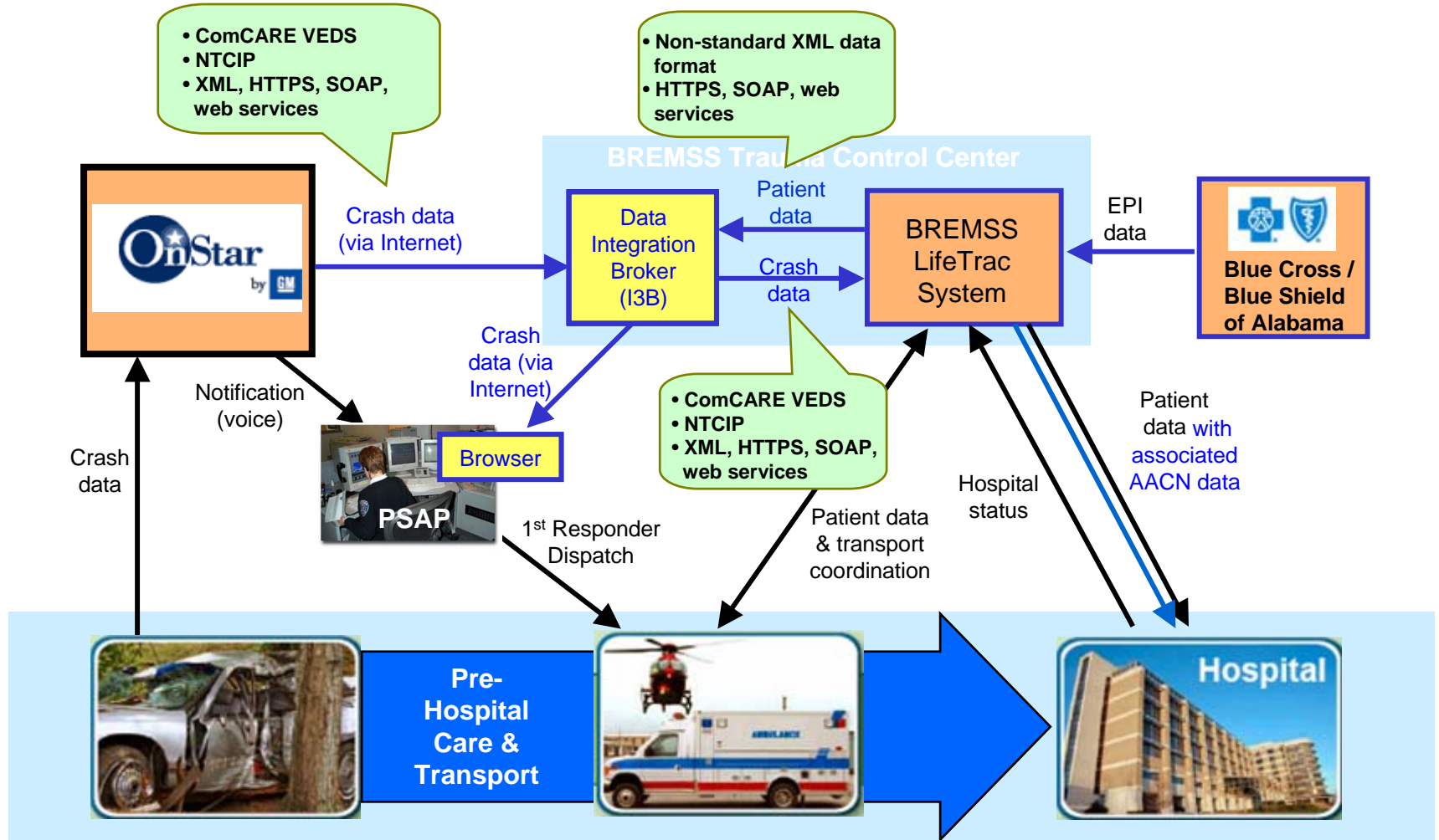
1. Deliver OnStar data to Alabama EMS
 - Integrate with BREMSS
 - Deploy web-based delivery elsewhere
2. Deliver OnStar data to Alabama PSAPs
 - Deploy web-based delivery
3. Develop operational and research foundation for national deployment
 - Evaluate / refine tools for using OnStar data
 - Assess benefits of OnStar to EMS and PSAPs
 - Conduct case studies
 - Begin outreach to other states



Alabama ACN Project Phases



Alabama ACN Data Flow



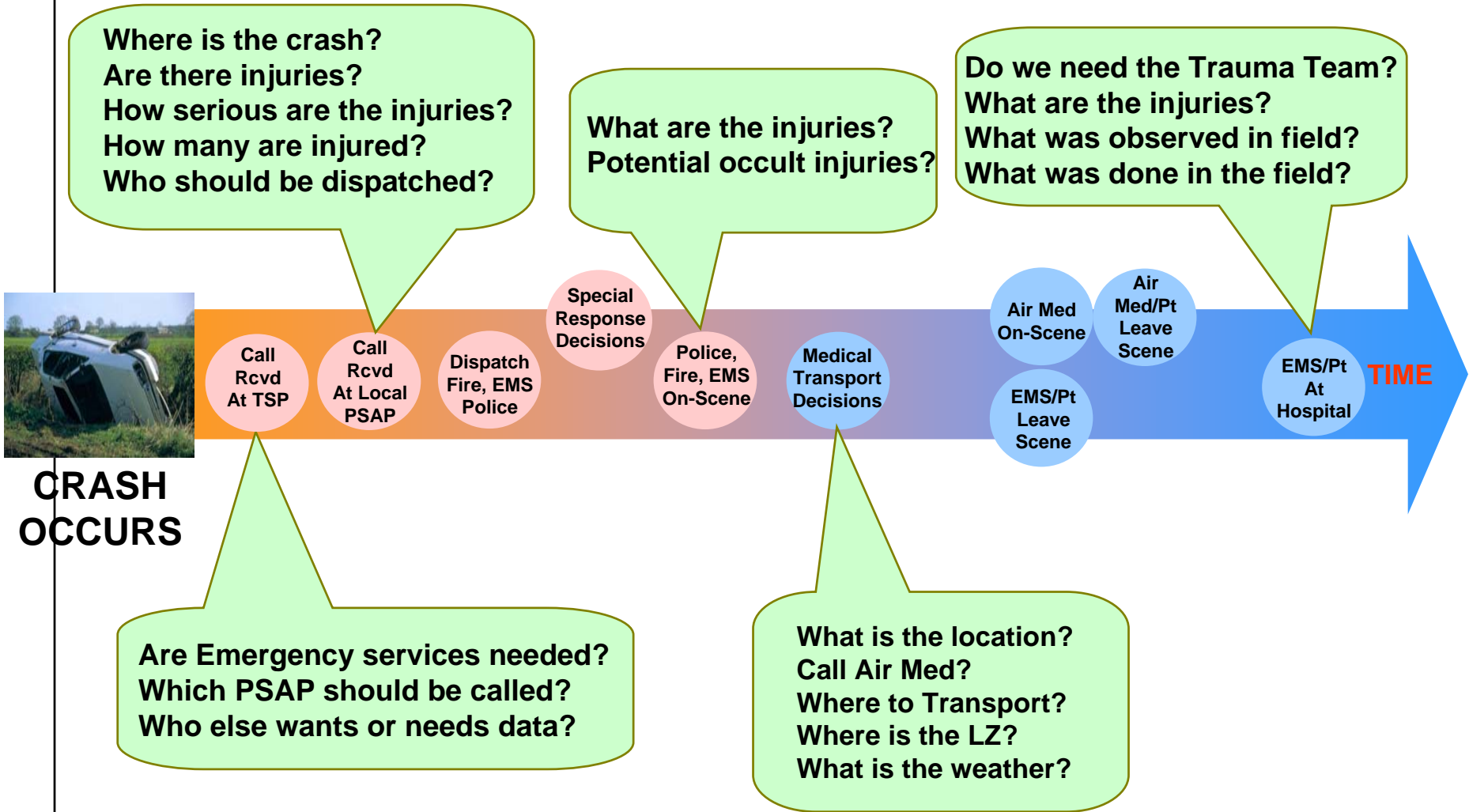
Topics

- Program Overview
- **Deployment Challenges Being Addressed**
- Experience to Date
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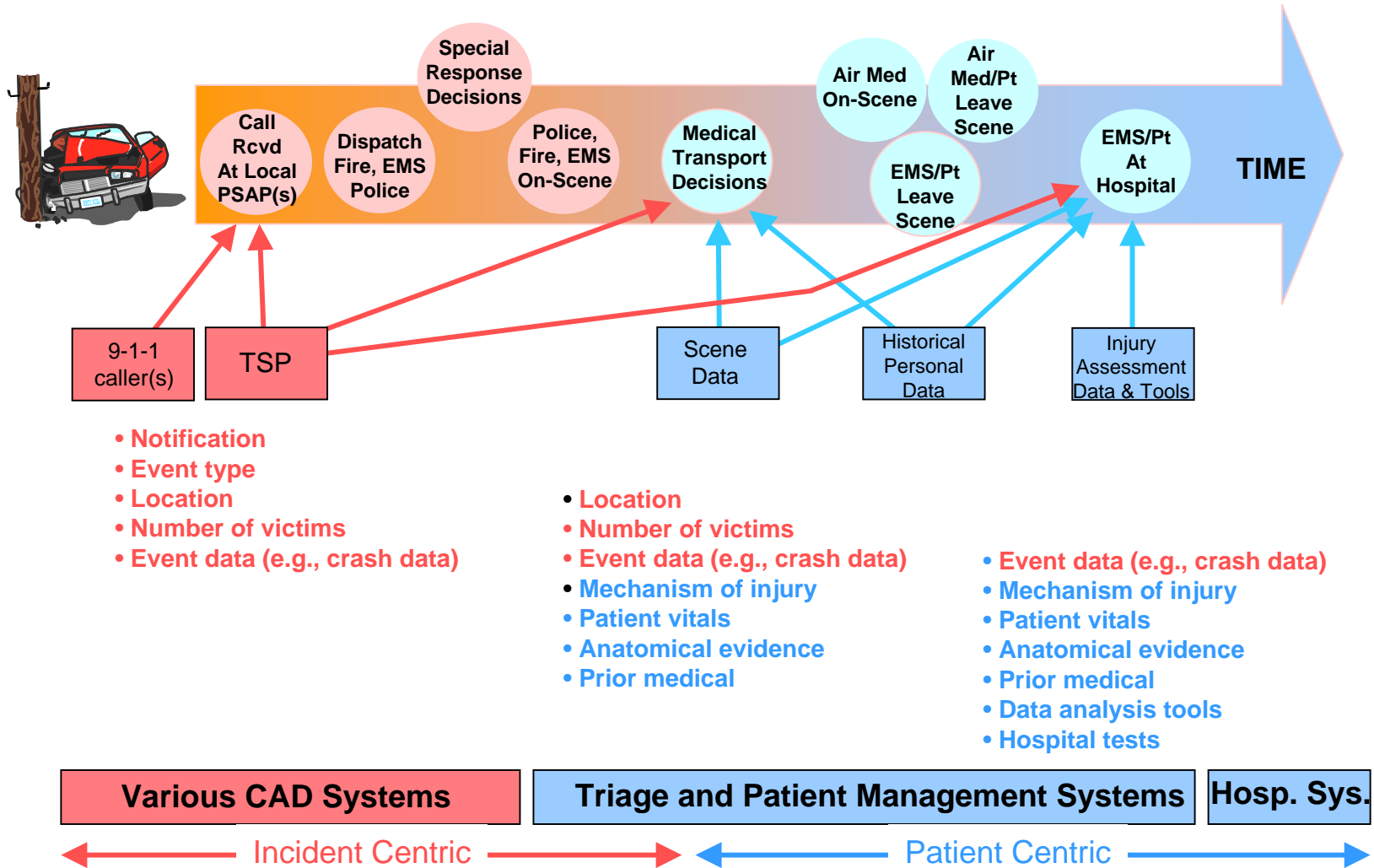
The Biggest Deployment Challenges Are Institutional and Operational

- Delivering the Right Data When Needed
- Making Sure the Data Is Actionable
- Overcoming Political and Jurisdictional Complexities
- Making Sure the Benefits Are Clear

Information Needs to Support Key Decisions



This Means Delivering the Right Data When Needed



Integrating with and Adding Value to Legacy Software

Example BREMSS LifeTrac Screen Showing OnStar Data Integration

**NOTE: Not actual data.
Data sanitized to protect
privacy of parties involved.**

The screenshot displays the LifeTrac software interface, version 3.5, running on a central server. The main window shows a grid of hospital status indicators under the 'Hospital Diverts' section. A modal window titled 'ACN/AACN Event - 06/08/2005 22:18:50' is overlaid on the screen, displaying crash data for a 2004 General Motors Malibu. The data includes the date received, location (AL), vehicle type (Automobile), manufacturer (General Motors), make (Chevrolet), model (Malibu), year (2004), color (Black), and VIN (1G2XU544243354367). The modal also indicates that an ACN/AACN event has occurred in the region and provides an 'Acknowledge' button. The background interface includes a navigation menu with options like Status, Patients, Bio/Chemical, Reports, Messages, Disaster, EPI, and Trac. A sidebar on the right lists various locations such as Birmingham and Malibu, each with a 'Details / Assign' button. At the bottom, there are buttons for 'Change Status', 'Resource Details', and 'Log Off', along with a status bar showing the system start time and current time.

Crash Data	
Date Received:	2006-01-21T09:05:12.365+00:00
Location:	AL
Automobile	
Manufacturer:	General Motors
Make:	Chevrolet (1)
Model:	Malibu
Year:	2004
Color:	Black
VIN:	1G2XU544243354367
Crash Data	
Heading:	268
Multiple Impacts:	false

Secure, Filtered, Browser-Based Access to Complete Incident Data Set

Example Alabama ACN Browser Display Showing OnStar Data

Note: BREMSS and PSAP operators trained on meaning of AACN data

NOTE: Not actual data. Data sanitized to protect privacy of parties involved.

Incident ID	Event Type	Date	Time	County	Estimated Location
684216224	ACN	Aug 25, 2005	12:18:32	Jefferson	1762 Cedarwood Court, Mobile 23561 at 14th and Helm
687615449	ACN	Aug 24, 2005	05:15:32	Morgan	8912 15th and Ginger Road, Madison 32789
683217856	AACN	Aug 23, 2005	06:12:57	Limestone	52 Lake Drive, Grimwood Street, 35872 at Madison
684512498	AACN	Aug 22, 2005	12:32:20	Shelby	192, Grover 32784 at Mile Marker 122
687623789	AACN	Aug 22, 2005	11:17:02	St. Clair	1782 Riverside Drive, St. Francis 22557

Summary

Call Type: AACN

Crash Forces (AACN crashes only)

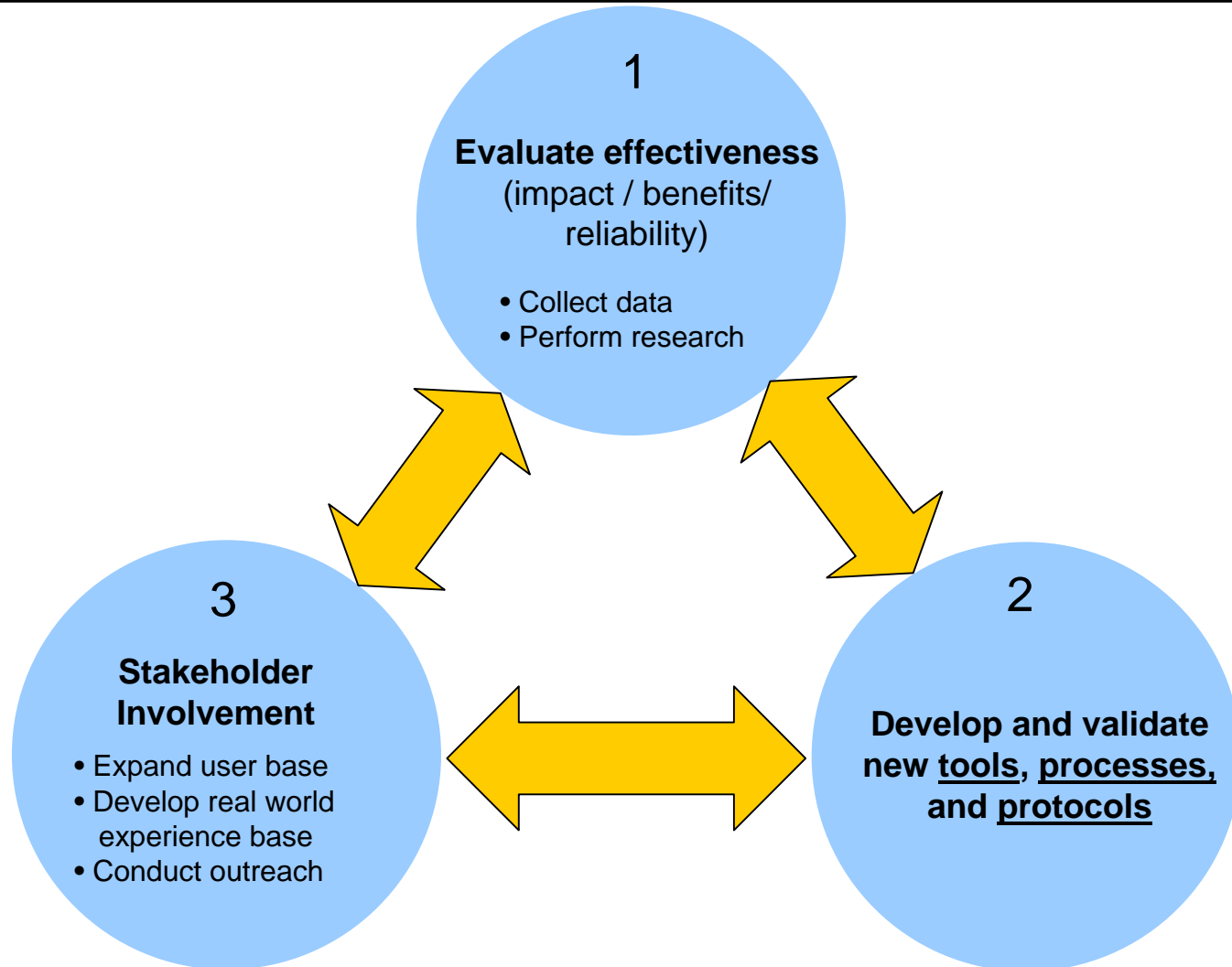
Date / Time
Date Call Received at TSP: Aug 23, 2005
Time Call Received at TSP: 06:12:57

Location
Estimated Location: 52 Lake Drive, Grim
Latitude: 32°56' 2, 452"
Longitude: -81° 32' 48, 09"
Pre-Crash Heading: Northbound

Principal Direction of Force

*N/A = Not Available
*TSP: Telematics Service Provider (example OnStar)

Doing the Peer Reviewed Research; Making the Benefits Clear

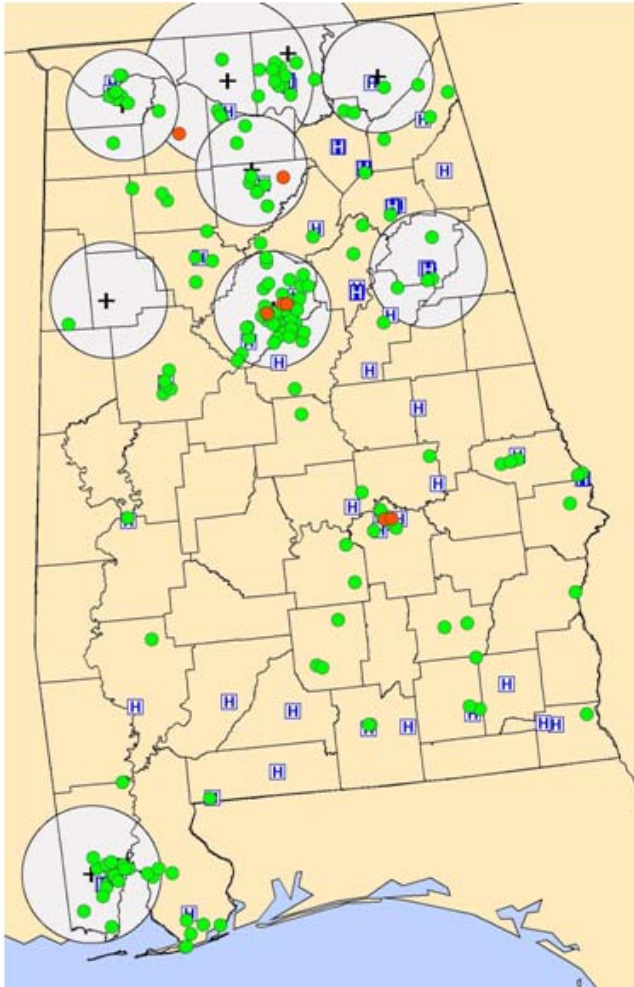


Topics

- Program Overview
- Deployment Challenges Being Addressed
- **Experience to Date**
- Future Potential



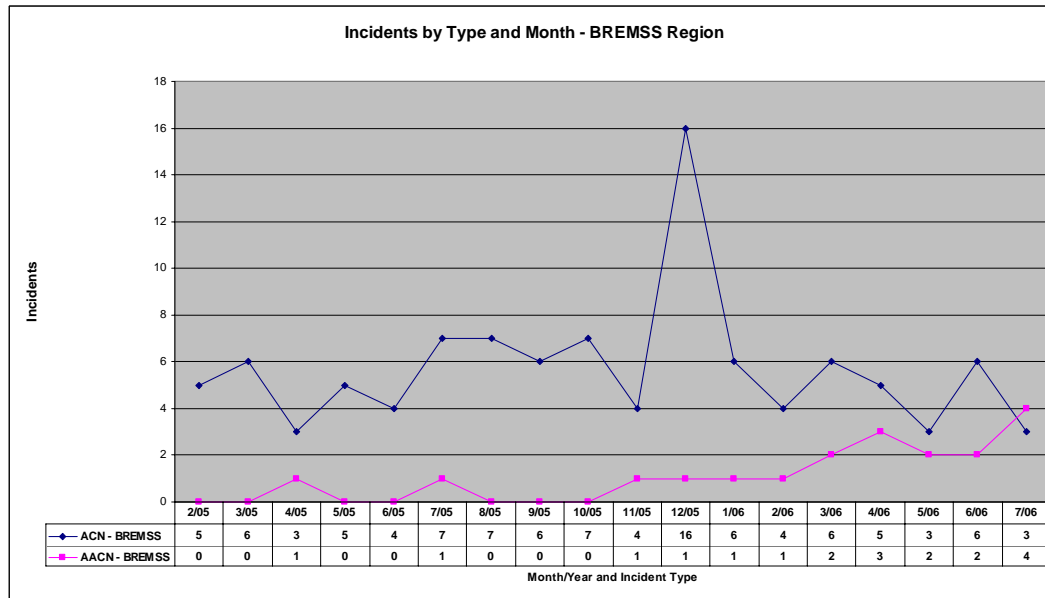
Operational Experience



- Start of System Operations: Feb 2005
- Incidents – BREMSS Region
 - ACN: 103
 - AACN: 19
- BREMSS Region Incidents with Trauma Patients*
 - ACN: 13 (10 Ground, 3 Aero-medical)
 - AACN: 1 (1 Aero-medical)
- Incidents – Statewide
 - ACN: 352
 - AACN: 76

* Patients meeting ATLS trauma triage guidelines and taken to Level 1 trauma center. Other injured occupants treated at nearest hospital.

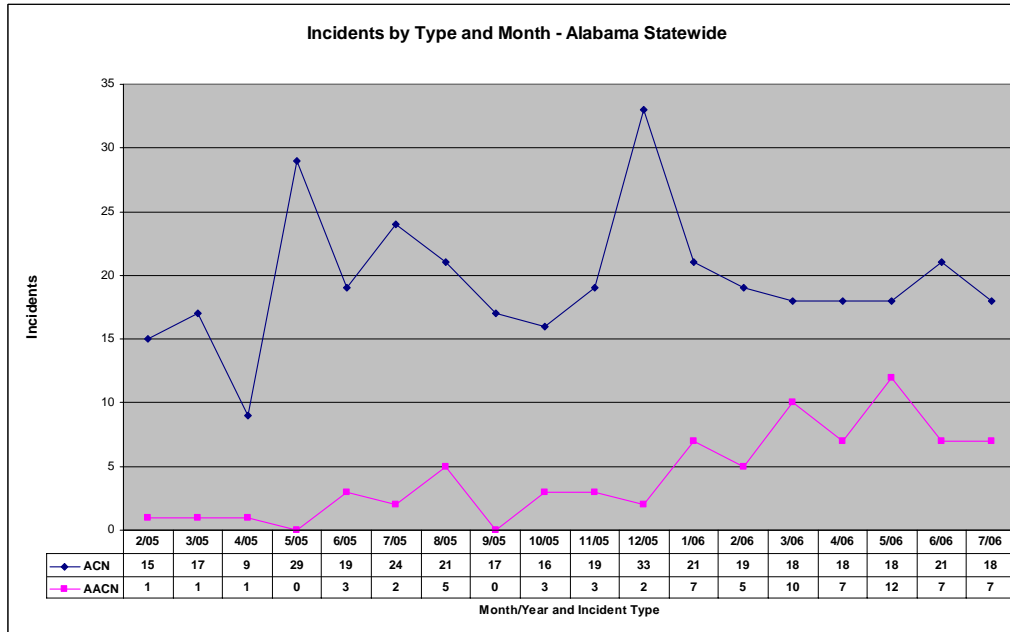
OnStar Calls By Month – BREMSS Region



	Total	Average per Month
ACN	103	5.7
AACN	19	1.1
	122	6.8



OnStar Calls By Month – Statewide



	Total	Average per Month
ACN	352	19.6
AACN	76	4.2
	428	23.8



Topics

- Program Overview
- Deployment Challenges
- Experience to Date
- **Future Potential**



Applying AACN Data to Support EMS Decisions

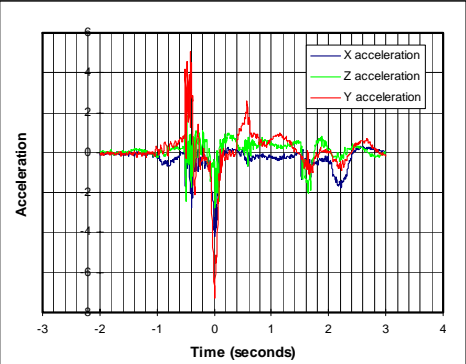
- EMS Dispatch
 - Multiple Ground ambulance needed?
 - EMS response priority?
 - Injury likelihood?
 - Early Aero-medical activation?
 - Transport to trauma center?
- Hospital
 - Mobilize trauma team?
 - Occult Injury potential?

Providing Tools that Can Use the AACN Data

Advanced
ACN-Equipped
Vehicle



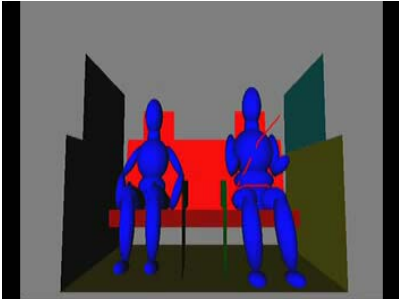
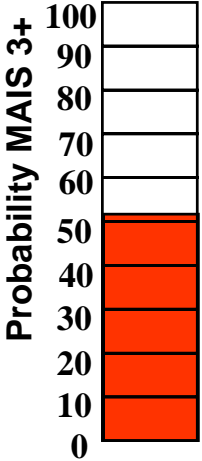
Crash Data
Principal Direction of Force
Crash Delta Velocity
Acceleration Time History



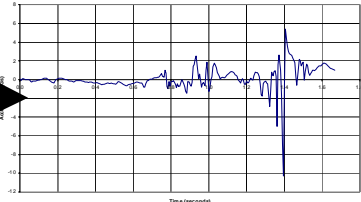
**and
Vehicle/ Occupant Data**
Restraint Use
Roll Over
Ejection or Entrapment
Vehicle Weight
Occupant Age, Gender

'Urgency Algorithm'
(see Bahouth et. al.)

**Injury Severity
Prediction
Algorithms**



**Crash Modeling/
Visualization**



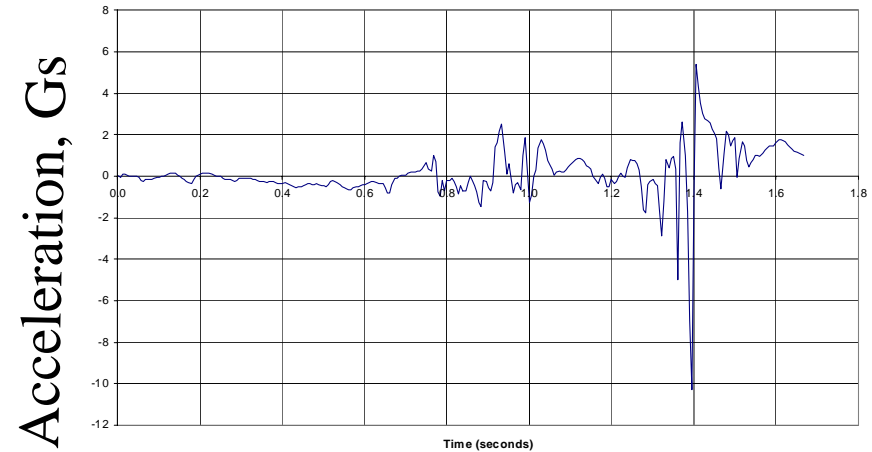
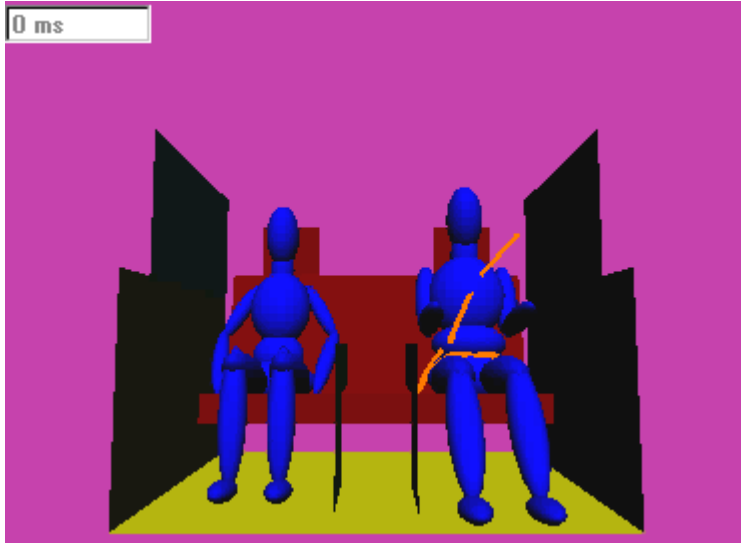
**Predicted Occupant
Dynamics &
Injury Criteria**



Analysis of Crash Effects

Articulated Total Body Code (ATB)

- 3-D Coupled Rigid-Body Dynamics
- Occupant kinematics
- Location and severity of cabin-interior body contacts
- Estimates of accelerations and forces on body regions



Time (sec)

**Front Right Passenger-
Pelvic Acceleration**

Conclusions

- The Alabama ACN Project Has Integrated OnStar Data with a Regional Trauma Management System in Alabama
 - Providing operational access to OnStar crash data
 - Establishing Alabama as a research laboratory
 - Building a foundation for broader deployment
- Successful Wide Scale Deployment Will Require
 - Peer-reviewed, outcomes-based research
 - Stakeholder involvement
- Integration with Legacy Software, Data, and Protocols Is Important for Emergency Response Effectiveness
 - Early focus is incident-centric
 - Later focus is patient-centric
- New Tools that Use AACN Data Offer Potential for Enhancing Decision Making