

# Truck & Bus Safety Research Needs Webinar

ANB70 Committee on Truck & Bus Safety  
AT060 Trucking Industry Research Committee  
June 27, 2013

## Research Needs Webinar Agenda

- Introduction/Overview of Agenda
- TRB Committees & Research Needs
- Strategic Sources of Research Needs
  - Truck & Bus Safety (ANB70)
  - Trucking Industry Research (AT060)
  - Federal Motor Carrier Safety Administration
- Current ANB70 RNSs
- New Ideas from ANB70 & AT060 Members
- Where do we go from here?

## TRB Vision:

- Each committee will:
  - Generate and manage a robust portfolio of Research Needs Statements (RNSs) for its discipline.
  - Assure that research organizations are aware of identified research needs.
  - Monitor status of identified research.
- Foster a TRB-wide community of Committee Research Coordinators (CRCs); e.g., webinars & workshops.

<http://rns.trb.org/>

- >1,000 RNSs
- Sort by recency, subject, committee
- Can sign up for automatic alerts
- Enhancements underway; e.g.,:
  - New set of checkboxes to better link RNSs to funding sources and researcher interests
  - Cross-committee endorsements.

## RNS Content

- Should state *what, why, how* (if known), *how much \$* (if known), but not *who*.
- Suggested subheadings:
  - Problem [Background]
  - Project Objective
  - Key Words
  - Related Work
  - Urgency/Priority
  - Cost
  - User Community
  - Implementation
  - Effectiveness [Outcomes]
  - Writer/proponent contact information [OPTIONAL]
  - Cited References
- **BUT YOU CAN USE ANY FORMAT YOU WANT!!!**



## Where do RNSs come from?

- Should reflect committee goals; e.g.,
  - Scope & charter
  - Circulars & other publications
  - Subcommittees
- Most RNSs are:
  - Written and submitted by *individuals* or member organizations, and thus reflect their interests & concerns.
  - Reviewed by all committee members and thus become *committee* products.

# Cross-Committee Synergy

- Individual committees manage & upload their RNSs to the TRB database.
- RNSs can be *reviewed* by multiple committees to increase inputs.
- Committees can *endorse* other committees' RNSs.
- Committees can *suggest changes* to other committees' RNSs.
- Committees can *modify* other RNSs and publish them separately.

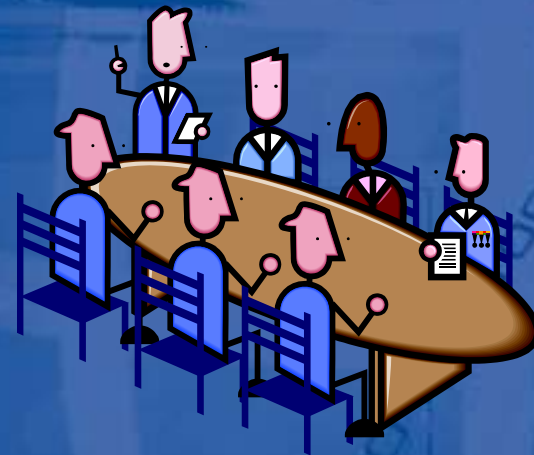
## ANB70 Scope & Topic Areas

- **Scope:** “motor carrier safety in all its aspects; to include . . . human, roadway, vehicle, operational, and organizational arenas . . .
- **Topic areas include:**
  - Problem Assessment & Data
  - Regulations
  - Enforcement & Compliance
  - Driver Health & Wellness
  - Driver Performance & Behavior
  - Carrier Safety Management
  - Vehicle Design & Technology
  - Roadway Design & Operations.



## ANB70 Subcommittees

- Operator Health & Wellness
- Motorcoach Safety
- Data Needs
- Alternative Compliance
- Driver Training
- Technology



## AT060 Mission

The mission of AT060 is to develop a truck transportation research agenda, drawing upon the combined resources of existing TRB committees, and to look for new ways for TRB to engage the trucking industry through an inclusive forum of the appropriate stakeholders.

## AT060 Focus Areas

- AT060 complements relevant TRB freight committees by focusing on a broad range of issues related to the trucking industry requiring a multi-disciplinary research approach.
- AT060 focuses on cross-cutting issues, such as
  - Business economics
  - Truck operations
  - Supply chain logistics
  - Shipper/carrier/consignee issues
  - Labor market and human resource issues.

## Coordination

- AT060 encourages cooperative efforts with other relevant TRB committees through outreach and education efforts to the trucking industry and to public-sector agency officials.
- AT060 also focuses on developing a balanced public-private approach to trucking research.



# FMCSA Motorcoach Safety Research

TRB ANB70/AT060 Webinar

June 27, 2013

Steven K. Smith

Director, Office of Analysis, Research, and Technology



Office of Research and Information Technology



# TRANSPORTATION FMCSA Motorcoach Safety Research

RESEARCH BOARD

- **Motorcoach model training curriculum:** Develop web-based multimedia training curriculum for drivers.
- **Spreading violations among related carriers:** Develop method to analyze driver and vehicle information from roadside inspections to identify unsafe carriers under common management.
- **On-Board Monitoring System (OBMS) study:** Identify safety impact of onboard monitoring systems and driver coaching.

## ANB70 Research Needs Statements

- 13 Current RNSs (~ twice TRB average)
- Reflect individual interests/concerns more than committee strategic planning.
- Topical relevance:
  - Driver Performance & Behavior (8)
  - Carrier Safety Management (7)
  - Problem Assessment & Data (6)
  - Vehicle Design & Technology (5)
  - Driver Training (2)
  - Driver Health & Wellness (2)
  - Roadway Design & Operations (1)
  - Motorcoach Safety (Specifically) (1)
  - Enforcement & Compliance (1)
  - Occupant Protection (1).
- Many are now three years old; must be validated as still-current, updated, or archived.

## (1) Identifying Trailer Loading Best Practices

- **Objective:** Survey the commercial trucking industry for best practices used to determine proper loading procedures.
- **Relevance:**
  - Driver Training
  - Driver Performance & Behavior
  - Vehicle Design & Technology
- **Filed Mar 2010, NEEDS UPDATE, will archive unless there is new input.**



## (2) Exposure Data to Support Improved Truck Crash Risk Estimates

- **Objective:** Evaluate existing and potential exposure measures corresponding to crash variables for generating more valid and meaningful relative risk estimates. Publish a compendium of exposure (“denominator”) variables and data similar to existing crash (“numerator”) reports.
- **Relevance:**
  - Problem Assessment & Data
  - Driver Performance & Behavior
  - Carrier Safety Management
- Filed Mar 2010, updated June 2013.

## (3) CMV Crash Risk by Time-of-Day

- **Objective:** Review the available data sources to determine large truck crash rates and risks by time-of-day. This includes numerator (crash number, harm) and denominator (exposure) measures.
- **Relevance:**
  - Problem Assessment & Data
  - Driver Performance & Behavior
  - Carrier Safety Management
- **Filed Mar 2010, updated June 2013.**

## (4) Indirect Visibility Systems (IVSs) on Buses

- **Objective:** Conduct literature review and focus groups to identify potential indirect visibility system configurations for certain bus types to improve visibility, increase driver situation awareness, and reduce crashes.
- **Relevance:**
  - Problem Assessment & Data
  - Driver Performance & Behavior
  - Vehicle Design & Technology
- **Filed Mar 2010, updated May 2013.**

## **(5) Investigating School Bus Driver Distraction**

- **Objective: Collect naturalistic data on school bus drivers performing their normal driving tasks on bus routes to determine distraction sources.**
- **Relevance:**
  - **Problem Assessment & Data**
  - **Driver Performance & Behavior**
  - **Vehicle Design & Technology**
- **Filed Mar 2010, updated May 2013.**

## (6) Measuring the Effectiveness of Professional Driver Training

- **Objective:** Conduct literature review and collect new data to determine the impact of pre-employment CMV driver training on crash rate and other outcomes.
- **Relevance:**
  - Driver Training
  - Driver Performance & Behavior
- **Filed Mar 2010, NEEDS UPDATE, will archive unless there is new input.**

## (7) Commercial Driver Health and Wellness Programs to Impact Driving Safety

- **Objective: Test two hypotheses:**
  - *CMV drivers who adopt a health and wellness lifestyle will be safer drivers*
  - *Employee H&W programs (e.g., screenings) will promote driver behavioral changes and additional carrier wellness initiatives.*
- **Relevance:**
  - **Driver Health & Wellness**
  - **Carrier Safety Management**
- **Filed Mar 2010, updated June 2013.**

## (8) Crash Harm per Freight Ton-Mile for Different Large Truck Configurations

- **Objective:** Determine which large truck transport vehicles (and specifically which sizes) provide the greatest freight haulage while resulting in the least crash harm.
- **Relevance:**
  - Vehicle Design & Technology
  - Roadway Design & Operations
- **Filed Nov 2010; to be updated in light of FHWA MAP-21 study.**

## (9) Technical Characteristics of Paratransit Buses Currently Built In The U.S.

- Objective: Develop a database with technical information on the construction, fueling, safety, passenger securement and durability of current paratransit buses built in the U.S.
- Relevance:
  - Vehicle Design & Technology
  - Occupant Protection
  - Motorcoach Safety
- Filed Mar 2011; updated Mar 2013.



## **(10) Survey Methodologies for Motor Carrier Research**

- **Objectives:**
  - Review the fundamentals of survey research methodologies in the context of CMV transport.
  - Generate guidelines for improving CMV transport surveys.
- **Relevance:**
  - Problem Assessment & Data
  - Carrier Safety Management
- **Filed May 2011.**

## (11) Single-Vehicle Crash Involvement as a Commercial Driver Risk Indicator

- **Objective:** Assess the validity, safety benefit, and practicality of using involvements in CMV single-vehicle crashes as indicators of driver risk.
- **Relevance:**
  - Problem Assessment & Data
  - Enforcement & Compliance
  - Health & Wellness
  - Driver Performance & Behavior
  - Carrier Safety Management
- Filed July 2011.

## **(12) Case Studies of Carrier Safety Advancement**

- **Objectives:**
  - **Conduct in-depth case studies of motor carriers which have progressively improved their safety programs.**
  - **Motivate and enable other carriers to undertake similar safety advancement programs.**
- **Relevance: Carrier Safety Management**
- **Filed Dec 2011.**

## **(13) Carrier Based Validation of Driver Selection Tools**

- **Objective: Conduct carrier-based validation studies of various tests and measurements used for driver selection and other assessments to improve driver selection.**
- **Relevance:**
  - **Driver Performance & Behavior**
  - **Carrier Safety Management**
- **Filed Dec 2011.**

## New ANB70 Ideas

- **14 New Ideas Submitted!**
- **Topical relevance:**
  - Carrier Safety Management (7)
  - Problem Assessment & Data (6)
  - Driver Health & Wellness (5)
  - Vehicle Design & Technology (4)
  - Enforcement & Compliance (4)
  - Driver Performance & Behavior (2)
  - Roadway Design & Operations (1)
  - Alternative Compliance (1).
- **When ready, RNS drafts will be distributed for committee member review.**
- **Approved RNSs will be uploaded to TRB database.**

Suggested:  
**(14) Psychological Stress & CMV Drivers**

- **Objective:** Determine the prevalence, health effects, and safety effects of psychological stress and related mental health conditions among CMV drivers.
- **Relevance:**
  - **Driver Health & Wellness**
  - **Carrier Safety Management**
- **Suggested by** Jeff Hickman, [jhickman@vtti.vt.edu](mailto:jhickman@vtti.vt.edu)
- **Status:** Draft RNS to be distributed for ANB70 review.

## Suggested: (15) Assessment of Truck Stop Rest & Hygiene Services

- **Objective:** Assess and compare the driver rest, sleep, and hygiene-related facilities and services available at North American truck stops, including any obstacles drivers face (e.g., cost, availability) in using them.
- **Relevance:** Driver Health & Wellness
- **Suggested by Bob Scopatz,** [bscopatz@vhb.com](mailto:bscopatz@vhb.com)
- **Status:** RNS to be drafted & distributed for ANB70 & AT060 review.

Suggested:

## (16) Why Are Commercial Drivers So Unhealthy?

- **Objective:** Determine the extent to which poor CMV driver health & wellness is caused by different job factors, but also *non-job* factors including underlying demographics, personal traits (resulting in self-selection for the job), and cultural health-related attitudes.
- **Relevance:** Driver Health & Wellness
- **Suggested by** Ron Knipling, [rknipling@verizon.net](mailto:rknipling@verizon.net)
- **Status:** RNS to be drafted & distributed for ANB70



## Suggested: (17) Health & Safety Communication Strategies with Commercial Drivers

- Objective: In support of health & safety information and education, determine the best media and formats for contacting and communicating with commercial drivers.
- Relevance:
  - Driver Health & Wellness
  - Carrier Safety Management
- Suggested by Karl Sieber, [wsieber@cdc.gov](mailto:wsieber@cdc.gov)
- Status: RNS to be drafted & distributed for ANB70 review.

## Suggested: (18) Using Electronic Media to Communicate with Drivers and Small Carriers

- **Objective:** Determine the best media and formats for communicating with individual drivers and small carriers in regard to both time-critical (e.g., traffic, weather, safety recalls) and longer-term (e.g., vehicle maintenance, driver health, regulatory compliance) health- and safety-related information.
- **Relevance:**
  - Driver Performance & Behavior
  - Driver Health & Wellness
  - Carrier Safety Management
- **Suggested by** Debbie Freund, [deborah.freund@dot.gov](mailto:deborah.freund@dot.gov)
- **Status:** RNS to be drafted & distributed for ANB70 & AT060 review.

Suggested:

## (19) Improving Carrier Risk Management Practices

- **Objective:** Identify means for motor carriers to identify their crash risks and means for measuring the effectiveness of safety measures in areas beyond regulatory compliance.
- **Relevance:**
  - Carrier Safety Management
  - Alternative Compliance
- Suggested by Jeff Burns, [jeffb@dollar-law.com](mailto:jeffb@dollar-law.com)
- **Status:** RNS to be drafted & distributed for ANB70

review.



**Suggested:**

## **(20) Multi-Dimensional Crash Problem Size Analysis**

- **Objective: Generate *en masse* a huge number ( $\geq 10,000$ ) of specific crash problem size statistics to support crash reduction benefits estimation and countermeasure assessment.**
- **Relevance:**
  - **Problem Assessment & Data**
  - **Driver Performance & Behavior**
  - **Vehicle Design & Technology**
- **Suggested by Ron Knipling, [rknipling@verizon.net](mailto:rknipling@verizon.net)**
- **Status: Draft RNS to be distributed for ANB70 review.**

## Suggested: (21) Effects of Unstable Traffic Flow on Truck and Bus Safety

- **Objective:** Examine the effects of unstable traffic flow on CMV crashes (e.g., rear-end, lane-change) and the potential safety and mobility benefits of disseminating traffic flow information.
- **Relevance:**
  - Carrier Safety Management
  - Roadway Design & Operations
- **Suggested by** Kun-Feng (Ken) Wu, [kfwu1106@gmail.com](mailto:kfwu1106@gmail.com)
- **Status:** RNS to be drafted & distributed for ANB70 review.

**Suggested:**

## **(22) CMV Traffic Enforcement Field Test**

- **Objective:** Conduct a large experimental field trial to determine the safety benefits of shifting enforcement resources from regulatory roadside inspections to greater CMV traffic enforcement.
- **Relevance:** Enforcement & Compliance
- **Suggested by** Ron Knipling, [rknipping@verizon.net](mailto:rknipping@verizon.net)
- **Status:** RNS to be drafted & distributed for ANB70 review.

Suggested:

## (23) Traffic Violation-Triggered Carrier Audits

- **Objective:** Assess the merits of initiating carrier audits following extreme traffic violations such as overspeeding, based in part on the Australian experience using this approach.
- **Relevance:** Enforcement & Compliance
- **Suggested by** Lori Mooren,  
<lori.mooren@unsw.edu.au
- **Status:** Draft RNS to be for ANB70 review.

## Suggested: (24) State Practices Relating to Exempt Motor Carrier Operations

- Objective: Examine state laws, regulations, and practices relating to MC operations that are exempted from HOS and other regulations; e.g., which industries/commodities, actual exemptions, safety data comparing exempt to regulated carriers/industries.
- Relevance: Enforcement & Compliance
- Suggested by Bob Scopatz, [bscopatz@vhb.com](mailto:bscopatz@vhb.com)
- Status: RNS to be drafted & distributed for ANB70

review



Suggested:

## (25) What Doesn't Make it to the MVR?

- Objective: Examine state and other jurisdictional practices (e.g., reporting criteria) and performance (e.g., completeness, accuracy) in reporting traffic convictions to other states and to CDLIS.
- Relevance:
  - Problem Assessment & Data
  - Enforcement & Compliance
- Suggested by Andrea Sequin, [sequina@schneider.com](mailto:sequina@schneider.com)
- Status: Draft RNS to be distributed for ANB70 review.

## Suggested: (26) Return-on-Investment from CMV Vehicle-to-Vehicle Communications.

- Objective: Analyze and quantify the ROI to purchasers of CMV vehicle-to-vehicle communications and associated technologies.
- Relevance:
  - Carrier Safety Management
  - Vehicle Design & Technology
- Suggested by George Reagle, [georgereagle@earthlink.net](mailto:georgereagle@earthlink.net)
- Status: RNS to be drafted & distributed for **ANB70** & AT060 review.

## Suggested: (27) Assess Foundation Brake Performance Monitoring Systems

- **Objective:** Examine and test existing monitoring systems for foundation brakes (particularly drum brakes), such as systems that can detect failures and/or excessive wear and alert the driver through electronic systems.
- **Relevance:** Vehicle Design & Technology
- **Suggested by** George Soodoo,  
[George.Soodoo@dot.gov](mailto:George.Soodoo@dot.gov)
- **Status:** RNS to be drafted & distributed for review.

## New AT060 Ideas

1. A Survey of Decision Factors of Former Line-Haul Drivers
2. Survey of Truck Research in Newly Industrialized Nations (STR-NIN)
3. Survey of Global Intermodal Networks as relates to Driver Population and Hours of Service

## Suggested: (1) A Survey of Decision Factors of Former Line-Haul Drivers

- **Objective:** Survey former Line-Haul drivers at day route or local delivery fleets to gather reasons for transferring and resulting effects on personal and professional lives. Identify changes to Line-Haul operations that would encourage them to return.
- **Relevance:** Labor market and human resource issues
- **Suggested by Rich Hanowski,**  
[RHanowski@vtti.vt.edu](mailto:RHanowski@vtti.vt.edu)
- **Status:** RNS to be drafted & distributed for AT060 review.

## Suggested: (2) Survey of Truck Research in Newly Industrialized Nations (STR-NIN)

- **Objective:** Categorize and characterize the challenges to NIN's with respect to trucking industries and the interaction of available mobile technology among fleet operators and drivers.
- **Relevance:** Business economics, Truck operations
- **Suggested by** Rich Hanowski, [RHanowski@vtti.vt.edu](mailto:RHanowski@vtti.vt.edu)
- **Status:** RNS to be drafted & distributed for AT060 review.

## Suggested: (3) Survey of Global Intermodal Networks as relates to Driver Population and Hours of Service

- **Objective:** Survey of driver income and hours of service and trip distance as relates to the volume of freight on the road in other developed countries could provide foresight at how the industry may proceed in balancing the demand and regulations between Line-Haul Trucking operations versus Intermodal operations in the United States.
- **Relevance:** Labor market and human resource issues
- **Suggested by** Rich Hanowski, [RHanowski@vtti.vt.edu](mailto:RHanowski@vtti.vt.edu)
- **Status:** RNS to be drafted & distributed for AT060 review.

## Where Do We Go From Here?

- Greater cross-committee communication & coordination (especially ANB70 & AT060).
- Current subcommittees should generate and update RNSs in their areas.
- Do we need:
  - RNS subcommittee(s) or working group(s)?
  - To annually conduct this webinar or otherwise regularly allocate committee time?
  - More formalized committee review/approval processes?
  - More formalized promotion and tracking of RNS funding?
- ***Individual and/or organizational initiative: If you think it should be done, write it up and submit it! (Even a short statement could stimulate further action.)***



*Thanks for Your Ideas & Your Participation!*

- **Brenda Lantz**  
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**rknipling@verizon.net**
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**mcs5f@virginia.edu**
- **Steve Smith**  
**Steven.K.Smith@dot.gov**

**THANK  
YOU**