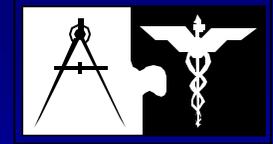


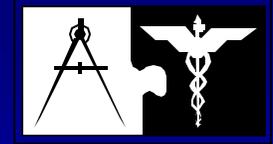
Crash Injury Research & Engineering Network (CIREN)

Office of Human-Centered Research NHTSA



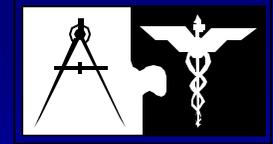
CIREN History

- **Started in May 1996**
- **Electronic database started in August 1999**
- **Substantial funding has been expended**
- **Infrastructure is in place, built on NASS**
- **Program expansion**
- **New partners (Mercedes, Ford)**
- **Started education and outreach**

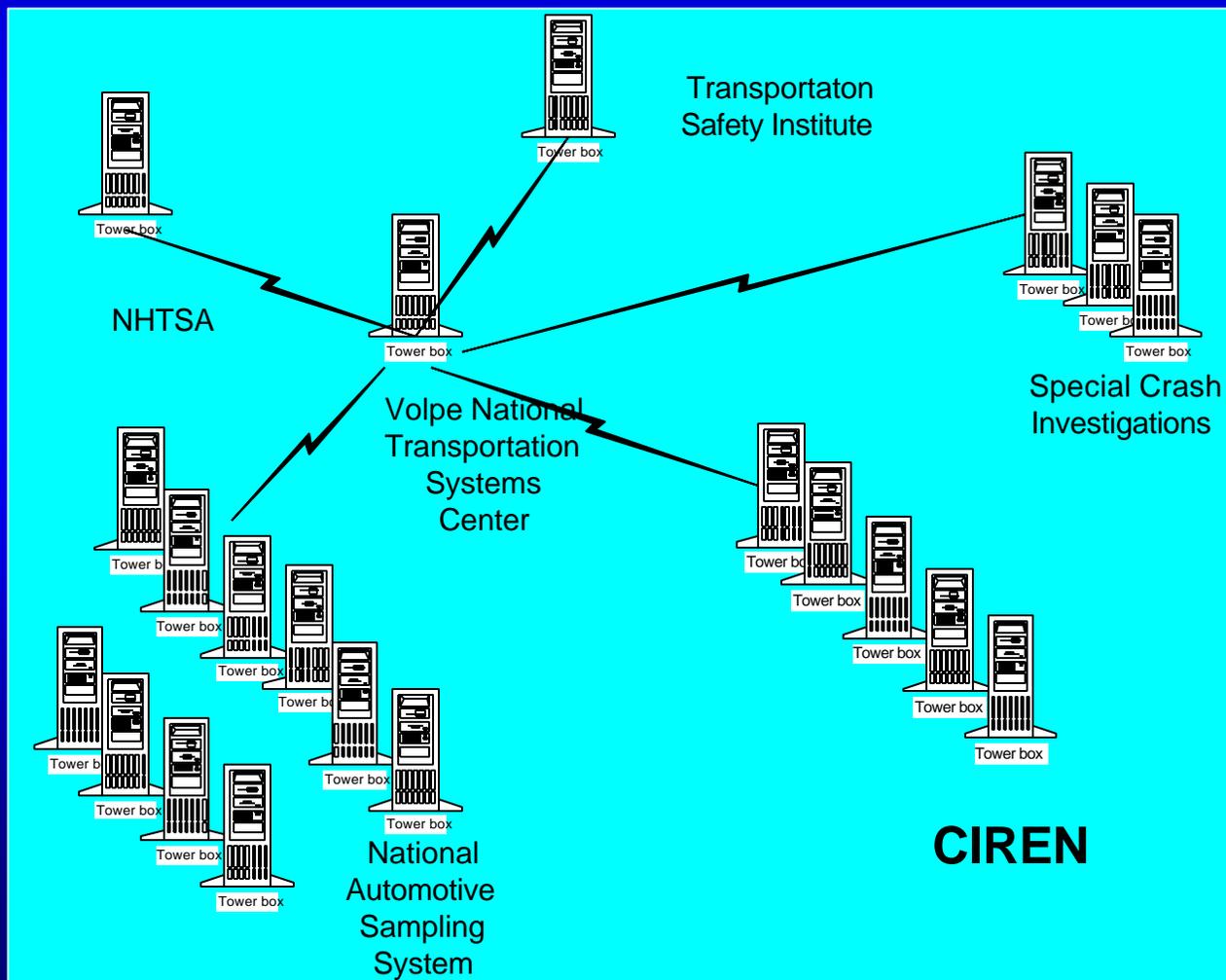


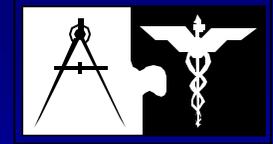
CIREN Now

- **Increased visibility of program**
- **Hardware & software installation complete**
- **Collaborative efforts among centers**
- **CIREN conference & quarterly meeting attendance**
- **Papers - Medical & Engineering**



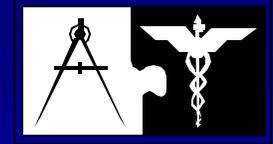
CIREN Wide Area Network





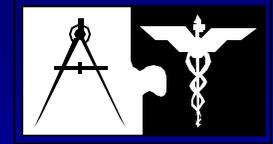
Database System

- **Crash data model**
- **Medical data model**



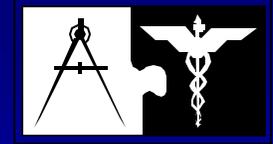
Crash Data Model

- **Standardized**
 - ▶ CIREN
 - ▶ NASS
 - ▶ SCI
 - ▶ GES
- **Over 650 data elements collected**



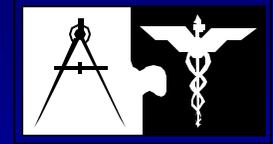
Crash Data Collection





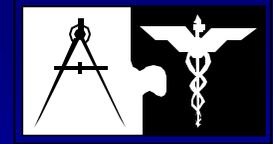
Scene Diagram





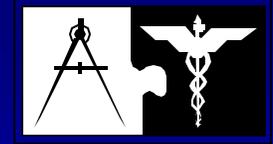
Vehicle Crush Profiles





Medical Data Model

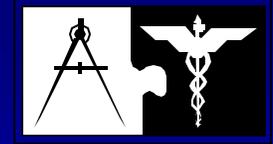
- **Standardized across all CIREN centers**
- **Common data elements (over 250 elements)**
 - ▶ Comorbidity
 - ▶ Complications
 - ▶ GCS scores
 - ▶ Invasive and non invasive procedures
 - ▶ Radiological tests
 - ▶ AIS injury coding
 - ▶ Costs



Medical Data Collection

LEFT ANKLE FRACTURE





Medical-Crash-Biomechanics

CIREN
 File Edit Components Action Configuration View Window Help

Radiological Tests
 Summary Detail

Intrusion
 Worksheet Sketch

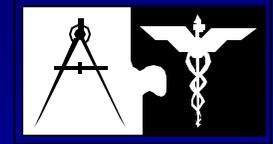
Row	Position	Area	Intruded Component	Comparison	Intruded	Intrusion	Magnitude	Crush Direction
▶ Second S4 Middle	Interior	Second seat back	84	37	47	>= 46 to < 61 cms	Longitudinal	
Second S4 Left	Interior	Second seat back	80	40	40	>= 30 to < 46 cms	Longitudinal	
Second S4 Right	Interior	Second seat back	87	71	15	>= 15 to < 30 cms	Longitudinal	
Second S4 Left	Interior	C-pillar	110	95	15	>= 15 to < 30 cms	Longitudinal	
Second S4 Left	Interior	Floor pan (includes	105	78	27	>= 15 to < 30 cms	Vertical	
Second S4 Left	Interior	Front seat back	37	9	23	>= 15 to < 30 cms	Longitudinal	

Injury Coding
 Summary Detail Intrusion Points of Contact Biomechanics Radiology Operations Images Note

AIS Code	Description	Injury Source	Confidence
6502223	Cervical Spine fracture facet	Skin laceration blood loss > 20% by volume	POSSIBLE
6302142	Cervical Spine Brachial plexus incomplete plex	Belt restraint B-pillar or door frame attachment p	POSSIBLE
3906063	Skin laceration blood loss > 20% by volume	Air bag compartment cover-driver side	POSSIBLE
3906063	Skin laceration blo		
3906042	Skin laceration ma		
3908001	Skin avulsion NFS		
3908021	Skin avulsion supe		
2906021	Skin laceration mir		
2906063	Skin laceration bk		
4906063	Skin laceration blo		
4908001	Skin avulsion NFS		
7920061	Upper extremity 2n		
5906063	Skin laceration blo		
6302162	Cervical Spine Bra		

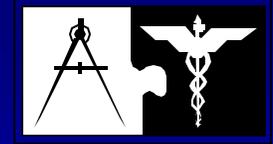
SF-36
 Summary Detail Graph

Current Injury: **6502223** Cervical Spine fracture facet



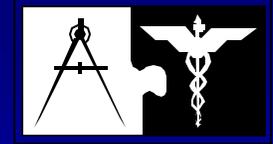
Central Repository

- **60 Gigabytes per year**
- **Optical juke box storage**
- **Images**
 - ▶ Crash photos
 - ▶ Sketches
 - ▶ X-rays
 - ▶ Sanitized patient photos



CIREN Capabilities

- **Common comparable elements**
- **Rapid data exchange**
- **Cross-center expertise**
- **Links surgeons, crash experts, and engineers**
- **Electronic rounds**



Future CIREN

- **Maintain momentum**
- **System enhancements (Phase II)**
- **Continued growth/new partners**
- **Expand education and outreach**
- **Make a difference**