Road Collision and Fatality Reduction through Driver Monitoring and Incentives

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May 12, 2017

Mention of commercial products does not constitute endorsement by the United States Government
Road Safety Challenges

Death of American Diplomat, Sana’a, 2006
Fatality rate had decreased 28% from 2000 to 2014, before increasing. About 9,500 vehicle fatalities/yr since 2014 are attributed to excessive speed.

* Preliminary NHTSA Estimate
Speeding Culture in the US?
Speeding Culture in the US?

- The Fast and the Furious (2001)
- Fast and Furious (2009)
- Fast Five (2011)
- Fast and Furious 6 (2013)
- Furious 7 (2015)
- Fast and Furious 8 (2017)
Four most frequent work-related fatal injury events, 1992–2010

Number of fatal work injuries

Highway incidents, Homicides, Falls, Struck by object

Network of Employers for Traffic Safety (NETS).

Nearly **two-thirds** of all people killed on U.S. roadways were members of the nation's workforce,
WHO Road Traffic Death Rates
1,300,000 fatalities/year

* Global Status Report on Road Safety: 2016
“In Ethiopia this happens and due to the number of people on the roads it will continue. Maybe with proper training to the local populace this type of event will be reduced.”

-CJTF-HOA driver LTC
Motor Vehicle Safety Management

- Written Mission Policy
- Driver Qualification, Evaluation & Orientation
- Medical Certification
- Safe Driver Training
- Operational Safety (Local Laws, Alcohol Proscription)
- Crash Protection (Seat Belts)
- Duty Limits (Fatigue Control)
- Distraction Controls
- Vehicle Inspections
- Mishap Reporting & Investigation
Overseas Official Vehicle Fatalities by FY

- 16/yr

- Posts without DriveCam
- DriveCam Posts

Years: 2001 to 2017

- 16/yr
Elevated Risk Posts

Killed in Traffic
70% of Fatalities since 2000 have occurred at 25 Posts

13/20 DriveCam posts have had 0 fatalities since program inception
Motor vehicle “accidents” have been viewed as random events that happen to others and as an inevitable outcome of road transport.

The term “accident”, in particular, can give the impression of inevitability and unpredictability – an event that cannot be managed. This is not the case.

Road traffic crashes are events that can be analyzed for causes and preventive measures.
Why Change Our Culture?

- Emotional impact on employees
- Negative press in local/international media
- Resource destructive
Why Change Our Culture?

INTERNATIONAL

A Thorn in Bush’s Side

The death of a popular Romanian musician haunts the NATO summit.

By Katie Paul | Newsweek Web Exclusive

A little over four years ago, a dark blue Ford SUV careened through a stop sign at 4:30 a.m. on a December night in Bucharest, Romania, broadsiding an oncoming taxicab and inflicting fatal head injuries on the passenger riding in the cab’s back seat. The accident probably would have faded into obscurity had that passenger not been 50-year-old Teofil Peter, a beloved local rock star—often likened to a Romanian Bruce Springsteen—and had the driver of the U.S. government-owned SUV not been 31-year-old S/Sgt. Christopher VanGoethem, a U.S. Marine serving as the commander of the U.S. Embassy security detail, who had been drinking that night.

Four years later, following a series of frustrations that have roiled fans and Romanian government leaders alike, the issue is popping up again—at an especially inopportune time for U.S. officials. Newspapers throughout Romania last week were plastered with headlines announcing the
Vehicle Event Recorders

Event Triggers
- Hard cornering
- Hard braking
- Rapid acceleration
- Speed $>75$ mph
- Collision
- Rough road

30-second video/audio loop always on

Indicator light alternates red and green while event is being saved;
Vehicle Event Recorders
Risky Behaviors
Risky Behaviors
Risky Behaviors
How Driver Risk Management Works

1. Capture risky driving
2. Download triggered event
3. Risk Assessment
   - Review, analyze, and score
4. Coach driver
5. Driver returns to field with guidance

Risk Reduction

Risk Identification

Behavior Modification
Sample Risk Scoring Scheme

Traffic violations
- Speeding: 5 points
- Red light: 5 points

Following too close
- ≤1 second: 5 points
- 1.00-1.75 seconds: 4 points
- 2.00-2.75 seconds: 2 points
Identifying Risky Drivers

FWD -0.01  LAT -0.01  Time -8.00  57 MPH GPS
Most motor vehicle collisions are the result of driver errors.

Most Driving Behavior Errors are “intentional”.

**Behavior Model**

- **Attitude**
- **Subjective Norm**
- **Perceived Behavioral Control**
- **Intention**
- **Behavior**

*Ajzen’s Theory of Planned Behavior*
Knowledge vs. Attitude: Is driving and texting dangerous?

• American Automobile Association reported in a 2009 survey that 95% of 2,501 drivers polled said that texting while driving was unacceptable behavior, yet:
  – 21% had recently texted or emailed while driving
  – 50% of the drivers age 16-24 had texted while driving
Outcome Pyramid: 12 months prior to serious collision

- **1 Serious Collision**
- **70 Minor Collisions**
- **1000 Near Collisions**
- **5000 Risky Behaviors**

**Reactive approach**
Investigate/discipline as needed

**Address Risky Behaviors that lead to crashes and collisions**
Outcome Pyramid: 8 months prior to serious collision

- 1 Serious Collision
- 40 Minor Collisions
- 500 Near Collisions
- 3500 Risky Behaviors

Reactive approach: Investigate/discipline as needed

Address Risky Behaviors that lead to crashes and collisions
• A “shortcut” used by the brain
• Helps us choose based what’s worked before
  – Confirmation Bias
  – In-group Bias
  – Recency Bias
  – Halo Effect
What messages are we sending?
Attitude/Behavior Changes Impact Crash Rates

- In 1982, alcohol impairment accounted for about 20,000 fatalities in US roads.
- By 2009, the number of alcohol-related fatalities was about 10,000.
- From 1982-2009, the # of vehicle miles traveled in the US almost doubled.

Source: US NHTSA
Early Program Results

The graph shows the trend of Total Score Per Vehicle and Scored Events Per Vehicle from May 2009 to Jan 2011. The Total Score Per Vehicle line is represented in blue, while the Scored Events Per Vehicle line is in red. The data indicates fluctuations over the period with a peak in 2010.
Awards/Recognition
• No policy violations for seat belts, cell phones, eating and traffic rules
• Lowest risk scores in the group
• 6 month intervals

Progressive Discipline
• Policy violations: verbal warning through separation
• 20 pts/month: verbal warning
• 30 pts/2 months: written warning
• 50 pts/3 months: 5 days suspension
• 100 pts/12 months: separation
Later Program Results

The graph shows a comparison of severity per vehicle (blue line) and frequency per vehicle (red line) over the course of 2011 and 2012. The severity per vehicle decreases steadily over the year, while the frequency per vehicle experiences fluctuations with peaks in certain months. The line chart indicates a general trend of improvement in terms of severity over time, with the frequency showing some variation but no clear pattern that suggests a consistent trend.
Risk Reduction For All Posts
Overseas Official Vehicle Fatalities by FY

- Posts without DriveCam: 16/yr
- DriveCam Posts: 5/yr
User Acceptance?
Questions?

Thank you for driving carefully through the village.