**Welcome to the National Academies, TRB 94rd Annual Meeting**
"Corridors to the Future: Transportation and Technology"

# The National Academies Transportation Research Board (TRB)
# EMS Transport Safety ANB10(5)
## *January 2015 Subcommittee Meeting*

**Monday January 12th 8-9.45**
**Marriott Marquis, Eastern Market (M3)**

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

---

Transportation Research Board 94rd Annual Meeting,
National Academies Washington, DC, January 12th, 2015
"Corridors to the Future: Transportation and Technology"

***Emergency Medical Services Transport Safety Subcommittee ANB 10 (5)***
***2015 January Meeting:***

# *ANB10(5) – EMS Transport Safety and developments in Technology and Standards*

Nadine Levick, MD MPH
Chair Emergency Medical Services Subcommittee ANB10 (5), TRB
CEO, Research Director, EMS Safety Foundation
Eileen Frazer RN
Co-Chair ANB10(5) TRB
Executive Director of Commission on Accreditation of Medical Transport Systems (CAMTS)

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

---

## Emergency Medical Services Safety Subcommittee ANB10(5) of the Transportation Research Board Monday January 12th, 2015 8.00 am – 9.45 am also via Webinar, Washington DC

Chair – Nadine Levick MD, MPH

Co-Chair – Eileen Frazer RN

Sponsored by Transportation Safety Management Committee (ANB10) –

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

---

## TRB Annual Symposium

ESEARCH BOARD
OF THE NATIONAL ACADEMIES

---

## Inaugural 2008 ANB10(5) Subcommittee meeting

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

---

## 94th TRB www.TRB.org


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## What is EMS?

- Emergency Medical Services – (EMS)
- Emergency medical care, public health, public safety and patient transport
- Bridge between the community and the hospital
- Volunteer – professional
- Urban – rural
- Disaster response
- Majority of transports NOT critical or life threatening – (<3% are critical)

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Transport related aspects of EMS

- dispatch of EMS vehicles
- transport policies and protocols
- vehicle fleets and vehicle design
- vehicle purchase standards
- Intelligent Transportation Systems technology
- driver training
- driver performance monitoring
- roadside and road design
- integrated traffic safety technologies
- scene safety and visibility
- safety data capture
- safety oversight

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## For the transportation folks…

Why is EMS Transportation Safety a focus

- Data state that per vehicle and per mile travelled high fatality rates
- Driven by drivers overrepresented in high risk group: under 25 years of age/male
- Designed outside of the automotive safety and occupant protection arena
- Dangerous driving practice: Travel at high speed and run red lights

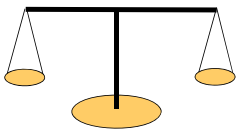
TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Yet….

- In less than 3% of transports is it a life threatening emergency

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

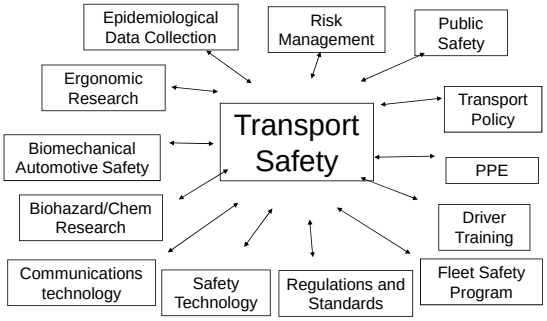
## Balance of concerns and risk during transport



- Response and transport time
- Clinical care provision
- Occupant safety/protection
- Public Safety

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Ambulance Transport Safety IS Complex AND Multidisciplinary




TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Negative impact on system performance…

- A medical error may kill a patient
  BUT
- An EMS crash can kill all those involved AND wipe out a rural EMS system AND negatively impact a regions response capacity……

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## USA EMS transport safety data estimates

includes police report data* and estimates based on known data capture deficiencies

- ~ 81,000 vehicles
- upto 9,000 crashes a year
- ~ One fatality each week
  - ~ 2/3 pedestrians or occupants of other car
- ~10 serious injuries each day
  - >50% not ambulance occupants
- Cost estimates > $500 million annually

*FARS/GES 2014 - http://www.naemt.org/Files/HealthSafety/2014%20NHTSA%20Ground%20Amublance%20Crash%20Data.pdf

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Ambulance transport a serious USA transport safety problem…

- the most lethal vehicle on the road both per mile travelled and per vehicle
- is exempt from federal commercial fleet safety oversight (FMCSA)
- 2/3 fatalities not in the ambulance
- More than half injuries are not in the ambulance
- Exempt from most FMVSS standards

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## In the USA there are more safety standards for moving cattle than for moving patients

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Today's AGENDA

1. **Opening Remarks -** Nadine Levick and Eileen Frazer 8:00 -8.15 AM
2. **Subcommittee Meeting** 8:15 - 9:45 AM
   - 2.1 Introductions
   - 2.2 Review and Approval of Minutes from 2014
   - 2.3 Review of Subcommittee activities 2014
   - 2.4 Sub-committee work program updates:
     - 2.4.1 Ambulance Transport Safety Summit 2015
     - 2.4.2 Research Needs Statements - Research Topics Database
     - 2.4.3 Administrative issues
       - 2.4.3.1 Liaison organizations
       - 2.4.3.2 TRB Changes/Communications/Website
       - 2.4.3.3 Membership/Recruitment
       - 2.4.3.4 2016 TRB Session Topics and Calls for Papers
3. **EMS National Updates –**
   - 3.1 Standards developments in 2014
   - 3.2 TIMS
   - 3.3 NAEMT Safety Course Update
   - 3.4 VFIS
   - 3.5 Federal Projects
   - 3.6 New communications technologies
4. **Research needs**

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Follow hashtags #TRBEMS15, #ANB10(5), #EMSSafety on twitter!


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Introductions

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## 2.2 Review and Approval of Minutes from 2014

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

**ANB10(5) Jan 2014 Subcommittee Meeting Minutes**

**www.EMSSafetyFoundation.org/ TRBJan2014MeetingMinutes.pdf**


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

**A HUGE Thank you from ANB10(5) to**

## Rick Pain PhD

**for steadfast, inspiring and insightful mentorship**

**Without Rick's visionary leadership, none of the activities of ANB10(5) would have ever been possible**

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

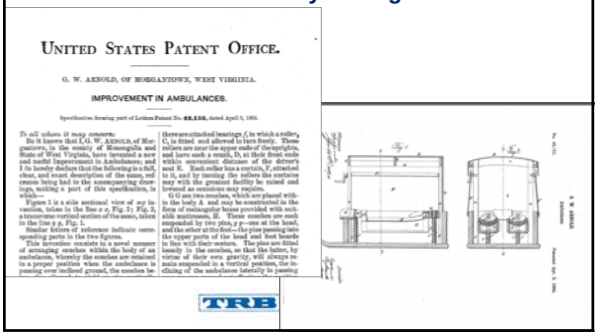
**This years TRB theme - "Corridors to the Future: Transportation and Technology"**

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Letter to Abe Lincoln – 1864 re: safety of ambulance design

## 1864 Ambulance Design Patent and diagrams

**Almost 150 years ago**



UNITED STATES PATENT OFFICE.

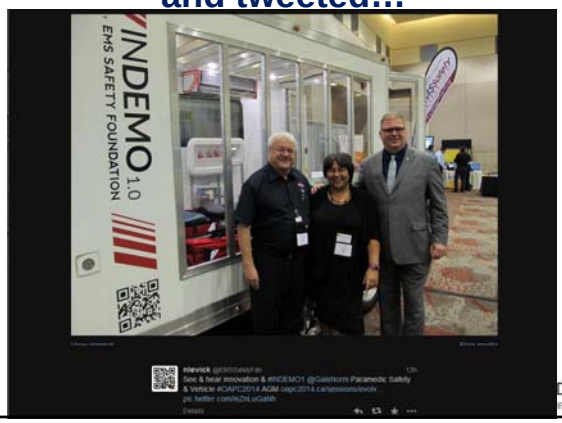
G. W. ARNOLD, OF MORGANTOWN, WEST VIRGINIA.

IMPROVEMENT IN AMBULANCES.



TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## and tweeted…




## Big Data and Mobile Health

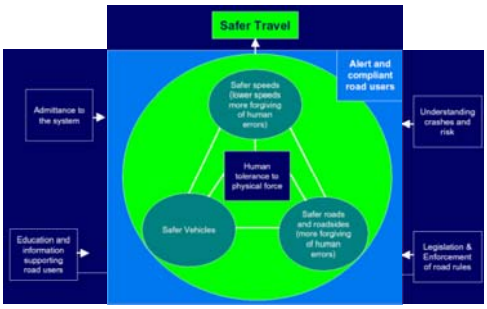

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES


## From our very first Subcommittee meeting

- facilitating translation of relevant related transportation safety research and knowledge to EMS



## Safe Systems Approach




*Source:* Road Safety Branch, Infrastructure and Surface Transport Policy, Department of Infrastructure, Transport, Regional Development and Local Government, Australia.

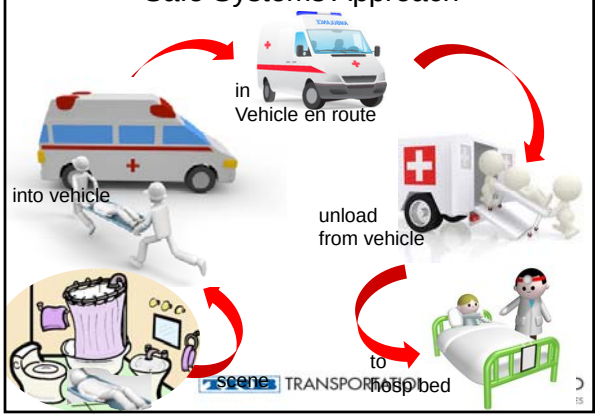


## Systems safety of:

- Dispatching a vehicle
- Getting you, your patient and equipment to, in and out of the vehicle
- Providing patient care inside the vehicle
- Occupant protection in crash and near miss situations
- Public safety



## Safe Systems Approach





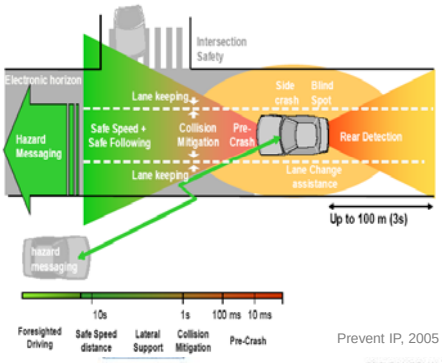

## System Design Constraints

- Do the clinical work that is required and essential
- Not get hurt or killed
- Not hurt or kill anyone else

So…

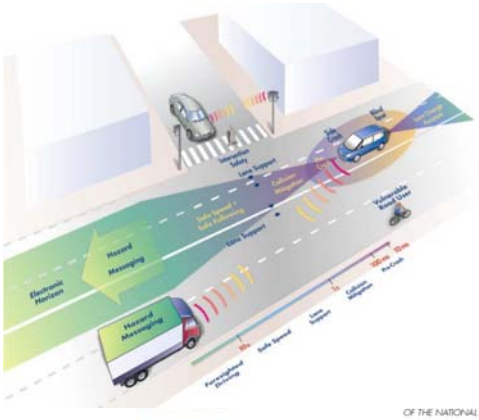
- Clinical need
- Human tolerance of injury

## Intelligent Transport Safety Systems




Prevent IP, 2005







## Miniaturize this interface ?



Now can be done on a smartphone platform!!!



## Much of this is now in our hands and on our heads!!




## Wireless patient monitoring

## July 17, 2014

http://www.marketwatch.com/story/crowdoptic-signs-software-deal-with-protransport-1-to-install-google-glass-in-ambulances-2014-07-17

July 17, 2014, 12:01 p.m. EDT

**CrowdOptic Signs Software Deal With ProTransport -1 to Install Google Glass in Ambulances**

**Companies Aim to Enhance Emergency Medical Services Using Google Glass**

MARKET WIRED

SAN FRANCISCO, CA AND SACRAMENTO, CA, Jul 17, 2014 (Marketwired via COMTEX) -- CrowdOptic, a maker of mobile and wearable broadcasting solutions, and ProTransport-1, Northern California's premier medical transport provider, today announced a software sales agreement under which ProTransport-1 will deploy the CrowdOptic Google Glass broadcasting solution in its ambulances and mobile medicine units.

ProTransport-1 will use Google Glass to broadcast real-time video evaluations of patients from ambulances during transport to the receiving healthcare institutions. This technology solution will aim to improve documentation and expand medical consultative opportunities for patients en route.

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## July 22, 2014

http://www.governing.com/news/headlines/paramedics-might-benefit-from-google-glass.html

**Why Paramedics Might Soon Get Google Glass**

BY MCCLATCHY NEWS | JULY 22, 2014

By Ameet Sachdev

While Google Glass' potential as a consumer device remains to be seen, Lauren Rubinson-Morris is excited about its possibilities in her workplace.

Rubinson-Morris is president and chief executive officer of MedEx Ambulance Service, a Skokie-based company that provides transportation to hospitals and other health care sites throughout the Chicago area.

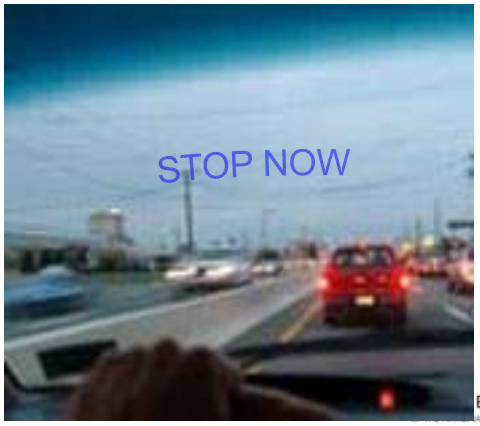
The company has acquired two pairs of Google Glass installed with software and connected to the Internet, allowing paramedics to transmit live video and audio from an ambulance to a doctor in an emergency room who will be able to watch the video stream on a tablet or desktop computer.

RELATED
Google Glass Now for Public Transit

The additional eyes on a patient can provide paramedics with advice, diagnosis and treatment options. MedEx plans to launch a test with Advocate Illinois Masonic Medical Center in Chicago

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES




BOARD

## From Wired August 2014

This $500 Display Makes Your Junker Car Feel Like a Fighter Jet

BY ALEXANDER GEORGE 08.05.14 | 12:00 PM | PERMALINK


## Breaking down the silos between:

- EMS practice
- Automotive occupant protection
- Fleet management
- Human factors and ergonomics
- New technologies in monitoring, communication
- Interoperability
- Fragmented oversight

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Twitter

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Sharing international practice

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

OF THE NATIONAL ACADEMIES

OF THE NATIONAL ACADEMIES

OF THE NATIONAL ACADEMIES

## This morning's meeting

- Will cover:
  - Review of TRB EMS Safety Subcommittee's activities
  - An overview of the TRB and opportunities for EMS
  - Research funding pathways via the TRB
  - National updates
  - Research Needs/Problems/Statements

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## The TRB and EMS

- TRB Mission:
  To provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multi modal.
- Provides service to government, public, and scientific and engineering communities.
- TRB Goals:
  - Being prepared for challenges.
  - Conduct and promote knowledge.
  - Provide timely and informed advice.
  - Act as an effective and impartial forum.
  - Promote collaboration.
  - Contribute to the professional development
  - Conduct and promote communications efforts.
  - Contribute to public's understanding.
  - A resource to the nation and to the transportation community worldwide

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## What is ANB 10 (5)?

- Emergency Medical Services Safety Subcommittee, ANB 10 (5)
  - Subcommittee of the Transportation Safety Management Committee ANB 10, of the Transportation Research Board of the National Academies

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## EMS Safety Subcommittee ANB10(5)

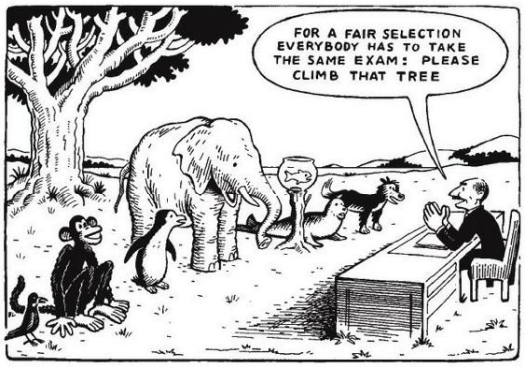
- Subcommittee supported by Transportation Safety Management ANB10
- Established July 2007
- First Subcommittee meeting – Jan 2008
- Chair, Nadine Levick MD, MPH
- Co-Chair, Eileen Frazer, RN
- Scope – Medical Transport Safety

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Multidisciplinary research

- Encompassing all aspects of transportation
- The expertise that EMS needs to address its transportation safety challenges includes:
  - Systems design
  - Transport systems safety
  - Human factors
  - Vehicles
  - Fleet operations
  - Air medical transport safety
  - Managing impaired operators
  - Road design and egress and access
  - Highway and operational hazards

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES




TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Fragmentation

- There are now numerous and variably sound or technically sophisticated events occurring sporadically on ambulance safety – none under a transportation umbrella

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## ANB10 (5) TRB EMS Subcommittee Mission

- '*Bridging the gap between what we do and what is known*
  *- Enhancing ambulance transport safety through shared knowledge of technical data*'.

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Integration

ANB10(5) is an independent platform for:

- Bringing fragmented information together
- Uniting diverse disciplines
- Focus on technically robust information

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## The Transportation Research Board (TRB)

- History

  TRB was established in 1920 as the National Advisory Board on Highway Research to provide a mechanism for the exchange of information and research results about highway technology.

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## TRB MISSION

- To provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal.

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## TRB divisions

- Technical Activities supports standing committees and task forces.
- Studies and Special Programs convenes specially appointed expert committees to conduct policy studies and program reviews, maintains the TRIS database, provides library services, prepares synthesis reports on behalf of the Cooperative Research Programs, and manages the Innovations Deserving Exploratory Analysis (IDEA) programs.

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## TRB research programs

- Cooperative Research Programs manages
  - National Cooperative Highway Research Program - NCHRP
  - Transit Cooperative Research Program - TCRP
  - Airport Cooperative Research Program – ACRP
  - National Cooperative Freight Research Program - NCFRP
  - Hazardous Materials Cooperative Research Program. -HMCRP
- Strategic Highway Research Program 2 (SHRP-2)
  - manages a targeted, short-term, results-oriented program of contract research designed to advance highway performance and safety for U.S. highway users.
- Administration and Finance provides financial, information technology, and other administrative support, including financial oversight of the contracts and grants that support the work of TRB, administration of publications sales and distribution, and maintenance of benefits and services for sponsor and affiliate organizations.

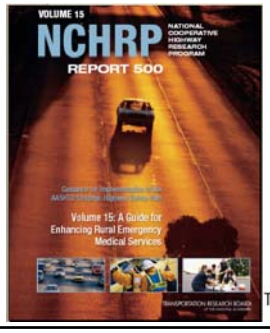
TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Special role for EMS at TRB

- One of the Key 4 E's
  - Engineering
  - Education
  - Enforcement
  - **Emergency Medical Services**

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Transportation Research Board is an excellent resource… we should be using it!!




TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Emergency Medical Services Response to Motor Vehicle Crashes in Rural Areas

**http://www.trb.org/Main/Blurbs/169523.aspx**


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## In Summary TRB Services

- A resource to the nation and to the transportation community worldwide
  - Opportunities for information exchange on current transportation research and practice
  - Management of cooperative research and other research programs
  - Analyses of national transportation policy issues and guidance on federal and other research programs
  - Publications and access to research information from around the world.

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Who is attending the 94th TRB meeting

- >12,000 transportation related researchers and technical personnel from all over the globe

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## TRB 2015

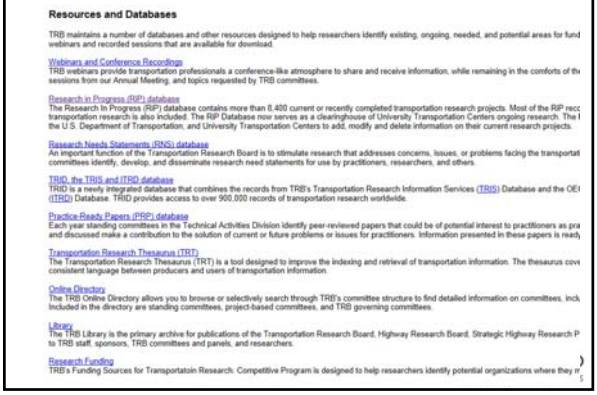
- Making Ambulances Safer for EMS Personnel
  - James Green, National Institute of Occupational Safety and Health
  - P15-6240
- A Mathematical Formulation and Heuristic Method for Relocation and Dispatching of Heterogeneous Fire Department Fleet
  - Elham Sharifi, University of Maryland, College Park
  - Ali Haghani, University of Maryland, College Park
  - Hadi Sadrsadat, University of Maryland, College Park
  - 15-0492
- A Double Standard Model For Emergency Medical Services Allocation Considering Resource Uncertainty
  - Yi Liu, Illinois Institute of Technology
  - Zongzhi Li, Illinois Institute of Technology
  - Harshingar Patel, Illinois Institute of Technology
  - 15-4705

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

# TRB Resources and Structured Transportation Research Programs

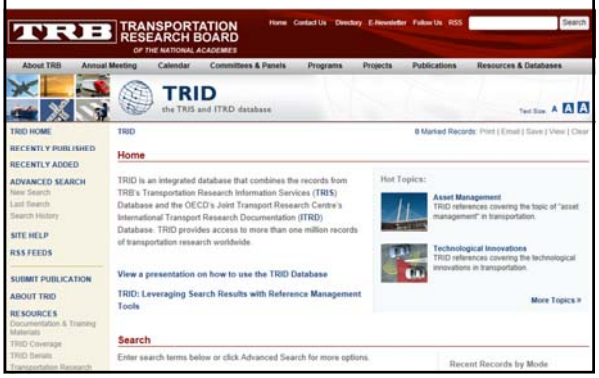
TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## TRB Resources




## TRID http://trid.trb.org/

**the TRIS and ITRD**




## Transportation Research Information Services (TRIS)

- Online Research Information
- TRB produces and maintains the Transportation Research Information Services (TRIS), the world's largest and most comprehensive online bibliographic database of published and ongoing transportation research.
- Through a cooperative agreement with the Bureau of Transportation Statistics, the TRIS Database is available on the Internet through the website of the National Transportation Library. This service, TRIS Online, can be accessed through the TRB homepage at www.TRB.org. TRIS is also available through two fee-based services, Dialog and Silverplatter's TRANSPORT CD-ROM.

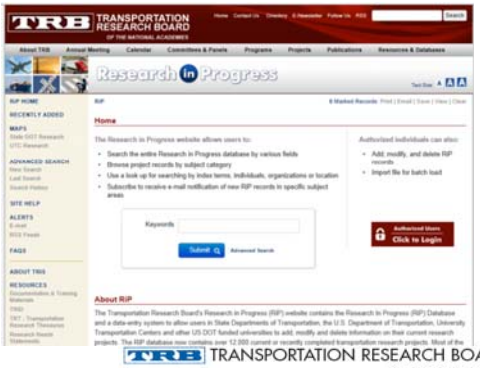
TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Other TRB Online Resources

- Research in Progress (RiP) Database
- RiP provides access to more than 10,000 descriptions of current or recently completed transportation research projects from federal and state transportation agencies, universities, and international organizations
- The TRB Publications Index is a searchable index of the Board's papers and reports.

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## RiP http://rip.trb.org/




TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Synthesis Program

- Reports on current knowledge and practice
- Synthesize fragmented, scattered, and unevaluated existing information
- Initiation of ~ 12 syntheses per year
- Selection process for synthesis topics:
  - widespread enough to generate broad interest
  - timely and critical for expediting delivery, improving the quality, or lowering the cost of transportation programs
  - current practice is non-uniform or inconsistent from agency to agency, or if the validity of some practices appears to be questionable
  - a need to organize and compress that which has already been learned and written on the topic
  - ongoing research or other activities in progress should not render the synthesis obsolete shortly after completion

TRB TRANSPORTATION RESEARCH BOARD
http://www.trb.org/Studies/Synthesis/SynthesesNCHRP.asp OF THE NATIONAL ACADEMIES

## National Cooperative Highway Research Program (NCHRP) Synthesis

- New NCHRP Synthesis topics submissions due February, 2015

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Strategic Highway Research Program (SHRP 2)

- Congress established the second strategic highway research program (SHRP 2) in 2006 to investigate the underlying causes of highway crashes and congestion in a short-term program of focused research. Focus areas:
  - Safety: Significantly improve highway safety by understanding driving behavior in a study of unprecedented scale
  - Renewal: Develop design and construction methods that cause minimal disruption and produce long-lived facilities to renew the aging highway infrastructure
  - Reliability: Reduce congestion and improve travel time reliability through incident management, response, and mitigation
  - Capacity: Integrate mobility, economic, environmental, and community needs into the planning and design of new transportation capacity

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## IDEA Program

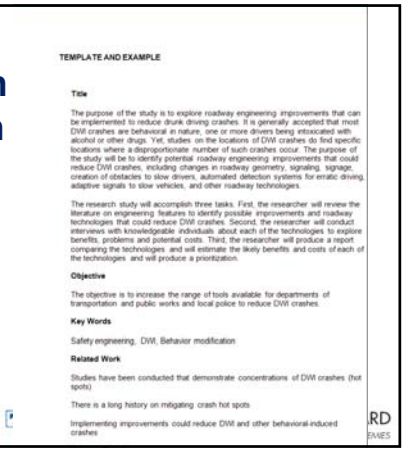

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Research Approaches

- Submission avenues:
  - Synthesis topic - NCHRP
  - SHARP 2 – Safety
  - Research questions/Problem statements



## Sample Research Question



TEMPLATE AND EXAMPLE

Title

The purpose of the study is to explore roadway engineering improvements that can be implemented to reduce drunk driving crashes. It is generally accepted that most DWI crashes are behavioral in nature, one or more drivers being intoxicated with alcohol or other drugs. Yet, studies on the locations of DWI crashes do find specific locations where a disproportionate number of such crashes occur. The purpose of the study will be to identify potential roadway engineering improvements that could reduce DWI crashes, including changes in roadway geometry, signaling, signage, creation of obstacles to slow drivers, automated detection systems for erratic driving, adaptive signals to slow vehicles, and other roadway technologies.

The research study will accomplish three tasks. First, the researcher will review the literature on engineering features to identify possible improvements and roadway technologies that could reduce DWI crashes. Second, the researcher will conduct interviews with knowledgeable individuals about each of the technologies to explore benefits, problems and potential costs. Third, the researcher will produce a report comparing the technologies and will estimate the likely benefits and costs of each of the technologies and will produce a prioritization.

**Objective**

The objective is to increase the range of tools available for departments of transportation and public works and local police to reduce DWI crashes.

**Key Words**

Safety engineering, DWI, Behavior modification

**Related Work**

Studies have been conducted that demonstrate concentrations of DWI crashes (hot spots)

There is a long history on mitigating crash hot spots

Implementing improvements could reduce DWI and other behavioral-induced crashes

Very important. This study is very important because drunk driving is the major cause of motor vehicle fatalities in the United States which, in turn, places a huge cost on our society, both monetary and in terms of the public good.

**Cost**

$75,000 - $125,000

**User Community**

FHWA, NHTSA, ITE, AASHTO, AMPO, NARC, IACP, USDOJ, NIJ

**Implementation**

The study will involve a literature review, interviews with experts, and a conceptual evaluation.

**Effectiveness**

This would be a first step in identifying new or overlooked technologies that could reduce DWI crashes

## ANB10(5) Umbrella Committee is ANB10 Transportation Safety Management

## How do TRB Subcommittees work?

RNS

RESEARCH NEEDS STATEMENTS

DETERMINATION OF CURRENT STATE BASED EMERGENCY VEHICLE CRASH DATA CAPTURE AND ANALYSIS: POLICE, FIRE AND EMS

I. PROBLEM TITLE

Determination of current state based emergency vehicle crash data capture and analysis; police, fire and EMS

II. RESEARCH PROBLEM STATEMENT

III. OBJECTIVE

IV. RESEARCH PROPOSED

V. ESTIMATE OF THE PROBLEM FUNDING AND RESEARCH PERIOD

VI. URGENCY AND PAYOFF POTENTIAL

VII. RELATIONSHIP TO FTA STRATEGIC GOALS AND POLICY INITIATIVES and TCRP STRATEGIC PRIORITIES

VIII. RELATED RESEARCH

IX. PERSON(S) DEVELOPING THE PROBLEM

X. PROCESS USED TO DEVELOP PROBLEM STATEMENT

XI. DATE AND SUBMITTED BY

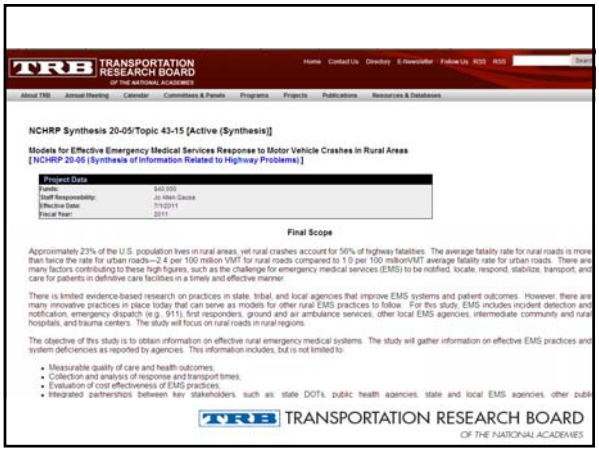
Submit to: Christopher W. Jenks, Manager, TCRP, Transportation Research Board, 500 Fifth Street, N.W.

ARD
ADEMIES

## Problem statement development in progress from 2008-2014

- Development and application of standardized definitions to capture EMS transport data across all agencies.
- Identifying ambulance fleet mix by state
- Determination of current state based emergency vehicle crash data capture and analysis; police, fire and EMS.
- Identifying the regional essential and optional equipment payload for ambulances
- Evidence for ambulance visibility and conspicuity
- Effectiveness and cost effectiveness of real time driver monitoring feedback devices for EMS services

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES



TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

NCHRP Synthesis 20-05/Topic 43-15 [Active (Synthesis)]

Models for Effective Emergency Medical Services Response to Motor Vehicle Crashes in Rural Areas

[ NCHRP 20-05 (Synthesis of Information Related to Highway Problems) ]

Project Data

Final Scope

Approximately 23% of the U.S. population lives in rural areas, yet rural crashes account for 56% of highway fatalities. The average fatality rate for rural roads is more than twice the rate for urban roads—2.4 per 100 million VMT for rural roads compared to 1.0 per 100 million VMT average fatality rate for urban roads. There are many factors contributing to these high figures, such as the challenge for emergency medical services (EMS) to be notified, locate, respond, stabilize, transport, and care for patients in definitive care facilities in a timely and effective manner.

There is limited evidence-based research on practices in state, tribal, and local agencies that improve EMS systems and patient outcomes. However, there are many innovative practices in place today that can serve as models for other rural EMS practices to follow. For this study, EMS includes incident detection and notification, emergency dispatch (e.g., 911), first responders, ground and air ambulance services, other local EMS agencies, intermediate community and rural hospitals, and trauma centers. The study will focus on rural roads in rural regions.

The objective of this study is to obtain information on effective rural emergency medical systems. The study will gather information on effective EMS practices and system deficiencies as reported by agencies. This information includes, but is not limited to:

- Measurable quality of care and health outcomes;
- Collection and analysis of response and transport times;
- Evaluation of cost effectiveness of EMS practices;
- Integrated partnerships between key stakeholders, such as state DOTs, public health agencies, state and local EMS agencies, other public

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

NCHRP 17-51 FRAMEWORK PROJECT

PUBLIC PROJECT WEBSITE

ABOUT THE PROJECT

Background

SIGN UP FOR NOTIFICATIONS

WEBINARS

DISCLAIMER

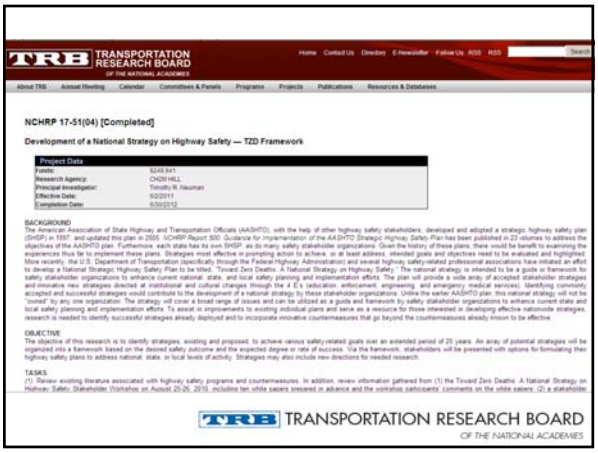
INTERIM TOPICS

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## NCHRP 17 - 51

- The Framework developed by NCHRP 17-51 will be a tool that Stakeholders can use to formulate their Highway Safety Plans which integrate EMS, at the National, State, or Local Level. More information about the Framework Project is available at: http://www.strategicsafetyplan.com

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES



TRB TRANSPORTATION RESEARCH BOARD

NCHRP 17-51(04) [Completed]

Development of a National Strategy on Highway Safety — TZD Framework

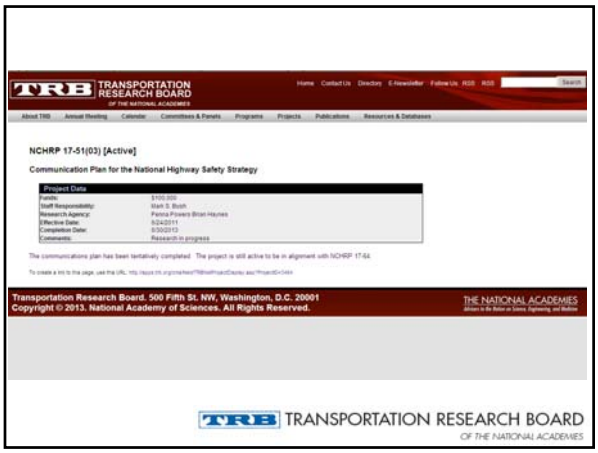
Project Data

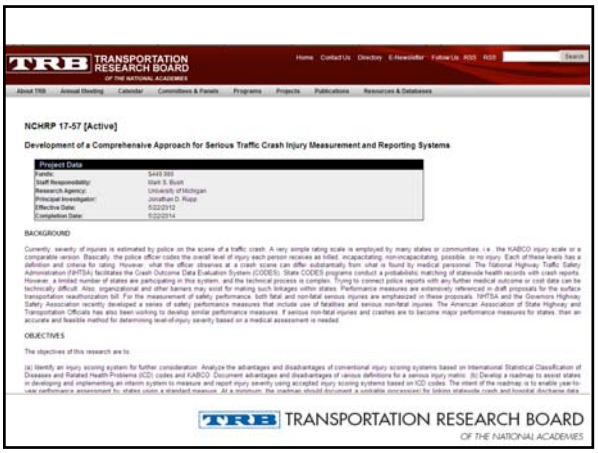
BACKGROUND

OBJECTIVE

TASKS

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES




## 2.3 Review of Subcommittee activities 2014

- EMS Today, 2014
  - INDEMO & Outreach with TRB Summit multimedia info
- EMS World Expo 2014
  - INDEMO & Outreach with TRB Summit multimedia info
- Input to NAEMSP Transport Safety Position Statement

## Subcommittee Meeting stats

Sure took us by surprise!

- >11,300 downloads of Subcommittee meeting handout
- >50,300 downloads of Synopsis of the 2012 Safety, Systems, Strategies and Solutions Summit handout
- >10,100 Fleet Tech Innovation handout
- >9,200 Standards Update handout

## The Safety Systems, Strategies and Solutions Summit Feb 2012

- ~50 onsite – lead representatives
- Live online participation with international representation
- 7 focus areas and a panel
- >120,000 downloads of presentation handouts
- Multi-Media 'e-document' with QR tags
- You tube overview

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## EMS Safety Systems Strategies and Solutions Summit, February, 29, 2012

- What are global best practice models
- Making it happen
- How can we translate global interdisciplinary best practice initiatives to North American EMS


http://www.emssafetyfoundation.org/2012TRBSummitMultimediawithLinksBW.pdf

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Your TRB EMS Safety Systems Strategies and Solutions Summit Multimedia Document

http://www.emssafetyfoundation.org/2012TRBSummitMultimediawithLinksBW.pdf

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## 2012 TRB Summit opening address

*For the **audio track** either:*
- *click on the 'Audio' links below with your mouse, or*
- *capture the QR codes below with your smart phone of any type (after downloading any free QR reader)*

**Agenda**

Biosketches of Presenters and Moderators

Audio 1

| | | |
|---|---|---|
| Opening Address: | A.J. Heightman | 8.00-8.15 |
| | Introductions and Safety Developments Update<br>Nadine Levick, MD, MPH, Rick Pain, PhD,<br>Research needs assessment forms explained – E. Frazer | 8.15-8.30 |
| Session 1: | Data and Recent Initiatives – moderator – C. Cobb - | 8:30 – 9:15 |
| • | Safety data update - N. Levick | 8:30 – 8:45 |
| • | Bureau of Labor Statistics data- J. Windau | 8:45 – 8:55 |
| • | NTSB /NEMSAC/NIST/DHS Update – E. Frazer | 8:55 – 9.10 |
| • | NAEMT Safety Course - G. Luedtke | 9:10 – 9:15 |

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## 2.4 Sub-committee work program updates:

2.4.1 Ambulance Transport Safety Summit April 2015
2.4.2 Research Needs Statements - Research Topics Database
2.4.3 Administrative issues
- 2.4.3.1 Liaison organizations
- 2.4.3.2 TRB Changes/Communications/Website
- 2.4.3.3 Membership/Recruitment
- 2.4.3.4 2016 TRB Session Topics & Calls for Papers

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## 2.4 Sub-committee work program updates:

2.4.1 Ambulance Transport Safety Summit 2015
- Synopsis of 2008, 2009, 2012 Summit resources
- Focus on: A Road Map to Safety
  - Integrating existing data, knowledge and resources
    - A systems engineering approach to applying safety concepts
  - Data supported practices, policies and standards
    - Fleet operations/transport clinical aspects
  - New technologies
    - Fleets/vehicles/human factors/patient monitoring/communications

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## 2.4 Sub-committee work program updates:

2.4.2 Research Needs Statements - Research Topics Database

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Research Problem Statements

Developed 3 small and 2 larger project outlines

1. Data definitions of:
   - i. ambulance
   - ii. emergency response
   - iii. ambulance crash
2. Essential/Optional Ambulance Equipment

What does each state require? Expert panel to identify -:

- i. essential equipment
- ii. optional equipment
- iii. equipment specific to regional needs

3. Fleet mix, by state



## Research Problem Statements

2 larger project outlines

4. Effectiveness and cost effectiveness of EMS monitoring feedback devices

5. Determination of State based emergency vehicle data capture and analysis: police, fire and EMS



## 2.4.3 Administrative issues

2.4.3.1 Liaison organizations

2.4.3.2 TRB Changes / Communications / Website

2.4.3.3 Membership/Recruitment

2.4.3.4 2016 TRB Session Topics and Calls for Papers



## ANB10 Committee

https://sites.google.com/site/trbcommitteeanb10

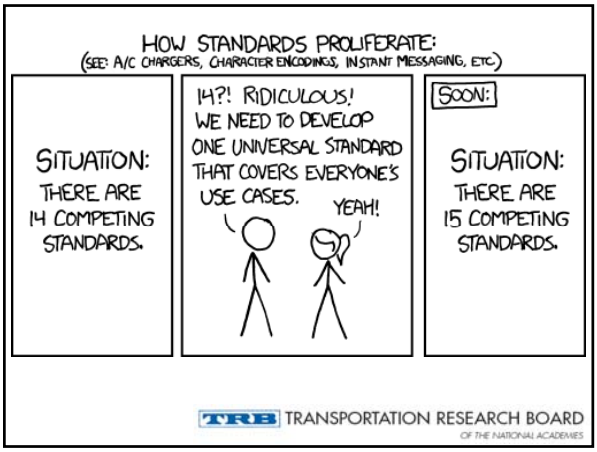

## 3. EMS National Updates

3.1 Standards developments in 2014
3.2 TIMS
3.3 NAEMT Safety Course Update
3.4 VFIS
3.5 Federal Projects
3.6 New communications technologies

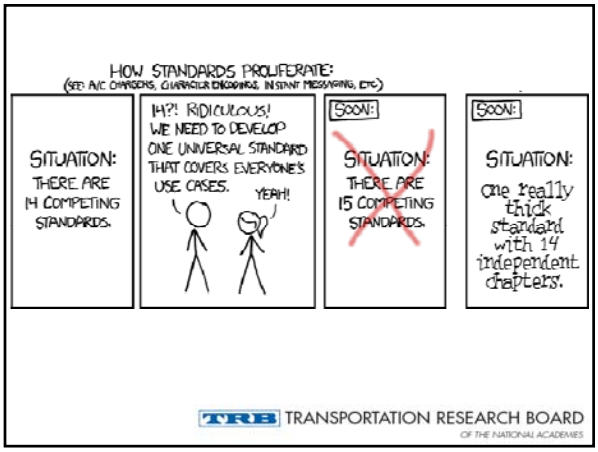


## 3.1 2014 Standards developments


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES




TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES




TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Standards ?

- KKK
- NFPA
- SAE
- ASTM 2020
- NASEMSO MVDR
- CAAS
- CAMTS
- FMVSS
- FMCSA
- State required ambulance equipment
- And international CEN, ASA, India, Malaysia

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## GSA KKK

- A purchase specification - not a safety design standard
- Sunset is extended to Oct 1, 2016

EMSSafety FOUNDATION
Innovation, Collaboration & Knowledge Transfer
www.EMSSafetyFoundation.org

National Association of State EMS Officials

## The Challenge as We See It

NASEMSO Perspective on Ambulance Vehicle Design

January 16, 2014

National Association of State EMS Officials

## State EMS Offices' Typical Roles

- Setting EMS educational standards
- Licensure of EMS personnel
- EMS response data collection
- Trauma system regulation
- Licensure of EMS agencies, including requirements for the design of ambulances
- Enforcement, inspections, investigations, sanctions

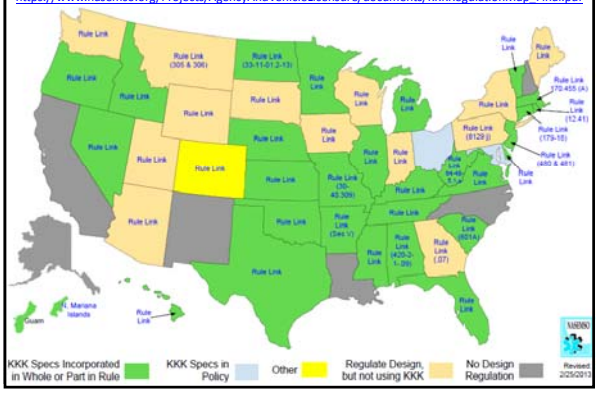
National Association of State EMS Officials

## States Regulate the Design of Ambulances

- 14, 500 ambulance services licensed in the US (2011)
- State approaches fall into 5 categories: (2012)
  - KKK specs incorporated in whole or part in rule
  - KKK specs in policy
  - Regulate design, but not using KKK specs
  - No design regulation
  - "Other"

## Incorporation of GSA KKK Specifications

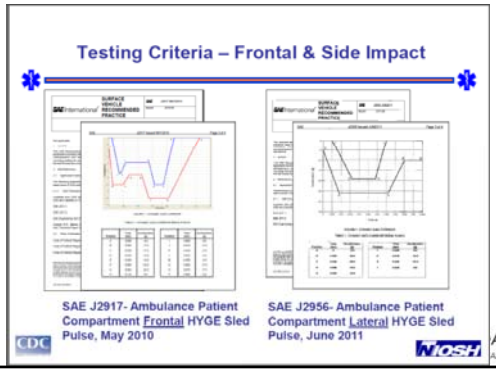
https://www.nasemso.org/Projects/AgencyAndVehicleLicensure/documents/KKKRegulationMap_Final.pdf



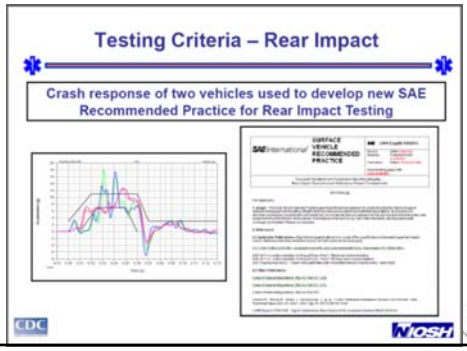

## Society for Automotive Engineers - SAE

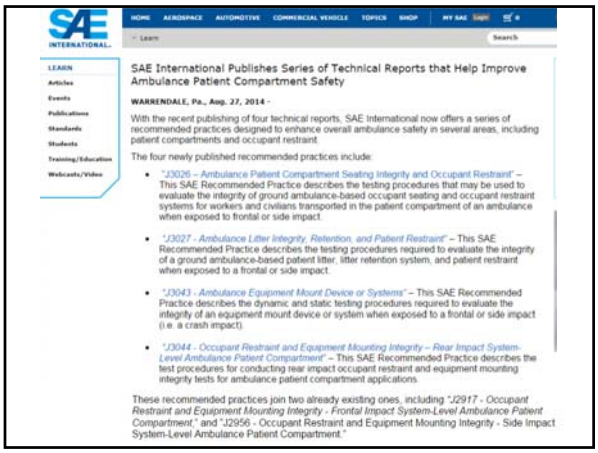

TRB TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES

## For restraint systems – not vehicle design & not based on crashworthy vehicles




## Again, for equipment anchors, NOT vehicle crashworthiness





SAE International Publishes Series of Technical Reports that Help Improve Ambulance Patient Compartment Safety

**WARRENDALE, Pa., Aug. 27, 2014 -**

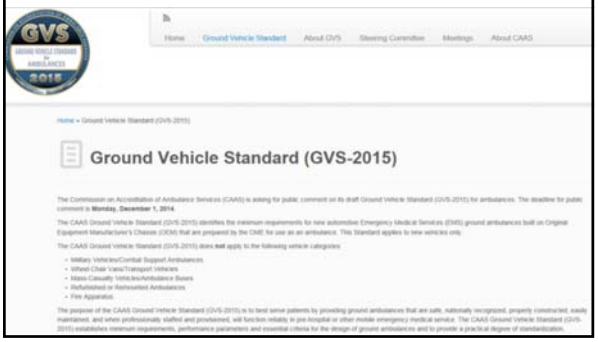
With the recent publishing of four technical reports, SAE International now offers a series of recommended practices designed to enhance overall ambulance safety in several areas, including patient compartments and occupant restraint.

The four newly published recommended practices include:

- "J3026 – Ambulance Patient Compartment Seating Integrity and Occupant Restraint" – This SAE Recommended Practice describes the testing procedures that may be used to evaluate the integrity of ground ambulance-based occupant seating and occupant restraint systems for workers and civilians transported in the patient compartment of an ambulance when exposed to frontal or side impact.
- "J3027 - Ambulance Litter Integrity, Retention, and Patient Restraint" – This SAE Recommended Practice describes the testing procedures required to evaluate the integrity of a ground ambulance-based patient litter, litter retention system, and patient restraint when exposed to a frontal or side impact.
- "J3043 - Ambulance Equipment Mount Device or Systems" – This SAE Recommended Practice describes the dynamic and static testing procedures required to evaluate the integrity of an equipment mount device or system when exposed to a frontal or side impact (i.e. a crash impact).
- "J3044 - Occupant Restraint and Equipment Mounting Integrity – Rear Impact System-Level Ambulance Patient Compartment" – This SAE Recommended Practice describes the test procedures for conducting rear impact occupant restraint and equipment mounting integrity tests for ambulance patient compartment applications.

These recommended practices join two already existing ones, including "J2917 - Occupant Restraint and Equipment Mounting Integrity - Frontal Impact System-Level Ambulance Patient Compartment," and "J2956 - Occupant Restraint and Equipment Mounting Integrity - Side Impact System-Level Ambulance Patient Compartment."

## 2014 New Organization in the field
## CAAS Ground Vehicle Standard (GVS-2015)
## http://www.groundvehiclestandard.org




## Energy transfer is not a consensus process

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

- **Opinion Consensus**

**vs**

**Technical Science**

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## 3.2 TIMS

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## TIM http://timnetwork.org


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Traffic Incident Management

- Planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective TIM reduces the duration and impacts of traffic incidents and improves the safety of motorists, crash victims and emergency responders.
  - Emergency Medical Services
  - Fire and Rescue
  - Law Enforcement
  - Towing and Recovery
  - Transportation
  - Medial Examiners/Coroners
  - Metropolitan Planning Organizations
  - Public Emergency Access Points (911 centers)

## National Unified Goal for Traffic Incident Management

- 18 Cross-cutting strategies to support three overarching goals
  - Responder Safety
  - Safe Quick Clearance
  - Prompt, Reliable, Interoperable Incident Communications
- Basis for TIM Network activities


## Where can I find the TIM Network?

- Look for Tim Shareswell
- On the web – www.timnetwork.org
- On Facebook – "Tim Shareswell" and "National Traffic Incident Management Coalition"
- Twitter – "The_TIM_Network"

## 3.3 NAEMT Safety Course Update

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

**Glenn Luedtke NREMT/P**
**Immediate Past Chair NAEMT Safety Course**

– 50 Years in EMS/Public Safety
– Director, Sussex County EMS (retired)

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

# EMS SAFETY COURSE

National Association of
Emergency Medical Technicians

NAEMT

## Course Design

- One-day program
- Interactive lecture, discussion, group activities
- Case studies using real incidents
- 8 hours continuing education credit (CECBEMS)
- Presented in 8 modules

## EMS Safety Course Committee


## Course Leadership

- Chairman, Mike Szczygiel (Segal)
  - Over 40 years experience in EMS
  - Nationally Registered Paramedic
  - Senior Loss Control Representative, Thomco Insurance
  - Part of the original design team for the EMS Safety Course

## Course Revision

- Revision project in progress
- Jones & Bartlett will produce all course materials
- Increased student participation
- Additional video and new photos
- Rollout planned for EMS World Expo
  - September, 2015
  - Las Vegas, NV
- Remains a one-day course

## NAEMT EMS Safety Course

*For more information on how to sponsor a course,*

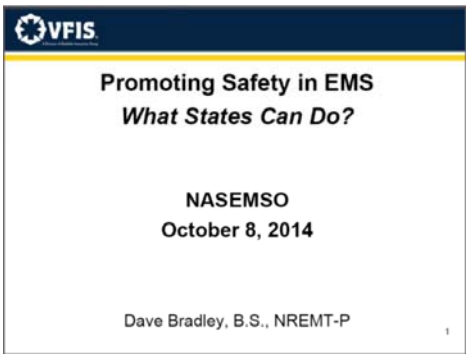
- ✓ *go to www.naemt.org , click "EMS Safety"*
- ✓ *call 1-800-346-2368 (1-800-34NAEMT)*
- ✓ *email info@naemt.org*
- ✓ *visit "NAEMT EMS Safety" on Facebook*

NAEMT

## 3.4 VFIS

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

https://www.nasemso.org/Meetings/Annual/Presentations2014/documents/Promoting-Safety-in-EMS-What-States-Can-Do-2014.pdf

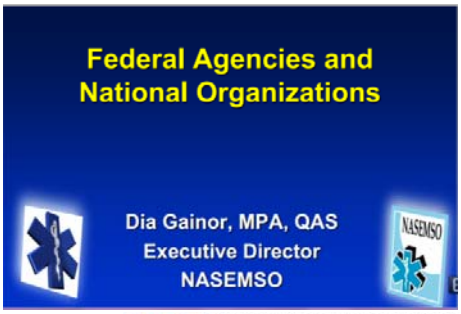



## 3.5 Federal Projects

- FHWA Strategic Highway Safety Plans & EMS
- Culture of Safety
- NIST/NIOSH/DHS
- DHS wireless
- NEMSAC

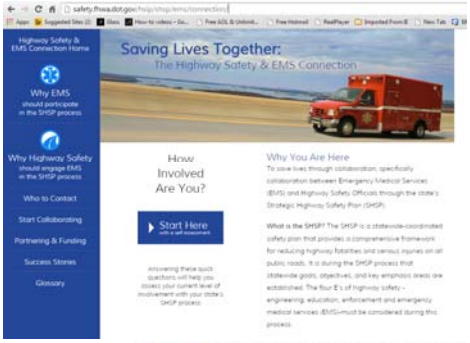
TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

https://www.nasemso.org/Meetings/Annual/Presentations2014/documents/Federal-EMS-Agencies-and-National-EMS-Resources-2014.pdf




TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

http://safety.fhwa.dot.gov/hsip/shsp/ems




TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

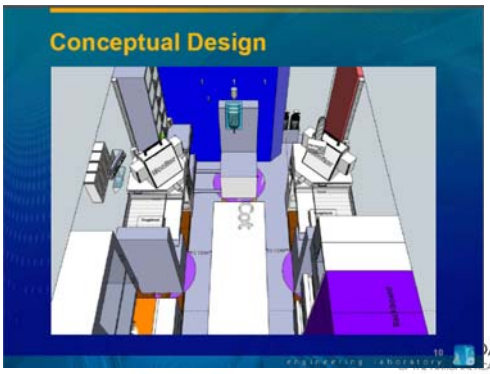
http://www.emscultureofsafety.org

**Final document released**


## NIOSH


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## NIST/NIOSH/DHS




## Automotive Safety & occupant protection remain unresolved, with serious automotive safety concerns


## DHS Wireless Patient Monitoring


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## TSAG
## http://www.tsag-its.org/


## www.EMS.gov


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## 3.6 New Safety Communication Technologies

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## New Tech

- **36% of Google Ventures' investments in 2014 were in healthcare and life sciences.** Upping its funding in the sector from just 9% in 2013, the tech giant plans to continue exploring the area with an emphasis on big data next year. **Wall Street Journal**

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

- **Ambulance drones could be saving lives soon!** Earlier this year, the Netherlands developed a prototype that can deliver a defibrillator to a patient suffering a heart attack. Once it lands, the drone uses live stream video conferencing to connect emergency responders to people on the ground

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## And even now AED Drones!

Ambulance Drone Delivers Defibrillator by Air (VIDEO)

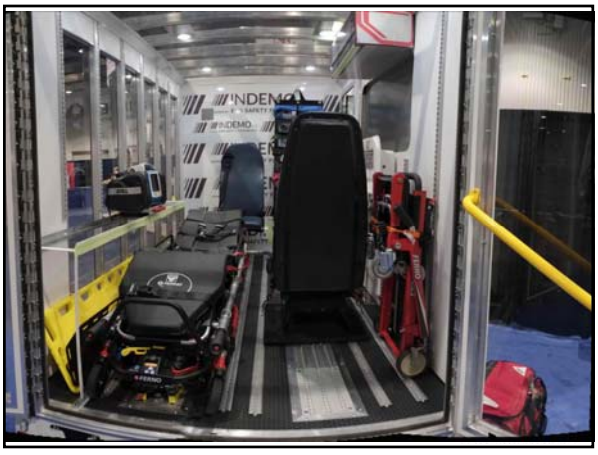
Automatic external defibrillators (AEDs) are now a common sight at airports and sports venues, but they're nowhere near to being ubiquitous. Alec Momot, a graduate industrial design student at TU Delft University in Holland, developed a drone with a built-in defibrillator that can quickly fly exactly to where it's needed.

## EMS Safety Foundation's new demonstration Project:

## Ambulance Safety INDEMO 1.0

- Designs so that you can do your work with optimum safety and efficiency.
- Based on state of the art science, practice and input from the world's leading experts in automotive safety and human factors.
- Designs that are cheaper, better, safer.

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

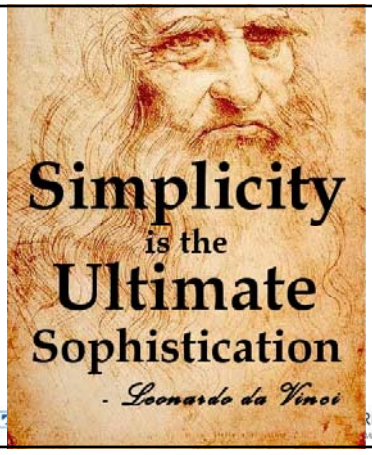




TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES




## Even use of scale lego models

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## www.INDEMO.info

INDEMO 1.0

*the future that you can have right now!*

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Would you like a virtual tour of INDEMO 1.0 or an onsite to visit your site/conference

?

http://www.emssafetyfoundation.org/INDEMOScheduleForm.htm

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Deploying new virtual tools for sharing innovation in design globally


TRB TRANSPORT

## And even mobile Virtual presence


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Virtual presence

TRB RIATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## TRB ANB10(5) 2015

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Forthcoming ANB10(5) 2015 Plans:

- White paper focusing on Technical Science underpinning guidelines and standards
- Minitopic seminars
- Preparation for Safety Systems Strategies & Solutions Summit April 2015
- Enhance social media foot print

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Proposed mini session topics

- Data driven transport related practices:
  - Fleet
  - Clinical
- Pediatric/Neonatal transport safety
- Motorcycles in EMS

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Sign up for ANB10(5) here…

http://www.objectivesafety.net/TRBSubcommitteesignup.htm


TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## New Business

- New projects
- Task Force?

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

## Any questions or comments?

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES