Truck and Bus Safety Research Data Needs

Draft for Group Editing/Revision

Notes on this draft:

1. ec117: *The Domain of Truck and Bus Safety Research* (http://onlinepubs.trb.org/onlinepubs/circulars/ec117.pdf) , includes a chapter on Problem Assessment and Data. That chapter is a launching-off point for the discussion of data systems currently available for truck and bus safety research. It also contains a short list of data needs that has been adapted for this report.

2. The catalog of data systems is presented in outline form for now. If we decide to include this information, we will need to expand this into text. The first decision, though, is whether we want to cover all of this, part of this, or none of it.

3. The "gaps" discussion centers around the questions we want to answer, not necessarily focusing on the limitations of current datasets. We should consider whether we want to cover both senses of the word "gap" and add something that specifically addresses that set of "gaps."

4. In some cases, the question listed is really a "family" of related questions. These could be "unpacked" if the group wishes, or we could use them to generate a more formal research problem statement, or fix the question in some other way if this multiple-issue format in a single heading doesn't work.

5. Everything here is open to editing and correction. Have at it! That includes our mission statement and scope of the committee. Those are proposed and should be finalized with input from the subcommittee.

6. We have some issues listed here that may be more relevant to the Training and the Health & Wellness Subcommittees. We need to decide how to handle that kind of issue in the report. It's easy enough to pass things over the wall to the other subcommittees, but do we feel as if leaving these items out of our report would make it incomplete in some way?

Table of Contents

<to be added>

I. Introduction: Mission of the Subcommittee and Purpose of this Document

This document states the mission and scope of the ANB70 Data Needs Subcommittee, lists data sources for truck and bus safety research (based in part on the committee circular), and briefly states a variety of unanswered research questions with associated data needs. Some of these unanswered questions are being addressed by TRB Research Problem Statements under development by subcommittee members.

(proposed)Mission Statement:
The ANB70 Data Needs Subcommittee exists to document and propose solutions to gaps in the available data to support analysis of truck and bus safety.

Scope:
The scope of the ANB70 Data Needs Subcommittee is all data containing information related to truck and bus safety. This includes information about driver-, vehicle-, the environmental factors and their interactions. Information useful in safety research may include, but not be limited to, crash records and associated traffic records data sources (roadway, driver, vehicle, citation/adjudication, and injury surveillance systems), exposure data (e.g., travel data, demographic information and population statistics), and data from commercial motor vehicle and driver inspections and motor carrier reviews.

Section II of this document provides a list of data sources for truck and base safety research.

Section III presents a series of truck and bus safety research questions. Some of these are further elaborated in the form of Research Problem Statements in Section IV.

II. Catalogue of data sources for Truck and Bus Safety Research

This section is intended as an annotated listing of the available data sources that have some use in truck and bus safety research. The goal in developing this list was to be as inclusive as possible, and to categorize the datasets by their functional use and contents. Strengths and weaknesses of each of the data sets could be presented here in this section if we want to do that.

A. Crash Data
   1. State and local crash records
      - Examples of states with good data, electronic field data collection including the SAFETYNET elements
      - Ability to link SAFETYNET and statewide crash data for validation.

- Automated uploading/sharing data to MCMIS/SAFETYNET
- Post-crash inspection – fatal and serious injury crashes
- Examples of shortcomings

2. USDOT crash records
   - Fatality Analysis Reporting System (FARS)
   - General Estimates System (GES)
   - Motor Carrier Management Information System (MCMIS)
   - Trucks in Fatal Accidents (TIFA)
   - Buses in Fatal Accidents (BIFA)

3. Crash Causation Studies
   - Large Truck Crash Causation Study (LTCCS)
   - NTSB post-crash investigation
   - European Truck Accident Causation (ETAC)
   - Michigan Fatal Accident Complaint Team (FACT)

4. Insurance industry claim information

B. Driver, Vehicle and Carrier Data

1. Inspections and Compliance Review
   - MCMIS inspections
   - State non-MCSAP inspections

2. Driver history
   - Driver licensure records
   - MCMIS driver conviction record
   - State driver history files
   - Commercial Driver License Information System (CDLIS)
   - Problem Driver Pointer System (PDPS)
   - Training information

3. Vehicle registration, title, tax records
   - State vehicle registration & title
   - Fuel tax (IFTA)
   - International Registration Plan (IRP)
   - VIUS – US Census Bureau

4. Motor Carrier Company records
   - Driver medical
   - Driver training
   - Crash/loss information
   - Automated recorder information

C. Roadway Data
   1. State and local roadway inventory
   2. Oversize/overweight permit routing systems
   3. Mapping systems (GIS, navigation systems)

D. Injury Surveillance System Data
   1. Emergency Medical Services (EMS)
   2. Emergency department (ED or ER)
   3. Hospital discharge
   4. Trauma Registry
   5. CODES project data

E. Naturalistic Driving Data Sources
   1. Event classification data
   2. Normal driving (e.g., randomly selected baseline epoch data)
   3. Crash investigation “clinical” data
   4. Traffic conflicts and “close call” data

F. Other Data Sources
   1. Research programs data & reports
   2. Training centers
   3. Surveys
      - Commodity Flow Survey
      - Traveler flow surveys
      - Other

G. Exposure Data
   1. Traffic volume
   2. Classification counts
   3. Toll facility classification counts
   4. Driver population data
   5. General population data
   6. Vehicle “fleet” characteristics (registration, etc.)
   7. Census information
   8. Travel and commodity flow surveys
   9. Trip generation studies
   10. Motor Carrier Company records

III. A "questions unanswered" gaps analysis

In this section, we list the questions that are currently unanswered in the field of truck and bus safety. It is generally agreed that these questions point to data gaps of one sort or another – either in the actual lack of relevant data, an inability to access existing data for independent analysis, or a failure of the existing data to support valid analysis. Following each question is a brief discussion of the data needs related to that question.

A. What are the most appropriate exposure measures for use in truck and bus safety analyses? Should we pursue better VMT data for trucks? Is a per-trip exposure measure possible? Do induced-exposure research methods work well for truck/bus safety analysis? (NOTE: There is a problem statement on this by Ron Knipling and it will be added to section IV of this report)

B. With 90% of crashes being ascribed to driver error, can we find some reliable way to code crash reports with indicator of "responsibility" or "contribution" for drivers based on the data coded? Ideally, this would be something after-the-fact so that we wouldn't have to require police officers to make this judgment. On a more global scale, can we develop a more comprehensive error taxonomy for crash involvement that truly shows us the proportion of crashes that are "accidents" (slips) versus those that are (at least partially) the result of some more conscious misbehavior on the part of drivers.

C. How predictive of overall crash contributing factors/circumstances are the data from fatal crashes? Can the cost of additional post-crash investigations/inspections for non-fatal crashes be justified based on a finding of the differences in the patterns for fatal versus total crashes? (NOTE: there is some related work going on at VTTI – we need to make sure this is not already covered, and ensure that the problem statement that comes from this is different from that work).

D. Inter-state motor carriers' crash involvements do not tell the whole story of truck and bus safety. How can we get more complete data on intrastate trucks and buses involved in crashes? We would need both reliable numerator data (crashes, injuries, etc.) and good exposure data for denominators.

E. We often know very little about the drivers involved in crashes, or about drivers in general (to have a basis of comparison to crash-involved drivers). We would like to know, for example, how training affects safety, what methods work to break drivers of bad habits (i.e., can we stop the cycle of repeat offenses that we see when comparing historical to current violations), which violations are most predictive of a driver later causing a crash? Can we quantify the link between specific violations and crash

risk? (NOTE: this includes some issues that would be best addressed by the Training Subcommittee)

F. Can we link driver health to safety in a valid, quantifiable way? What is the crash, injury, or fatality risk associated with various driver health problems or issues? (NOTE: This would perhaps be best addressed by the Health and Wellness Subcommittee.)

G. If we were to develop measures of driver-related risk, how would we use them in the real world? The biggest barrier facing implementation of any driver-based inspection selection system is that we don't know who is behind the wheel at any given time. What would be a cost-effective way to gather real-time "who is driving" information for use in inspection selection or enforcement? Also, what are the legal barriers that would have to be addressed in trying to implement such a system? (NOTE: this issue may be outside our scope since it deals with practical application rather than research per se. Would like to get a sense of the subcommittee's will on this.)

H. What are the effects of abuse/misuse of licit (prescription and non-prescription) drugs on commercial driving safety? Do these medications pose a serious safety risk, and if so, under what circumstances? (NOTE: this seems like Health and Wellness might take it on rather than our Subcommittee.)

Section IV: Research Problem Statements

In this section, TRB-format research problem statements will be included to address selected questions posed in Section III.. We propose to add them here as a form of synopsis for readers, not as the "official" source of submission of problem statements. That happens under its own schedule and the problem statements should not be held up waiting for this publication to be completed. However, it does seem reasonable to propose projects to deal with the data gaps as listed and the problem statement format is the usual way to do that within TRB.

A. Ron Knipling's Exposure Data research problem statement would be presented here.