



Ambulance Safety – The Ride of Your Life



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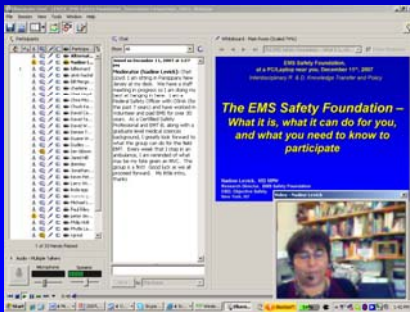
So what is a Webinar?

A Webinar is:

- ▶ Real time interactive web technology
- ▶ No other hardware is necessary aside from a computer connected to the internet and a microphone- if you choose to speak
- ▶ These interactive seminars can also be stored for later asynchronous use

The EMS Safety Foundation

www.EMSSafetyFoundation.org
brings this presentation to you



Nadine Levick MD, MPH

- ▶ Emergency Medicine Physician and Public Health Academic, (USA & Australia)
- ▶ Founder of EMS Safety Foundation
- ▶ Chair, National Academies Subcommittee TRB EMS Transport Safety, USA
- ▶ Recipient, International Society of Automotive Engineers, Women's Leadership Award for EMS Safety



Ambulance Transport Safety

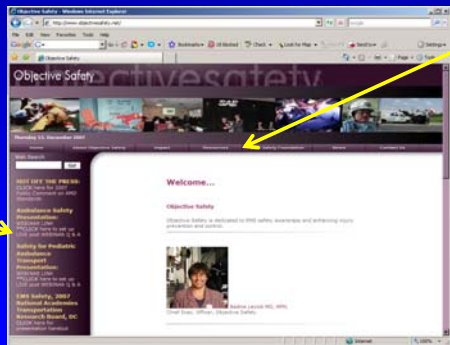
- ▶ Emergency care, public health, public safety, and patient transportation.
- ▶ Important Principle:
Ambulance transport safety is part of a system, the overall balance of risk involves the safety of all occupants and the public
- ▶ All get home safely

Your Interactive Handout
awaits you online at...

▶ www.objectivesafety.net

This WILL be FAST!!
No need to take any notes – all text
slides will be awaiting you in your
online Handout

<http://www.objectivesafety.net>



Firstly!

▶ ~~An accident ?~~

▶ or
a predictable and preventable event

A tragic emergency health care intervention outcome

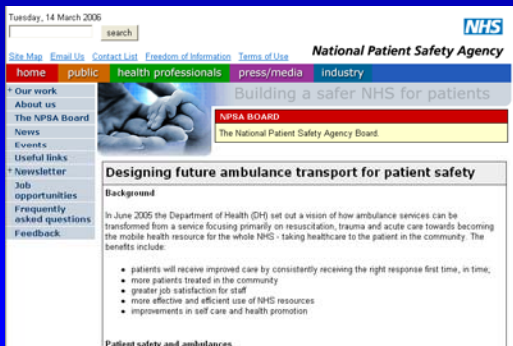


It does happen....

A devastating tragedy...

- ▶ An ETT down the wrong hole may kill your patient and be a terrible burden for the pts family and for the medic involved
- ▶ BUT an EMS crash can kill all involved AND wipe out an EMS systems response capacity.....

A routine concept...



But Ambulance Safety is....

- ▶ 'patient safety'
- AND also
- ▶ 'provider' and 'public safety'

Safety oversight of what and by whom

- ▶ Vehicle Safety
- ▶ Vehicle Design
- ▶ Transportation systems safety
- ▶ Safety Equipment Design
- ▶ Vehicle and Safety Equipment Testing and Standard development
- ▶ Safety policies

There are more safety standards for moving cattle than for moving patients in the USA



October 2008 JEMS Article "Rig Safety – 911"



the EMS transport process

- ▶ communications/dispatch
- ▶ the patient
- ▶ restraining device/seat
- ▶ transporting device/gurney
- ▶ paramedics/transport nurses, doctors & family
- ▶ patient monitoring equipment
- ▶ clinical care & interventions
- ▶ protective equipment
- ▶ the vehicle
- ▶ the driver/driving skill
- ▶ other road users
- ▶ the road



The Emergency Department (ED)



An ambulance is not an ED /ICU on wheels





Is there an acceptable rate of morbidity and mortality for pre-hospital transport systems??

USA EMS data

In the USA*

- ▶ ~ 50,000 vehicles
- ▶ ~ 5,000 crashes a year
- ▶ ~ One fatality each week
 - ◆ ~ 2/3 pedestrians or occupants of other car
 - ◆ Approximately 4 child fatalities per year
- ▶ ~10 serious injuries each day
- ▶ Cost estimates > \$500 million annually
- ▶ USA crash fatality rate/capita 35x higher than in Australia

*FARS/BTS 2005-6

Is it your service's tragic year?

- ▶ ~ 50 fatalities a year
- ▶ 15,000 EMS services
- ▶ Each year one in 300 services experiences a fatality

Safety - Why now?

- ▶ Operating optimally in a transportation environment that is largely devoid of specific safety standards for the hazards and risks present
- ▶ Bridge the gap between what technical information exists and what is accessible and applied to EMS

This is not a crashworthy environment



June 17th 2008 a paramedic and a patient killed

EMS CRASH KILLS PATIENT AND A SUSSEX COUNTY (DE) PARAMEDIC IN THE LINE OF DUTY
Tuesday, June 17, 2008

We regret to advise you that a female Sussex County (DE) Paramedic was killed in the Line of Duty as was a patient killed in a horrific crash involving an ambulance in Sussex County (DE) this morning.

The single vehicle crash happened around 0240 Hours on the John J. Williams Highway near the Lewes-Rehoboth joint fire company substation in Angola.

The Mid-Sussex Rescue Squad ambulance was transporting to Beebe Medical Center with a patient, 2 MSRS Squad members and the Sussex County Paramedic were on board when it struck a tree, which opened the side of the ambulance as seen on our home page. Tragically, the patient was killed as was the Sussex County EMS Paramedic, who was killed in the Line of Duty.

Sussex County EMS also suffered a close call last year when a Paramedic John Schmitt was seriously injured in a crash when a civilian struck the Milford Fire Company ambulance he was riding in, while returning from a run. Additional details on this morning's crash will follow.



In this vehicle...



October 31, 2008, Kentucky



April 30, 2009 - Tennessee



August 2009 – Impaired...

EMS^{COM} RESPONDER

Home News Training Multimedia Buyers Guide Forums Magazines Events

Posted: Thursday, August 13, 2009
Updated: August 13th, 2009 05:08 PM GMT-05:00

Kentucky EMT Indicted on Murder Charges after Crash

By Andy Alcock/WLKY
Story by [wky.com](#)

LOUISVILLE, Ky. --

A Louisville EMT who was driving an ambulance involved in a fatal crash has been indicted on seven criminal charges, including murder and operating a motor vehicle under the influence of intoxicants.

Tammy Brewer, 36, was behind the wheel when that crash took place in April 2008. The patient inside the ambulance, Vickie Whobrey, 54, died of her injuries from the wreck.

Only WLKY was there April 30 when Brewer appeared in court to face a no proof of insurance charge after she was involved in an unrelated non-injury accident in her own vehicle.

September 15th, 2009 ...this week

ONE KILLED, THREE INJURED IN TN AMBULANCE CRASH

Wednesday, September 16, 2009 - A fatal wreck occurred last night in Johnson County involving a car, whose driver is suspected of being on drugs, and a rescue squad ambulance. The civilian crossed the center lane of Highway 57, and hit a Johnson County Rescue Squad ambulance. The hit pushed the ambulance off the road. It came back onto the road, but the ambulance's rear fire caught the edge, and flipped it over an embankment. A female patient in the ambulance died at the scene, and three others were air-lifted by Wings to JCMC.

The driver of the car that hit the ambulance, 51 year old Brenda J. Buchanan was probably was on dope. The THP said that drugs may have been a factor in the crash, so they're treating this as a criminal investigation. We wish the rescue squad members a quick recovery.



An interhospital transport ? "Do no harm...?"

Date last updated: Tuesday, January 23, 17:14 PST

01/23/2007 | Print This Article | EMail This Article to a friend |



Pa. ambulance involved in crash; patient pronounced dead at scene

By Fitzhugh Evans
The York Dispatch (Pennsylvania)
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An Adams County ambulance rushing a patient to York Hospital collided with a car at the intersection of routes 30 and 616 in West Manchester Township at 9:47 this morning, and the patient was pronounced dead at the scene.

York County Deputy Coroner Claude Stobley said the patient, a woman, was being transported from Gettysburg Hospital because she was suffering a "significant" heart condition.

He said he's still trying to determine whether she went into cardiac arrest and died prior to the crash, or whether she suffered a fatal heart attack because of or after the crash. Stobley said she suffered no significant traumatic crash-related injuries.

Very Important Principle

Ambulance transport safety is part of a **SYSTEM**, the overall balance of risk involves the safety of all occupants and the public



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Driver dies after ambulance crash

A post office van driver has died after his vehicle was in collision with an ambulance in Glasgow.

The incident happened just before 04:30 BST on Wednesday, as the ambulance made its way along Westland Drive in Jordanhill, to an emergency call.

The ambulance was suffered minor injuries on the crash.

Two ambulance crew members suffered minor injuries, but the 50-year-old van driver was taken to the Western Infirmary where he died.

Strathclyde Police said the road had been closed as part of their inquiries.

A Royal Mail spokesman described the accident as a tragedy and said: "He was a long-serving member of staff and our thoughts are with his family, friends and colleagues."

Fatal accident involving 999 call

Red Light warning to all drivers

A paramedic who caused the death of a Royal Mail driver while making his way to an emergency call has admitted careless driving.

A Glasgow paramedic was fined £300 and had six points put on his driving licence at Glasgow Sheriff Court.

His ambulance went through a red light and crashed into a van driven by Francis Goodwin, 50, in Glasgow's west end in July 2006.

Updated on 08 December 2008

Ambulance crash baby 'critically ill'

Source: ITN

A baby who was injured when an ambulance skidded on ice and overturned is still critically ill in hospital.

The infant was being taken from Preston to Leeds in the vehicle when it skidded and overturned on the A62 at the junction with the A621, West Yorkshire Police said.

The four-week-old baby was taken in another ambulance to Leeds General Infirmary and a spokesman for Leeds Teaching Hospitals NHS Trust said the boy was in a "critical but stable condition" at the LGI.

A spokeswoman for Yorkshire Ambulance Service said the vehicle involved was providing an emergency transfer and was operating its blue lights and sirens at the time of the accident.

A doctor and nurse were on board, along with the usual ambulance personnel, the spokeswoman added.

The baby was described as in a serious condition prior to the accident but the reason why he was being moved has not been disclosed.

The parents of the child were travelling separately.

A police spokesman said: "It is believed ice on the roadway was a primary contributory factor."

The ambulance crew were said to be "shocked" by the accident but otherwise unhurt. No one else was injured, the police spokesman added.

The junction remains closed while the vehicles are recovered and investigations continue.

ASU - THE Union For UK Ambulance Staff
 Press | Regional News

Ambulance driver dies in Cork crash 16th September 2005

17 September 2005 20:00



An ambulance driver has died and the patient he was carrying is in a serious condition after the vehicle crashed near Cork city this morning. A second medical technician, who was a passenger in the ambulance, is in a stable condition in hospital. The accident happened at 4.50am this morning at Tureen on the main Bandon to Cork city road. The two emergency medical technicians in the ambulance were bringing a woman to Cork University Hospital when the vehicle crashed. No other vehicle was involved. Three ambulances brought the injured to Cork University Hospital. The driver, a man in his 40s who is believed to be from west Cork, died later in the intensive care unit. The second medical technician is in a stable condition, while the woman is described as being critical. The Health Service Executive has expressed sympathy to the family of the dead man. This is believed to be the first fatality involving an ambulance crew in the southern area. Gardaí say they are investigating the cause of the crash. Source RTE Online

April 2009

BBC NEWS ONE-MINUTE WORLD NEWS

Page last updated at 13:43 GMT, Thursday, 2 April 2009 20:43 UK

Ambulance crashes on a 999 call



The ambulance driver and a paramedic were taken to hospital suffering from minor injuries. Two ambulance workers on their way to a 999 call were themselves taken to hospital after their vehicle crashed into a lamp post.

July 2009

BBC NEWS BBC NEWS CHANNEL

Page last updated at 14:08 GMT, Wednesday, 29 July 2009 15:06 UK

Four injured in ambulance crash

Four people were injured when an ambulance was involved in a head-on crash with a van in East Yorkshire. The accident happened on the A164 at Carnaby in Birdlington as the ambulance was answering a call on Saturday night. The ambulance driver, a 44-year-old woman from Hummerby, suffered multiple injuries. Her passenger, a 42-year-old Scarborough man, suffered a broken rib. The 18-year-old van driver had a broken leg. His 14-year-old passenger escaped with minor injuries. The ambulance driver and the two teenagers were taken to Hull Royal Infirmary by an air sea rescue helicopter from RAF Leconfield. The ambulance passenger was taken to Scarborough hospital. The ambulance was not carrying a patient at the time.

Reducing 'blue light' collisions through driver assessment

The number of people killed or injured in police collisions has risen by 60 percent according to a recent report by the Independent Police Complaints Commission (IPCC). In 2003/2004 there were 2016 casualties, compared with 1259 the previous year, and collisions are the single largest cause of police related death.

DRY, chairman Nick Haddock said recently that, "having and risk assessment on the line to challenge safety and reduce repeat offending police officers' and, indeed, driver risk assessment are shorter, less costly and can be used in the Health and Safety at Work Regulations 1999.

A highly effective and proven way of reducing accidents involving emergency vehicles is to risk assess the driver. This approach is gaining momentum amongst agencies that operate large fleets of vehicles, and domestic organisations as both the number of collisions and those who have been fatally injured. These risk assessments for emergency services personnel who drive vehicles that light up.

Emergency Services Times Agency

Why your ambulance service needs driver risk assessment

ambulance collisions are costing you more than you think. They damage vital assets, your people and vehicles, operational performance. They also cost you your reputation if an incident involving the police is involved in an ambulance-related collision.

10 accident statistics, published by the Department for Transport in 2005, reported an average of one collision each day involving an ambulance. The statistics also revealed that ambulance collisions accounted for 10% of all emergency services collisions. A study by the ranks of the call that vehicles responding to an emergency were likely to have been driving under emergency conditions (Driver et al, 2007). In other words, there has been increasing pressure on ambulance drivers to address response targets and this has been contributing to the risk.

Currently risk assessments are routinely carried out for ambulance equipment and emergency tasks, yet ambulance driver risk assessments have only recently been

▶ **This IS a Transportation and Automotive Safety issue**

Benefit of Safety

▶ Any cost of addressing these issues is dwarfed in contrast to the huge burden of not doing so - in financial costs let alone the personal, societal, ethical and litigation costs

Some odd facts

- ▶ Ambulances are generally not built by the automotive industry
- ▶ Intelligent Transportation Systems (ITS), transportation safety engineering is not generally integrated into EMS systems
- ▶ Although all EMS systems have medical direction and oversight, it is rare for there to be transportation expertise oversight

UPS and Laundry trucks have very similar design and even more stringent safety requirements to EMS vehicles BUT very different cargo.....

People are passengers and NOT packages or parcels

The 'workplace' IS a vehicle

- ▶ EMT's often in vulnerable positions during transport.
 - ♦ Bench seat
 - ♦ Captains chair
 - ♦ Standing or kneeling



View of Ambulance interior from Rear

Absence of standards and oversight

- ▶ Challenges in identifying best practice
- ▶ Myriad of unregulated commercial products
- ▶ No safety performance standards
- ▶ Absent national safety oversight

- ▶ "Ambulance transport has a death toll...."

Carl Craige EMT-P, Chief Platte Valley Ambulance

A screenshot of a news article from the Anchorage Daily News. The article is titled "Paramedic injured in crash is recovering" and is by Julie O'Malley. It reports on a crash involving an Anchorage Fire Department ambulance on the Glenn Highway at Airport Heights Drive. The ambulance was struck by a Dodge pickup truck, injuring three paramedics. The article lists the names of the paramedics: driver Eric Tuott, EMT Joss Warner, and paramedics Dave Wallace and Tony Brugliera. A sidebar on the right lists "More anchorage stories" including "Coalition says Strawberry plans don't qualify for tax vote", "Bomb threat at elementary school leads to arrest of a eighth-grader", "City revises ads about smoking ban", "Suspect caught in death", and "Alcohol rears a factor in tent death".



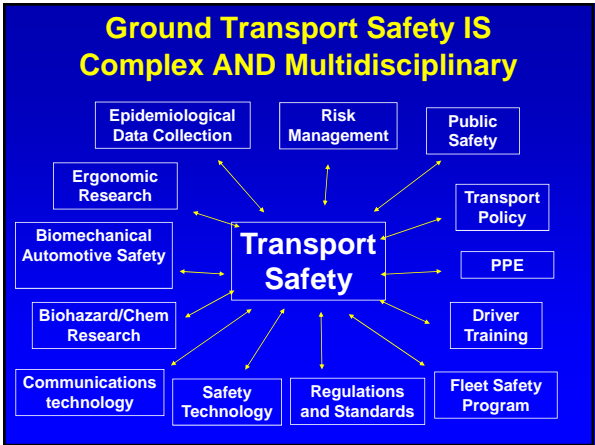
Nascar Safety Expert

- ▶ On ambulance patient compartment
“It is a death vault”

*Tom Gideon,
 Head of Safety, GM Nascar*

So for EMS personnel...

- ▶ What’s going to kill you?
- ▶ What’s going to injure you?

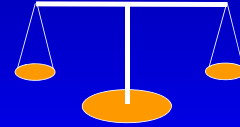


Art... ? Automotive Safety Engineering surely

Goals

- ▶ Standards for safety
- ▶ Policy based on Science
- ▶ Databases to demonstrate outcome

Balance of concerns and risk during transport



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

Safety Management

- ▶ A Safety Culture
- ▶ Protective Policies
- ▶ Protective Devices
 - ♦ To prevent a crash
 - ♦ In the event of a crash
- ▶ Continuous Education and Evaluation



The Crash Event - Crash Testing

- ▶ An introduction
- ▶ What one needs to know
- ▶ What do the tests really mean
- ▶ And, what tests are meaningful

Testing the real world



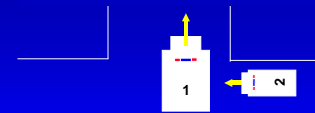
Intrusion vs Deceleration

- ▶ **Intrusion**
= vehicle to vehicle or vehicle to fixed narrow object
- ▶ **Deceleration**
= sudden stop – ie. sled test

Dynamic Safety Testing

- ▶ requires sophisticated, expensive equipment
- ▶ measurably demonstrates forces generated during collision
- ▶ accepted international standard for vehicle restraint systems

What is actually happening during an ambulance crash

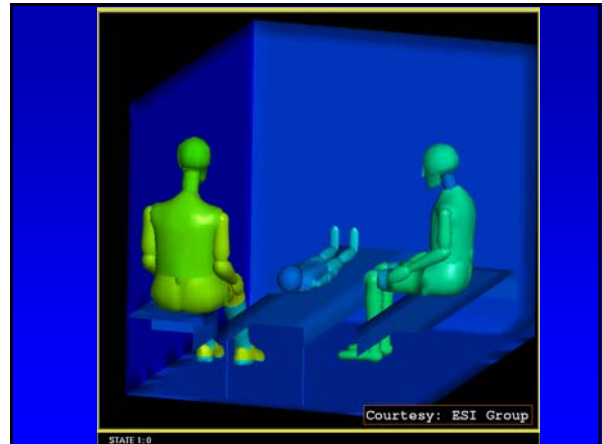


1 – Target vehicle,
Type I ambulance
2 – Bullet vehicle,
Type II ambulance
Closing speed 44 mph



And this all takes place in 60 milliseconds
– the blink of an eye





A few key words about restraint systems...

PPE from the stationary environment can be highly hazardous in the automotive setting

NOT new technical data...

Richardson S.A., et al, Int. J. of Crash., 4:3, 239 – 259, 1999

Side facing 4-point harnesses demonstrated to be lethal, even at slow ground vehicle speeds

NOT new technical data...

Richardson S.A., et al, Int. J. of Crash., 4:3, 239 – 259, 1999

Side facing 4-point harnesses demonstrated to be lethal, even at slow ground vehicle speeds

Being seated IN an automotive seat is what will protect you

- ▶ Anything that allows or encourages you to get up out of your seat will also encourage you to be injured or killed – it is potentially lethal to be out of your seat in any fashion
- ▶ 4 or 5 point harnesses for sidefacing occupants are potentially lethal – and is in **NO WAY SUPPORTED BY ANY DATA OR AUTOMOTIVE SAFETY EXPERTISE**

What do we know now??

- ▶ Intersection crashes are the most lethal
- ▶ There are documented hazards, some which can be avoided
- ▶ Occupant and equipment restraint with standard belts is effective. (Over the shoulder harnesses for patients should be used, with the gurney in the upright position where medically feasible)
- ▶ Some vehicle design features are beneficial - automotive grade padding in head strike areas, seats that can slide toward the patient
- ▶ Electronic Driver monitoring/feedback systems appear to be highly effective
- ▶ Head protection??

Innovation

International approaches

- ▶ The state of the art non-USA vehicles have **NO** squad bench nor the after market structural vehicle modifications that can potentially decrease crashworthiness integrity that were seen in study vehicles.

EMS Safety Foundation Delegation bringing innovation to you





Vehicle Occupant Safety design

European design
Safety technology
is a key focus



Safe and Ergonomic design



Flexibility to manage two patients



Important...

- ▶ Ergonomics and automotive safety issues are interrelated
- ▶ Crashworthiness priorities override the ergonomic issues

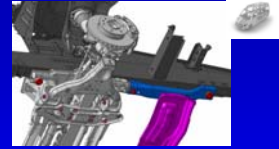
High speed crash, rolled and the occupants (patient and medics) had only minor scratches



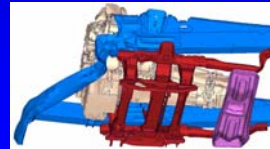
Safety first - Passive Safety



Fold-in ridges on subframe



Front axle module



Front axle module after crash

- A main feature in a front-end crash is the "disconnectable" front axle, which releases additional deformation zones in the longitudinal frame member when a particular force level is reached.
- On a frontal crash, transmission and engine will be pushed underneath front occupants.

Is safety crash tested by automotive experts



Unlike this vehicle



So....

- ▶ Which vehicle do you want to be in ?
- ▶ Which vehicle is the best for efficient, and effective patient care?
- ▶ Which vehicle provides optimal risk management ?
- ▶ What is the optimal fleet mix?

Fleet Mix ?



Safety concepts out there now

- ▶ Driver feedback technologies
- ▶ Tiered dispatch
- ▶ Enhanced ambulance vehicle design
- ▶ Intelligent Transport Technologies - ITS
- ▶ New Safety Standards

What about changing driver behavior in the real world??

AN OPTIMAL SOLUTION FOR ENHANCING AMBULANCE SAFETY: IMPLEMENTING A DRIVER PERFORMANCE FEEDBACK AND MONITORING DEVICE IN GROUND EMERGENCY MEDICAL SERVICE VEHICLES

Nadine R. Levick, MD, MPH
Maimonides Medical Center

REAL WORLD APPLICATION OF AN AFTERMARKET DRIVER HUMAN FACTORS REAL TIME AUDITORY MONITORING AND FEEDBACK DEVICE: AN EMERGENCY SERVICE PERSPECTIVE

Nadine Levick
Objective Safety LLC
United States of America
Larry Wiersch
Michael E. Nagel
Cetronia Ambulance
United States of America
Paper Number 07-0254

Purpose of 'Feedback box' Program

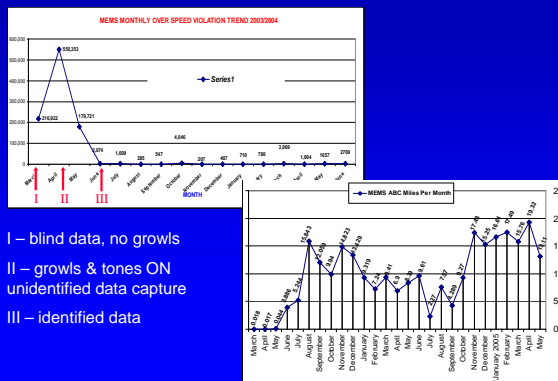
- ▶ Enhance Safety
- ▶ Improve Driver Performance
- ▶ Save Maintenance Dollars
- ▶ Aid Accident / Incident Investigation

How the Device Works

- ▶ Computerized monitoring device installed on each vehicle to measure parameters
- ▶ Each driver has individual key "fob"
- ▶ Data collected every second
 - ♦ including: vehicle speed and performance, driver behaviors and emergency mode
- ▶ Auditory feedback of warning 'growls', and penalty tones
- ▶ Data downloaded automatically every day



Demonstrated Effectiveness



A key to safe ambulance transport



Extensive Indirect cost savings

- ▶ Fewer out of service vehicles
- ▶ Improved transport times
- ▶ Decreased administrative lost in managing unsafe behaviors
- ▶ Decreased legal burden
- ▶ Automatic system wide data
- ▶ Insurance benefits

Visibility and lighting issues



Policy and practice ignorant of existing technical safety data

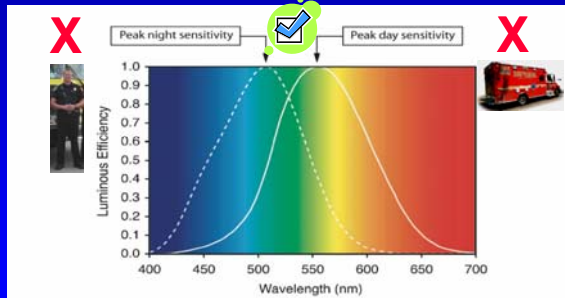


Figure 1. The scotopic (dashed line) and photopic (solid line) luminous efficiency functions, describing the spectral sensitivities of night and day vision, respectively.

Summit County EMS - Colorado

Old vehicle



New yellow vehicle markings

Staff use lime-green vests & jackets



“ The multicolored (patterned) ambulance while distinctive, may suffer decreased conspicuity because of the effects of camouflage” De Lorenzo & Eilers Annals EM 1991



August 2009 - review

Emergency Vehicle
Visibility and
Conspicuity Study

EA-1217/August 2009





Risk/Hazards

- ▶ Predictable risks
- ▶ Predictable fatal injuries
- ▶ Serious occupational hazard
- ▶ Public safety hazards

What do we know works...

- ▶ Vehicle Operations Safety Policies
- ▶ Squad bench lap seat belts
- ▶ Patient over the shoulder harnesses
- ▶ Securing equipment
- ▶ Forward and rear facing seating
- ▶ Some electronic technical devices
- ▶ Safety awareness
- ▶ Cultural change

Important Principles !

1. A culture of safety
2. Drive cautiously
3. Wear your belts & restrain all occupants
4. Secure all equipment
5. Integrate scientific data into your policies and procedures

- Unrestrained occupants and equipment are a potential injury risk to all occupants

Very Important Principle

Ambulance transport safety is part of a SYSTEM, the overall balance of risk involves the safety of all occupants and the public

PREDICTABLE PREVENTABLE and NO ACCIDENT

National Academies TRB Ambulance Transport Safety Summit October 29, 2009 - Join us gratis

The screenshot shows the TRB website with the following content:

- TRANSPORTATION RESEARCH BOARD** OF THE NATIONAL ACADEMIES
- 2009 Ambulance Transport Safety Summit**
- EMS (Emergency Medical Services) Summit and Midyear Meeting**
- Outline:**
 - 10:00 a.m. Registration
 - 10:30 a.m. Opening Remarks
 - 11:00 a.m. Keynote Address: "The State of the Art in Ambulance Transport Safety" by Dr. Robert A. Hays
 - 11:30 a.m. Panel Discussion: "The State of the Art in Ambulance Transport Safety" moderated by Dr. Robert A. Hays
 - 12:00 p.m. Lunch
 - 1:00 p.m. Panel Discussion: "The State of the Art in Ambulance Transport Safety" moderated by Dr. Robert A. Hays
 - 2:00 p.m. Panel Discussion: "The State of the Art in Ambulance Transport Safety" moderated by Dr. Robert A. Hays
 - 3:00 p.m. Panel Discussion: "The State of the Art in Ambulance Transport Safety" moderated by Dr. Robert A. Hays
 - 4:00 p.m. Panel Discussion: "The State of the Art in Ambulance Transport Safety" moderated by Dr. Robert A. Hays
 - 5:00 p.m. Panel Discussion: "The State of the Art in Ambulance Transport Safety" moderated by Dr. Robert A. Hays
 - 6:00 p.m. Dinner

<http://www.objectivesafety.net/TRBSummit2009.htm>

Conclusion

- ▶ Ambulance transport has serious hazards and safety issues
- ▶ Major advances in ambulance safety research, infrastructure and practice over the past 5 years
- ▶ New technologies for vehicle design, occupant and equipment restraint and driver performance are now available
- ▶ Failure to transfer knowledge from transportation and automotive safety is unacceptable and dangerous
- ▶ Ambulance is still way behind the state of the art in vehicle safety and occupant protection

Thank you!
Any Questions??
Electronic handout available online
<http://www.objectivesafety.net>

The screenshot shows the Objective Safety website with a person in the bottom left corner pointing at the screen. The website content includes:

- Objective Safety**
- Welcome...**
- Objective Safety**
- Objective Safety is dedicated to EMS safety assessment and enhancing their prevention and control.