SAFETY DATA MANAGEMENT AND ANALYSIS: ADDRESSING THE CONTINUING EDUCATION NEEDS FOR THE PACIFIC NORTHWEST (PHASE 2)

PROJECT REPORT

by

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16. Abstract

The purpose of this two-part project was to respond to gaps in delivering transportation safety education and to develop introductory curriculum materials for both academicians and practitioners. The project objectives included: developing a comprehensive understanding of needs and priorities with regard to safety data management and analysis; developing a set of core skills and knowledge required for safety data management and analysis; providing a comprehensive set of safety data workforce development resources that could be easily accessed for use and distribution; and identifying and utilizing proven delivery pipelines to supplement program outreach efforts and activities in the safety data area.

This technical report documents the cumulative work completed as part of the second phase in which three elements were further examined. First, the set of tools developed for practitioners was pilot tested and reviewed by a focus group and then refined on the basis of the feedback received. Second, the set of tools developed for academicians was reviewed by 18 faculty members representing institutions from throughout the country to gauge the effectiveness of those products in the classroom; all participating faculty members taught transportation or transportation safety-related courses. Lastly, as an extension to the state-level crash reporting methodology described in the first phase, the research team examined how crashes were reported in remote areas and how reliance on local sources, such as a town newspaper, might provide a more comprehensive assessment as to the number of crashes and crash types that occur than existing trauma registries and crash databases.

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Executive Summary

Although there has been a significant reduction in the number of collision-involved injuries and fatalities in recent years, the United States still faces unacceptably high collision rates in comparison to other developed countries. Road safety is a challenging and evolving field, and preparing both students and practitioners with expertise in road safety and the research that has been conducted is one important mission that cannot be underestimated by educators to better solve forthcoming road safety challenges. However, most domestic universities do not have an independent road safety course in their civil engineering departments. Student knowledge of road safety is built on scattered sessions that are provided by other transportation-related courses such as those in transportation engineering, planning, and freight and supply chains. Similarly, practitioners may be provided with anecdotal evidence of transportation safety trends, but the availability of transferable training materials in a delivery-ready format is limited. Road safety is interdisciplinary in nature, as it intersects civil engineering, psychology, mechanical engineering, urban planning, public health, and other disciplines. For these reasons, developing materials for road safety benefits many potential end users.

The purpose of this project was to respond to gaps in delivering transportation safety education and to develop introductory curriculum materials for both academicians and practitioners. The project objectives included developing a comprehensive understanding of needs and priorities with regard to safety data management and analysis; developing a set of core skills and knowledge required for safety data management and analysis; providing a comprehensive set of safety data workforce development resources easily accessed for use and distribution; and identifying and utilizing proven delivery pipelines to supplement program outreach efforts and activities in the safety data area.

This report documents the work conducted as part of a two-phase project. In the first phase, which was reported separately, user group surveys of practitioners and academicians were conducted, safety data were analyzed, and training tools and techniques were identified and developed. Several key takeaways were identified as part of that study. From a practitioner standpoint, while the acquisition, flow, storage, and use of data are similar from state to state, many of the details are quite different, such as the data used for state highway projects and data used for local projects within a given state. The most common reported difficulty with the data seemed to be crash locations, but all states recognized this aspect and worked to validate and modify, if appropriate, location data through some sort of quality control (QC) process. Several agencies may have been involved in the data's gathering and compilation, and inter-agency cooperation and coordination were an important part of assuring accuracy and usability of the data. Despite the automated nature of data transfer from one agency to another, errors in the data or in interpretation were possible.

For this second phase, three activities that were initiated in the first phase were expanded. First, the set of tools developed for practitioners was pilot tested and reviewed by a focus group and then refined on the basis of the feedback received. Second, a set of tools developed for academicians was reviewed by 18 faculty members to determine the potential value and effectiveness of these products in the classroom. The participating faculty members from throughout the country taught transportation or transportation safety-related courses. Lastly, as an extension to the state-level crash reporting methodology described in the first phase, the research team took a closer look at how crashes are reported in remote areas and updated current safety data management practices for low volume roads and rural transportation in remote villages. They attempted to reconcile the differences between crash reporting and injury/fatality

reporting systems by using three data sources as part of a case study: 1) the standard crash reporting system used in Alaska by the Alaska Department of Transportation and Public Facilities (ADOT&PF), which is similar to the system used in most other states; 2) the Alaska Trauma Registry, a state-mandated system for reporting all hospital emergency admissions; and 3) crashes reported in the local newspapers of three communities, including one large community on the highway system and two smaller communities not on the highway system. Trauma Registry and newspaper data indicated that crashes of off-road vehicles were usually not reported in the ADOT&PF database. For small communities, reliance on local sources, such as a town newspaper, may in fact provide a more complete set of crash data than official trauma registries and other agency databases.

1. Introduction

Recent advancements in data collection capabilities have allowed transportation-related agencies to collect mountains of safety data. Therefore, there is an immediate need to find out what types of safety data are being collected, what types of safety analysis can be done with the collected data, and what (other) types of safety data and analysis approaches are required to meet the safety objectives.

Extensive collection efforts exist with regard to roadway, traffic, licensing, and vehicle data. For example, more than 5 million traffic crashes are reported annually in the United States, and over 37,000 lives were lost on roadways in the United States, according to the National Highway Traffic Safety Administration (2017). The documentation process for every single one of those crashes must begin at the scene of the incident with information gathered by a member of the law enforcement community or by the private citizen(s) involved in the crash. This information is subsequently transmitted to a local or state agency for data entry, processing, and aggregation for the purpose of future analysis.

With the increased complexity of various safety data management and analysis activities, and with most transportation agencies faced with limited staff and financial resources, there is an opportunity to provide the transportation workforce, which includes practitioners and academicians alike, with the resources needed to effectively understand, manage, and analyze safety data. Safety data collection, management, integration, improvement, and analysis activities are integral to developing a robust data program that leads to more informed decision making, better targeted safety investments, and overall improved safety outcomes.

1.1 Objectives

This project responded to current gaps in research and identified a methodology to benefit all system users. The objectives included the following:

- Develop a comprehensive understanding of needs and priorities with regard to safety data management and analysis;
- Develop a set of core skills and knowledge required for safety data management and analysis;
- Provide a comprehensive set of safety data workforce development resources that can easily be accessed for use and distribution; and
- Identify and utilize proven delivery pipelines to supplement program outreach efforts and activities in the safety data area.

1.2 Approach / Method

This research collaboration leveraged the cumulative expertise in transportation safety and transportation education of five institutions: the University of Alaska-Fairbanks (UAF), Oregon State University (OSU), Washington State University (WSU), the University of Washington (UW), and the University of Idaho (UI). The following chapters represent the work conducted in this project. Chapter 2, lead authored by the University of Idaho, discusses the implementation of safety education tools developed for practitioners. Chapter 3, lead authored by the University of Washington, discusses the implementation of safety education tools developed for academicians. Chapter 4, lead authored by the University of Alaska Fairbanks, examines how safety data may best be quantified and collected in remote areas.

2. Implementation (Practitioner Perspectives)

In order to identify the road safety challenges that local agencies are facing and to share available resources, it was essential to develop a comprehensive understanding of needs and priorities with regard to safety data management, analysis, and safety culture. Current and new practitioners need to be provided with a fundamental set of core skills and knowledge required for safety data management and analysis to support local transportation decision-making. A structured process was developed in order to better understand current practices and needs. The process steps included a preliminary assessment, survey, survey data analysis, draft presentations, interview, interview data analysis, and final presentations. The objectives of the first four steps, which were previously discussed in the first phase of this study, are summarized below:

- A preliminary assessment of past studies was conducted that focused on the basic concepts of road safety and agency involvement; this effort established a baseline understanding of road safety.
- A survey was developed and distributed to collect information on local agency practices.
- The survey results were analyzed to identify the challenges of and the resources currently used by local agencies.
- Draft presentations were created with the use of the preliminary assessment and the data collected.

The second phase of this study sought to further examine how use of these developed tools could be actively used by practitioners in the future. To that extent, two specific steps were taken:

- Draft presentations were sent to practitioners who previously participated in the survey as a pilot study. Interviews were conducted as a data collection method.
- The data were analyzed with the use of a qualitative tool and defined criteria. The draft presentations were modified in accordance with the data collected.

2.1 Interviews

On the basis of the feedback provided by the practitioners, an initial set of PowerPoint slides was developed to address user needs. (The content of these slides is described in the next chapter.) To further evaluate the applicability and effectiveness of these learning tools, the slides were sent to a subset of practitioners for testing as part of a pilot study. The main purpose was for local agencies to review and comment on the content, images, graphics, text, and general format of the slide deck. The directors, superintendents, or supervisors of each agency were encouraged to share the presentations with newer staff, as well as to provide their own feedback. The initial approach was to contact all practitioners who had previously participated in the survey. Practitioners from cities and counties in the Pacific Northwest were selected to perform this task, and from the 14 agencies contacted, seven agencies (N=7) agreed to participate in this following evaluation. The presentations were sent in both .pdf and PowerPoint formats to the participants.

A phone interview was conducted two weeks after initial contact with the participants. During this period of time, a twelve-question interview script was developed that focused on specific topics and concerns related to the content and format. The questions were divided into the following categories: initial perception, usefulness, formatting, and recommendations. The questions are summarized in Appendix A.

Each interview was recorded with the permission of the participants, and the analysis was conducted on the basis of the participant's observations of the initial slide deck. The average time of each interview was 11 minutes 42 seconds. The interview was administered to six agencies in the state of Idaho and one agency in the state of Oregon. Their working experience, in their respective agencies, ranged between eight and 32 years.

2.2 Interview Responses

The interview responses were reported as qualitative data, and as a strategy to report this type of data, frequencies were used to develop a useful summary based on the important points of the interview. In the qualitative analysis, the data were indexed to develop different analytical categories and theoretical explanations (Pope, Ziebland, Mays, 2000). A study done by Knafl and Howard recommended the following minimal requirements for reporting qualitative data: "preparation for data collection, length of time spent collecting data, how data were recorded, and the amount of data collected; steps were taken to organize, categorize, or summarize the data prior to final analysis; management of threats to the validity and reliability of the data; and the process by which conclusions were derived from the data" (Knafl and Howard, 1984).

The data were analyzed by using two different approaches. The first approach used Dedoose, a cross-platform application that analyzes qualitative data and mixed methods research. The second approach followed the steps recommended in the Knafl and Howard study which was previously described. In the following paragraphs, each method and associated results are explained.

For the Dedoose analysis, the interviews were uploaded and analyzed with audio recorded from each participant. After the audio files had been uploaded, a description of the participants was created in a descriptors tab. The purpose of the descriptor tab was to describe

the source of the data, such as names, agency, age, gender, and other characteristics that represented the participant. From the information collected, the following fields were created: participant name, years of experience, and agency. After the descriptor set had been developed, each descriptor was linked to its respective interview file. The analysis consisted of creating codes that represented a specific characteristic or description identified by each participant. For example, a code representing the need to break up the presentations or reduce the number of slides was created and called “Improve Length;” all codes were simple and straightforward. (The codes used in the software are listed in Appendix C.) Each code was linked to an excerpt that represented a phrase in the interview uttered by the interviewer or interviewee. This process of linking the code was done for each interview. Dedoose presents several options for reporting the results, but for this analysis, the results were reported in a frequency chart matching users with the established codes (see figure 2-1).

	Easy to follow	Good Format	Good information	Good length	Helpful	Improve Length	No Topics	No Usage/ No Share	Purpose (In Detail)	Purpose (Simple)	Recommendations	Road Safety	Share	Topics	Usage	Totals
Participant 1	1	3	2	2	1		1	1		1			1			13
Participant 2	3	3	3		1	1			1		4	3	1	2	1	23
Participant 3			2		1	3			1		3		1	2	1	14
Participant 4	1	1	1	1	1				1		3		1	1	1	12
Participant 5	1				1	1	1	2		1		1				8
Participant 6	1	3	1		2	3	1		1		4	3	1	2	1	23
Participant 7	1		1	1	1			2		1	1			1		9
Totals	8	10	10	4	8	8	3	5	4	3	15	7	5	8	4	

Figure 2-1: Code application per user

As seen in figure 2-1, the code that most frequently occurred was the Recommendations code (N=15). This code represented the number of times the participants suggested a modification to the presentation, such as breaking up the slides or adding new content. The code that occurred the fewest times was Purpose (Simple) (N=3). Four participants mentioned the need to improve the length of the slides, and two of them mentioned it three different times during the interview. More than half of the participants felt that the slides were easy to follow (N=6), had good information (N=6), and stated that the images and graphics were helpful (N=7). Four participants said they were willing to use the slides in the future, and five participants desired to share them within their own agencies. The slide deck received a positive reaction with regard to its format and content but a negative reaction overall. The participants' suggestions were taken into account when modifications were made to the initial set of slides.

In the second approach, interview notes were recorded and reviewed on the basis of the positive or negative responses provided by the participants. The responses were grouped into the following categories: usefulness, format, topics, and recommendations. A summary of the responses is shown in Appendix B. Participants were asked to describe in their own words the purpose of the presentation. Overall, most of the responses captured the main purpose of the slide deck: the slides were intended to be a tool or a resource to support practitioners and their agencies in identifying their role in the safety system and identifying the resources available to them to improve their agency's safety culture, and to gain insight into how to address road safety. The presentation was also intended to help new engineers learn about the field of road safety as they begin a career in this field.

The presentation received a positive reaction when practitioners were asked whether they would use it themselves and whether they would share it with their agencies. More than half of

the participants were willing to use the slide decks for their own knowledge (N=4) or share it within their own agency (N=5). The agencies that negatively responded explained that the reason for not using the slides was that their city was considerably smaller or their roads were managed by a highway district or county, and others responded that they use other training resources.

A majority of the participants noted that the presentation had a good format, with the different fonts, graphics, and images making the slides interesting and catching the attention of the audience (N=7). The presentation was easy to follow, and the variety of images and graphics was helpful to better understand each topic. Two participants were concerned with the amount of information provided in the presentation and explained that so much content presented in one sitting might overwhelm a new engineer or cause a general audience to lose interest at some point during the presentation.

The topics that were most interesting to the participants were the following: road safety programs, local road safety plan, FAST act, the cooperative aspect of road safety, statistical data, the important role of local agencies, and the history of road safety. Three participants commented about the importance of allowing the audience to participate and having a place for discussion in between key topics to allow the audience to ask questions, discuss topics, and not lose their interest in the presentation.

The participants were also asked for suggestions on future presentation topics. Some participants were interested in knowing more about funding and the training available to participate and compete in safety grants. Another topic suggested was how to address human error such as texting and fatigue while driving. With regard to topics already covered in the presentation, breaking them down into more specific and in-depth content was suggested.

The interviews allowed the participants to express their recommendations to make the presentation more effective and beneficial. Some of the recommendations included adding an index, which would allow users to skip topics and move forward to topics of more interest to them. The inclusion of an abbreviated index at the beginning of the presentation for new practitioners who do not have experience with safety acronyms was mentioned. Another suggestion was to add a "takeaway" at the end of each presentation. A takeaway would serve as a next step after the lecture and would provide information such as who to contact, first steps toward change, or links to web pages.

2.3 Results

Using the information and insight collected from the initial survey, a three-part training tool was initially developed for broad dissemination to transportation practitioners. This tool, which could be used as part of a continuing education training program, was designed to be both dynamic and self-sustainable so that there would be value for those teaching this subject matter related to safety data and safety data management. The development of this tool in the form of a set of transferable PowerPoint presentations was implemented because of PowerPoint's ease of use, accessibility, and distribution. The three presentations included a definition of learning objectives, identification of reading materials, road safety terminology, resources currently available, survey results, local agencies challenges, and recommendations. The three presentations were developed with the intent of being offered as part of a series but could also be delivered as stand-alone presentations.

The presentations themselves were developed in three phases. The first phase consisted of the development of an extensive outline. This helped to identify the primary topics for each presentation and selected subtopics that would be included. The subtopics were categorized in

terms of relevance and anticipated interest to the audience. The topics were organized in a logical sequence so that material could be shared in an orderly manner. Each slide deck could be independent of one another, so the topics identified for each presentation were selected on the basis of this concept. After these considerations were taken into account, an outline was developed, and the main topics are highlighted in figure 2-2.

Figure 2-2: Presentation organization

The second phase consisted of assembling the content for each presentation. The slide decks were developed with the intent that anyone could serve as a presenter, even those possessing minimal familiarity with the material. With this concept in mind, a detailed script was written in the notes section of each individual slide. This script was designed to provide the necessary background for the speaker while simultaneously allowing the presenter to provide additional insight as needed. Another benefit to developing a script was that the speaker would be encouraged to remain on point for each slide. To maintain audience interest, two to three bullet points were typically provided on each slide, and additional graphs and images were used

to illustrate or highlight particular concepts. All graphics and figures were provided by either the research team or available in a public domain space so as to avoid any potential copyright violations. In figures 2-3 and 2-4, the structure of the slides and examples of the title page and content page are presented.

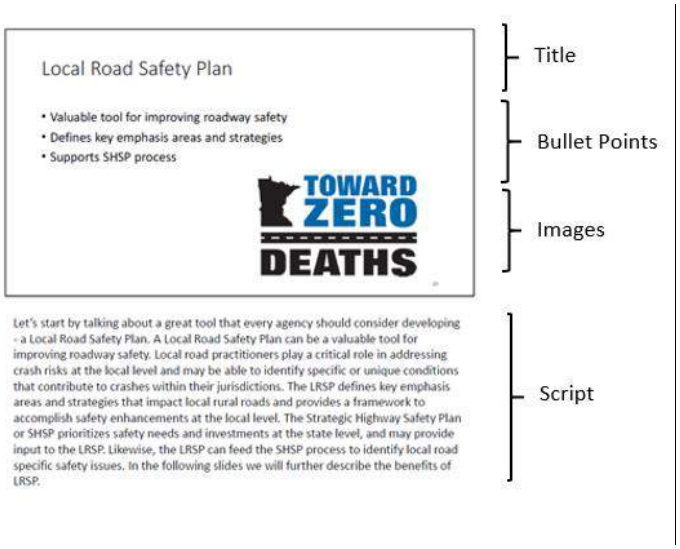


Figure 2-3: Slide structure (example)

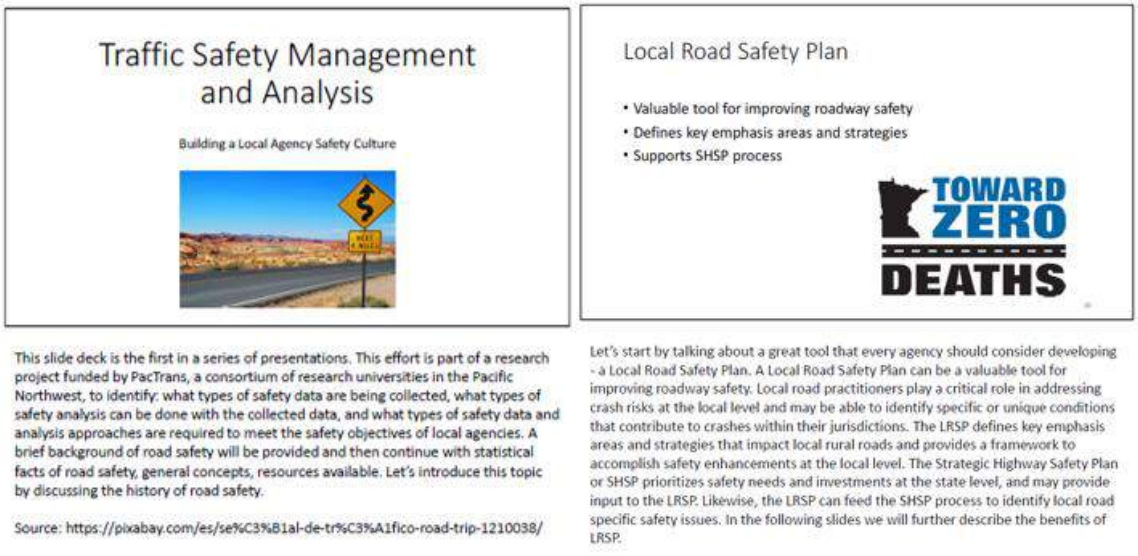


Figure 2-4: Example of title page (left) and content page (right)

The third phase consisted of revising and editing the presentations. The primary objective during the revision process was to make certain that the technical content met the needs of the

intended audience. The slides were reviewed so that the information provided was described effectively and succinctly, the content on each slide made sense, the graphics on each slide were suitable, and the key messages and takeaways for each presentation were retained. Below, additional details related to the content of each presentation are provided.

The slide deck for the first presentation introduced the training by starting with the history of road safety in the United States, from the Interstate Act of 1956 through the 2015 FAST Act. Statistical facts of road safety around the United States were presented and included, but were not limited to, the number of fatalities and crashes, roadway ownership in the Pacific Northwest states, and the economic impact of crashes. The next section described general concepts of road safety, such as defining road safety, describing the road users, and discussing performance measures. Current safety legislation and its importance were then discussed. A significant part of this presentation described the resources available to local agencies, beginning with governmental agencies that focus on improving road safety and concluding with a discussion of specific manuals, courses, and available software.

The second presentation highlighted ongoing research efforts, along with the methodology and analysis of the local practitioner survey and the responses collected. Descriptions of the purpose, objectives, and methodology used for the research were provided. Each step of the methodology was listed and described, and key elements such as preliminary assessment, past studies, and data collection were provided. The target population and survey objectives were described, and each survey question was explained. The survey responses were presented and included information on the response rates and geographic location of each responder. Specific survey results were discussed, with an explanation identifying the resources

that local agencies in Idaho had available and the challenges that agencies faced while addressing road safety.

The third and final presentation focused on local agencies in the State of Idaho. It identified the challenges they faced and provided recommendations to address these challenges. State-specific road safety statistics from 2010 to 2015 were introduced, along with details as to how the transportation system was organized in the state. The challenges of gathering road safety data from local agencies were explained and included causes, consequences, and the importance of addressing them. A discussion followed encouraging the use of the Strategic Highway Safety Plan for local agencies. The advantages and implementation methods were explained, and additional resources were provided so that practitioners could obtain more information. In the final section of the presentation, noteworthy practices throughout the United States were highlighted to showcase how some states were addressing their challenges. The presentation ended with a short conclusion section that presented the key points of the presentation.

The slide decks were modified in accordance with the comments and suggestions of the seven practitioners who participated in the interviews from the states of Idaho and Oregon. Initially, the slide deck consisted of three presentations with 55 slides, 59 slides, and 39 slides, respectively. After taking into account the extensive amount of content in the first and third presentations, both of those slide decks were divided into two presentations. This changed the number of slide decks from three to five. In figure 2-5, the new outline is presented and the corresponding topics highlighted. The second and fifth slide decks were presented as new presentations, with 32 slides and 26 slides, respectively. The first slide deck was reduced to 25 slides, and the fourth slide deck decreased to 30 slides.

The slide deck for the revised first presentation was broken into two presentations. The first slide deck starts with the history of road safety in the United States from the Interstate Act of 1956 through the 2015 FAST Act and statistical facts of road safety around the United States, presenting data such as the number of fatalities and crashes, roadway ownership in the Pacific Northwest states, and the economic impacts of crashes. It continues by describing general concepts of road safety, such as defining road safety, describing the road users, and discussing performance measures. Current safety legislation and its importance are then discussed. The second slide deck describes the resources available to local agencies, beginning with the federal agencies that focus on improving road safety and concluding with a discussion on specific manuals, courses, and available software.

The second presentation has the same content, as it was not divided but is now considered the third slide deck. The old third presentation was divided into two presentations. The fourth slide deck focuses on the local agencies in the State of Idaho and identifies the challenges they face to address road safety. State-specific road safety statistics from 2010 to 2015 are introduced, along with details about how the transportation system is organized in the state. The challenges that practitioners face in gathering road safety data from local agencies are explained and include causes, consequences, and the importance of addressing them. A discussion follows encouraging the use of the Strategic Highway Safety Plan for local agencies. The advantages and implementation methods are explained, and additional resources are provided so that the practitioner can obtain more information. The fifth and final slide deck provides recommendations to address the challenges discussed in the previous presentation. Noteworthy practices throughout the United States are highlighted to showcase how some states are

addressing their challenges. The presentation ends with a summary and key information toward building a safety culture environment.

An index and acronym table were also added to the slide deck, as requested by the participants to help practitioners better understand the terminology and search specific topics within the slide deck. A slide was included at the end of each presentation providing contact information, along with the initial steps needed to improve an agency's safety culture. All these modifications were considered initial changes toward the continual improvement of the content of the presentations.

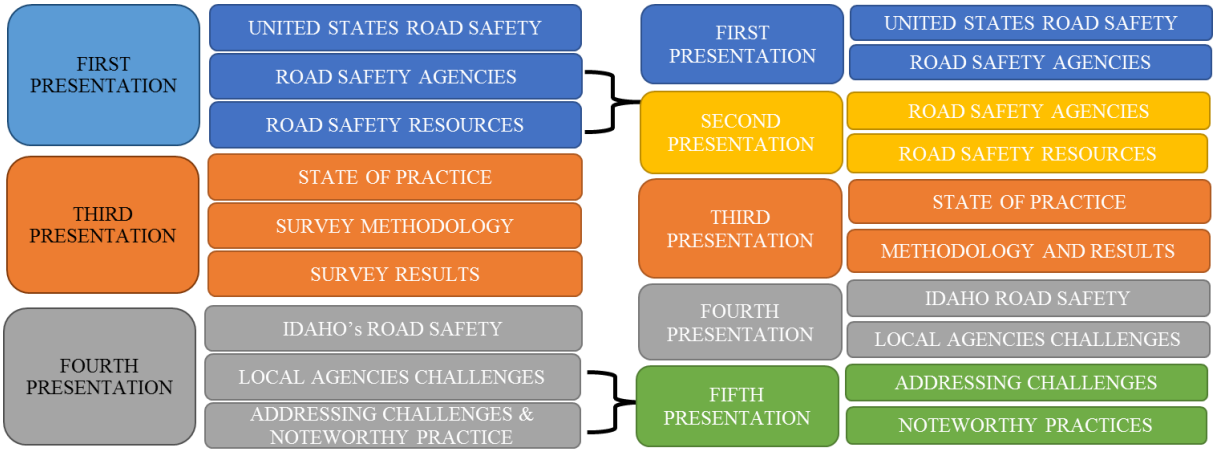


Figure 2-5: Presentation organization (updated)

2.4 Summary

Safety planning efforts and funding often start at the state level and trickle down to local and regional agencies. The five presentations created serve the purpose of addressing some of these challenges and providing alternatives to assist local agencies. Local practitioners had a chance to evaluate the initial draft of the presentations and recommend changes that would make the content more effective. The practitioners suggested several changes, such as dividing the content into shorter presentations. This change was intended to avoid loss of audience interest

and increase engagement and participation. Another recommendation was the inclusion of an index and acronym list that would allow users to search for specific topics and learn new terminology. The comments and recommendations improved both the slides and their content. Future evaluation can still be done by interviewing local agencies from cities and counties that manage more complex road systems, metropolitan planning organizations, highway districts, LTAC, and state departments of transportation. The use of the slides during future presentations will generate more feedback, which can be used to further update and expand the content.

The primary challenge to addressing safety remains a key responsibility of each local agency, which, with limited staff or resources, must be properly engaged and informed in order to best address existing roadway safety needs and continue to improve the safety culture of its agency and community. Future research opportunities exist on the topic of road safety culture as well as local agency participation in road management, the effectiveness of countermeasures, and safety grants participation. All of the topics in the presentations that were developed can still be expanded on the basis of the interest of the audience. Currently, many courses and training opportunities exist around the country but it is essential to also create tailored educational material (in this case to address issues in Idaho), and this approach and the format created can be applied to other states that are interested in improving their safety culture.

3. Implementation (Academic Perspectives)

Transportation engineering is a critical sub-discipline of the civil engineering profession as indicated by its inclusion on the Fundamentals of Engineering Examination, overlap with other specialty areas of civil engineering, and its recognition by the Transportation Research Board (TRB), Institute of Transportation Engineers (ITE), and American Society of Civil Engineers (ASCE). However, colleges and universities do not always offer an independent course on transportation safety and are more likely to provide coverage in the form of safety-related modules as part of a broader transportation engineering course. Specific safety-themed discussions may appear in sections focusing on transportation engineering, transportation planning, and freight transportation.

For this research effort, a stand-alone educational module focused on roadway safety was developed. This safety module, divided into three separate lectures, targeted both upper-level undergraduate students and graduate students who have an interest in transportation safety. .

3.1 Lecture Development

The three lectures were designed for and with different student levels in mind. An individual faculty member would be encouraged to select the appropriate lecture materials for his or her targeted student group. The details of the three lectures are introduced below:

- *Introduction to Road Safety: Core Definitions and Issues*. This introductory-level lecture covers the basic definitions of road safety such as collisions, collision rate, risk, risk factors, relative risk, injury severity, and crash reduction or mitigation rate. This lecture also provides a cursory review of traffic safety issues worldwide.

- *Road Safety Research: History, Analytical Approaches, Data, and Safety Measures*. This analysis-level lecture reviews the general trends of safety research history. In addition, an overview of the 3Es or 5Es, public health, Haddon Matrix, and the system approach to analyzing contributing crash factors and associated multidisciplinary elements are discussed. Exposure to road safety data is also provided. This process helps students to understand how safety data are collected and how biased data can be. In the end, by introducing various safety measures, including user, vehicle, infrastructure, rescue, and monitoring systems, this lecture provides a comprehensive introductory overview of safety measures.
- *The Future of Road Safety: Emerging and New Challenges*. This advanced-level lecture invites students to think about emerging or future road safety challenges such as texting and driving and automated vehicles. The framework for a student course project implementing research design and conceptualizing safety analysis is provided.

3.2 Assessment Framework

A formative evaluation approach was introduced to assess these three lectures. On the basis of Wolf ’s Curriculum Development Process (Wolf, 2007) and Kirkpatrick’s Four Levels of Evaluation (Kirkpatrick and Kirkpatrick, 2016), an assessment framework was developed to evaluate the overall module.

The assessment framework shown in figure 3-1 illustrates the steps used to evaluate the three developed lectures. The roadway safety module containing three lectures (i.e., introductory level, analysis level, and advanced level) and one module plan (i.e., objectives, contents, and target users) was provided to invited faculty members (see Appendix E) for their input and

feedback (see interview questions in Appendix F). Their insights were used to refine the initial version of the roadway safety education module and are described in the following sections.

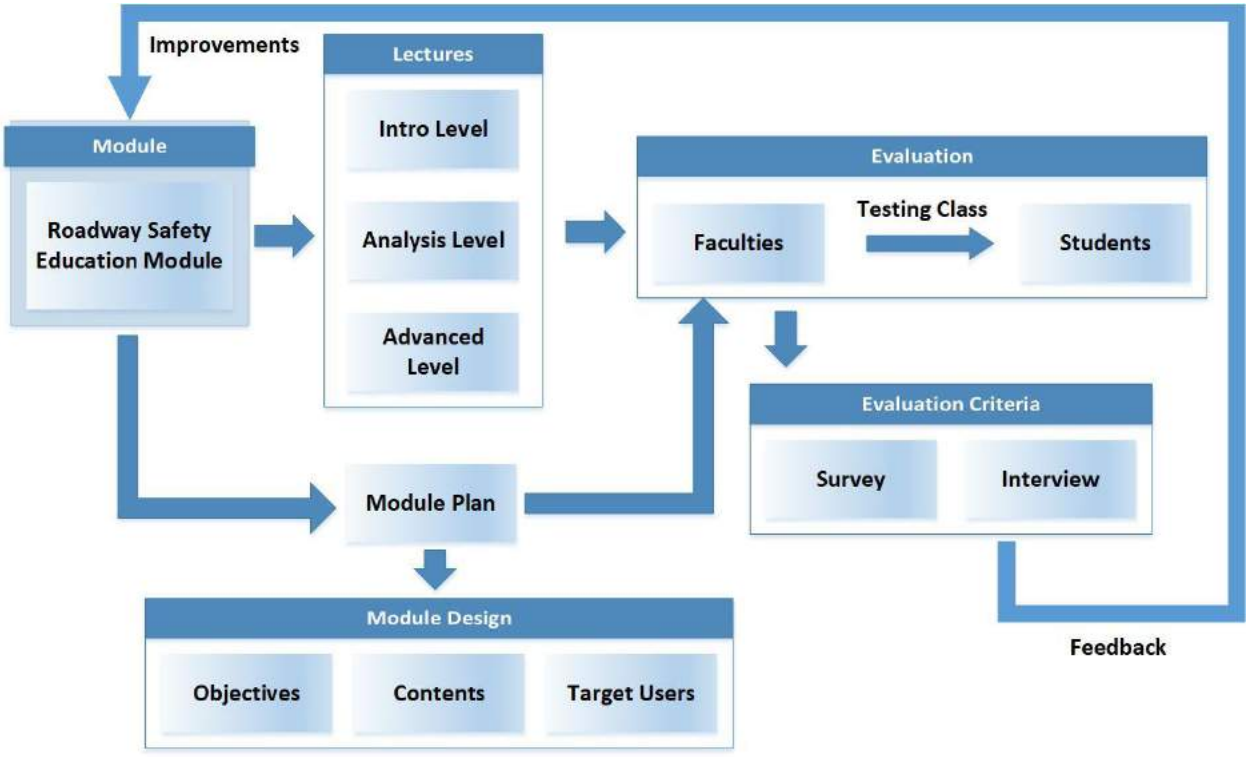


Figure 3-1: Assessment framework for evaluating the safety education module

3.3 Evaluation Criteria

On the basis of the principles identified by Hass and Parkay (Parkay et al., 2006), individual differences, flexibility, and systematic planning are criteria that depend in part on knowledge of the different approaches to learning. Similar to the Technical Education Curriculum Assessment (TECA) method developed by Keiser et al. (2004), five core criteria were proposed to evaluate the perspectives provided by faculty members. Interview questions were also developed and are listed in Appendix F.

The five core evaluation criteria included the following:

1. *Instructional Strategies*. Did the curricula support teaching strategies that could easily be applied by faculty and engage students?
2. *Systematization*. Did the designed module cover all of the important knowledge of roadway safety to provide maximum value for students?
3. *Congruity*. Did the three levels of lecture material satisfy the different levels of student needs?
4. *Clarity and Integrality of Objectives*. Did the objectives of this module completely and clearly reflect the current essential needs of safety education in transportation engineering?
5. *Operability of the Module*. Could the developed module, including the three lectures, homework, and reading materials, be easily used by faculty members during class?

3.4 Interviews

To evaluate the developed roadway safety education module, three specific steps were taken:

- The module, including three lectures, corresponding homework, and related references were sent to academicians (faculty members) who had teaching or research experience in the field of roadway safety.
- Eighteen academicians were interviewed and asked a series of integrated questions to obtain their feedback with regard to improving the developed roadway safety education module.
- The data and feedback obtained from the interviews were analyzed by using a defined criteria and qualitative method. The roadway safety education module was modified in accordance with the feedback provided by the interviewed faculty.

Phone interviews were conducted after each invited academician accepted our invitation. A nine-question interview script (see Appendix F) was developed that focused on specific topics and concerns related to the strengths and weaknesses of the roadway safety education module and how improvements could be made.

Each interview was recorded with the permission of the participants, and a follow-up analysis was conducted on the basis of the response and feedback provided by interviewees with regard to the developed materials. The average duration for each interview was 22:32 minutes, and all interviewees were university faculty members who had teaching or research experience in the field of roadway safety.

3.5 Interview Responses

Interview responses were reported as qualitative data. The frequencies based on the important points of the interview were used to develop a summary for identifying critical information. In a qualitative analysis, the thematic content approach is employed to extract key insights from the interview responses (Gul and Sozbilir, 2015; Daghan and Akkoyunlu, 2015).

Interviewee information with regard to gender and position are summarized in figure 3-2. Of the 18 interviewees, ere about 22 percent (N=4) were female faculty members and 78 percent (N=14) male. A majority of them were professors (39 percent) and assistant professors (33 percent).

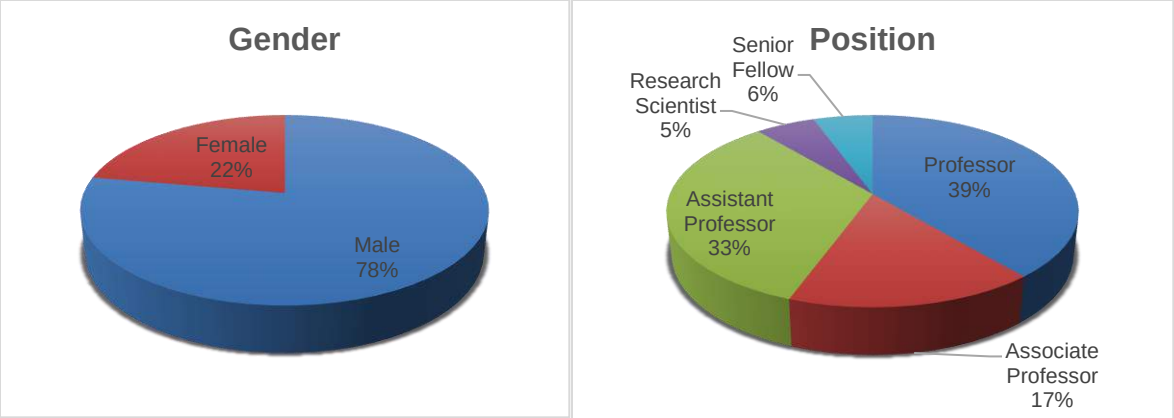


Figure 3-2: Interviewee gender and position

Their roadway safety-related teaching experience and their willingness to use the developed roadway safety education module from this study in their courses are summarized in figure 3-3. About 61 percent (N=11) of the interviewees had taught a roadway safety or transportation safety course. Twenty-two percent (N=4) of them had taught roadway safety as a component of other related courses. When asked whether the developed materials would be used for a future class, 33 percent (N=6) of faculty members interviewed responded favorably; another 28 percent (N=5) anticipated using parts of the developed module. Some interviewees (less than 22 percent or N=4) stated that they were unlikely to use the developed module because they felt that their courses were either already well-designed or incorporated components of our content materials in existing lectures.

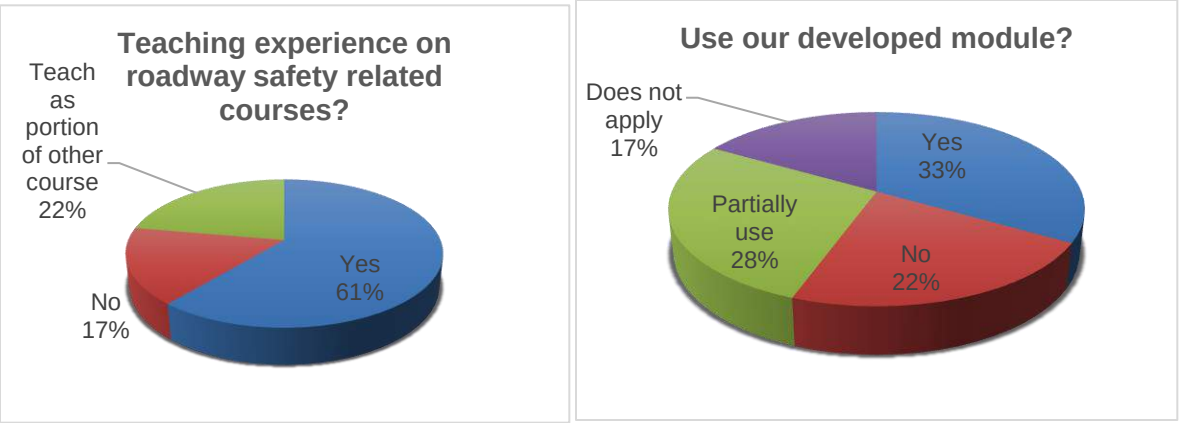


Figure 3-3: Interviewee teaching experience and willingness to use

The interviewees who had taught roadway safety-related courses were asked to briefly describe the syllabus or contents of their corresponding class. Each interviewee also provided helpful feedback as to how the developed roadway safety education module could be improved. Specific details are discussed in the following section.

3.6 Results and Analysis

This section describes the qualitative feedback provided by the interviewees with regard to the content of their current syllabi, existing course material needs or gaps, learning objectives, and feedback associated with the favorable or unfavorable design and content of the initial version of the developed course module.

3.6.1 Syllabi of Roadway Safety-Related Courses

Academicians who had previously taught roadway safety or transportation safety-related courses were asked to summarize their current course syllabus or the priorities of their transportation safety class. On the basis of a review of the six syllabi provided (N=6), the common threads were captured as the 16 topics shown in priority order in the bulleted list below. The numbers in brackets indicate the number of times the subject matter appeared on a particular syllabus.

- Introduction to transportation safety (N=6)
- Regression analysis of count data and development of statistical models (5)
- Crash/safety data investigation and analysis (5)
- Human factors in traffic safety (5)
- Highway Safety Manual (HSM) (4)
- Identification of hazardous locations (4)
- Countermeasure development (4)
- Development of safety performance functions (SPFs) (4)
- Highway safety design (3)
- Safety and economic evaluations of countermeasures (3)
- Development of crash modification factors (CMFs) (3)
- Roadway and vehicle factors in traffic safety (2)
- Traffic engineering studies used in traffic safety analyses (2)
- Pedestrian and bicycle considerations and traffic calming (2)
- Current traffic safety research and literature review (1)
- Safety audits and highway legislation (1).

On the basis of the responses, common topics included a general introduction to transportation safety, human factor issues, crash/safety data investigation and analysis, and statistical modeling. Since the courses taught were often described in terms of "highway safety" or "transportation safety," variation in content areas was expected. Using this priority list, the roadway safety education module developed as part of this study was refined to cover as many of these topics as possible.

3.6.2 Course Material Needs

When asked to describe the materials "most needed" for a traffic safety class, the interviewees provided a variety of responses:

- Real-world case study data (i.e., state crash data, traffic volume data, regional GIS maps) (N=4)
- Good homework problems (2)
- A good textbook (2)
- More compelling classroom activities (1)
- Reading materials (1)
- Cost of design treatment for reducing crash risk (1)
- Updates to lecture materials (1).

The interview responses indicated that the development and availability of real-world case studies, along with good homework problems and a supplemental textbook on roadway safety, are current voids with regard to available curriculum material.

3.6.3 Key Learning Objectives

Interviewees were asked to identify the learning objectives, perceived to be the most important for this class, that were not covered in our draft module framework. The opinions are highlighted below:

- Be able to use the Highway Safety Manual.
- Be able to apply a variety of quantitative techniques that can be used and applied to solve real-life transportation safety problems.
- Be able to evaluate the safety and/or economic effectiveness of countermeasures using several different methods.

- Be able to apply ethical road safety approaches.
- Be able to understand human factor elements with regard to roadway safety.

The research team acknowledges the importance of each of these topics. However, because of the detailed nature of topics such as the Highway Safety Manual, highway design, economic evaluation of countermeasures, and safety audits and highway legislation, coverage was not included as part of this platform.

3.6.4 Personal Preferences

The interviewees were asked to share their most and least favorite parts of the developed lectures. Specific comments are summarized below.

Favorite Parts

- General background of roadway safety
- International perspective integrated into the lecture materials
- Slides full of images
- Reference list / literature review
- Emerging issues and challenges in future roadway safety (Lecture 3)
- Haddon Matrix (Lecture 2)
- Pictures showing distracted driving (Lecture 1)
- Description of policies and laws in different countries (Lecture 1).

Least Favorite Parts

- International perspective integrated into the lecture materials
- Engineering components missing data-driven methodologies
- International components without focusing on United States
- System approach should be improved (Lecture 2)

- Using the word “accident” in the lectures
- Use contributing factors rather than risk factors.

According to the interviewee responses, many reacted favorably to the developed module. There were conflicting opinions from different interviewees as to whether or not international data should be included. One interviewee thought the lectures should focus on crash data in United States, but ere two interviewees supported the integration of international data, since international students may be present in the class and find the information relatable. Domestic students might also find the comparative data to be of interest.

3.6.5 Modifications and Suggested Improvements

Many suggestions and comments were provided when interviewees were asked how the roadway safety education module could be improved. Key modifications and suggestions are summarized below:

- Think about opportunities for increasing the active participation of students.
- Integrate real-world data analysis into the class.
- Use the word “crash” instead of “accident.”
- Use contributing factors rather than risk factors.
- The definition of a “protective factor” should be clarified.
- The difference between crash severity and injury severity should be clarified. In fact, crash severity is defined by the most severe injuries sustained by all occupants in a crash.
- There are not any meaningful methods for safety analysis in the developed slides. The Highway Safety Manual and all the methods in the HSM should be mentioned.
- The basic statistical methods used for safety analysis should be introduced.
- It is difficult to follow the slide of “system approach” (Lecture 2).

- The slides seem to target the students from public health, public polices or general audience, not for engineering students. Good effort collecting lots of information and facts, but the slides lack information on data sources, principles, methods, and engineering safety countermeasures (roadway design, traffic control and operations, and maintenance, or planning).
- The developed slides do not have a clear focus but have too many pictures, which become a distraction.
- The slides need less purple and more color and bold text for key words.
- There is no need for slide numbers. Those are taking up a lot of space, with little value.
- Lecture 3 is a lot shorter than the other two lectures (too short for a 75-min lecture, and not much content).
- Highly recommend trying to keep bullets and sentences to two lines only. Some of the text is very meaty and attendees will not have time to read it all.

Based on this feedback, selected modifications were carefully made as part of the updated iteration of this roadway safety education module.

3.7 Summary

This research developed a stand-alone educational module focused on roadway safety. Three lectures were created as part of this safety module that targeted upper-level undergraduate students and graduate students who have an interest in transportation safety. In order to assess the performance of the developed module, a formative evaluation approach was introduced. Five core criteria were utilized as evaluation guidelines for faculty members. A total of 18 academicians, composed of faculty members from universities throughout the country, accepted an invitation to review a draft version of a roadway safety education module and provide

interview feedback. Interviewee information was analyzed to both validate the survey results and gain insight to improve the developed module. To enhance the structure of the developed lectures, additional learning objectives were suggested by the interviewees. Recommendations included the development of real-world case study data and the development of methods to increase the active participation of students during the lectures.

4. Crash Reporting in Remote Areas

4.1 Introduction

In the first report, the research team explored how roadway crash data were acquired, stored, and utilized in engineering and management decisions regarding highway projects. The outcomes derived from that analysis dealt mostly with standard crash data, namely highway vehicles on roadways. For this follow-up effort, non-standard safety data, for crashes of off-highway vehicle users such as all-terrain vehicle (ATV or "four-wheeler") riders and snowmachine users, as well as reports of non-standard crashes in hospital records, were examined. These data are especially important for rural and remote regions, where much of the active transportation does not occur on highways, commonly uses non-highway vehicles, or experiences a scarcity of administrative resources. In this chapter, the common areas of data interest among injury/fatality crash reporting systems and their data discrepancies are examined. We scrutinized the standard crash reporting system used by the Alaska Department of Motor Vehicles (DMV) and the Alaska Department of Transportation and Public Facilities (ADOT&PF), as well as a non-standard system (for this study), namely the Alaska Trauma Registry. These data sources were then compared with police reports and other data from local newspapers to identify any anomalies or discrepancies. This assessment was conducted for one large and two medium-sized Alaska communities as case studies.

4.2 Non-standard Data and Rural Issues

Alaska has hundreds of communities that are not "on" the highway system. Some of these communities are classified as small cities and called "rural hubs." These communities typically have some local highways for access, as well as an asphalt airport runway. However, in these hubs and in all of the smaller communities, the road system is limited, and automobiles

and small trucks share the few available roadways with ATVs and snowmachines. In the winter, the river bodies freeze and are often used by snow machines, ATVs, and occasionally highway vehicles. The hubs are generally served by Alaska State Troopers and sometimes by local police. A few of the smaller communities also have troopers, but most have Village Public Safety Officers (VPSOs), and some do not have any formal law enforcement presence. For these reasons, both the nature of crashes and their reporting are likely to vary from the standard in these rural areas.

Although road systems in rural localities are highly variable in quantity and quality, their importance cannot be overlooked; for example, the road between a village and an airstrip or boat launch may be of critical importance. Funding may be available for construction or maintenance of these facilities, but data are needed for state-level safety planning algorithms. Reliable crash reduction factors (CRFs), needed for input into economic models, are based on historical data that may not be available for many rural locations because this type of data is simply not collected on those facilities.

Three sources of data were used for this study: the Alaska DMV database of highway crashes, the Alaska Trauma Registry of hospital encounters, and newspaper records from three (one large and two small) Alaska communities.

4.2.1 Alaska DMV

In the state of Alaska, collected crash data is initially submitted to the Department of Motor Vehicles (DMV). After review, the data are sent to the ADOT&PF and input into a database from which data can be extracted for future use. The data are then used to support funding requests from the Highway Safety Improvement Program (HSIP) and other reports as needed.

Any incident causing either damage is in excess of $2000 or an injury is reported by police on Form 200 or, in the case of citizen reports, on Form 209. Citizen reports are predominantly used to document property damage-only crashes. (An officer might ask a driver to access the Form 209 website, print a .pdf hard copy version, complete it by hand, sign it, and then send it to the DMV, where it is placed in a file and scanned.) The DMV collects crash reports but does not parse the data. The DMV sends a copy of any crash report to the ADOT&PF either electronically, as a .pdf, or as a hard copy. A subset of data from the report is entered into the ADOT&PF Oracle database either electronically or by hand. ADOT&PF staff and/or contract personnel enter these data, and ADOT&PF headquarters staff also geo-locate the data.

There are four Form 200 crash data formats:

1. Electronic: Traffic and Criminal Software (TraCS) data are transmitted directly into DMV and ADOT&PF's systems;
2. Electronic: Fairbanks police data are transmitted directly into DMV and DOT&PF's systems;
3. Hard-copy .pdfs: Anchorage police data are uploaded to an FTP site for use by DMV and ADOT&PF; and
4. Paper entries: typically from rural areas, these documents are either paper report scans or actual paper reports.

In the state of Alaska, the Department of Public Safety uses a system called TraCS (Traffic and Criminal Software). This system compiles the electronic Form 200 data from state troopers, local police, airport police, and university police. Troopers and other enforcement officers use a "Toughbook" to enter Form 200 data. Trooper staff review each report and if it is

satisfactory, then TraCS data are sent to the DMV system. From there, the parseable TraCS data are sent to the ADOT&PF Oracle database.

Historically, nearly 9- percent of crashes have been reported with Form 200 (police) and 20 percent with Form 209. In 2013, a significant change occurred. The National Highway Traffic Safety Administration (NHTSA) recommended that Form 200 be Model Minimum Uniform Crash Criteria (MMUCC0 compliant, so these recommendations were incorporated when the form was updated. However, the "new" Form 200 has been judged to be more complex and difficult for law enforcement to complete, and some officers have chosen not to use the Form 200 for crash types that they would have reported in the past. The net result is that a greater number of reports are now submitted with Form 209. On the basis of preliminary data from 2013, Form 200 was submitted in about 8,000 cases (64 percent) in comparison to approximately 4,500 cases using Form 209 (36 percent).

Note that Fairbanks police (FPD) use a different data platform for Form 200 data, but once they are approved, FPD data are also electronically transmitted to the DMV and then to ADOT&PF. In comparison, Anchorage police collect data electronically and then generate a .pdf of Form 200, which is electronically sent via file transfer protocol (FTP) to the DMV and ADOT&PF.

ADOT&PF crash data staff and contract personnel compile the data from all .pdfs and paper documents into the Oracle database at ADOT&PF. All records require crashes to be geo-located, although it is often difficult to determine the correct location from citizen reports. However, the DMV data do not show non-highway or non-roadway crashes. As a result, an automobile and snowmachine crash would be reported in the data if the crash occurred on or adjacent to a highway, but not if it occurred off the highway.

In Alaska, there is close coordination between the DMV database and the federal Fatal Accident Reporting System, or FARS. However, a fatal snowmachine or ATV crash would not be reported in FARS.

4.2.2 Trauma Registry

The Alaska Trauma Registry is an information system that documents the most seriously injured patients in Alaska and the treatment they received. The system is maintained by the Division of Public Health in the Alaska Department of Health and Social Services. It collects data from all 24 of Alaska's acute care hospitals. The criteria for inclusion in the Trauma Registry are patients with injuries who are admitted to an Alaska hospital, held for observation, transferred to another acute care hospital, or declared dead in the emergency department, and for whom contact occurred within 30 days of the injury. Injuries include trauma, poisoning, suffocation, and the effects of reduced temperature. The trauma registry does not include patient, physician, hospital, clinic, or ambulance service identifiers.

Trauma registry data are confidential and protected under Alaska Statute 18.23.010-070. All Trauma Registry personnel and those requesting Trauma Registry data are required to sign a confidentiality statement. Obtaining Trauma Registry data requires a signed Release of Information Policy and Confidentiality Statement form, and a completed Data Element list must be sent to the Alaska Trauma Registry Manager. The data are then sent to an email address provided by the party making the request via secure file transfer. Data were obtained for 2009 through 2014, but only the records from 2013 were used for this study.

4.2.3 Newspaper Reports

The collection of vehicular crash data from newspaper reports involved searching from three representative Alaskan communities of varying populations for an entire year, extracting

relevant data for all identified crashes, and summarizing the findings in a way that would allow tracking whether the crashes were also found in the DMV and Trauma Registry databases. The 2013 analysis year was chosen because it also represented the most recent time window for which Trauma Registry data were available, with the cities of Fairbanks, Ketchikan, and Nome selected for reasons explained earlier.

4.2.3.1 Fairbanks

The Fairbanks Daily News-Miner is a daily paper for a community of about 70,000 persons. Fairbanks is on the highway system but over 300 miles from Alaska's largest city, Anchorage. The 2013 Fairbanks Daily News-Miner, via the University of Alaska Fairbanks Elmer E. Rasmuson Library's NewsBank (2018) archival search engine, was used to find both police blotter (i.e., public safety) and regular newspaper reports.

4.2.3.2 Ketchikan

Ketchikan is a city in the Ketchikan Gateway Borough; it is the southeastern-most city in Alaska, with a population of 8,050 (2010 census). The surrounding borough, encompassing suburbs both north and south of the city along the Tongass Highway (most of which are commonly regarded as a part of Ketchikan, albeit not a part of the city itself), plus small rural settlements accessible mostly by water, registered a population of 13,477 in that same census (Wikipedia 2018). In the summer tourist season, tour boats produce a large, temporary increase in population. At the Elmer E. Rasmuson Library (2018) microfilm collection in the Alaska and Polar Regions Collections and Archives Department, all issues of the 2013 Ketchikan Daily News were searched, and all identified crash reports from the police records columns (containing reports from Ketchikan City Police and State Troopers) were summarized.

4.2.3.3 Nome

Nome is located on the southern Seward Peninsula coast on Norton Sound of the Bering Sea. In 2014 the population was estimated at 3,788, a rise from the 3,598 recorded in the 2010 Census. As of the 2010 census, the area population was 9,492 (Wikipedia, 2018). The census area is more likely important in this context because crashes outside the city limits would be included in the news reports. A microfilm search similar to that for the Ketchikan Daily News was conducted of all issues of the Nome Nugget for 2013, identifying crash reports by the Nome City Police and State Troopers.

4.2.4 Method

For each traffic crash, the following data were captured when possible:

- Publication date
- Occurrence date
- Occurrence, report or response time
- Reporting agency
- Description
- Location
- Names
- Injuries
- Follow-up, injury treatment, etc.
- Damage value
- Notes/other comments.

4.3 Results

Appendix I contains a listing of the data extracted from the three newspapers for 2013. The Fairbanks Daily News-Miner archival search used the keywords “crash,” “accident,”

"collision," and "struck." Of the 653 hits, 132 were vehicular crashes of some type. All are summarized on the spreadsheet in Appendix I. The report includes 12 fatal crashes, of which one was a double fatality, resulting in a total of 13 fatalities for 2013.

The microfilm search for Ketchikan identified 48 vehicular crashes, none of them fatalities. Approximately 20 percent of the reports came from communities outside Ketchikan and environs, such as Craig and Klawock. A wide variety in the number of reports per month, from one to 12, was noted; there was also a gap of no reports from Ketchikan Police between February 3 and August 27, 2013. We assumed, however, that data were sufficient to provide the basis for researching the proportion of those crashes reported in the media that were also found in the DMV and TR databases.

For Nome, the microfilm search identified 39 vehicular crashes, none of which were fatal. These included several snowmachine and ATV crashes. The reports were fairly well distributed across the year.

Figure 4-1 presents the crash data from the three sources. It includes snowmachines and ATV data, as well as reported off-road data.

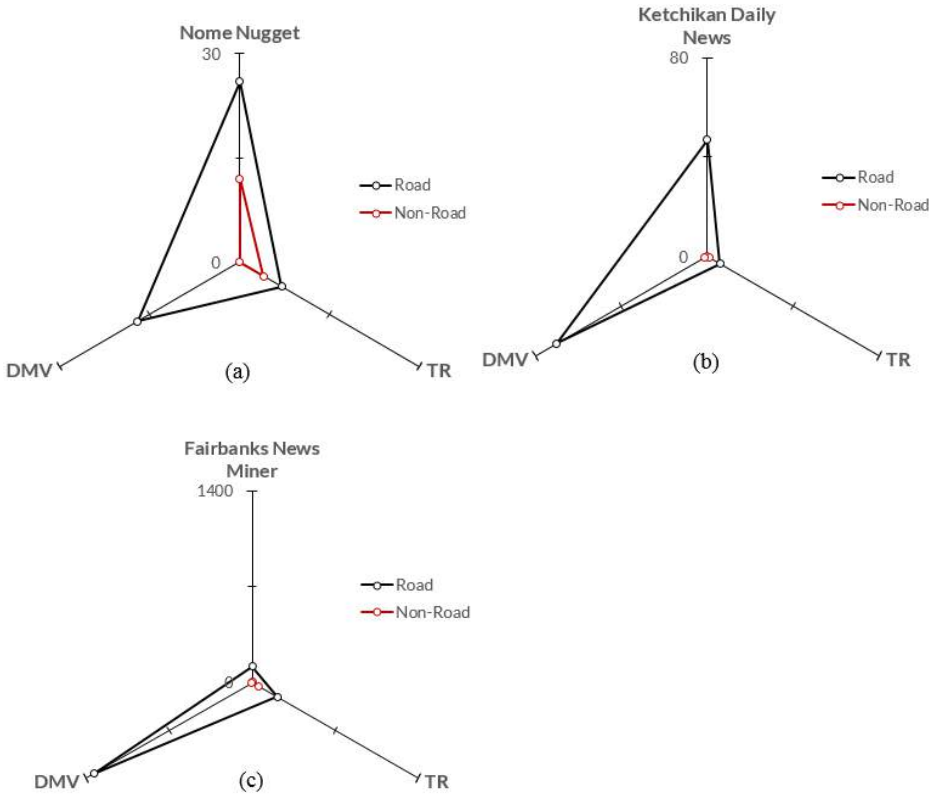


Figure 4-1: Relative number of all transport-related incident records in the local newspaper, Trauma Registry, and DMV records for (a) Nome, (b) Ketchikan, and (c) Fairbanks, Alaska, in 2013

Figure 4-1 indicates that the DMV data did not show any, or very few, off-road crashes. It would have shown such data had the crash occurred on a roadway with a car or truck. For Nome, where full newspaper reporting was available all year, there was good correlation between the numbers reported in the DMV and the newspaper. (This would also have been true if the Ketchikan newspaper data had been adjusted for the half year of missing data.) For Fairbanks, the newspaper only reported a small fraction of the crashes that were reported to the DMV. For Nome, the number reported in the TR correlated well with both the newspaper and the DMV. This is consistent with more newsworthy injury crashes making the newspaper and more serious crashes being reported to/by the police. However, this was not the case in

Ketchikan, where fewer crashes were reported in the Trauma Registry. This result would have been more pronounced if the newspaper reports for the missing months had also been factored. For a larger community such as Fairbanks, a greater proportion of crashes as found in the Trauma Registry than was reported in the newspaper. In Fairbanks, a smaller proportion of crashes was also found in the Trauma Registry than was more diligently reported to the DMV for non-injury crashes and non-newsworthy crashes. In contrast, the Trauma Registry represented about 50 percent of the DMV crashes and one-third of the crashes reported by the newspaper. In contrast, the Ketchikan numbers implied that less than 10 percent of the DMV crashes was captured by Trauma Registry notes.

Figure 4-2 shows extracted snowmachine and ATV data from each data source. All three locations yielded similar data, with most crashes not occurring on highways and not shown in the DMV data. Only Fairbanks (with its much larger number of reported crashes) captured any off-road crashes that were reported in the DMV database. The Nome newspaper and Trauma Registry data showed that some off-road vehicle crashes occurred on a road. In fact, about half the off-road vehicle crashes occurred on a road, which, given the personal experiences of the researchers, mirrored the general use of the roads by off-road vehicles in rural areas. There were too few off-road vehicle crashes in Ketchikan to draw any inferences. An analysis of Fairbanks data showed that many of the non-roadway Trauma Registry reports were not picked up by the newspaper. On the other hand, there was a correlation among the three sources with regard to crash information in Fairbanks, perhaps indicating that the crashes involving off-road vehicles with highway vehicles resulted in more serious injuries.

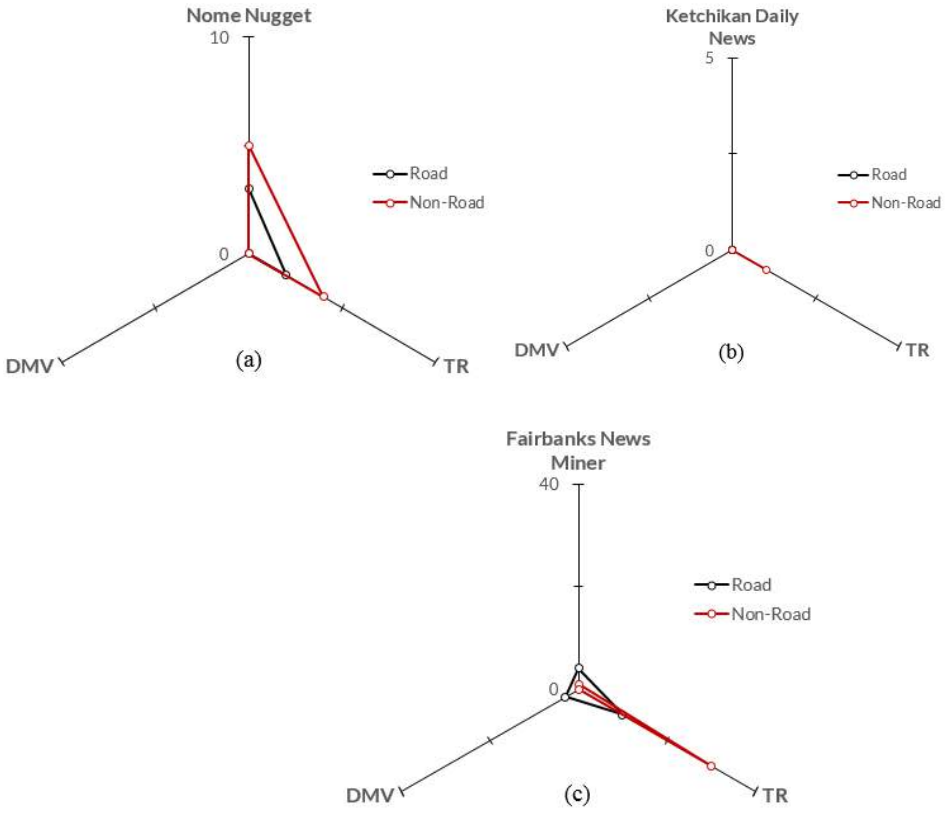


Figure 4-2: Relative number of ATV and snowmachine incident records in the local newspaper, Trauma Registry, and DMV records for (a) Nome, (b) Ketchikan, and (c) Fairbanks, Alaska, in 2013.

Figure 4-3 shows the overlap of records for the two hubs, Nome and Ketchikan. In Ketchikan, for example, there were 100 total crashes, but only 61 were reported in the DMV, 36 reported in the DN, and three reported in the Trauma Registry. As a result, the DMV only recorded 61 percent of the crashes.

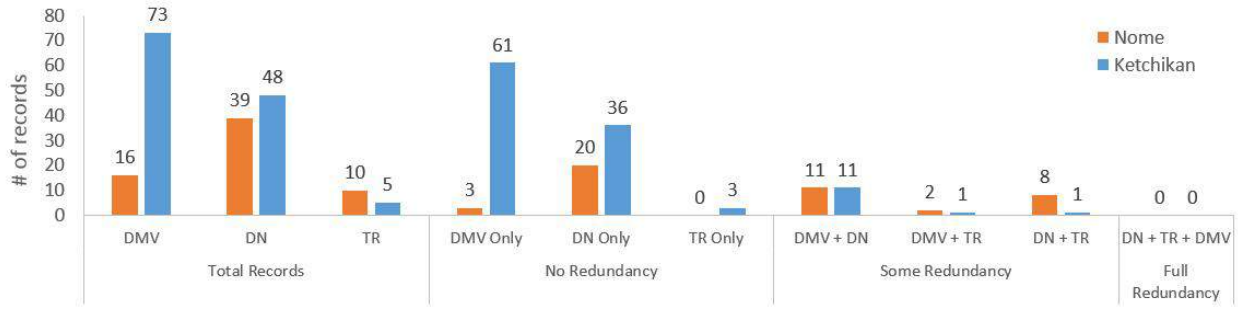


Figure 4-3: Overlap of records for Nome, Alaska, and Ketchikan, Alaska (2013)

4.4 Summary

A review of Trauma Registry and newspaper data indicated that crashes of off-road vehicles were usually not reported in the DMV database. In Fairbanks, the Trauma Registry numbers indicated that crashes with injuries were not reported or were under-reported in the DMV database and in newspapers. In Nome and Ketchikan, despite the fact that newspaper reporting in smaller towns may vary in thoroughness, a large fraction of crashes that were not officially in either the recorded DMV or the Trauma Registry were picked up in the newspapers.

In smaller communities, it appears that the most complete set of crash "data" may be found in the local newspaper. Therefore, when seeking support for transportation system improvements that would improve vehicular safety, officials in these communities would do well not to neglect newspaper reports as valid sources of data. However, as community size increases, the local paper likely has many more competing events to report, so a smaller percentage of crashes is reported.

5. Conclusions

The field of transportation engineering places significant attention on general themes such as roadway design, traffic operations, and planning. The context and importance of *safety* as part of this discussion is not always clearly defined or established, so in this study the need to incorporate, emphasize, and highlight the role of this transportation pillar as part of curriculum materials for both students and practitioners was explored. An independent set of modules focused on transportation safety was developed and refined for each target audience. In addition, safety data from communities in Alaska were examined to determine whether existing databases fully capture all crashes that occur in remote areas or involve non-traditional modes of transport (i.e., modes other than automobiles). Each of these activities contributed to the existing body of knowledge and confirmed that there are, indeed, many opportunities that remain to define or redefine the role of transportation safety, either in the form of educational materials or in terms of assessing the processes and protocols currently employed by practitioners.

The materials that were separately developed for academicians and practitioners should be viewed as an important and necessary first step. Although the materials have been reviewed, edited, and updated, the slides and accompanying resources should be refined and adapted for personalized use by future adopters. On the basis of the initial feedback provided by reviewers, opportunities remain for instructors to tailor the modules to meet individual needs and teaching styles. The focus group suggested that the slide decks could be shortened and active learning activities developed; the research team supports these recommendations and encourages future users to consider such changes to satisfy audience expectations. Furthermore, instructors are strongly encouraged to incorporate relatable, real-world applications and case studies to supplement the materials that have been developed; this type of context will greatly support

learning and benefit the students and recipients of this developed material. Despite the collective effort of many professionals representing different transportation-related disciplines, the significant numbers of fatalities, injuries, and crashes that occur each year suggest that conversations and learning about transportation safety must continue in order to bring this topic to the forefront of transportation engineering-related discussions.

6. References

Daghan, G., Akkoyunlu, B. (2015). General trends of the studies about the sustainability of the technology usage in education: A thematic content analysis study. Egitim Ve Bilim-Education and Science, 40(178), 225-253.

Elmer E. Rasmuson Library. (2018). University of Alaska Fairbanks. Alaska and Polar Regions Collections & Archives. Accessed February 13 & 15 and November 20, 21 & 22, 2017.

Gul, S., Sozbilir, M. (2015). Thematic content analysis of scale development studies published in the field of science and mathematics education. Egitim Ve Bilim-Education and Science, 40(178), 85-102.

Keiser, J., Lawrenz, F., Appleton, J. (2004). Technical Education Curriculum Assessment. Journal of Vocational Education Research, 29(3), 181-194.

Kirkpatrick, J., and Kirkpatrick, W. (2016). Kirkpatrick's Four Levels of Training Evaluation, 1st Edition, Association for Talent Development: Alexandria.

Knafl, K. and Howard, M. (1984). "Interpreting and Reporting Qualitative Research", Research in Nursing and Health, 7, 17-24.

National Highway Traffic Safety Administration. (2017). "USDOT Releases 2016 Fatal Traffic Crash Data. https://www.nhtsa.gov/press-releases/usdot-releases-2016-fatal-traffic-crash-data.

NewsBank, Inc. (2018). Access World News. Fairbanks Daily News-Miner. http://infoweb.newsbank.com.proxy.library.uaf.edu/resources/search/nb?p=AWNB&t=pubname%3AFDNB%21Fairbanks%20Daily%20News-Miner%20%28AK%29. Accessed April 21, 26, 28, 29, & 30, 2017.

Pope, C., Ziebland, S., and Mays, N. (2000). Analyzing qualitative data. British Medical Journal, 320(7227), 114.

Parkay, F., Anctil, E., and Hass, G. (2006), Curriculum Planning: A Contemporary Approach. 8th Edition, Pearson: New York.

State of Alaska Department of Labor and Workforce Development, Current Alaska Population Overview. (2018). http://live.laborstats.alaska.gov/pop/popestpub.cfm. Accessed February 18, 2018.

Wikipedia. (2018). Article titled "Ketchikan, Alaska, https://en.wikipedia.org/wiki/Ketchikan,_Alaska. Accessed 21 March 2018.

Wikipedia. (2018). Article titled, “Nome, Alaska “ https://en.wikipedia.org/wiki/Nome,_Alaska. Accessed 21 March 2018.

Wolf, P. (2007). A model for facilitating curriculum development in higher education: A faculty driven, data-informed, and educational developer–supported approach. New Directions for Teaching & Learning, 2007(112), 15-20.

APPENDICES

APPENDIX A – PRACTITIONER INTERVIEW SCRIPT

Hello, I'm _____ and I'm calling on behalf of the University of Idaho.

We're conducting this phone interview as a follow-up to the three traffic safety education presentations that were sent to you.

Is this a convenient time for you?
1 – Yes, if yes continue.
2 – No, if no schedule another time _____.

The information from this interview will help us to improve and enhance the content, as we want this resource to benefit local agencies.

A. Would it be okay if we record this interview? [Yes or No]

Thank you. This interview will have a total of thirteen questions. Let's begin.

1. What is your name and what agency do you work for?
2. How long have you been with [this agency]?
3. In your own word, what do you think is the purpose of these presentations?
4. If given the opportunity would you use these presentations yourself?
5. Do you think you would share these presentations within your own agency?
6. Would you recommend these presentations to your transportation colleagues? Yes or No.
7. Would you please comment on the general format of the presentations?
8. Were the presentations easy to follow? Yes or No. Please describe.
9. Were the images and graphics on the slides helpful? Yes or No. Please elaborate.
10. What specific topic or topics did you find most interesting?
11. Was the length of the presentations appropriate?
12. Can you suggest any topics that you would recommend for future presentations?
13. Are there any changes that you would recommend to make the presentations more effective?

This concludes our interview. Do you have any questions for us?

APPENDIX B – PRACTITIONER RESPONSE CODING

Codes	Description
Easy to follow	The participants felt that the slide deck was easy to follow.
Good Format	The participants felt that the slide deck had a good format.
Good Information	The participants felt that the slide deck had good content.
Good length	The participants felt that the slide deck was appropriate in length.
Helpful	The images and graphics were considered helpful.
Improve Length	The participants suggested the need to divide the presentation(s).
No Topics	There were no interesting topics for the participants.
No Usage/ No Share	The participants were not willing to use or share the slide decks.
Purpose (In Detail)	The purpose of the presentation was explained in a detailed way.
Purpose (Simple)	The purpose of the presentation was explained in a simple way
Recommendations	The participant recommends changes to the slides or the addition of new content.
Road Safety	The participants mention ways to address road safety.
Share	The participants were willing to use or share the slide decks.
Topics	There were interesting topics for the participants.
Usage	The participants were willing to share the slide decks.

APPENDIX C – PRACTITIONER INTERVIEWS - QUANTITATIVE RESULTS

Numbers	Questions	Participant 1	Participant 2	Participant 3
1	What is your name and what agency do you work for?	City of Emmett, Idaho	Lewis County, Idaho	Swan Valley, Idaho
2	How long have you been with [this agency]?	32 years	8 years	10 years
3	In your own word, what do you think is the purpose of these presentations?	I think it is ways to look at or improve road safety and the requirements of the federal highway and the state of Idaho to address safety.	How different agencies can work together to address rural road safety and address the local agencies limited resources.	Not completely sure but to address transportation issues.
4	If given the opportunity would you use these presentations yourself?	Possibly. The major concern is a lot of information which need to be broken down.	Yes	No sure, the city is too small and it considers that bigger agencies would benefit more from the presentations.
5	Do you think you would share these presentations within your own agency?	Yes, he would.	Yes, she likes the first slide deck. It was easier to read and follow. Appendix at the beginning of the presentation for any new engineers starting in road safety.	
6	Would you recommend these presentations to your transportation colleagues? Yes or No.	Yes, he would.		
7	Would you please comment on the general format of the presentations?	The different fonts and images makes the presentation interesting. The statistical information was interested, it catches the attention. ave a full-time grant writer which makes it harder to compete with counties which have staff focus in this task which gives them an edge when competing with the small cities.	Find the slides easy to read. Go through the grammar and readability or spelling errors. The slides are informative.	
8	Were the presentations easy to follow? Yes or No. Please describe.	Yes, the slides are good and depends on how much time do you focus in each slide. Slide 26 have three bullet points and the script paragraph looks quite extensive.		They were easy to follow.
9	Were the images and graphics on the slides helpful? Yes or No. Please elaborate.	Yes, good images.	Yes, it catches your attention. Makes you stop and think.	Yes it was helpful
10	What specific topic or topics did you find most interesting?	FAST act and the funding information. Include controlled open discussion or question between key topics which allows the audience discuss different topics and experiences.	Rural road programs and LRSP oriented to highway districts. Agencies with limited resources can still make an impact.	
11	Was the length of the presentations appropriate?	There was an initial misunderstanding of the actual length of the presentations but after setting that the slides are divided in 3 parts he considers that the presentation had an appropriate length.		Maybe the presentations are a little bit long but a lot of information is being covering so it might be alright.
12	Can you suggest any topics that you would recommend for future presentations? Suggest any changes.	Training in the safety grants. Local agencies must hire engineering firms for competing in grants. Funding. How to successfully participate for grants.	Addressing human error, more education and state educational programs. Specific content related to the topics already covered. Create a type of index that people can go to specific content.	No recommendation in the moment.

Numbers	Questions	Participant 4	Participant 5	Participant 6
1	What is your name and what agency do you work for?	City of Garden City, Idaho	City of Hailey, Idaho	Jerome County, Idaho
2	How long have you been with [this agency]?	9 years	25 years	24 years
3	In your own word, what do you think is the purpose of these presentations?	To help agencies to address road safety	Help different agencies understand their involvement in the process and how safety and planning is a big plan on it.	Collect information in road safety.
4	If given the opportunity would you use these presentations yourself?	Probably not. They use other training sources.	Yes, I would but it is a little bit long because of the amount of information it has. Someone that is beginning it would be hard to determine where to start.	Probably not unless it's a specific information they need. Highway district tells or dictates what they can do or not.
5	Do you think you would share these presentations within your own agency?	Yes, probably show it their safety meeting but actually the city doesn't do a whole lot of road safety which is done by Ada county.	Yes.	Yes
6	Would you recommend these presentations to your transportation colleagues? Yes or No.		Yes	Yes
7	Would you please comment on the general format of the presentations?	Clear and concise, well directed, was put together very well.	It would be nice to have a skip ahead certain chapters.	Yes
8	Were the presentations easy to follow? Yes or No. Please describe.		It is easy to follow but it would have been nice to have a way to skip forward toward safety aspects or funding.	Yes it was easy to follow
9	Were the images and graphics on the slides helpful? Yes or No. Please elaborate.	The images and graphics were helpful. Well put together.	Images and graphics were helpful but wish he could like to click in the link. Recommend to contact LTAC.	The images and graphics were helpful.
10	What specific topic or topics did you find most interesting?	I cannot really say.	Federal funding and how it works. Road safety aspects. Combine efforts to improve road safety including enforcement, education, engineering and EMS.	
11	Was the length of the presentations appropriate?	Yes, he think so		It has an appropriate length
12	Can you suggest any topics that you would recommend for future presentations? Suggest any changes.	They came clear and concise and use a good amount of time.	More chapters related to safety and funding. If we broke the presentations, there is some great specific topics that can go more in depth.	I wouldn't change anything because he considers himself an amateur and he is more focus into planning.

APPENDIX D – PRACTITIONER SLIDE DECKS (5 TOTAL)

Content

- Building a Local Agency Safety Culture
  - Road Safety History
  - Roadway Statistics
  - Road Users and Performance Measures
  - Current Legislation
- Transportation Agencies and Resources Available
  - Partner Agencies
  - Manuals
  - Courses
  - Software

Content

- Highway Safety in Practice
  - Introduction and Objectives
  - Preliminary Assessment
  - Survey (Methodology)
  - Survey (Results)
- Road Safety for Local Agencies in Idaho
  - State of Idaho
  - Idaho Statistics
  - Challenges
  - Local Road Safety Plan

Content

- Addressing the Challenges and Noteworthy Practices
  - Data Collection
  - Data Analysis
  - Road Safety Audits
  - Project Prioritization
  - Noteworthy Practice

Abbreviation Index

Traffic Safety Management and Analysis

Building a Local Agency Safety Culture

Road Safety (The Early Years)

Road Safety (The Early Years)

Road Safety (1990s)

TEA-21
Moving Americans into the 21st Century

Road Safety (2000s to present)

SAFETEA-LU
Safe Accountable Flexible Efficient Transportation Equity Act:
A Legacy for Users

Road Safety (2000s to present)

Vision and Mission

U.S. Department of Transportation
Federal Highway Administration

NHTSA

GHSA

Agency Self-Assessment

Does your agency have a safety mission?

If so, what is it?

Cooperation

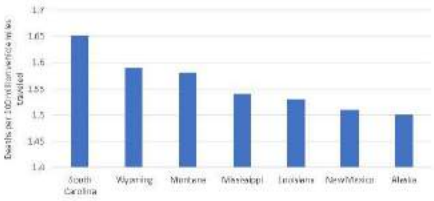
- Cooperation equals success in road safety
- Road safety has to involve all transportation aspects

Local Roadways

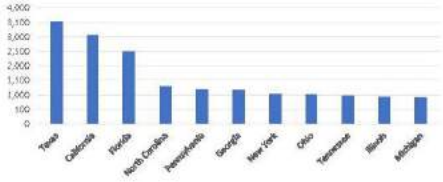
- Experience the highest overall crash rates
- Local agencies must take the lead

Roadway Statistics

Fatal Crashes in the U.S. (Top 7 States)



Crashes by State (Top 11)



Urban Road Ownership (2014)

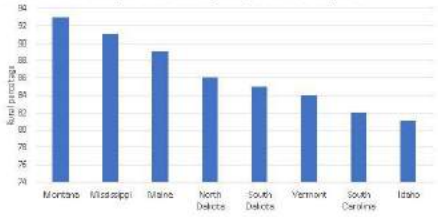
	URBAN					
STATE	STATE HIGHWAY AGENCY	COUNTY	TOWN, TOWNSHIP, MUNICIPAL(1)	OTHER JURISDICTIONS(2)	FEDERAL AGENCY(3)	TOTAL
Alaska	686	1,598	327	7	72	2,640
Idaho	367	334	4,463	698	2	5,618
Montana	512	-	3,653	-	-	4,164
Oregon	1,228	3,827	9,716	161	22	14,898
Washington	1,544	6,423	16,485	90	433	24,844
U.S.Total	168,060	243,477	775,851	6,653	7,641	1,301,680

Rural Road Ownership (2014)

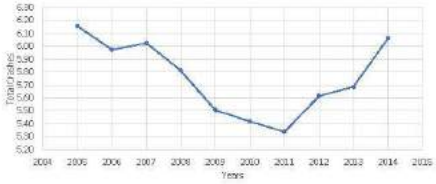
	RURAL					
STATE	STATE HIGHWAY AGENCY	COUNTY	TOWN, TOWNSHIP, MUNICIPAL(1)	OTHER JURIS-DICTIONS(2)	FEDERAL AGENCY(3)	TOTAL
Alaska	4,897	2,114	1,456	2,303	2,319	13,089
Idaho	4,629	15,526	1,890	13,061	8,002	43,243
Montana	10,492	42,594	1,175	4,295	12,322	70,819
Oregon	6,450	29,173	1,247	1,379	20,252	58,501
Washington	5,511	32,745	1,629	8,370	8,217	56,473
U.S. Total	614,743	1,597,119	559,289	50,705	153,490	2,975,347

Units in miles

Rural Roadway Percentage by State (Top 8)



Economic Impact of Crashes



Agency Self-Assessment

What are your agency's key statistics?

Which statistics would you highlight?

Roadway Users

- Motor-Vehicle Drivers
  - Cars
  - Trucks
  - Motorcycles
  - Buses
- Bicyclists
- Pedestrians

Road Safety Performance Measures

- Fatalities
- Fatalities and Serious Injuries
- Fatalities and All Injuries
- Crashes

Current Legislation

- Fixing America's Surface Transportation (FAST) Act
- Improves nation's surface transportation infrastructure

FAST Act

- Funding:
  http://www.fhwa.dot.gov/fastact/funding.cfm
- Guidance and Regulation:
  http://www.fhwa.dot.gov/fastact/guidance.cfm

Highway Safety Improvement Program (HSIP)

- Core federal-aid program
- HSIP projects must be consistent with SHSP
- Funds used to maximize opportunities to advance projects that can reduce fatalities and serious injuries

Traffic Safety Management

- Combined efforts at improving safety would collectively exceed the efforts of agency working independently?

Partner Agencies

Federal Departments and Programs

- Department of Transportation (DOT)
- Federal Highway Administration (FHWA)
- National Highway Traffic Safety Administration (NHTSA)

State and Local Agencies

- Governors Highway Safety Association (GHSA)
- State Department of Transportation
- Counties and Cities

Summary

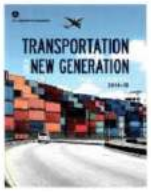
- A brief background of road safety in United States
- Describe the importance of road safety
- Introduce road safety's main concepts
- Agencies involve in road safety improvements.

Traffic Safety Management and Analysis

Transportation Agencies and Resources Available

Department of Transportation

- Safe and secure public travel
- Increase personal mobility
- Contribute to nation's economic growth



Federal Highway Administration (FHWA)

- Supports state and local agencies in the design, construction, and maintenance
- Improve mobility and highway system performance

U.S. Department of Transportation
Federal Highway Administration

Federal Highway Administration (FHWA)

National Highway Traffic Safety Administration (NHTSA)

- Responsible for reducing deaths, injuries and economic losses
- Investigates safety defects in vehicles
- Promotes the use of safety belts, child safety seats, and air bags

NHTSA

Governors Highway Safety Association (GHSA)

- Represents state and territorial highway safety offices
- Provides leadership
- Supports states and local agencies to improve traffic safety

GHSA

Department of Transportation – State Level

- Own mission and vision
- Backbone of economy

Counties and Cities

- Manage a safe, high-quality local public street system
- Operations and maintenance practices vary by jurisdiction

Toward Zero Deaths

- Brings stakeholders together
- Defines the common vision
- One person dies every 16 minutes in a traffic crash

State Police

- Patrol, investigations
- Commercial vehicle safety
- Alcohol beverage control

Counties and Cities

Local Agency Case Study

How do we decide which operating condition poses the greatest safety risks?

HSIP

Highway Safety Manual (HSM)

- Introduction, Human Factors and Fundamentals
- Roadway Safety Management Process
- Predictive Method
- Crash Modification Factors

Highway Safety Improvement Program Manual (HSIP)

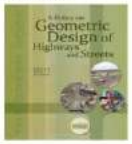
Roadway Data Improvement Program

- Improve safety data
- Expand capabilities for analysis and evaluation
- Support safety initiatives

RDIP
Roadway Data Improvement Program

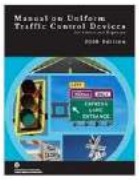
Geometric Design of Highway and Streets (Green Book)

- Research and practices for highway and street geometric design
- Reference manual to assist with administrative, planning, and educational efforts



Manual on Uniform Traffic Control Devices

- Promote highway safety and efficiency.
- Road users of regulations.
- Minimize the occurrences of crashes.



Safety Improvement on High Risk Rural Roads

- Costs and benefits of safety treatments on high risk rural roads
- Safety treatments
- Initial and reoccurring maintenance costs

How do we decide which operating condition poses the greatest safety risks?

NATIONAL HIGHWAY INSTITUTE

Courses National Highway Institute

Courses related to HSM

- FHWA has developed a series of training courses on specific parts of the HSM that are offered through the National Highway Institute (NHI).
  - HSM Practitioner's Guide for Geometric Design Features (NHI 380070)
  - Interactive Highway Safety Design Model (NHI 380071)
  - New Approaches to Safety Analysis (NHI 390075)
  - HSM Practitioners Guide for Horizontal Curves (NHI 3800088)
  - Application of Crash Modification Factors (NHI 380093)
  - Using IHSDM (NHI 380100)
  - HSM Practitioner's Guide for Intersections (NHI 380105)
  - Highway Safety Manual Online Overview (NHI 380106)

Local Highway Technical Assistance Council

- **Road Scholar Classes**
  - ATSSA Flagger Certification
  - Basic Math
  - Communication Skills
- **Road Master Classes**
  - ATSSA Traffic Control Technician
  - Environmental BMPs
  - Pavement Maintenance II

Since 1994

LHTAC Alternative Courses

- Electives
- ADA Compliance
- Asphalt Paving Materials
- Asphalt Production and Proportioning
- ATSSA Traffic Control Supervisor Course
- Bicycle Operation
- Basic Survey
- Bicycle & Pedestrian Facility Design Course
- Gravel Road Maintenance and Design
- Gravel Roads Academy
- Heavy Equipment Courses
- Hot Mix Asphalt Workmanship Training
- Hot Mix Pavement & Sign Maintenance
- Local Systemic Safety Data Analysis and Solutions
- Manual of Uniform Traffic Control Devices
- Motor Grader Operation
- Class A, B Hook Construction
- Planning Paving Workmanship
- Retroreflectivity for Signs
- Roadside Safety 133
- Road Safety Audits
- Roads 101
- Small Structure Inspection & Maintenance
- Supervising with Confidence
- Welding Advanced
- Welding Basic
- Winter Maintenance

Software

- WebCars
- Interactive Highway Safety Design Model
- Geographic Information System
- LHTAC crash data
- Travel Demand Model - QRS II
- AASHTO Pavement
- AASHTO Safety

WebCars

- WebCars is a crash analysis reporting system used in the State of Idaho.
- IMPACT 2K is a software designed to complete crash reports electronically.
- IMPACT 2K software electronically transmits crash data to WebCARS

Interactive Highway Safety Design Model

- Software analysis tools evaluates safety and operational effects of geometric design.
- Makes it significantly easier and faster to evaluate design decisions

IHSDM

Geographic Information Systems

- Enables people see, analyze, and understand patterns and relationships.
- Data in many different forms can be entered into GIS.

LHTAC crash data

- Designed to help meet the requirement of the HSIP
- Crash data is acquired annually from the ITD Office of Highway Safety
- Displayed crash locations indicate the approximate vicinity of a crash

Travel Demand Model - QRS II

- Quick Response System II is the strategic travel forecasting package
- Four-step planning process for highway and transit forecasting

AASHTO Pavement

- Pavement ME Design is a pavement design software.
- Efficiency in the calculation process
- Tools to allow easy comparison between pavement designs

AASHTO Safety Analyst

- Safety Analyst is a set of software tools used for highway safety management.
- Implements the six main steps of the highway safety management process.
- Facilitates cost-effective, site-specific highway safety improvements

Summary

- Agencies responsible of road safety.
  - **Federal Agencies**
  - Department of Transportation (DOT)
  - Federal Highway Administration (FHWA)
  - National Highway Traffic Safety Administration (NHTSA)
  - **State and Local Agencies**
  - Governors Highway Safety Association (GHSA)
  - State Department of Transportation
  - Counties and Cities

Summary

- Road Safety Resources
  - Manuals
    - Highway Safety Manual
    - Highway Safety Improvement Manual
  - Courses
    - National Highway Institute
    - LHTAC
  - Conferences
  - Software

Traffic Safety Management and Analysis

Highway Safety in Practice

Survey: Population Target

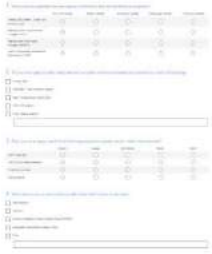
- Local practitioners from Idaho
- Local agencies
- Local consultant

Survey Objectives

- Identify what local agencies do to address their challenges
- Identify what material they use to address road safety issues
- Determine the biggest challenge for local agencies

Survey Format

- Ten questions
- Multiple choice, ranking, and short answers

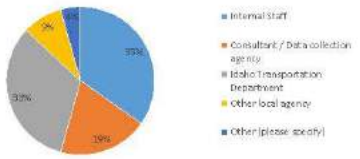


Counties and Cities

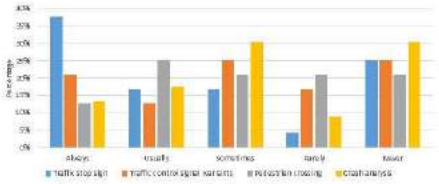
Survey (Responses)

Agency Familiarity

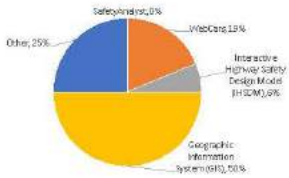
Traffic Safety Data Collection



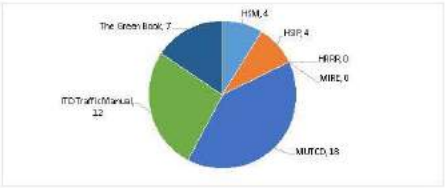
Level of Safety Analysis



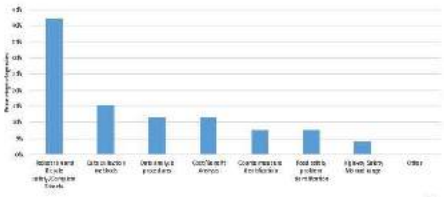
Traffic Safety Software



Safety Documentation



Recent Training



Agency Needs

	Ranking					
Priority	**1**	**2**	**3**	**4**	**5**	**6**
Data Collection Methods	2	2	1	1	4	7
Data Analysis Procedures	1	5	4	2	4	2
Countermeasure Identification	1	0	4	5	6	2
Road Safety Problem Identification (per HSM & HSIP)	2	2	7	5	2	1
Project Prioritization	5	5	3	3	1	3
Project Funding	8	5	1	2	2	3

Prioritizing Needs

	Ranking			
Needs	**1**	**2**	**3**	**4**
Hire additional staff or expertise	7	2	5	9
Increase training or technical assistance opportunities	5	7	5	2
Increase data collection opportunities / frequency	4	9	5	3
Enhance data analysis capabilities	4	3	6	6

Future Training Topics

Problem Identification	Countermeasures	Project Prioritization
Design of Highways and Streets	Traffic Signals and Management	Road Safety Audits
Transportation Planning	Funding	

Summary

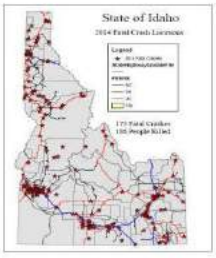
- Description of the survey's objectives and procedures
- Determine what resources are available to address road safety
- Identify the local agencies challenges to address road safety

Traffic Safety Management and Analysis

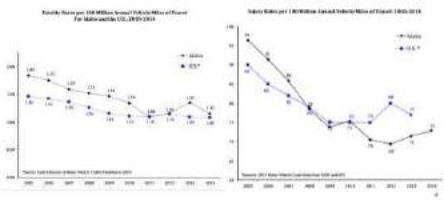
Road Safety for Local Agencies in Idaho

Idaho's Traffic Crash Clock 2014

State of Idaho



Idaho Injuries and Fatalities



Idaho Crash Severity

Table 3
Injury Severity of Persons Involved in Traffic Crashes: 2010-2014

	2010	2011	2012	2013	2014	Change 2013-2014	Avg. Change 2010-2013
Fatalities	209	167	184	214	186	-13.1%	2.1%
Serious Injuries	1,396	1,293	1,207	1,262	1,273	0.9%	-3.3%
Visible Injuries	3,565	3,354	3,428	3,549	3,689	3.9%	-0.1%
Possible Injuries	6,764	6,219	6,273	6,533	6,806	4.2%	-1.0%
No Injuries	44,239	40,920	42,620	44,051	42,993	-2.4%	0.0%
Unknown / Missing	818	706	333	344	392	14.0%	-11.1%
Total Persons in Crashes	56,991	52,859	54,125	55,952	55,239	-1.1%	-0.5%

Idaho Economic Cost of Crashes

Table 4
Economic Cost of Idaho Crashes: 2014 Estimates

Incident Description	Total Occurrences	Cost Per Occurrence	Cost Per Category
Fatalities	186	$6,993,502	$1,287,791,342
Serious Injuries	1,273	$523,382	$611,645,808
Visible Injuries	3,689	$98,577	$334,140,238
Possible Injuries	6,806	$60,040	$408,633,680
Property Damage Only	13,742	$6,951	$95,520,431
Total Estimate of Economic Cost			$2,457,730,700

Urban and Rural Crashes

Table 4
Comparison of Crashes by Roadway Classification: 2010-2014

	2010	2011	2012	2013	2014	Change 2013-2014	Avg. Change 2010-2013
Fatal Crashes	199	185	152	200	175	-12.5%	2.2%
Urban	44	42	30	41	40	-2.4%	-1.2%
Rural	155	143	122	159	135	-15.1%	2.6%
Injury Crashes	7,861	7,509	7,492	7,958	8,217	3.3%	0.0%
Urban	4,838	4,919	4,762	4,963	5,299	0.8%	0.9%
Rural	3,023	3,020	2,730	2,667	2,818	5.7%	-4.0%
Total Crashes	22,992	22,555	20,013	22,288	22,114	-1.0%	-0.8%
Urban	14,215	13,780	12,043	13,705	14,678	7.0%	-1.1%
Rural	8,777	8,775	7,848	7,697	7,464	-3.0%	-4.2%

Idaho Local Agencies

- Many local roads are maintained by local agencies
- With limited resources and staff, making it particularly challenging to address safety issues.

Counties and Cities

- Manage a safe, high-quality local public street system
- Operations and maintenance practices vary by jurisdiction

State Police

- Patrol, investigations
- Commercial vehicle safety
- Alcohol beverage control

IDAHO State Police
Providing public safety across the State of Idaho through law enforcement excellence

Challenges

Challenge: Project Funding

- Local agencies may lack funds to implement safety improvements
- Local agencies struggle with competing priorities and issues

Challenge: Project Prioritization

- Multiple methods for prioritizing safety projects exist
- Many considerations enter into project selection beyond safety

Challenge: Data System Integration

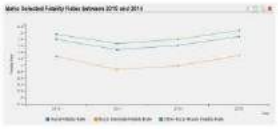
- Proper data collection, access, and analysis will:
  - Improve data quality, timeliness, completeness, and uniformity
  - Improve data sharing
  - Improve access to real-time information
  - Enhance access

Challenge: Countermeasure Identification

- CMFs
- Funding constraints

Challenge: Data Collection

- Safety
- Equipment Failures
- Communication Issues



Challenge: Lack of staff or expertise

- Small local agencies may lack the resources needed to apply for the safety funds
- States provide training or assistance to offset this challenge

Challenge: Training or technical assistance opportunities

- Lack of local staff creates more multitasking and less efficiency
- Lack and uneven commitment to training
- Technical assistance programs vary widely

Addressing Challenges

- Every situation and every agency is unique

Local Road Safety Plan

- Valuable tool for improving roadway safety
- Defines key emphasis areas and strategies
- Supports SHSP process

TOWARD ZERO DEATHS

Benefit: Proactive Approach

- Routine safety analyses of the roadway network
- Agencies utilize both systemic and spot location improvements

Benefit: Develop Partnerships

- Improve relationships with the public, stakeholders, and governmental agencies
- Improving road safety is a benefit for everyone involved
- Differing philosophies, competing priorities, and varying business cultures will be present

Benefit: Multidisciplinary Cooperation

- Develop effective solutions
- Leverage resources
- Engineering, enforcement, education, and EMS
- Ability to influence strategic priorities

Benefit: Safer Roadways

- Comprehensive approach
- More safety awareness
- Partner "experience" factor

Benefit: Safety Funding

- Justify funding requests
- Linkage to SHSP

Benefit: Managing Liability

- Proactive approach
- Demonstrates agency responsiveness
- Reduce crash potential and improve overall safety performance

Critical Success Factors

- Have a champion
- Develop a clear vision and mission
- Assemble collaborative partners
- Allocate appropriate resources
- Establish open communication

Additional Resources

- Developing Safety Plans: A Manual for Local Rural Road Owners
- Strategic Highway Safety Plans: Guidebook to Saving Lives
- SHSP contacts

Summary

- Importance of road safety in the State of Idaho
- Identify the challenges that local agencies face to address road safety
- Identify the importance of implementing a Local Road Safety Plan

Traffic Safety Management and Analysis

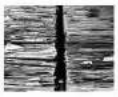
Addressing the Challenges and Noteworthy Practices

Data Collection

- First step in the transportation safety planning process
- Needed to establish goals, performance measures and identify projects
- Tasks include collecting, storing, and sharing
- Datasets include crash data, roadway characteristics, traffic volumes, driver and passenger information

Data Collection

- K – fatality
- A – serious injury
- B – non-incapacitating injury
- C – possible injury
- O – no injury



Technology Usage

- Roadway Photolog
- Automating The Roadway Inventory
- Global Positioning System
- Traffic Counters

Data Collection

- Automated, semi-automated, and manual systems
- Some roadway data collected manually

State Strategy

- State DOTs uses a variety of strategies to mitigate the issues local agencies face

Data Analysis

Analysis Category
Benchmarking
Identify Crash Trends and Contributing Factors
Identify and Evaluate Focus Crash Types
Network Screening—Identify Sites for Safety Improvement
Systemic Analysis—Identify Safety Risk Factors
Corridor and Intersection Planning Safety Analysis

Data Analysis: FHWA

- FHWA provides and supports a wide range of data and safety analysis tools

Data Collection and Analysis Tools

- Model Inventory of Roadway Elements (MIRE)
- Highway Safety Information System (HSIS)
- Highway Safety Manual (HSM)
- Interactive Highway Safety Design Model (IHSDM)
- Fundamental Data Elements (FDE)
- Safety Analyst

Pedestrian and Bicycle Safety Tools

- Pedestrian and Bicycle Crash Analysis Tool (PBCAT)
- Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE)
- Bicycle Countermeasure Selection System (BIKESAFE)

Additional Data Analysis Tools

- Intersection/Interchange Safety Analysis Tools (ISAT)
- Surrogate Safety Assessment Module (SSAM)

Training and Development

- State DOTs, LTAPs, MPOs, and universities provide training for local practitioners
- Promotes sustainable safety programs
- Builds organizational capacity

Road Safety Audits

- Formal safety performance examination conducted by independent audit team
- Improved understanding of crash cause and countermeasures
- FHWA provides a set of guidelines used for RSAs

Road Safety Audits*

Project Prioritization

- Benefit/Cost Analysis
- Compares all of the benefits associated with a countermeasure

Countermeasure Evaluation Methods

- Net Present Value
- Benefit / Cost Ratio
- Cost-Effectiveness

Countermeasure Identification

- Manuals
- Websites (ex: Crash Modification Factor Clearinghouse)

Noteworthy Practice: Data Collection

- Washington State DOT (WSDOT) resolve data inconsistencies by collecting latitude and longitude coordinate data.
- Iowa DOT implemented a program to collect roadway features, structures, and crash data

Noteworthy Practice: Data Collection

- Alabama AHTD developed eCrash electronic crash form to improve the accessibility and ease of use for crash reporting on local roads
- Colorado DOT worked with Statewide Traffic Records Advisory Committee to streamline data collection and reporting processes

Noteworthy Practice: Data Collection

- Montana Highway Patrol is rolling out a Web-based reporting system, SmartCop, to allow for greater ease of data access
- New Hampshire's Nashua Regional Planning Council reduced data collection time delay by using Google alerts

Noteworthy Practice: Data Access

- Wisconsin DOT (WisDOT) operates the WisTransPortal System
- Iowa DOT has a suite of crash data analysis tools available for cities and counties

Noteworthy Practice: Data Analysis Tools

- Geographic Mapping Tools
- Data Analysis Tools that incorporate other roadway characteristics

Noteworthy Practice: CalTrans Manual

- Caltrans Benefit/Costs Tool and Local Road Safety Manual
- Analysis tools needed to identify locations with roadway safety issues
- Manual provides an easy-to-use, straightforward, comprehensive step by step safety analysis

Noteworthy Practice: Ohio GCAT

- Ohio's Crash Data Analysis Tools
- Developed a crash-mapping tool
- Crash data for all local roadways is available

Noteworthy Practice: Ohio Partnership

- Ohio LTAP/DOT/County Engineers Association of Ohio Partnership
- Collaboration provides funding for local road safety improvements
- Methods to educate local agencies on the federal-aid process

Conclusions

- Data are needed to establish reasonable goals, objectives, performance measures and targets
- Agencies can collect data using automated, semi-automated, and manual systems
- Start small to overcome data analysis barriers

APPENDIX E – ACADEMICIAN INTERVIEWEES

- University of Cincinnati
  Jiaqi Ma, http://ceas.uc.edu/caecm/facultyandStaff/profiles/jiaqi_ma.html, jiaqi.ma@uc.edu
- University of Idaho
  Michael Lowry, http://www.uidaho.edu/engr/departments/ce/our-people/faculty/michael-lowry, mlowry@uidaho.edu
- Oregon State University
  David Hurwitz (human factors), http://cce.oregonstate.edu/hurwitz, david.hurwitz@oregonstate.edu
  Salvador Hernandez, http://cce.oregonstate.edu/hernandez, sal.hernandez@oregonstate.edu
- Texas A&M University
  Dominique Lord, https://ceprofs.civil.tamu.edu/dlord/, d-lord@tamu.edu
- Northwestern University
  Ian Savage, http://faculty.wcas.northwestern.edu/~ipsavage/, ipsavage@northwestern.edu
- University of Texas at Austin
  Kara Kockelman, http://www.caee.utexas.edu/faculty/directory/kockelman, kkockelm@mail.utexas.edu
- University of Central Florida
  Jaeyoung Lee, https://www.dr-lee.net/, jaeyoung.lee@ucf.edu
- University of Minnesota
  Lee Munnich, https://www.hhh.umn.edu/directory/lee-munnich, munni001@umn.edu
- University of Michigan
  Lidia Kostyniuk, http://www.umtri.umich.edu/who-we-are/staff-directory/lidia-p-kostyniuk, lidakost@umich.edu
- University of Maine
  Per Erik Garder, https://civil.umaine.edu/faculty/per-erik-garder/, garder@maine.edu
- Oklahoma State University
  Qiang (Joshua) Li, https://cive.okstate.edu/node/113, qiang.li@okstate.edu
- University of North Carolina at Charlotte
  Srinivas Pulugurtha, https://coefs.uncc.edu/sspulugu/, sspulugurtha@uncc.edu
- Montana State University
  Yiyi Wang, http://www.montana.edu/wang/, yiyi.wang@ce.montana.edu
- University of Washington at Seattle
  Linda Boyle, https://ise.washington.edu/people/faculty/boyle, linda@uw.edu
- University of Alaska at Anchorage

Osama Abaza, https://www.uaa.alaska.edu/academics/college-of-engineering/departments/civil-engineering/faculty-bios-ce/osama-abaza.cshtml, oabaza@alaska.edu

- University of Wisconsin at Milwaukee
  Xiao Qin, https://uwm.edu/engineering/people/qin-ph-d-xiao/, qinx@uwm.edu
- Ohio University
  Bhaven Naik, https://www.ohio.edu/engineering/about/people/profiles.cfm?profile=naik, naik@ohio.edu

APPENDIX F – ACADEMICIAN INVITATION AND INTERVIEW SCRIPT

Email Message for Inviting Academicians:

Dear Prof./Dr. _____,

Greetings and hope this letter finds you very well! I am _____ at Department of Civil and Environmental Engineering at UW. Supported by the PacTrans's education grant, our research team members have developed an educational module for a transportation safety course to be adopted in universities. Three lectures are designed for different levels of students (Please see them in the attachments). Since you have rich experience in the field of roadway safety, we would like to learn from your insights about how we can improve this educational module. If you agree to review and give comments on our developed lectures, we would like to setup a short telephone interview (20 mins) to ask some questions and learn about your guidance when you have time. Will look forward to hearing from you soon.

Sincerely,

_____

GoToMeeting or phone interviewing:

Hello, Prof./Dr. _____. As you know, we have an education project funded by the PacTrans, which is a university transportation center (UTC) regional center granted by the USDOT. Our research team members developed the education module for a transportation safety course which contains three lectures to be adopted in universities. Since you are an expert in the field of roadway safety, we would like to ask you several questions in regarding to improve our developed education module.

A. Would it be okay if we record this interview? [Yes or No]

Thank you. This interview will have a total of nine questions. Let's begin.

1. Have you taught a roadway safety class before? [Yes or No] (If Yes, go to 2; if No, go to 3)
2. Can you briefly describe the syllabus/contents of your transportation safety class?
3. Based on your review of the materials that we have developed, would you use them in your course? [Yes or No] (If Yes, go to 4; if No, go to 5)

4. Would you suggest any modifications? Please provide us with some feedback (based on the curriculum evaluation criteria we developed). (Go to 6)
5. In what ways would the materials need to be modified in order for you to implement?
6. What types of materials do you need “the most” for your traffic safety class?
7. What are the learning objectives you perceive as most important for this class (not covered in our module framework)? Why?
8. Regarding the materials developed, which part did you like the most, and which part did you dislike the most? Why?
9. Are there any other comments you would like to share?

This concludes our interview. Thanks a lot for supporting our research.

APPENDIX G – ACADEMICIAN SLIDE DECKS (3 TOTAL)

1

Introduction to Road Safety: Core Definitions and Issues

2

Background

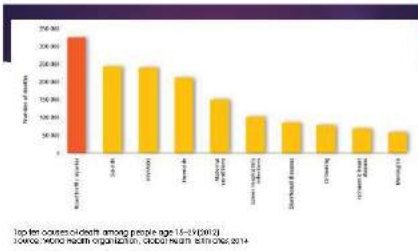
Traffic collisions result in unwanted health consequences and add tremendous cost to society.

Transportation engineers have the ability to: improve road safety (from the built environment), contribute to vehicle design, and examine the behavioral issues of road users in order to reduce fatalities, injuries, and property damage.

3

Major references of this lecture

5



Top ten causes of death among people age 15-19 (2012)
Source: World Health Organization, Global Health Estimates 2014

6

Core Definitions

COLLISION, INJURY, EXPOSURE, RISK, CONTRIBUTING FACTORS, AND SAFETY MEASURES

Definitions

7

- A **crash** is a violent collision, typically of one vehicle with another or with an obstacle.
- A **traffic collision or crash** occurs when a vehicle collides with another vehicle, pedestrian, bicycle, animal, road debris, or other stationary obstruction, such as a tree or utility pole.
- Traffic crashes may result in property damage, injury, or death.

Injury

8

- An **injury** occurring in a crash involves the transfer of energy to the human body. Injury prevention includes the use of helmets and safety belts.
- **Injury severity** is often classified into five ordinal scales, including no injury (property damage), possible injury, minor injury, severe injury, and death.
- Public health professionals use an **Injury Severity Score** to assess trauma severity. This score ranges from 1 to 75, with a higher score indicating a more severe injury.

Injury pyramid

9

Exposure

10

- **Exposure** is often meant as exposure to risk.
- The measure of exposure in road safety is generally defined in terms of the amount of travel, such as miles traveled, trips traveled, and hours traveled.

Risk

11

- **Risk** is used to quantify the level of road safety relative to the amount of exposure, as opposed to the absolute level of safety as measured by the number of accidents or fatalities.

Contributing / Protective Factor

12

- A **contributing factor** refers to characteristics, events, or experiences shown to precede an undesirable outcome and associated with an increase in the likelihood of that outcome.
- A **protective factor** is an influence that modifies, improves or alters a person's response to some environmental hazard associated with an undesirable outcome. It is a characteristic that reduces the likelihood of negative outcomes.

Contributing/protective factors include factors influencing **exposure to risk**, factors influencing **crash involvement**, factors influencing **crash severity**, and factors influencing **injury severity**. (Here, crash severity is defined by the most severe injuries sustained by all occupants in a crash.)

13

Safety measures

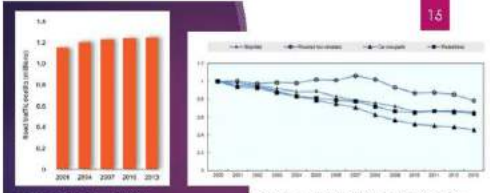
Safety measures are activities and precautions taken to improve road safety.

Source: Examples of assessed road safety measures - A short handbook

14

Worldwide Road Safety Issues

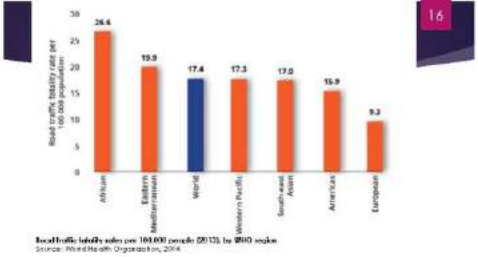
15



Number of worldwide road fatalities
Source: World Health Organization, 2014

Development of fatalities in IRTAD (The International Traffic Safety Data and Analysis Group) countries by road user type (Year 2000 = 1.0)
Source: OECD Road Safety Annual Report 2015

16

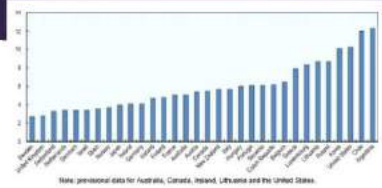


Road traffic fatality rates per 100 000 population (2013), by WHO region
Source: World Health Organization, 2014

17

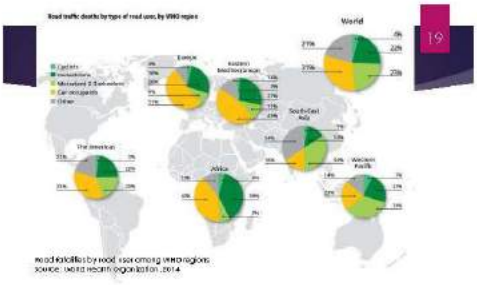
Road fatalities per 100 000 inhabitants in IRTAD (The International Traffic Safety Data and Analysis Group) member countries (2013)
Source: OECD Road Safety Annual Report 2015

18

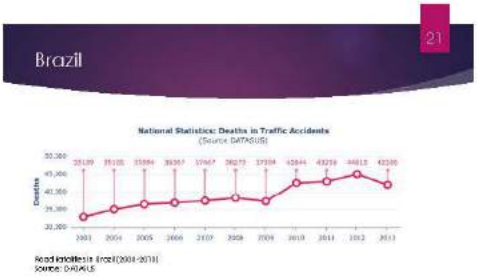


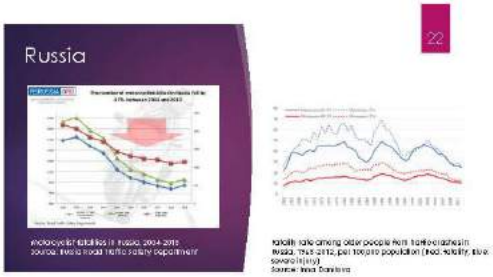
Note: provisional data for Australia, Canada, Ireland, Lithuania and the United States.

Road fatalities per 100 000 inhabitants (2013)
Source: © OECD Road Safety Annual Report 2015


19
World
Europe
Western Pacific
South-East Asia
The Americas
Africa


20
Road safety problems in developing countries
BRAZIL, INDIA, AND CHINA


21
Brazil
National Statistics: Deaths in Traffic Accidents
(Source: DATASUS)
Deaths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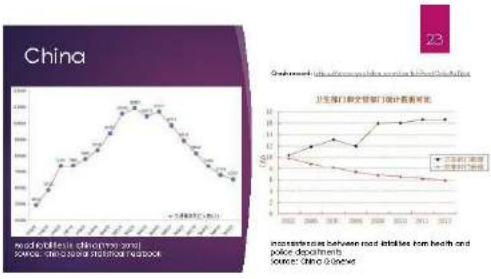
Russia


23
China


China's road usage
24
Busy intersections
Mixed traffic in small towns
Peak hour rail transit facilities
Congested older streets
Overloading in remote areas
Visibility issues

India

25

Road injuries and fatalities in India (1970-2011)
Source: Ministry of Road Transport & Highways-Government of India

Graph record:

India road usage

26

Improper overloading

Collecting donations

Poor visibility and no separate pathway

Passenger overcapacity

Panhandling

On-street parking

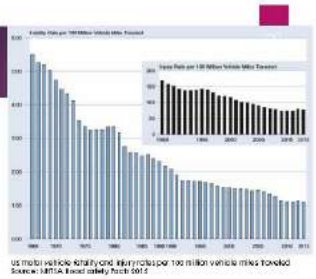
India

27

Road safety in the United States

28

US traffic crash fatality rate and injury rate



US motor vehicle fatality and injury rates per 100 million vehicle miles traveled
Source: NHTSA, Road safety Facts 2011

Road safety in Washington State

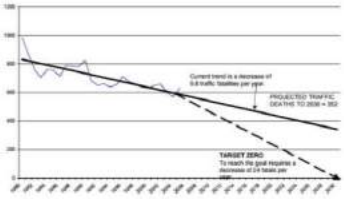
30

31

Prioritized planning factors for safer roads

Factors involved in Washington traffic fatalities from 2003 to 2008
Source: Washington's State Strategic Highway Safety Plan 2010

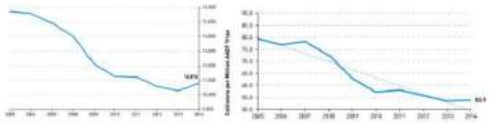
Traffic Deaths in Washington State



Washington State traffic deaths and Target Zero vision
Source: Washington State Strategic Highway Safety Plan: Target Zero

33

Road Safety in Seattle, WA



Police reported collisions on Seattle streets
Source: Seattle Department of Transportation 2015 Traffic Report

Seattle collision rate
Source: Seattle Department of Transportation 2015 Traffic Report

34

Road safety related issues

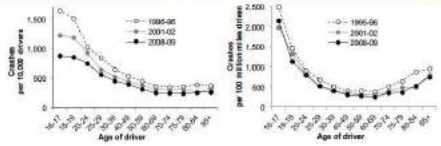
35

Crash characteristics by age groups

CHILDREN AND YOUNG DRIVERS

36

Vehicle Crashes in Relation to Driver Age



Drivers involved in Police-Reported Crashes per 10,000 Drivers (left) and Per 100 Million Miles Driven (right) in relation to driver age, U.S.
Source: Motor Vehicle Crashes, Injuries, and Deaths in Relation to Driver Age: United States, 1995 – 2010, AAA, 2012

37

child restraint laws, by country/area
Source: World Health Organization, 2014

38

Child crash fatalities

Child traffic fatalities by age group (2004-2013)
Source: NHTSA Road Safety Facts 2015

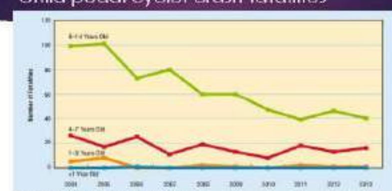
39

Child pedestrian fatalities

Child pedestrian fatalities by age group (2004-2013)
Source: NHTSA Road Safety Facts 2015

40

Child pedal cyclist crash fatalities



Child pedal cyclist fatalities by age group (2004-2013)
Source: NHTSA Road Safety Facts 2015

41

Young drivers

Age (Years)	Total Number of Drivers Killed	Percentage of Drivers With BAC .01+ g/dL	Percentage of Drivers With BAC .08+ g/dL
15	41	10%	7%
16	127	12%	10%
17	268	19%	14%
18	387	29%	21%
19	432	32%	26%
20	527	38%	32%

Young drivers killed, by age and percentage with BAC = 0.01 or higher (2015)
Source: NHTSA Road Safety Facts 2015

42

When young drivers drink

- Crash risk is much higher
- A driver under the age of 21 with a BAC of .07 is more than 5 times more likely to be involved in a crash than drivers over 21

Characteristics of crashes involving young drivers: passengers

43

- Presence of teen passengers greatly increases the crash risk of teen drivers
- Risk increases significantly with each additional passenger
- Adult drivers experience either no change in risk or a small safety benefit with having passengers

Characteristics of crashes involving young drivers: combined risks

44

- Crashes involving alcohol, speeding, and with passengers present: 20 times more likely for teens than for middle aged adults
- Crashes occurring at night and involving both alcohol and passengers: 9 times more likely

Summary for young drivers

45

- Young drivers exposure risk increases due to inexperience and lack of mature judgment.
- Risk is exacerbated by alcohol or drug impairment.
- These risks occur in the U.S. as well as many other countries.
- Some predictable characteristics include speeding, carrying passengers, and not wearing seatbelts.

Graduated Driver Licensing (GDL)

46

- Graduated Drivers Licensing, or GDL, is a three-stage approach to granting young drivers full license privileges.
- Most states have some form of a GDL law in place.
- Generally, the three stages of GDL are: supervised learning period, intermediate license, and full-privilege license.

Does GDL work?

47

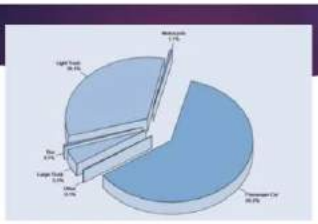
- As indicated by NHTSA, GDL programs help reduce teen driving crashes, injuries, and deaths.
- States began enacting GDL laws in the 1990s.
- NHTSA suggested that the number of young drivers aged 15-20 involved in fatal crashes was 4,347 in 2011, down 48% from the 8,325 involved in 2002.

48

Crash characteristics by other traffic modes

TRUCK AND MOTORCYCLE

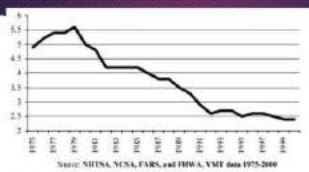
49



Proportion of Vehicles Involved in Traffic Crashes
Source: NHTSA Traffic Safety Facts 2012

50

Truck involved crashes



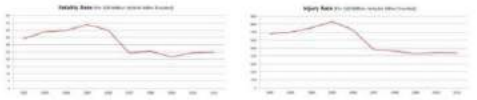
Source: NHTSA, NCSA, FARS, and FHWA, VMT data 1975-2000

US large truck fatalities per 100 million VMT
Source: Analysis of fatal large truck crashes, 2003, National Center for Statistics and Analysis

fatalities in crashes involving a large truck per 100 million people
Source: NHTSA, FARS

52

Motorcycle crashes



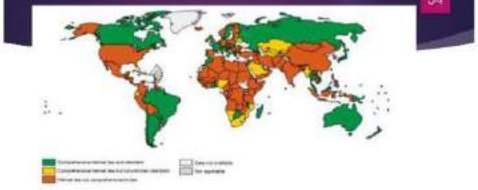
Motorcycle fatalities per 100 million vehicle miles traveled
Sources: NHTSA

Motorcycle injuries per 100 million vehicle miles traveled
Sources: NHTSA

53

Motorcycle fatalities in the US (2011)
Source: NHTSA

54



Motorcycle helmet laws and helmet standards, by country/area
Source: World Health Organization, 2014

55

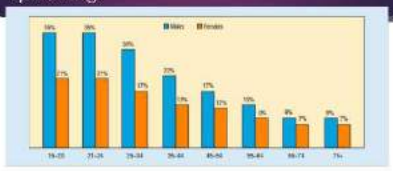
Human Errors / Behaviors

SPEEDING, DRUNK DRIVING, DISTRACTION, AND DROWSY DRIVING

56

57

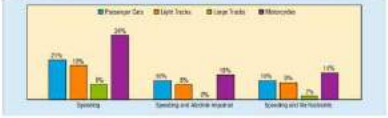
Speeding



Percentage of speeding drivers in fatal crashes, by age and gender (2018)
Source: NHTSA Road Safety Facts 2018

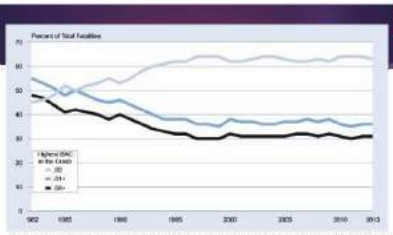
58

Drunk driving



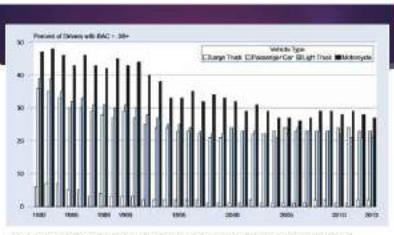
Percentages of speeding, speeding with alcohol impairment (BAC = 0.08+), and speeding with no recorded alcohol among fatal crashes, by vehicle type (2018)
Source: NHTSA Road Safety Facts 2018

59



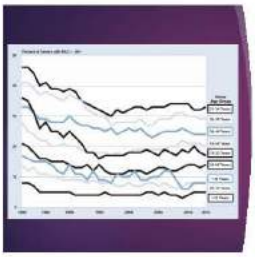
US proportion of persons killed, by highest driver blood alcohol concentration (BAC) in the crash (1982-2018)
Source: NHTSA Traffic Safety Facts 2018

60



US proportion of drivers involved in fatal crashes with BAC = 0.08+ by vehicle type (1982-2018)
Source: NHTSA Traffic Safety Facts 2018

61



US Proportion of Drivers in Fatal Crashes with BAC > 0.00 by Age (1982-2015)
Source: NHTSA Traffic Safety Facts 2015

62

Roadside alcohol / drug testing

63

National survey on drug use and health estimates of impaired driving (2012)

64

drinking and driving laws, by country/area
Source: World Health Organization, 2014

65

Distracted driving

66

Distracted driving

88% Of Us Feel Threatened When Others Drivers Use Cell Phones

Yet 67% of us continue to use our cell phones

88%

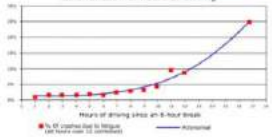
67%

Driving and Texting bans in the US

Drowsy driving

68

Percentages of crashes due to fatigue as a function of hours of driving



Percentage of crashes due to fatigue as a function of hours of driving
Source: National Motor Coach Safety Administration

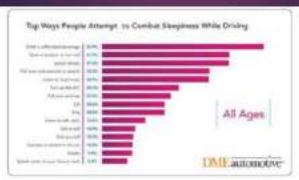
69

The effects of driver fatigue include:

- Impaired judgment
- Lack of attentiveness
- Slow reaction time
- Increased likelihood of falling asleep at the wheel

Methods to combat sleepiness

70



Emerging safety issues

71

Decade of action

Five pillars for a Safe Systems approach

1

Road Safety: Research, Analytical Approaches, and Safety Measures

2

Outline

- *History of road safety research*
- *Analytical approaches*
  - 5 E's
  - Public health approach
  - Haddon's Matrix
  - System approach
- *Safety measures*
  - User-related measures
  - Vehicle-related measures
  - Infrastructure-related measures
  - Rescue services
  - Planning-based crash prevention
  - Traffic controls

3

Road safety research topics

- Human factors
- Road design and safety
- Vehicle design and safety
- Policies
- Road safety system

Time line

Perspective of consideration	Early years of motorisation	1930-1960s	1970-1980s	1990s	2000s
Road safety management (OECD, 2008)	n/a	Focus on driver interventions	Focus on system-wide interventions	System-wide interventions, with targeted results and leadership	Safe-system approach
Road safety research paradigms (OECD, 1997)	Vehicle control; descriptive research ("what")	Mastering traffic situation ("why"); research around the classical 3E's Engineering, Education, Enforcement	Managing the traffic system ("how"); mathematical models; cost-benefit analysis	Managing the transport system; multi-dimensional analysis	Cross-disciplinary analysis; theory development
Main road crash causes (Wegman et al., 2007)	Crashes as a chance phenomenon	Crashes are mono-causal Crashes caused by the crash-prone	A combination of crash caused fitting within a 'system approach'	The road user is the weak link; more behavioural influence	Better implementation of existing policies; 'Systems' management perspective

5

Time periods and characteristics of road safety paradigms (OECD)

	1900–1920	1920–1950	1950–1970	1960–1985	1985/1990–Now
Crash	Chance phenomenon, bad luck	Road devils, crash prone drivers	Road user, or vehicle, or road	Multi-causal approach	Result of integral road system
Research	What	Who	How the cause	How which causes, technical improvements	Multi-dimensional
Measures	On an ad hoc basis	Educate, enforcement	Choice from the 3E's	Technical solutions for vehicle & road	Adapt road system to road user

6

Road safety research

- Introduction of driver assistance system (Google self-driving car)
- *Greater reliance on public transport, walking, and biking*
- *Driver behavior adaption*
- *Speed management*
- *Young drivers and aging population*
- *Interdisciplinary research (health, environment, and engineering)*

The fields marked in red have been extensively investigated.

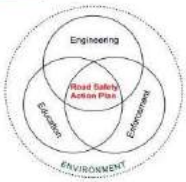
7

Road Safety Analytical Approaches

8

3 E's/ 5 E's approach

- **Engineering**
- **Enforcement**
- **Education**
- Environment
- Emergence Aid



9

Multidisciplinary crash investigation: VALT 2003

- The Finnish Motor Insurers' Centre (VALT) has developed a coherent set of procedures to investigate fatal crashes.
- VALT is a multidisciplinary team at the University of Helsinki that includes a police officer, vehicle engineer, traffic engineer, physician, and sometimes a psychologist.
- The investigation results are documented in an original folder and database with more than 300 variables.
- However, such multidisciplinary crash investigation has been criticized in the United States for lacking such reliability.

VALT includes such items as road-user health and motives; vehicle features and loads; road and environmental conditions; and system factors such as laws, enforcement, and road norms. The team deals with the following questions:

- What took place?
- Why did it happen?
- Why were the consequences as they were?
- How can the incident be prevented?
- How can the consequences be prevented?

10

VALT team members

- Act as experts in their own fields on the investigation team.
- Function as contact persons to the authorities and organizations in their own areas of knowledge.
- Clarify the issues raised using the investigation forms in their fields for the crash being investigated.
- Examine other issues in their own areas if the crash investigation requires it.
- Participate in other ways to help the investigation team achieve its objective.

11

VALT: police and vehicle specialist

Police

- Assembles the investigation team for study the crash.
- Calls in the experts required for the crash investigation.
- Organizes photographs at the crash scene and makes sure required sketches are made at the location.
- Clarifies, especially for the parties involved, the contributing factors related to the background, and produces corresponding proposals for improvement.

Vehicle specialist

- Investigates the technical condition of the vehicles involved and the damage caused in the crash.
- Examines the use of safety equipment in the vehicles, and explains, mainly with the physician, the effect of the structure of the vehicle and safety equipment on injuries.
- Makes calculations of the sequence of events and of the preventive possibilities of the crash.
- Clarifies contributing factors related to the vehicles and safety equipment, and produces corresponding improvement proposals.

12

VALT: transport engineer and health professional

Transport engineer

- Investigates road marks on the road, and draws conclusions about the sequence of events.
- Evaluates the effect of the traffic environment on the origin of the crash and its consequences.
- Prepares a sketch of the scene of the crash.
- Explains the association of contributing factors—especially the road in relation to the structure, the guidance of the traffic, the traffic environment, the weather and conditions—and produces corresponding improvement proposals.

Physician/psychologist

- Investigates the victims and, with the vehicle specialist, the possible sources of injury.
- Investigates the physical and psychological state of the drivers and pedestrians involved, obtains historical information about the health of the parties involved, and evaluates the effect of these on the origin of the crash.
- Examines the contributing factors related to driving ability and produces improvement proposals.
- Investigates issues related to the traffic environment and traffic control, and evaluates the actions of the parties involved.

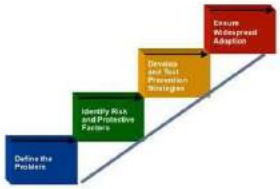
Limitations of VALT

13

- It is costly to establish and operate such a research team. The team operates at a small scale to focus on investigating fatalities.
- The analyses are varied by cases, and the identified causal relations are quite inferential to the other cases.

Public health approach

14



Public health approach

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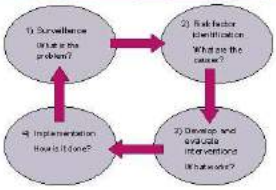


Understanding the four inter-related steps of the public health approach

16

- What is the problem?
  - Determine the magnitude, scope and characteristics of the problem.
- What are the causes?
  - Identify factors that increase the risk of disease, injury or disability.
  - Determine factors that are potentially modifiable.

Understanding the four interrelated steps of the public health approach

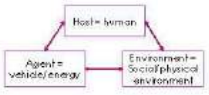
17

- What works?
  - Assess measures that can be taken to prevent the problem.
  - Pilot test and evaluate interventions.
- How is it done?
  - Implement proven and effective interventions.
  - Evaluate effectiveness of interventions.

Haddon matrix

18

- The "**Haddon Matrix**" is a table showing the host, agent, and environmental factors involved, set against the time sequence of an incident.



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Haddon matrix with contributing factors

20

Phase	Factors: Human	Factors: Vehicle and equipment	Factors: Environment
Pre-crash	Crash prevention	Information Attitudes Impairment Police enforcement	Roadworthiness Lighting Braking Handling Speed management	Road design and road layout Speed limits Pedestrian facilities
Crash	Injury prevention during the crash	Use of restraints Impairment	Occupant restraints Other safety devices Crash protective design	Crash-protective roadside objects
Post-crash	Life sustaining	First aid skill Access to medical	Ease of access Fire risk	Rescue facilities Congestion

Haddon matrix with research questions

21

	Host (person)	Agent (vehicle)	Physical environment	Social environment
Pre-event	Is the person predisposed or overexposed to collision risk?	Is the agent hazardous?	Is the environment hazardous? Possibility to reduce hazards?	Does the environment encourage or discourage risk-taking and hazard?
Event	Is the person able to tolerate force or energy transfer?	Does the agent provide protection?	Does the environment contribute to collision during event?	Does the environment contribute to collision during event?
Post-event	How severe is the collision?	Does the agent contribute to the collision?	Does the environment add to the collision after the event?	Does the environment contribute to recovery?

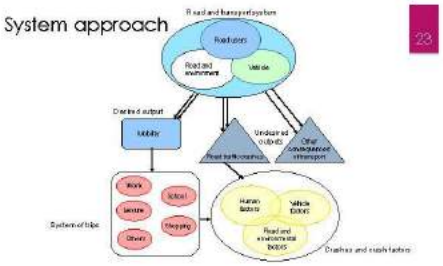
System approach

22

- Understand the system as a whole.
- Understand interactions between different components.
- Consider not only underlying factors, but also role of different agencies and actors in prevention efforts.

System approach

23



Summary

24

- The SEs approach offers diverse solutions to prevent road crashes.
- The public health approach is helpful in the analysis of contributing factors and guiding decision-making.
- The Haddon matrix helps to identify human, vehicle and environmental factors during pre-, crash- and post-crash phases.
- The systems approach considers all factors contributing to road traffic injuries as well as the role of different agencies and actors in prevention efforts.

25

Road Safety Measures

26

Safety measures

Safety measures are activities and precautions taken to improve road safety.

27

User-related measures

- Training and education
  - Driving training, campaigns, and retaining courses
- Traffic law and enforcement
  - Speed and alcohol limits, safety belt wearing obligation, and increasing fines

28

Example: education and training

29

Example: public media campaign

30

Public event campaign

- Objective
  - Organizing public events to promote speed reduction and improve road safety

Public event campaign

31

- Teaching the public on the importance of road safety
  - Speed reduction
  - Safe driving
  - Prevention of traffic crashes
- Tools for tutoring
  - pictures
  - videos
  - PowerPoint presentations
  - advices from transport experts
  - educational leaflets
  - broadcasting safety information

- Traffic crash simulations
  - Crash test vehicle
  - Turnover vehicle
- Prevention for speed reduction
  - Control/Monitor vehicles/motorcycle
  - Radar for speed measurements
  - Rescue vehicles

32

- Rescue simulations
  - evacuation of traffic crash victims
  - first aid practice
  - rescue team

Example: bicycle laws

34

WA rules of the road

35

- Alcoholic beverages: RCW 46.61.519
- Cell phones – Hands-Free Law: RCW 46.61.667
- Child passenger restraints and penalties: RCW 46.61.687
- Children unattended in vehicle when running: RCW 46.61.685
- Dropping load and other materials – Covering: RCW 46.61.655
- DUI – Impaired Driving: RCW 46.61.502
- HOV Lanes (high occupancy vehicle): RCW 46.61.165
- Minimum speed – Passing slow vehicles: RCW 46.61.425
- Mopeds, EPAMDs, and motorized scooters: RCW 46.61.710
- Motorcycles – Operating on road ways: RCW 46.61.608
- Motorcycles – Riding on motorcycles: RCW 46.61.606
- Passing vehicles and reckless driving: RCW 46.61.500
- Refusal to cooperate with officers – Penalty: RCW 46.61.520
- Roadway construction zones: RCW 46.61.527
- Seat belt requirements and penalties: RCW 46.61.688
- Speed fines defined – Certain types permitted: RCW 46.61.527
- Speeding and maximum speed limit: RCW 46.61.400
- Texting while driving – RCW 46.61.668
- Trailers – Riding in trailers or towed vehicles: RCW 46.61.687
- Unattended motor vehicles – Removal: RCW 46.61.560

Source: http://www.wsp.wa.gov/traffic/rules.htm

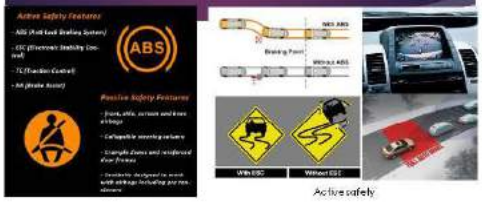
Vehicle-related measures

36

- Active safety
  - "Active safety" refers to safety systems that help avoid crashes.
- Passive safety
  - "Passive safety" refers to features that help reduce the effects of a crash.
- Telematics e-safety
  - Telematics encompasses tele communications, vehicular technologies, road transportation, electrical engineering, and computer science to improve road safety.

Active safety versus passive safety

37



Active safety

Passive safety features

38

Passive safety

E-safety feature example: Intelligent speed adaptation

39

Intelligent Speed Adaptation (ISA) is an in-vehicle system that supports driver compliance of the speed limit.

Infrastructure-related measures

40

- Road design
  - Complete streets, safe routes to school, 2+1 roads.
- Road construction
  - Construction site safety
- Road Maintenance
  - Winter maintenance

Infrastructure-related measures

41

Road design and road construction, as safety measures, are to:

- Locate roads and industries that traffic volume is minimized
- Establish a hierarchical road system, that traffic is segregated according to different characteristics and needs;
- Ensure that no easily preventable traffic hazards exist before roads are opened to the public;
- Design individual roads to be of low collision rate;
- Identify areas (i.e. schools) which have particular needs for safety measures and introduce specific treatments at such sites

Complete streets

42

Complete Streets are streets for everyone. They are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities.

44

Safe routes to school

SafeRoutes

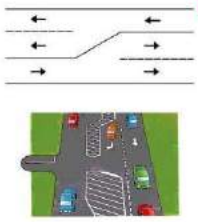
Safe Routes to School programs are designed to decrease traffic and pollution and increase the health of children and the community. Safe Routes to Schools promotes walking and biking to school

45

2+1 Road Design

The 2 Plus 1 design incorporates two lanes in one direction and one lane in the opposite direction, separated by a flexible safety barrier.

The 2 plus 1 road design significantly reduces the risk of head-on crashes



46

Speed management: from forgiving roads to self-explaining/organizing roads

Definitions

- **Forgiving roads**: is a concept that designs roads to "forgive" mistakes (driver error or faulty vehicle) made on roads
- **Self-explaining roads**: on which drivers are encouraged to naturally adopt behaviors consistent with road design.

How to change forgive roads to self-explaining roads?

- Speed reduction
- Traffic separation
- Enforced by lane width changing, road marking, signing, and street lighting

47

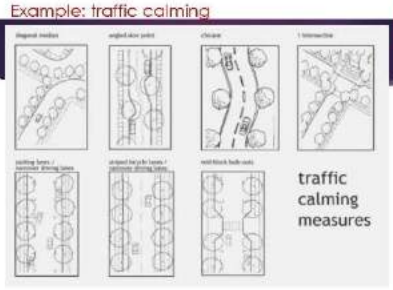
Example: forgiving roads to self-explaining roads

48

Example: self-explaining roads

Example: traffic calming

49



Example: road construction

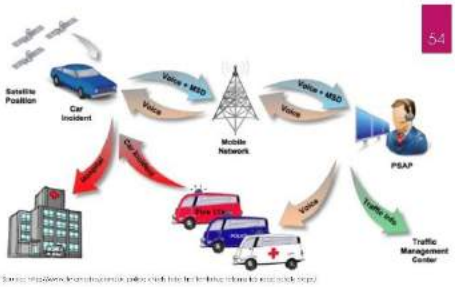
50

Driving speed in adverse weather is negatively correlated with stopping distance and maneuver space.

Rescue services

53

- Alert
- Rescue



54

Planning-based crash prevention

55

Land planning can be used as a road safety measure to:

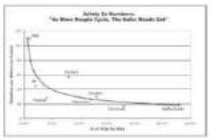
- Locate roads, residential areas, workplaces and other industries in such a way that traffic volume and travel distances are minimized;
- Set up a road network which ensures that traffic volume on local access roads is small;
- Develop a simple and accessible road system.

Planning-based crash prevention

56

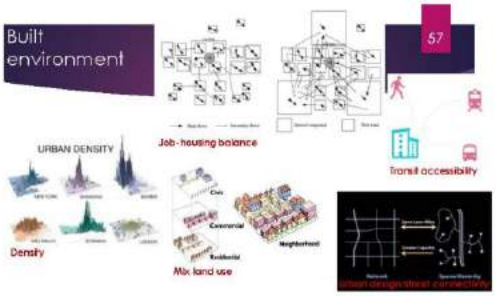
Safety in numbers theory is used to describe the evidence that a motorist is less likely to collide with a pedestrian or cyclist when the numbers of pedestrians or bicyclists increase.

In compact cities, a greater density is associated with higher non-motorized travel modes and lower crash risks.



Built environment

57



Urban vs. Suburban

58

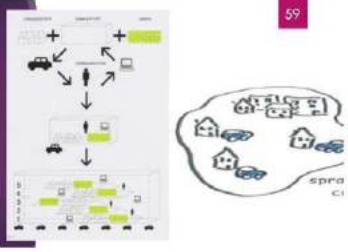
Urban

Suburban

Compact city versus sprawling city

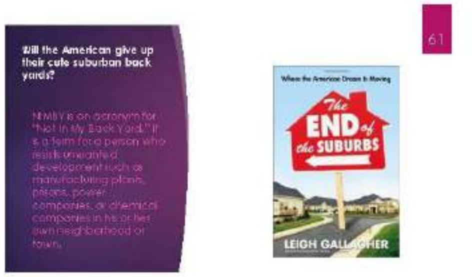
59

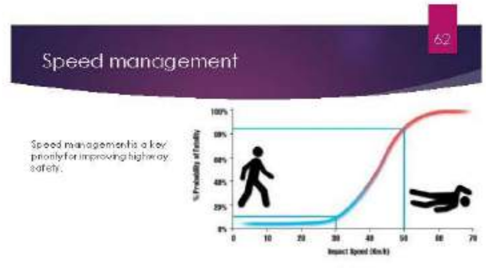
Dense urban environments, like compact cities, are more friendly to pedestrians and bicyclists, which is associated with a lowering speed and a safer road environment.



Is new urbanism advocating a safe road environment?

New Urbanism is an urban design movement which promotes environmentally friendly habits by creating walkable neighborhoods containing a wide range of housing and job types.


61
Will the American give up their cute suburban back yards?
NIMBY is an acronym for "Not In My Back Yard." It is a term for a person who resists unwanted development such as manufacturing plants, prisons, power companies, or chemical companies in his or her own neighborhood or town.
Where the American Dream Is Moving
The END of the SUBURBS
LEIGH GALLAGHER


62
Speed management
Speed management is a key priority for improving highway safety.
100%
80%
60%
40%
20%
0%
0
10
20
30
40
50
60
70
Impact Speed (Km/h)


63
Maximum speed limit in the US
60
65
70
75
80
85


64
Speed management
The "human" element was also a major consideration in the methods used to control speed. Countries first designed roadways to achieve the desired speed objective through the functional use of the roadway (self-organizing roads), but roadway speed management was also achieved through aggressive enforcement and public education.


65
Speed management: speed cameras
1. Camera
2. Strobe
3. Sensor
1. Zone Type
2. Speed Limit
3. Hours of Operation
30


66
Speed management: variable speed limits
55

Traffic control

67

- Traffic control involves directing vehicular and pedestrian traffic around a construction zone, crash or other road disruption, thus ensuring the safety of emergency response teams, construction workers and the general public. Traffic control also includes the use of CCTV to monitor traffic to manage flows and demands.

On-road traffic control devices

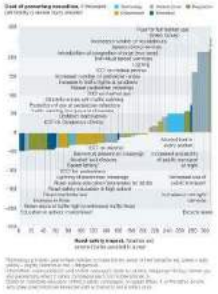
68

- Signs
  - Stop/slow paddle held by workers
  - Fixed orange signs
  - Changeable message signs
  - Arrow boards
- Markings
  - Painted pavement markings
  - Raised pavement markers
- Lane Routers
  - Barricades
  - Cones
- Other
  - Work crews in vests and hard hats
  - Warning lights
  - Truck-mounted attenuators

Road safety financial budget

This example shows a financial budget for safety campaigns.

Cost-benefit and cost-effectiveness are core elements of public policy analyses, with no exception of safety policies.



Existing road safety programs

70

- Vision Zero (Sweden)
- Sustainable safety (The Netherlands)
- ExecutiveDirection (France)

1

The Future of Road Safety: Emerging and New Challenges

2

Challenging road safety issues

- Risk of new techniques
  - Introduction of self-driving cars
- Safe driving in reduced visibility
  - Influence of fog/smog on driving behavior
- Driver distraction
  - Texting

3

Self-driving car safety issues

- Google self-driving car is an autonomous car, developed by Google X as part of its project to develop technology for mainly electric cars.
- Legislation has been passed in four U.S. states (Nevada, Florida, California, and Michigan) and Washington, D.C. allowing driverless cars.
- Google plans to make these cars available to the public in 2020.

4

How does a self-driving car work?

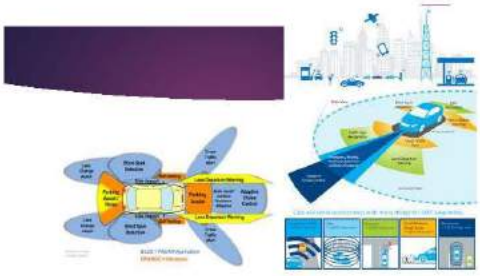
The innovation of self-driving cars is based on the use of an intelligent transportation system, improved telecommunication, GPS-based services, computer-based visibility, radar sensing, and in-vehicle safety systems.

Vehicle to vehicle communication is being architected as a framework for real-time, short-range wireless data exchange between vehicles that provide significant safety benefits.

5

Self-driving car technology

- Radar
- Ultrasonic Sensors
- Global Positioning System (GPS)
- Dedicated Short Range Communications (DSRC)
- Cameras
- LIDAR
- Mapping Technologies
- Route Planning and Navigation Algorithms



Driverless cars in Europe

7

Driverless cars in China

8

Debate

9

Potential benefits

- If self-driving cars can be safely operated, many human errors related road safety issues could be addressed, such as fatigue, speeding, intoxication, and distraction.
- These cars can also help people with physical constraints and inexperienced drivers, such as teenagers, senior citizens, and disabled people to improve road safety and increase quality of life.
- These cars can contribute to the reduction of gas consumption and green house gas emission.
- These cars could potentially lead to a more efficiently operated traffic system.

Conflicts and collisions

10

- From 2015 September 23rd to 2015 November 30th, the Google self-driving car team drove more than 424,000 miles in California public roads with a maximum speed of 35 mph. However, the drivers were forced to interrupt operations 13 times, and 272 times the tests were stopped and then restarted.
- On February 14, 2016, a Google self-driving car attempted to avoid sandbags blocking its path. During the maneuver it hit a bus. Google addressed the crash by stating that "In this case, we clearly bear some responsibility, because if our car hadn't moved there wouldn't have been a collision." Google characterized the crash as a misunderstanding and a learning experience.
- The public's safety concerns on self-driving cars are increasing.

Concerns about self-driving cars

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- The self-driving car is moving along predetermined routes. It may not be able to stop in time because of braking limitations. The machine may not be as sensible as a human.
- The self-driving car operates with GPS, radar, computer vision, and ITS system. Harsh weather may interrupt the signals and the system. Can the current sensing technology support reliable travel?
- The built environment changes overtime. Some changes are temporal, while others are permanent. For instance, a road may experience a closure. If the event is not promptly reported to the ITS system, self-driving cars may still consider travel on the planned route.

Concerns about self-driving cars

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- There will be a long transition period for self-driving cars to replace conventional vehicles.
- The risk of motion sickness is much higher when using self-driving cars.
- When a crash occurs, who is responsible for the compensation?

Safety reliance and public perception

13

- Are self-driving cars more prone to crashes?
- How can a person's perception about the safety of using self-driving cars be improved?

Safe driving in reduced visibility

14

Weather conditions partly determine the road conditions and influence driver behavior.

Many weather conditions create negative effects on road visibility: fog, snow, smog, black ice, low sun, strong wind, and high temperatures.

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Safe driving in reduced visibility

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There is limited help that transportation professionals can offer to the public when driving with reduced visibility (i.e., reduce travel demand, use public transportation, reduce operating speeds, drive with caution).

Research with regard to driving in reduced visibility (i.e., risk of collision in smog) is emerging in some developing countries, especially China and India.

Los Angeles, 1943

17

1943, LA Smog

Driving in smog (China)

18

China's smog, which prompted the government to issue a "red alert", claimed its first human casualties.

Auto pollution kills more people than auto collisions

Video:

19

Three fatalities were reported in chain collision involving 50 cars @ Changzhou City

Smog + Rain

Video: http://

20

In-Class Exercise

- Apply the public health approach to calculate the relative risk of a crash in smog versus in a sunny day.
- Use Haddon's matrix to analyze the pile-up collision in China. Who were the agent, the host, and the environment?
- Follow the 5 E's framework to provide safety improvement strategies for driving in smog.

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Driving in smog (India)

India's smog-shrouded capital puts cars off roads

22

Texting & Driving

Distracted driving is any non-driving activity a person engages in that has the potential to distract him or her from the primary task of driving and increase the risk of crashing.

There are three main types of distraction:

Visual — taking your eyes off the road

Manual — taking your hands off the wheel

Cognitive — taking your mind off what you're doing

Among all types of distractions that can endanger drivers' safety, texting is the most alarming because it involves all three types of distractions.

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Distracted Driving Crash Facts

In 2013, almost 18 percent of all crashes involved some type of distraction. (NHTSA)

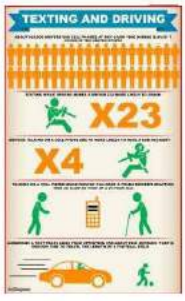
Nearly 3,154 people died in 2013 in crashes involving a distracted driver, and 424,000 were injured. (NHTSA)

Younger, inexperienced drivers aged 15 to 19 have the highest proportion of distraction-related fatal crashes.

Drivers who use hand-held devices are four times as likely to get into crashes serious enough to injure themselves. (Source: Insurance Institute for Highway Safety)

Using a cell phone while driving, whether hand-held or hands-free, delays a driver's reaction as much as having a BAC at the legal limit of .08 percent. (Source: University of Utah)

Texting and driving: A deadly habit



Cell Phone is a driving distraction

25

A driver's first responsibility is the safe operation of the vehicle.

If you are distracted by a phone conversation, you are putting yourself at risk of a collision, and possibly endangering others.

Texting While Driving – How Dangerous is it?

Distracted Driving Website: Distraction.gov

Cell Phone is a driving distraction

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Alternatives:

- Turn off cell phone while driving
- Pull off to the side of the road to make important calls

NOTE: Hands – free devices are safer than holding a phone, however, that does not diminish the dialing distraction and inability to focus completely on driving during a conversation.

Cell Phones: Alternatives and Exceptions

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Hands Free Alternatives:
(better than texting, but still distracting)

- Bluetooth
- Voice-activated and speed dialing
- Push-to-Talk devices (radio)
- Voice mail and Caller ID: answer caller until getting to safe destination

Exceptions:

- Emergencies – calling law enforcement for assistance
- Reporting road hazards to the authorities
- Notifying the authorities of erratic driver
- Note: before using in emergency, determine if the call can be made safely.

"It's time to put it down"

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Message from National Highway Traffic Safety Administration (NHTSA)

IT'S TIME TO "PUT IT DOWN"

Drivers Simply Can't Do Two Things At Once

- Drivers who use hand-held devices while driving are four times as likely to get into another serious crash or near-crash than drivers not doing so.
- The proportion of drivers reportedly distracted at the time of the fatal crashes has increased from 8 percent in 2004 to 11 percent in 2009.
- One of the most commonly recognized distractions is cell phone use. Cell phone subscriptions have grown exponentially from 1988 through 2009: about 89 percent, or approximately 277 million of all Americans, have a cell phone, according to CTIA – The Wireless Association. For many, it is the only kind of telephone they possess. In a recent NHTSA survey, most individuals (77 percent) reported that they talk on the phone while driving at least some of the time.

Everyone Has A Personal Responsibility

With more portable technology now than ever, driver distractions have risen to unprecedented numbers. We live in a world where people expect instant, real-time information 24 hours a day and those drivers do not stop just because people get behind the wheel. Drivers simply do not realize the dangers that are posed when they take their eyes and minds off the road and their hands off the wheel and focus on activities other than driving.

Portable Electronic Equipment Policies

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- Example policy verbiage (L & I employee policy):
- "Use of portable electronic equipment, including, but not limited to, cell phones (including hands-free), text pagers, Blackberries and other PDAs, electronics, and laptop computers, is prohibited at any time while driving any vehicle on work business, except in an emergency situation where 911 is called.
- Voice activated Global Positioning Units (GPS) are acceptable. However any input of these devices must be done prior to driving.
- Supervisors will train employees on safe and acceptable alternatives to using electronic equipment while driving."

Examples of notices for employers

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Washington State law on texting while driving

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- The Washington State Patrol announced that texting while driving and failure to use a hands-free device became a primary traffic offense on June 10, 2010. (RCW 46.61.668)
- The fine for the violation is $124.
- Does using a GPS device violate the texting while driving law?

  RCW 46.61.668 states drivers can use a GPS or navigation device if it's "permanently affixed to the vehicle." If the GPS device is not affixed to the vehicle then drivers can get a $124 ticket.

- Is it legal to use a navigation program on an iPhone or Blackberry?

  It is okay as it's permanently affixed to their vehicle. If the phone is in a driver's hand while the GPS is being used – this likely is grounds for most police – it's against the law.

  People will likely argue what "permanently affixed" means. In between lines, the authorities don't want drivers to be looking at GPS devices in their hand while driving.

Further Information

Federal Office of Highway Safety Administration – Distracted Driving Fact Sheet

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States with laws banning texting while driving

APPENDIX H – ACADEMICIAN HOMEWORK ACTIVITIES

Homework #1

1. The trends of traffic crashes in the past decade reported by OECD (declining) and WHO (increasing) are quite different. Why?

2. If the crash risk of older people driving is measured by the number of collisions per 100 million VMT or the number of collisions per 100,000 population, will the results be consistent? Why?

3. What are the differences between exposure, risk, risk factors, and safety measures?

4. What are the three main types of distractions? Can you put the following distractions into the right type?
   - Eating breakfast
   - Texting
   - Talking on the phone
   - Making up
   - Adjusting radio channels
   - Laughing with other passengers

5. Discuss five (5) characteristics for each that place children, older people, and young drivers as the "at risk" groups?

6. Please identify the road safety problems in your community through several interviews. You can add more questions.

   Step 1: Talk to at least four residents about general road safety problems in your community. Respondents should be of different gender and age groups.
   Key Questions:
   - How do you define your community? Who is part of my community? Who is not?
   - What is your preferred transportation mode?
   - Do you have children? Have your ever worried about your children's safe routes to schools?
   - Do you like the road facilities in your community? Who has influence? Who is at risk?

   Step 2: Identify detailed problems.
   Key questions:
   - What is the most common contributing circumstance to motor vehicle crashes in your community?
   - Which problem results in the worst injuries or the highest number of collisions?
   - Which road safety problem is the community most concerned about?

- Which transportation mode is the most dangerous in your neighborhood? Why?
- Is this problem becoming more serious?
- What are people trying to achieve with this problem?

Step 3: Collect and analyze relevant information to support your argument.
Key questions:

- Have other communities faced similar problems?
- Have they solved the problems? How did they approach it?
- Is our community reflective of a larger trend to the whole city?

Step 4: Ask respondents to evaluate themselves as road users.
Key questions:

- How often do you distract the driver when you are sitting in the car?
- Have you ever made a phone call or sent messages when you are driving?
- Do you follow the rules when biking? Have you ever biked on drive lanes?
- How would you rate your parents/children as drivers?
- Should motor cyclists be able to decide whether to wear helmets?
- How would you rate yourself as a safe pedestrian?
- Have you ever allowed your children to play games in the street?
- Have you ever stared at your smartphone when crossing a street?
- How often do you cross a street when the light is red?
- How well do you know traffic safety laws?
- How well do you follow traffic safety laws?

Step 5: Synthesize your findings and compare these findings with City/State's reports. Report your findings (step 5) on an answer sheet.

Homework #2

1. Discuss why it is important to report road crashes and record the historical information?

   Possible answer: The historical collision profile can be smartly utilized for multiple purposes by different agencies and social groups.
   - The historical information helps local authorities to track the road collision status in the city, which serves as a guide to the transport administrators for strategizing on road safety and prevention measures.
   - The historical collision profile is the database to portrait the crash pattern, which helps transport engineers to identify collision concentrated areas that should be given priorities for safety improvements.
   - The historical collision profile is the most important source for researchers to sort out the causes of crashes, such as who are the most victims and offenders, and which behavior is the most dangerous. The historical information also helps researchers to compare the past with the current status and figure out whether the risk factors have been treated, and whether the road safety has been improved.
   - The historical information also helps road users to find out which time there are more crashes on the road and why.

2. Read the following collision scene description and answer the question.

   On a heavy rainy day, a speeding driver who was late for passing through an intersection and violating the traffic when the light had just turned red in downtown Seattle. The car was pretty old. Simultaneously, the driver's mother was trying to reach him through phone call. He did not response, but took a look on the phone to check out who was calling. The drive lane was steep and the driver was relatively hard to slow down. In addition, the stop sign was partially blocked by street trees. Unfortunately, the driver hit a motorcyclist, for whom the light had just turned green. However, the motorcyclist was not wearing a helmet and suffered severe head injuries. The driver suffered facial injuries. Both the car and the motorcycle had property damages. The police found out that the driver did not wear the seatbelt.
   Question: using the Haddon matrix, identify the risk factors related to the driver and the motorcyclist.
   Possible answer: This exercise is designed to test students' capabilities in identifying the chained events involved in traffic injury causation. Students should be able to classify the risk factors under two phases (post-crash is excluded) of the Haddon matrix by groups (human, vehicle and equipment, and environment). In addition, this exercise directs students to investigate the interaction among different road elements.

3. A commonly used method to deal with road safety problem worldwide is based upon the 5E's approach. Explain some of the Engineering Services needed in the campus and come up some suggestions improve the road environment safety.

   Possible answer: The answer should be case specific to a campus' features. Some general responses to this question may include:

- Enforcement: heavy and visible policing, showing the public that if they violate the traffic, they will be caught and punished.
- Education: advertising or organizing public campaigns to inform the university community the consequences of dangerous behaviors, such as unsafe driving and jaywalking.
- Engineering: creation of a forgiving road network, identifying particularly dangerous sections of roads, and using low-cost solutions regarding different safety outcomes.
- Environment: encourage mixed land use to reduce students' travel demand, such as placing more grocery stores; improve the density of newly established buildings; promote friendly walking and biking environments.
- Emergency Medical Attention: enduring that patients involved in crashes receive medical assistance within the critical 'golden hour" after the crash, which reduces the probability of serious injuries.

4. Use the public health approach to evaluating the effectiveness of a road safety education program in a school?

   Possible answer: the evaluation of the program using the public health approach may include the following four steps:
   - Begin at the school.
   - Survey the site and identify the potential risks of the traffic environment, and safety issues nearby, for example where are safe places to play, where to stop, and which route is the safest.
   - Split the students into two groups, enhance psychological and educational measures to one group of students, while keep the another group of students uneducated.
   - Evaluate and compare students' learning outcomes.

Homework #3

1. Using the public health approach to design an experiment to testify: between self-driving cars and traditional passenger cars, which one is more prone to crashes.

   Possible answer: The public health approach includes four steps: defining the problem, identifying risk factors, developing the intervention strategy, and comparing the results. The most essential step is the intervention. Using a self-driving car to replace the conventional passenger car is the intervention strategy that should be considered in designing in this experiment.

2. In which ways do weather conditions affect the road safety, and the safety outcome of self-driving cars?

   Possible answer: Weather is the state of the atmosphere, which includes air pressure, temperature, humidity, clouds, wind, and precipitation. Weather conditions affect both crash rates and the exposure to traffic hazards. Such effects are strongest for the conditions of precipitation (including snow and hail), fog/smog, low sun, wind, ice forming, and hot temperatures.

   When driving self-driving cars in harsh weathers, the GPS system may not report accurate geospatial coordinates, in that way the self-driving cars may not be able to plan correct routes. Also, the operation of radar/ultrasonic sensors/LiDAR system is impacted by weathers. If signals are reported with errors, the detection of surrounding vehicles and buildings could be inaccurate. In addition, cameras are influenced by harsh weathers. The spatial locations and colors of surrounding objects may not be visible in harsh weathers, such as road lanes, traffic control signs, and moving vehicles. If signs are blocked by fog or smog, the self-driving car may make wrong decisions.

3. Relative risk is the ratio of the probability of an event occurring in an exposed group to the probability of the event occurring in a non-exposed group. By following this idea, supposing the number of car in Seattle is 300,000, the number of crashes in a sunny day is 500, while the number of crashes in a fog is 1000, what is the relative risk of crash in those two days?

   Possible answer: RR = (500/(300,000-500))/(1000/(300,000-1000)) = 0.501

APPENDIX I – CRASH DATA FROM NOME, FAIRBANKS, AND KETCHIKAN

Nome Nugget 2013 Media Discourse Analysis
fib 6feb2017

Incident No.	Nome Nugget Publish Date	Occurrence Date	Occurrence, Report or Response Time	Reported by	Description	Location
1	10-Jan	2-Jan	8:55 PM	Nome City Police	3 vehicle accident; 2001 GMC Yukon stopped & then proceeded into intersection & struck northbound Chev pickup it didn't see. Pickup was propelled to right and struck a third vehicle that was stopped on other side of intersection	Intersection Greg Kruschek Ave & Nome-Beltz Hwy; near AC Store
2	17-Jan	7-Jan	7:31 PM	Nome City Police	Off-road vehicle accident involving snow machine	Near high school
3	17-Jan	9-Jan	7:33 PM	Nome City Police	Cab ran into another vehicle on Front St; he stepped out of cab to smoke; cab backed into another vehicle	Front St
4	7-Feb	28-Jan	3:30 PM	State Troopers	Snow machine accident; training for Iron Dog; Polaris Indy 600 hit driftwood log at approx 80 mph; catapulted off.	3 miles north of Shaktoolik
5	28-Feb	21-Feb	8:30 AM	State Troopers	Vehicle rollover; 2008 Jeep Liberty	6.5 mi Kougarok Rd
6	28-Feb	24-Feb	5:46 PM	Nome City Police	Two vehicle accident; both damaged	Tobuk Alley
7	7-Mar	25-Feb	5:45 PM	Nome City Police	Single snow machine collision	Sea ice
8	21-Mar	14-Mar	2:33 PM	Nome City Police	Hit and run collision	Front St
9	21-Mar	16-Mar	5:17 PM	Nome City Police	Hit and run collision	Vehicle parked in front of a local business on Sixth Ave
10	21-Mar	17-Mar	12:35 PM	Nome City Police	Traffic accident	near First Avenue
11	28-Mar	22-Mar	7:52 AM	Nome City Police	Two vehicle collision; red 2002 Ford pickup failed to yield to white 1999 GMC carryall	near intersection of East 4th and H Streets
12	28-Mar	23-Mar	12:12 PM	Nome City Police	Car driven by Grebe backed into another vehicle	Seppala Drive
13	11-Apr	4-Apr	6:19 PM	Nome City Police	Green pickup damaged by a vehicle that left the scene	Front St near State of Alaska parking lot
14	2-May	25-Apr	8:20 PM	Nome City Police	Leaving the scene of an accident	(not reported)
15	9-May	2-May	8:03 AM	Nome City Police	Hit and run accident	East side of town
16	16-May	7-May	9:59 PM	Nome City Police	13 year old female took mother's car without permission, backed into a second vehicle and fled the scene	Residence on 2nd Ave
17	13-Jun	5-Jun	11:34 PM	Nome City Police	Hit and run	(not reported)
18	27-Jun	22-Jun	12:51 AM	State Troopers		Council Rd
19	22-Aug	13-Aug	3:00 AM	Nome City Police	ATV Accident	West Beach
20	22-Aug	13-Aug	1:39 PM	Nome City Police	ATV Accident. Female driver fell off ATV	Near a dredge
21	29-Aug	25-Aug	9:35 PM	Nome City Police	Vehicle collision; driver backed into another vehicle	Residence near 5th Ave
22	12-Sep	2-Sep	12:25 AM	Nome City Police	Vehicle collided with 2 other vehicles	(not reported)
23	12-Sep	4-Sep	6:00 PM	Nome City Police	Motor vehicle accident	
24	12-Sep	7-Sep	11:04 AM	Nome Dispatch Center	Two-vehicle accident; Nome Volunteer Ambulance & Fire Department responded	East end of Nome
25	19-Sep	12-Sep	12:05 AM	State Troopers	Capsized boat; boaters made it to shore safely; rescued by volunteer searchers and village public safety officers; safely returned to Brevig Mission	near Port Clarence

Nome Nugget 2013 Media Discourse Analysis						
Fb 6feb2017						
Incident No.	Nome Nugget Publish Date	Occurrence Date	Occurrence, Report or Response Time	Reported by	Description	Location
26	19-Sep	15-Sep	1:55 AM	Nome City Police	Accident between dirt bike & pickup truck; truck was pulling into driveway when dirt bike with no headlight hit truck.	Nome-Teller Highway
27	19-Sep	15-Sep	9:22 PM	Nome City Police	ATV accident	next to AC store
28	10-Oct	30-Sep	1:09 PM	Nome City Police	Motor vehicle collision. Driver pressed accelerator instead of brake when pulling into parking spot	business on Seppala Dr
29	7-Nov	3-Nov	11:53 PM	Nome City Police	Nome Police Department patrol vehicle struck by another car that was unable to stop at a stop sign due to recent snow	(not reported)
30	14-Nov	4-Nov	9:00 AM	Nome City Police	Toyota Tundra pickup traveling north lost control, careened sideways into southbound land and struck a Chevy pickup. First snow on ground & ice made for dangerous road conditions.	just north of Watchglass Rd on Nome-Teller Hwy
31	21-Nov	12-Nov	5:59 PM	Nome City Police	Red van knocked over street signs	Warren & Division Streets
32	21-Nov	12-Nov	10:24 PM	Nome City Police	Single vehicle accident; blue van left road & rolled onto driver's side	off Sixth Ave
33	21-Nov	13-Nov	4:49 PM	Nome City Police	Dumpster struck a vehicle; dumpster apparently driven by high winds & icy conditions	Airport terminal
34	21-Nov	17-Nov	5:41 PM	Nome City Police	Hit and run of parked Toyota pickup; damage occurred in August	East side of small boat harbor
35	28-Nov	19-Nov	10:41 AM	Nome City Police	Vehicle rollover; vehicle was unoccupied when reporting party passed it at approx 7:45 AM	Beam Rd
36	28-Nov	22-Nov	2:51 PM	Nome City Police	Single vehicle accident; slid into stop sign.	
37	28-Nov	23-Nov	7:09 PM	Nome City Police	Fender bender: Single vehicle accident; backing out of local business -- struck another parked vehicle	"a local business"
38	12-Dec	7-Dec	8:33 AM	Nome City Police	Hit & run: vehicle parked in front of owner's residence was struck on front bumper & grill; damage to both. Vehicle was pushed into street by force of impact	residence of First Ave
39	2-Jan-14	17-Dec	9:00 PM	State Troopers	Snow machine fell through ice	Nunavulnuk River; traveling from Stebbins to Kotlk

Nome Nugget 2013 Media Dis					
Fib 6feb2017					
Incident No.	Name(s)	Injuries	Follow-up/Treatment	Damage $	Notes/comments
1		Minor, to 5 yr old child in Chev pickup	Not mentioned	$25,000 est total	
2		no significant injuries		not available	
3	Robert O'Connor			"minor damage"	
4	Tyler Huntington (27)	Broken pelvis, internal injuries; bruised lower abdomen	Medivaced to Alaska Native Medical Center, Anchorage; 7 hour surgery		
5	Jennifer Marcell (27)	None		$4000 est	No citation; was wearing seat belt
6		None		not reported	No citation
7		Yes	Transported to Norton Sound Regional Hospital for observation and treatment.		Alcohol appears not to have been involved.
8					
9					
10		None			"report will be filed with DMV"
11	Brendan Scanlon (44) -- Ford; Darrin Iyatunguk -- GMC	Several unrestrained children in GMC suffered minor injuries ranging from a bloody nose to scrapes and abrasions; full extent of injuries unknown at time of press release		minimum $10,000	Citations issued -- failure to yield after stop (Scanlon); unrestrained children (Iyatunguk)
12	Gordon Grebe (64)			Not available	Citation for unsafe backing
13					
14					Suspect has been located; will be summoned to court for numerous violations
15	George Langton (38)				Arrested for several violations; remanded to Anvil Mountain
16					Juvenile released to mother; charges to be forwarded to Juvenile Probation Office
17	Nirmala Soysa (62)				Issued citation for leaving the scene of an accident
18	22 yr old Nome resident	Driver & 2 passengers injured; Nome Volunteer Fire Dept treated & transported them			Alcohol believed to be a factor
19	Passenger Joshua Brock (20) cited for MCA	Driver transported to Norton Sound Regional Hospital -- non-life threatening injuries			Alcohol believed to be a factor
20		NVAD personnel rendered assistant and transported patient to NSRH			Alcohol not a factor
21	Jeanie Waltz (53) (driver)			Est more than $2000	Waltz issued citation for Limitations on Backing; alcohol not involved.
22	Reva Boolowon (30)			Minimal damage to one vehicle	Boolowon arrested for DUI; remanded to Anvil Mountain
23		No apparent injuries			Victims ran from scene prior to officer arrival
24		One person transported to NSRH with non life threatening injuries			
25	James Kakoona (23), Paul Kakoona (21) & Donald Ahnangnatoguk (23)				

Nome Nugget 2013 Media Dis					
Fib 6feb2017					
Incident No.	Name(s)	Injuries	Follow-up/Treatment	Damage $	Notes/comments
26		None			
27		Yes. Nome Volunteer Ambulance Service responded & transported patient to NSRH			
28	Nivaaluk Brandt-Ellanna (21)				Driver cited for driving without a valid operator license
29				Minor damage sustained by both vehicles	
30		One passenger transported by Nome Volunteer Ambulance Dept to NSRH for medical treatment; all involved reported only minor injuries			Driver of Toyota was issued 2 citations: Basic speed & Motor vehicle insurance reqd.
31					Investigation indicated signs were knocked over but not damaged
32	Kathleen Panatasaq (27) (driver)	4 persons in vehicle; none sustained serious injuries	Medics responded; medical assistance was declined.		
33				approx $500	
34	Mark Hottmann (62) (owner?)				
35		None reported	Owner was contacted; stated they will get vehicle back on road with another of their vehicles	None reported	
36		None		Yes; to stop sign and vehicle	
37	Male juvenile (16)	None			Cited for Limitation on backing
38				Front bumper & grill	
39	Albert Bogeyaktuk Jr. (27)				Search teams from Kotlik and Troopers; family member independently located Albert

Fairbanks News-Miner 2013 Media Discourse Analysis						
Traffic Accidents						
flb 13may1017						
Incident No.	News Miner Publish Date	Occurrence Date	Occurrence, Report or Response Time	Reported by	Description	Location
1	5-Jan-13	1-Jan-13	7:00 AM	Fairbanks police	Driver sped north on Cowles St in Pontiac G6, slid through stop sign, crashed through fence, landed nose first on Chena River, climbed through passenger door and fled up river bank.	Cowles St and Chena River
2	8-Jan-13	3-Jan-13	10:30 PM	Fairbanks police	2004 Chevrolet Cavalier struck moose	Richardson Hwy near Lakeview Terrace exit
3	8-Jan-13	4-Jan-13	5:15 PM	State troopers	Pedestrian hit by Toyota Avalon traveling about 5 mph while crossing Kendall Ave	Kendall Ave & Badger Rd intersection
4	16-Jan-13	16-Jan-13		State troopers	accident between semi-truck & grader	Southbound Steese Hwy between Farmers Loop & Chena Hot Springs Rd
5	18-Jan-13	18-Jan-13	afternoon	State troopers	Small passenger car headed southbound struck DOTPF road grader working in tandem with other equipment to clear snow; fatality. OCCURRENCE DATE MAY BE 11JAN2013	296 Mile Parks Hwy near Nenana
6	23-Jan-13	21-Jan-13	11:28 AM	State troopers	Eight-wheel Stryker vehicle rear-ended 1999 Chevy van that had slowed to turn left; van spun into oncoming lane and was struck by Chevrolet Silverado	Richardson Hwy at Jack warren Rd (Delta)
7	24-Jan-13	17-Jan-13	11:03 PM	State troopers	Mitsubishi Montero drove into ditch	Goldhill Rd
8	24-Jan-13	?		Fairbanks police	Vehicle faced wrong way, drove onto median and over a road sign	Johansen Expwy
9	26-Jan-13	24-Jan-13	1:42 AM	Fairbanks police	Red Chevrolet Impala (Walsh driving) accelerated from intersection, spun out, and struck Pontiac G6	Cowles St & Airport Way
10	27-Jan-13	25-Jan-13	just before 7 AM	State troopers	School bus with 5 students aboard hit calf moose, killing the moose	Near 3.5 Mile Murphy Dome Rd
11	29-Jan-13	26-Jan-13	7:25 AM	State troopers	White Dodge Durango drove into ditch	Old Richardson Hwy at Sloan St (North Pole?)
12	29-Jan-13	25-Jan-13	9:13 PM	State troopers	Pontiac G6 crashed with another vehicle	Chena Pump Rd & Amherst Dr
13	29-Jan-13	28-Jan-13	morning	Fairbanks police	At least 6 accidents due to ice fog	Five mile stretch of Richardson Hwy near Fairbanks
14	30-Jan-13	29-Jan-13	2:48 PM	State troopers	3/4 T GMC pickup with trailer towing logs slowed down to turn into parking lot and struck Army Humvee; continued into parking lot & struck soldier who was exiting from a parked Humvee and then hit two parked Stryker vehicles.	Parking lot near mile 315 Richardson Hwy
15	31-Jan-13	27-Jan-13		Fairbanks police	2000 Pontiac Grand Prix collided with another vehicle in Frontier Lodge parking lot; then drove away	Frontier Lodge parking lot, Old Richardson Hwy
16	31-Jan-13	30-Jan-13	10:41 AM	State troopers	2005 Kenworth semi driving north swerved to avoid stopped car, went into ditch; trailer swung into southbound lane & struck a stopped Ford van; van was pushed into a Mercedes-Benz van behind it.	Parks Hwy in Healy
17	31-Jan-13	30-Jan-13	about midnight	Alaska DOTPF	Strong winds & blowing snow; truck overturned in southbound lane; pipe spilled on to roadway; guardrail damaged; traffic in northbound lane occasionally stopped while debris was being cleared.	29 Mile Elliott Hwy
18	31-Jan-13	30-Jan-13	night	Alaska DOTPF	Strong winds & blowing snow; truck slid in to ditch along southbound lane, partially blocking roadway.	42 Mile Elliott Hwy
19	4-Feb-13	4-Feb-13		DOTPF issued adv	Vehicle accident blocking southbound lane	Mile 126 Dalton Hwy
20	5-Feb-13	3-Feb-13	7:07 PM	State troopers	Snow machine crash -- riding Arctic Cat on road, lost control and it overturned	Denali Hwy near Cantwell
21	6-Feb-13	?	12:29 PM	State troopers	Chevy pickup driving north; snow from southbound car obscured vision; Chevy rear-ended a Kenworth semi that had slowed for a turning car.	314 Parks Hwy
22	9-Feb-13	4-Feb-13	morning	Fairbanks police	2003 Jeep Grand Cherokee hit parked red 2000 Dodge Intrepid; did not leave identifying information	A Davis Rd parking lot
23	13-Feb-13	5-Feb-13	9:24 AM	Fairbanks police	Two vehicle crash	28rd Ave & Turner St
24	13-Feb-13	8-Feb-13	1:44 AM	Fairbanks police	Chevrolet Impala high centered	Johansen Expwy near Danby St
25	15-Feb-13	13-Feb-13	6:44 PM	State troopers	Red GMC Sierra in ditch 60 ft from road in snow; slid off road while turning into Lynx Lane	Ballaine Rd just north of Lynx Lane
26	15-Feb-13	12-Feb-17	7:30 PM	State troopers	GMC van driving south collided with a caribou; killed the caribou	Mile 208 Parks Hwy near Cantwell
27	15-Feb-13	14-Feb-13	11:15 PM	Fairbanks police	Ford F-150 pickup speeding north on Cushman St, hit snow berm, lost control and slammed into wall of Roundup Restaurant.	Cushman St; Roundup Restaurant
28	18-Feb-13	18-Feb-13		State troopers	Two-vehicle accident. Dodge truck attempted to pass a Rav4	Mile 358 Parks Hwy, near Sheep Creek Rd
29	19-Feb-13	15-Feb-13	1:10 AM	State troopers	Vehicle traveling east collided with moose	4.5 Mile Chena Hot Springs Rd
30	20-Feb-13	13-Feb-13	8:40 PM	State troopers	OCCURRENCE DATE MAY BE 20FEB13. Small passenger vehicle lost control while rounding a turn and collided with semi-truck in oncoming lane; passenger side of small vehicle struck front of semi; both vehicles slid into ditch; driver of small vehicle was declared dead at the scene	Parks Hwy 845 Mile near George Parks Memorial turnoff
31	20-Feb-13	13-Feb-13		State troopers	Vehicle traveling eastbound attempted to pass in no-passing zone; collided with vehicle in oncoming lane	1431 MI Alaska Hwy
32	20-Feb-13	15-Feb-13	1:10 AM	State troopers	Vehicle collided with moose	Chena Hot Springs Rd at Esro Rd

Fairbanks News-Miner 2013 Media Discourse Analysis						
Traffic Accidents						
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Incident No.	News Miner Publish Date	Occurrence Date	Occurrence, Report or Response Time	Reported by	Description	Location
33	21-Feb-13	20-Feb-13	6:22 AM	Fairbanks police	Vehicle trying to avoid another vehicle collided with traffic signal control box	Lathrop St & Airport Way
34	25-Feb-13	25-Feb-13			"accident"	356.5 Richardson Hwy, just N of Badger Rd overpass intersection; northbound lanes
35	26-Feb-13	26-Feb-13	2:36 PM	Fairbanks police	26feb OCCURRENCE DATE MAY BE EARLIER. Three vehicles involved in this two-vehicle collision. Vehicle fish tailed onto Richardson Hwy; lost control. Vehicle on Richardson (left lane) braked to avoid collision, went into ditch, kicked up snow & debris, and blocked view of next driver, who collided with the in-the-ditch vehicle	Richardson Hwy & Badger Rd on-ramp (6 mi or 12 mi not stated)
36	28-Feb-13	24-Feb-13	6:00 PM	Fairbanks police	Ran stop sign; collided with another vehicle	3rd St and Eagle Ave
37	28-Feb-13	28-Feb-13	morning	State troopers	Kia SUV struck moose and struck guard rail	161.5 Mile Parks Hwy between Trapper Creek and Cantwell
38	2-Mar-13	28-Feb-13	6:14 PM	State troopers	Chevrolet Malibu lost control and collided with Ford Sport-Trac; Malibu caught fire	313 Mile Richardson Hwy S of Midway Lodge
39	3-Mar-13	2-Mar-13		DOTPF	Vehicle rear ended grader clearing snow	Richardson Hwy near Moose Creek
40	3-Mar-13	January 2103		DOTPF	Vehicle crashed into back of grader clearing snow; driver killed	Parks Highway near Nenana
41	5-Mar-13	2-Feb-13		State troopers	Green 2013 Ford Mustang crashed into mailbox; driver did not have permission to drive this vehicle	
42	7-Mar-13	1-Mar-13	10:45 PM	Fairbanks police	Drove into a ditch	D St
43	7-Mar-13	2-Mar-13	7:48 AM	State troopers	Chevrolet HHR collided with Ford F-150	Mitchell Expwy
44	7-Mar-13	2-Mar-13		Fairbanks police	Rolled a Toyota Tundra	10th Ave & Steese Hwy
45	7-Mar-13	6mar13 (?)	3:15 PM	Fairbanks police	School principal came out of school to investigate a report that Smith was smoking marijuana in a black 1999 GMC Yukon; Smith took foot off brake and hit him and knocked him to ground.	Tanana Middle School parking lot
46	3-Apr-13	26-Mar-13	evening	Fairbanks police	Nenana ambulance, with siren on and lights flashing, driving north struck by Dodge Durango traveling west	Lathrop St & 23rd Ave
47	8-Apr-13	7-Apr-13	4:30 PM	State troopers	Head-on collision; 2 fatalities; 2008 Ford F450 pickup traveling north (Ponder) collided with southbound 2007 Ford 550 truck (Kincaid); each pulling a trailer	Parks Hwy; near East Fork Chulitna River; about 25 mi S of Cantwell
48	19-Apr-13	10-Apr-13	8:30 AM	Fairbanks police	2007 Honda CRV struck several other vehicles	Mitchell Expwy & Lathrop St
49	23-Apr-13	22-Apr-13	12:49 PM	State troopers	2010 VW Jetta rear-ended 1999 GMC Sierra which had stopped so a tractor trailer pulling an oversized load in the opposite direction could cross bridge. Sierra burst into flames; occupants escaped safely	Little Goldstream Bridge, 314.5 Mile Parks Hwy
50	28-Apr-13	26-Apr-13	11:50 AM	Fairbanks police	2010 Kenworth semi impacted and dislodged fuel pumps at gas station	Gas station in south Fairbanks
51	2-May-13	28-Apr-13		State troopers	two-vehicle collision	near Cherokee Ave
52	2-May-13	24-Apr-13	9:00 PM	State troopers	Ran into traffic control device	College Rd & University Ave
53	15-May-13	5-May-13		Fairbanks police	red 2005 Dodge pickup hit parked car	S Cushman St
54	15-May-13	19-May-13	7:56 PM	State troopers	Rear-end accident	Just-A-Store on Chena Pump Rd
55	16-May-13	7-May-13	9:50 PM	Fairbanks police	"accident"	Airport Way & University Ave
56	17-May-13	13-May-13	afternoon	State troopers	ATV crash; toddler not breathing; then improved; then died	Delta Junction (?)
57	27-May-13	26-May-13	6:00 PM	State troopers	Fatal ATV accident; lost control of ATV; rolled over on her	Two Rivers Road; 200 ft. S of turnoff to Two Rivers School
58	27-May-13	27-May-13	afternoon	Alaska DOTPF	Overturned truck blocking road. One land open	88 Mile Dalton Hwy
59	28-May-13	26-May-13	4:40 PM	State troopers	Motorcycle struck guardrail while negotiating a corner; driver thrown from cycle; fatality	near Mile 1362 Alaska Highway
60	4-Jun-13	31-May-13	11:00 PM	Fairbanks police	ATV accident; victim unconscious & trapped under machine	S Cushman near Alta Way
61	8-Jun-13	18-May-13	3:15 AM	Fairbanks police	One vehicle accident. 1998 Pontiac Grand Prix driving at high rate of speed approaching intersection, struck traffic signal support and spun around. Driver was ejected through passenger window.	Airport Way and Gillam Way
62	11-Jun-13	7-Jun-13	12:45 PM	Fairbanks police	2006 Dodge Neon failed to yield when turning left and was struck by vehicle traveling through intersection.	Mitchell Expwy & Lathrop St
63	22-Jun-13	18-Jun-13	evening	State troopers	Green 1996 Toyota pickup hit a tree in a ditch, injuring driver and a passenger; driver left; passenger found at scene bleeding from mouth and with scrapes and bumps on his face	Chena Lake Recreation Area
64	30-Jun-13	29-Jun-13	11:30 PM	State troopers	Driving Honda ATV down a bank on old forestry road; ATV rolled on top of her; family member rolled ATV off her and began first aid	5 miles off Quartz Lake Rd; near campground area

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Traffic Accidents						
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Incident No.	News Miner Publish Date	Occurrence Date	Occurrence, Report or Response Time	Reported by	Description	Location
65	5-Jul-13	26-Jun-13	6:26 PM	Fairbanks police	Hit and run accident; Headley lost control of his vehicle while turning onto Romans Way; hit passenger side of other vehicle; fled scene; went to nearby apartment	near corner of Romans Way and Old Richardson Hwy
66	6-Jul-13	5-Jul-13	10:56 AM	State troopers	2006 BMW 1200RT motorcycle crossed into opposite land and struck front passenger door of a 40.5 foot motorhome; fatal to cycle driver	8.6 Mile Taylor Hwy
67	29-Jul-13	24-Jul-13	afternoon	State troopers	Jeep SUV struck bicycle; Jeep then rear ended by Chevy PK	Peger Rd near Ave of Flags
68	30-Jul-13	26-Jul-13	5:00 PM	Fairbanks police/ State troopers	Red Ford Explorer threw woman out of vehicle and then collided with the truck ion front of it. Later the same vehicle struck office building	1 University Ave Taco Bell 2 2175 University Ave near Davis Rd
69	31-Jul-13	27-Jul-13	4:42 AM	Fairbanks police	White Ford Fusion & black Dodge pickup; driver of pickup (McGurl) crashed into Fusion as Fusion was trying to stop McGurl from driving	Lathrop HS parking lot
70	2-Aug-13	31-Jul-13	8:44 PM	Fairbanks police	25 year old man driving 2000 Nissan Murano SUV was turning south when he struck a 9 year old boy and dragged him under the vehicle.	turning onto Steese Hwy from Third St
71	5-Aug-13	4-Aug-13	early morning	State troopers	Truck pulling fifth-wheel trailer struck multiple vehicles while leaving RV park	RV park in Healy
72	7-Aug-13	4-Aug-13	afternoon	State troopers	Four motorcycles struck rear of 2011 Chevrolet Malibu, which had braked quickly when the vehicle in front of the Malibu (a maroon 2009 Ford 150) slowed down for a pavement break;	Construction zone near Healy
73	12-Aug-13	11-Aug-13	about 6 PM	Airport police	Two motorcyclists failed to navigate a curve & left the road; one died	Van Horn Rd near University Ave
74	13-Aug-13	7-Aug-13	12:15 AM	State troopers	2003 Ford Ranger involved in a "crash."	Chena Pump Rd & Chena Point Ave
75	14-Aug-13	13-Aug-13	evening	State troopers	Raft accident; sheep hunting; Vogel injured when dragged behind raft	Gerstle River 25 river miles from Delta Junction
76	17-Aug-13	12-Aug-13	12:17 AM	Fairbanks police	Two-vehicle accident	200 block 2nd Ave
77	28-Aug-13	24-Aug-17		State troopers	Black Chevrolet Silverado crashed in ditch; Brown said he swerved to avoid a dog.	Bias Drive off Chena Hot Springs Rd
78	29-Aug-13	24-Aug-13	9:09 PM	State troopers	Lost control of green Chevrolet pickup truck and rolled truck	East Chena Hills Drive
79	29-Aug-13	24-Aug-13	2:56 AM	State troopers	Ford F-150 ran into back of another vehicle; driver of that vehicle followed the F-150 to Chena Pump Rd & provided troopers with license number.	University Ave Taco Bell
80	3-Sep-13	31-Aug-17	afternoon	State troopers	1999 International oil tanker truck traveling west lost control, careened into south side ditch and rolled over; some oil leakage	136 Mile Denali Hwy, outside Cantwell
81	14-Sep-13	12-Sep-13	10:30 PM		Vehicle collided with moose	Richardson Hwy outside Fairbanks; near Badger Rd exit
82	14-Sep-13	11-Sep-13	2:00 AM	Ft Wainwright pol	"accident"	Ft Wainwright front gate
83	14-Sep-13	10-Aug-13	5:55 AM	Fairbanks police	2010 GMC Sierra ran into wall at Noble St & Wendell Ave; driver found unconscious behind wheel. Firefighters extracted him from truck	Noble St & Wendell Ave
84	19-Sep-13	18-Sep-13	10:52 AM	State troopers	Vehicle roll over; Army helicopter with three medics aboard spotted crash and transported three victims to FMH	188 Mile Richardson Hwy, 2 mi No of Paxson
85	24-Sep-13	23-Sep-13	about 1 pm	State troopers	Head-on collision; 1 fatality; eastbound Ford F-250 & westbound Jeep Liberty; driver of F-250 lost control	Badger near Riverview gas station
86	30-Sep-13	28-Sep-13	evening	sister Debbie Mille	Car hit her dog and then her	Chena Pump Rd
87	9-Oct-13	5-Oct-13	evening	Fairbanks police (?	During police chase, car missed turn & launched 31 ft & landed on 2nd floor of 8 ft 10 in tall utility building; driver fled but was apprehended nearby	Mitchell Expwy exit at Old Airport Way
88	10-Oct-13	10-Oct-13	12:19 AM	Fairbanks police	OCCURRENCE DATE MAY BE OCT 3. Silver 2007 Nissan Pathfinder destroyed about 178 ft of fence.	N side of Airport Way to the west of Barnette St
89	11-Oct-13	10-Oct-13	9:05 AM	State troopers	Carlile semi methane truck drifted off road, jackknifed, and flipped on its side.	Mile 214.5 Parks Hwy, just north of Cantwell
90	17-Oct-13	11-Oct-13	9:16 PM	State troopers	Vehicle ran into power pole. Caused power interruption.	Old Richardson Hwy & Cobb St
91	17-Oct-13	28-Jul-13	10:58 PM	Fairbanks police	Harley Davidson motorcycle (Ludwig = driver) collided with Hyundai Azera sedan; driver of Hyundai said she had ROW because she had yellow light.	Cowles St & Airport Way
92	25-Oct-13	25-Oct-13	4:27 AM	State troopers	OCCURRENCE DATE MAY BE OCT 18. Single vehicle accident; drove into a ditch southbound, went airborne for about 65 feet and came to rest on northbound side of highway.	Hagelbarger Rd at Steese Hwy

Fairbanks News-Miner 2013 Media Discourse Analysis						
Traffic Accidents						
flb 13may1017						
Incident No.	News Miner Publish Date	Occurrence Date	Occurrence, Report or Response Time	Reported by	Description	Location
93	25-Oct-13	28-Jul-13		State troopers	Single vehicle accident	Entrance to Chena Lake Recreation Area
94	27-Oct-13	14-Jul-13	4:30 PM	State troopers	Red SUV crashed into trees on Old Richardson Hwy in North Pole; Lowery found unconscious in vehicle	Old Richardson Hwy in North Pole
95	29-Oct-13	27-Oct-13	3:30 AM	Fairbanks police	Gold Subaru Tribeca struck 55 year old women who was crossing Old Steese Hwy	Old Steese Hwy near Rock N Rodeo
96	31-Oct-13	31-Oct-13	12:03 AM	State troopers	1985 Chevrolet Suburban; rollover crash; lost control; fatal to driver	curve on Healy Spur Rd
97	31-Oct-13	22-Oct-13		Fairbanks police	Car crashed into one-way sign	median dividing N & S traffic on Cowles St
98	31-Oct-13	24-Oct-13	morning	State troopers	OCCURRENCE DATE MAY BE 31OCT2013; White GMC pickup truck found in ditch; more than 35 ft off road; had driven into & uprooted several trees	Filer Rd & Echo Acres Way
99	8-Nov-13	3-Nov-13		North Pole Police	2011 Nissan pickup with Hawaii plates went into ditch & damaged railroad light pole	Laurance Rd & Old Richardson Hwy
100	26-Nov-13	24-Nov-13	3:26 PM	State troopers	Black Hyundai in and out of ditch; then struck 1992 Ford truck at Geist Rd & University Ave (no injuries); then struck 2006 Toyota Matrix and light pole at Peger Rd and Phillips Field Rd (driver of Matrix: whiplash to back and neck); Mason & passenger fled on foot; found near Spenard Builders	Chena Pump Rd near Roland Rd
101	2-Dec-13	30-Nov-13	about 4 PM	State troopers	2006 Ford F-150 pickup (Courey = driver) driving S lost control on icy road. 2011 Freightliner semi (King = driver) also driving S attempted to maneuver out of way. Freightliner & its trailer slid off road & into ditch. Front ends of both vehicles damaged	Steese Hwy just N of Fairbanks
102	11-Dec-13	29-Nov-13	8:13 PM	State troopers	Black GMC SUV went into ditch	Nordale Rd area
103	11-Dec-13	30-Nov-13	4:51 AM	Fairbanks police	Gray Ford Explorer drove through fence	Market St
104	11-Dec-13	29-Nov-13	4:14 PM	Fairbanks police	Blue 2007 Cadillac CTS involved in two-vehicle crash	Phillips Field Rd near Chena River
105	13-Dec-13	4-Dec-13	3:44 AM	Fairbanks police	1998 Jeep Cherokee hit guardrail three times and spun around 180 degrees; driver found asleep behind the wheel; he remembered starting to slide.	Badger Rd exit of Richardson Hwy (6 mi or 12 mi?)
106	27-Dec-13	23-Dec-13	12:01 AM	Fairbanks police	Rear ended a vehicle stopped for red light	Noble St & 2nd Ave
107	27-Dec-13	20-Dec-13	7:31 AM	State troopers	Black Toyota Tundra drove into ditch	West Chena Hills near Forrest Dr
108	1-Feb-13	29-Jan-13	6:54 PM	Fairbanks police	Collision with another vehicle	Peger Rd. and Airport Way
109	7-Mar-13	2-Mar-13	Friday morning	Fairbanks police	1997 Chevy Astro Van struck 2001 Volkswagen Jetta and 2010 GMC Sierra	Jetta: Airport Way & Washington Dr; GMC: Washington Dr.
110	4-Apr-13	6-Oct-13	2:09 AM	Fairbanks police	Gray 1997 F-150 pickup struck College Rd. overpass at Johansen Expy	College Rd. at Johansen Expwy
111	4-Apr-13	31-Mar-13	3:59 PM	Fairbanks police	Blue 2005 Dodge pickup truck struck median; woman passenger injured; driver said he crashed because another vehicle cut him off.	College Rd. & Eleanor Ave.
112	17-May-13	?	?	Fairbanks police	Dodge Durango SUV struck victim as he got out of his (victim's) vehicle; driver then got out and began punching victim.	?
113	18-Jun-13	15-Jun-13	3:37 PM	Fairbanks police	Vehicle pulled on to highway in front of motorcycle; cycle struck vehicle	Richardson Hwy. near Fairbanks
114	18-Jul-13	17-Jul-13	3:04 AM	State Troopers	53 yr old woman passenger was ejected from (or got out of) red pickup truck and possible hit by the truck	Gravel pit at 25 mi. Chena Hot Springs Rd.
115	19-Jul-13	17-Jul-13	3:30 AM	State Troopers	1996 Chevrolet Blazer driving north; forced off road by vehicle that crossed into its lane; rolled; ended up in trees beside road; offending vehicle did not stop.	154 mi. Parks Hwy S of Cantwell
116	26-Aug-13	24-Aug-13	7:50 PM	State Troopers	4 motorcycles passing through construction zone; one struck a belly dump that was turning	Chena HS Rd at Nordale Rd construction site
117	5-Sep-13	28-Aug-13	6:58 AM	State Troopers	Blue Hyundai Sonata struck moose as it crossed road	Badger Rd.
118	21-Sep-13	16-Sep-13	Monday evening	Fairbanks police	Hit and run; "dark SUV" struck 7 year old girl	Lathrop St. & Kennicott Ave.
119	21-Sep-13	20-Sep-13	about 1:0 PM	Fairbanks police	Hit & run; struck 9 year old boy riding bicycle; driver stopped, told kids to be more careful, refused to give them a ride home, said he was late for work, and left the scene.	Frontage Rd. by Pioneer Park
120	29-Sep-13	27-Sep-13	3:15 PM	AKDOTPF	Carpenter Contracting dump truck struck bridge beam; working on nearby Birch Creek boat launch	144 mi Steese Hwy
121	2-Oct-13	24-Sep-13	?	State Troopers	Red Dodge truck spinning circles; struck utility pole guy wire	Parking lot on Schacht St.
122	19-Oct-13	19oct13 (?)	early Saturday	State Troopers	Vehicle-moose collision; Blue Subaru; driver died	Sheep Creek Rd.

Fairbanks F					
Traffic Acci					
flb 13may1					
Incident No.	Name(s)	Injuries	Follow-up/Treatment	Damage $	Notes/comments
1	Joshua Matthew Beane, 29		Father took him to hospital for evaluation		Probable DUI, but report was too delayed to administer chemical breath test
2		Multiple people transported to FMH with non-life-threatening injuries			Moose salvaged by local charity
3	Fred John, 70 (driver); Robert Henderson, 32 (pedestrian)	Troopers transported Henderson to FMH to get checked			John not cited
4		None reported			
5	Robert Gusty, 20 (small car driver; deceased); Brad Gusty, 19 (passenger (injured)	R. Gusty deceased; B. Gusty serious but non-life-threatening injuries			
6	Joshua Anderson (military vehicle driver)	Van driver	Treated at Delta Family Medical Clinic		Anderson cited for basic speed violation
7	Jason Lee Sweitzer, 30				Sweitzer was charged with DUI
8	Michele Lynn Rowland, 20				Rowland was charged with DUI
9	Eric Andrew Walsh, 29	none reported			Walsh charged with DUI & leaving the scene
10	Ulysses Kriopf-Castillo, 22 (driver)	None, except dead moose			Moose donated to charity
11	David Uvyuaq Kasak, 48				Charged with DUI, driving with revoked license, and violating court-ordered release condition not to drink alcohol
12	Richard Dean Ourada, 73				Charged with DUI
13					
14		Soldier suffered serious life-threatening injuries	Evacuated to FMH		No indication of drugs or alcohol
15	Beltran Daniel Rose, 49				Rose charged with DUI, leaving the scene and making a false report
16	Matthew Borgman, 49 (Kenworth); John Witt, 42 (Ford); Howard Elmer, 54 (Mercedes)	Minor injuries to Witt. Treated at scene		Minor damage to all three vehicles	
17					
18					
19					
20	Loren Howard, 48	Life-threatening injuries	Taken to FMH		Alcohol is considered a factor; not wearing a helmet
21	John Lerandeau, 51 (Chevy driver)	Lerandeau -- minor injuries but declined medical treatment		Chevy totaled	
22	Jordan W. Evans, 22 (driver of Jeep; was supposed to be warming vehicle up for owner)				Evans charged with DUI and leaving the scene
23	Gantumur Tsogt, 47				Tsogt charged with DUI
24	Misty Rose Beetus, 34				Beetus charged with DUI, leaving the scene and driving with a revoked license
25	Jason Lawrence Cantoni, 40				Cantoni charged with DUI
26	Peter Lochner, 24	None except dead caribou		$20,000 to van	Was wearing his seat belt
27	Peter Alfred Coleman, 52			Damage to wall, glasses & dishes more than $10,000	Driver left the scene; later apprehended by Troopers on Geist Rd at 2 AM
28		One person transported to FMH as precautionary measure; another treated at the scene			
29	Thomas Smith, 38	None to Smith; dead moose			Vehicle was towed from the scene
30	David A. Yudin, 21 (driver of passenger vehicle; fatality); Michael S. Luper, 25 (driver of semi)	Fatal to Yudin; no injuries to Luper			Impairment is not believed to be a factor
31	Harry David, 64 (driver who attempted to pass); Erica Burkhead, 33 (oncoming lane)	A child was transported from scene for medical evaluation		Both vehicles totaled	David cited for passing in no-passing zone
32	Thomas Smith, 48	None		Car was towed from scene	Moose donated to charity

Fairbanks F					
Traffic Acci					
flb 13may1					
Incident No.	Name(s)	Injuries	Follow-up/Treatment	Damage $	Notes/comments
33		None			DOTPF made temporary fix to signals
34					
35		Both drivers in collision taken to FMH; non-life-threatening injuries			
36	Merrill Herbert Moses, 51				Moses charged with DUI
37	Clint Mayeur, 50	None to Mayeur or moose			Moose walked away
38	Lonnie Triplet, 38 (Malibu); Misty Nouchi, 33 (Sport-Trac)	Both drivers & 3 passengers in Sport-Trac transported to FMH			Alcohol not believed to be a factor
39		Driver of vehicle was hospitalized			
40	Robert Gusty, 20	Fatal to Gusty			
41	Dewayne Hailey, 26			$200-300 to mailbox; $2,000 to Mustang	Hailey charged with 1st degree vehicle theft, criminal mischief, and failure to report an accident
42	Michael Lee Gaddis, 60				Gaddis charged with DUI and driving with revoked license
43	Jason Edward Thomasson, 37 (Chevrolet driver)				Thomasson charged with DUI
44	Jesse Allen Rutigian, 30				Rutigian charged with DUI
45	Madison N. Smith, 18				Smith charged with DUI
46	Joe Fortess (Nenana Fire Chief (not the driver)); Michelle Marie Solomon, 26 (Durango driver)	Solomon injured shoulder & face; patient in ambulance asleep and not injured in this accident			Ambulance was headed to FMH; Solomon charged with DUI in September 2013
47	Roy K. Ponder, 57; David A. Kincaid, 57; two passengers Teresa A. Ponder, 55, (wife) & Molly M Kincaid, 24 (daughter)	both drivers died; both passengers has non life-threatening injuries	Teresa Ponder to FMH by Cantwell ambulance; Molly Kincaid to Wasilla hospital by Trapper Creek ambulance		Snowy; 20 to 30 degrees
48	Todd R. Dean, 40	One driver injured			Dean charged with DUI
49	Minor Smith, 52 (VW driver); Darla Coghill, 57 (GMC driver); one GMC passenger	Serious but non-life-threatening (Smith)	Smith transported to FMH; Coghill and passenger to FMH in private vehicle		
50	Not identified			$26 - 30,000	Pipes broken but no fuel spilled
51	Daniel Michael Sproule, 28				Sproule arrested and charged with DUI
52	Christine Dee Palm, 50				Palm was arrested and charged with DUI
53	Joshua Robert Bean, 24				Bean charged with DUI
54	Judith Beeman, 50 (driver who drove into rear end of another vehicle)				Beeman arrested for DUI
55	Robert Harrison Brook, Jr., 63				Brook arrested for DUI
56	Charles Gross, 22 months	fatal to Gross	taken to Family Medical Clinic; later to Providence Medical Center Anchorage where he died May 15		
57	Robyn Blemke, 12 (deceased); unnamed 13 year old passenger injured	fatality; passenger sustained minor injuries			Both were wearing helmets
58					
59	Gail Erickson, 48	Fatality			She was wearing appropriate safety gear.
60	Matthew David Freedle, 35	unspecified head injury	transported to FMH; then flown to Providence Alaska Medical Center, Anchorage; in critical unit		Investigation continuing as of 4 June; Died weekend of 22-23 June from injuries
61	Gordon Andrew Taylor, 27	Bleeding from forehead	Transported to FMH	"Heavily damaged"	Taylor charged with DUI
62	Julie Ann John, 40 (driver of Dodge)				John arrested for DUI and felony drugs misconduct
63	Renita Lynn Peter-Allen, 20 (driver)	Driver found at FMH being treated for injuries; passenger found at scene bleeding from mouth and with scrapes and bumps on his face			Peter-Allen charged with DUI & 3rd degree felony assault
64	Carla Converse, 31	"critical"	Emergency crews took Converse to FMH		Not wearing helmet

Fairbanks F					
Traffic Acci					
flb 13may1					
Incident No.	Name(s)	Injuries	Follow-up/Treatment	Damage $	Notes/comments
65	Dwayne Alan Headley, 41	None reported			Headley charged with felony DUI (because of past DUI convictions), driving with revoked license, and leaving the scene of an accident
66	Roy D. Orvist, 63 (cycle, fatality); John A. Sharps Jr., 67 (motorhome)	fatal to Orvist			Drugs and alcohol not suspected
67	David Mutchler, 24 (bicycle); Suen Wu, 48 (Jeep); Michael Beard, 32 (Chevy)	None			Mutchler was wearing a helmet
68	John Penyea				Penyea charged with DUI, leaving the scene & driving a vehicle without a court-ordered ignition interlock. PROBABLY SHOULD BE CONSIDERED TWO CRASHES
69	Trevor John McGurl, 23				McGurl charged with 3rd degree felony assault & DUI
70		suspected minor injuries to boy	Boy taken to FMH		No citations -- conflicting accounts of the crash
71	Troy Clinkenbeard, 48				Charged with DUI & leaving the scene of an accident; transported to Fairbanks Correctional Center
72	4 motorcyclists: Charlie Potter, 66; Mark Elliott, 47; Randy Rocheleau, 60; Dale Leedom, 51; two drivers: Buddy Garrett, 58 (Ford 150); Ashley Wensel, 27 (Malibu).	Potter seriously injured: to FMH; Elliott minor injuries: to FMH; Rocheleau minor injuries treated at scene; Leedom not injured. Garrett and Wensel not injured.			None of motorcyclists was wearing a helmet; both drivers were wearing seatbelts.
73		One fatality			Military personnel; identities not given in this report (waiting for DOD to notify next of kin)
74	Solomon Dru Stone, 41				Stone charged with DUI
75	Melvin Ilber, 62; Michael Vogel, 56	Vogel: broken ribs & severed finger	Air National Guard heli copter took Vogel to FMH (on 2nd try; first had mechanical problems)		
76	Marsha Alice Andon, 31				Charged with DUI & misdemeanor drugs misconduct
77	Ryan Arthur Brown, 29				Brown charged with DUI, weapons misconduct & failure to give immediate notice of an accident
78	Vincent John Cee, 39			Damage from rollover	Charged with DUI
79	Michael Ryan Bittorf, 27				Bittorf charged with DUI, refusal to submit to chemical breath test, and three counts of violating release conditions
80	Roger Ketzler, 56	minor	transported to FMH	cracked tanker hull, allowing small oil leak	Cited for not wearing seat belt and failure to exercise due care
81		minor injuries			Moose killed and donated to charity
82	Penny Farina, 33				Charged with DUI
83	Brandon Shane Heil, 21		transported to FMH		Arrested on DUI charge
84			Transport by Army helicopter		
85	Jennifer Santell, 35 (Jeep) (fatal); Jean Peif, 54 (Ford)	fatal to Santell; no injuries to Peif			Difficult conditions -- area's first significant snowfall; no indication that alcohol was a factor
86	Terry Froese		To emergency room; then several surgeries, including ankle surgery		Dog had to be euthanized
87	Christopher Duane Turco, 34 (driver); his mother, 7- and 6-year olds	Three passengers injured			Charged with felony eluding: failure to stop at direction of an officer
88	Thomas Richard Joseph Briggs, 23				Charged with DUI & leaving the scene of an accident
89	Russell Bowman, 45	None			Cited for negligent driving
90	Matthew Lee Smith, 29 (driver); Nancy Kay Holtry (passenger)				Smith arrested for DUI; Holtry arrested for assault on law enforcement officer & disorderly conduct
91	Lyle Irman Ludwig, 52	Injury to motorcycle passenger	Injured medivaced to Anchorage		Ludwig charged with DUI
92	Conrad J. Moses, 22			Totaled	Charged with DUI and violating court order not to drink alcohol

Fairbanks F					
Traffic Acci					
flb 13may1					
Incident No.	Name(s)	Injuries	Follow-up/Treatment	Damage $	Notes/comments
93	Nicole Elizabeth Meyer Crites, 34	Taken to FMH	Medivaced to Providence Alaska Medical Center, Anchorage		Charged with DUI
94	Norman Fred Lowery, 35				Charged with DUI
95	Linda Hering, 58 (Subaru driver)	head trauma injury	injured taken to FMH; later to Anchorage		Hering arrested for DUI and 3rd degree felony assault
96	William F Revely IV, 24	Fatality; 2 passengers with minor injuries			Speed and alcohol appear to be factors.
97	Kenneth Mercer, 52				blood alcohol 0.000; Mercer said he takes Lithium & another medication.
98	Joel Edwin Ratchford, 26				Ratchford charged with DUI
99	Christopher William Dalluge, 33				Dalluge charged with DUI & leaving the scene
100	Henry Lamont Covington Mason Jr, 24	(See description)			Charges: failure to stop at direction of an officer, leaving the scene of an injury accident, two counts of failure to report a collision, and two counts of assault in the fourth degree. Taken to Fairbanks Correctional Center. THIS SHOULD PROBABLY BE COUNTED AS THREE ACCIDENTS.
101	Mark Courey (Ford); Michael King (Freightliner)	None			
102	Lauren Lee Hamsley, 50				Hamsley charged with DUI
103	Karin Elizabeth Amundson, 20				Amundson charged with DUI
104	Ellen Dorinda Madero, 27				Madero charged with DUI
105	Donald Joe Ludwig, 29				Ludwig charged with DUI & misdemeanor drugs misconduct
106	Freddie Thomas Lampe, 44				Lampe arrested for DUI
107	David Lee Evans, 54				Evans arrested for DUI
108	Johny Paul Ginder, 64				Charged with driving under the influence; 0.199 breath alcohol
109	Edward E. Johnson, 70 (driver of Astro)				Johnson charged w DUI and weapons misconduct; 0.179 breath alcohol
110	Arthur Nicholas Busch, 27	Yes	Taken to Fairbanks Memorial Hospital		Busch charged w DUI; 0.134 blood alcohol
111	Robert M. Coucoules, 22	Passenger suffered facial cut; and her brain hurt	Taken to Basset Army Community Hospital	Heavy damage to pickup	Coucoules charged with third-degree felony assault and DUI; refused to take chemical alcohol test
112	Justin Allen Skinner, 28 (driver)	Victim was hit on his arm.			Skinner charged with misdemeanor assault
113	John Riley (vehicle driver); cyclist not named in report	cyclist -- serious but not life threatening	Cyclist taken to Fairbanks Memorial Hospital		Vehicle driver cited for failure to yield to oncoming traffic
114	Mary Crawford, 53 (passenger); Jeffrey Bizzarro, 46 (driver)	Serious injuries to Mary Crawford	Taken to Fairbanks Memorial Hospital		Bizzarro arrested for DUI and refusing to provide breath sample
115	Harley Mills, 24 (driver); Sherry Mills, 25; 4 children ages 5,5,8&9	Serious injuries to Sherry Mills and one 5 year old; less serious to other 4	Seriously injured medivaced to Providence Hospital; less seriously injured taken to Mat-Su Regional Hospital in Palmer		
116	Robert Organ, 47 (cyclist)	Non-life threatening	Transported to Basset Army Hospital		
117	Monica Benison, 45	Minor	Taken to Fairbanks Memorial Hospital		Moose salvaged for charity
118	Rashid Akbar, 19 (aka Glasco)	Head injury	Child transported to Fairbanks Memorial Hospital; later flown to Providence Alaska Medical Center in Anchorage		Arrested after an "abbreviated foot pursuit" and charged with felony; $50,000 bail
119		Broken leg	Treated at Fairbanks Memorial Hospital		
120				Damage to critical support members in center of bridge	Weight limits have now been imposed.
121	Joshua Lane Dinwiddie, 31				Charged w felony DUI, criminal mischief & driving w revoked license; 0.291 breath alcohol
122	Brittney Zabriskie, 23	Fatality			

Ketchikan 2013 Media Discourse Analysis						
Traffic Accidents						
flb 24Nov2017						
Incident No.	Ketchikan Daily News Publish Date	Occurrence Date	Occurrence, Report or Response Time	Reported by	Description	Location
1	12-Jan-13	2-Jan-13	6:12 PM	State Troopers	49 yr old Thorne Bay man driving north in 2001 Suzuki GVK; lost control due to ice road; vehicle flipped & came to stop	Boundary Rd, Klawock
2	22-Jan-13	18-Jan-13	6:56 AM	State Troopers	30 yr old Ketchikan man driving 1995 Jeep Wrangler; hit patch of black ice; slid into ditch & rolled over	3.3 mi S Tongass Hwy
3	24-Jan-13	17-Jan-13	10:45 AM	Ketchikan Police	Hit & run accident involving 2 vehicles	3800 block Tongass Ave
4	30-Jan-13	29-Jan-13	10:10 AM	Ketchikan Police	2 yr old boy "bumped" by car backing out of driveway	5100 block Shoreline Dr
5	22-Feb-13	3-Feb-13	11:46 AM	Ketchikan Police	Car accident; driver fled; police found him -- 29 yr old Ketchikan man -- short distance away	5000 block N Tongass Hwy
6	28-Feb-13	25-Feb-13	10:00 PM	State Troopers	Ford F_150 in ditch	Near mi 5 Craig-Klawock Hwy
7	9-Mar-13	7-Mar-13	3:52 PM	State Troopers	20 yr old Thorne Bay man driving pickup northbound; hit patch of ice; slid off road; rolled over into ditch	Near mi 7.5 mi Thorne Bay Rd
8	9-Mar-13	8-Mar-13	8:00 AM	State Troopers	23 yr old Klawock woman driving sport utility vehicle southbound; hit patch of ice; slid off road; rolled over into ditch	Mi 17.5 Klawock-Hollis Hwy
9	12-Mar-13	10-Mar-13	9:45 AM	State Troopers	17 yr old girl driving sport utility vehicle; hit patch of ice; lost control; slid off road; struck guard rail	Thorne Bay Rd
10	15-Mar-13	13-Mar-13	5:52 AM	State Troopers	35 yr old Ketchikan man driving a van; crossed centerline; sideswiped oncoming pickup truck	Near mi 12 North Tongass Hwy
11	26-Mar-13	21-Mar-13	11:30 PM	State Troopers	Found man who had driven his vehicle into a ditch	Old Ward Lake Rd
12	2-Apr-13	29-Mar-13	12:57 PM	State Troopers	19 yr old Ketchikan man driving north in two-door car; turned onto Sunset at high rate of speed; lost control of vehicle. 60 ft of skid marks on highway; then traveled another 30 ft over an embankment before coming to a stop	Intersection of N Tongass Hwy & S end of Sunset Dr
13	4-Apr-13	2-Apr-13	5:51 AM	State Troopers	60 yr old Craig man driving pickup slowed to turn left; sport utility vehicle driven by 37 yr old Klawock man attempted to pass; collision resulted. SUV crashed into a guard rail.	Near intersection of Boundary & Airport Rds, Klawock
14	10-May-13	7-May-13	3:45 PM	State Troopers	Semi truck driven by 44 yr old Craig man collided with pickup truck driven by 60 yr old Naukati man.	Naukati Detour Rd
15	14-May-13	?	12:45 AM	State Troopers	Drove light utility vehicle into utility pole, causing it to fall onto the road	Coffman Cove
16	14-May-13	10-May-13	1:30 PM	State Troopers	57 yr old Thorne Bay man driving pickup north; talking to passenger. Vehicle drifted onto shoulder; overcorrected; crossed centerline; rolled over; landed in ditch.	Near mi 12 Thorne Bay Rd
17	21-May-13	18-May-13	1:45 AM	State Troopers	Driving S on N Tongass Hwy; lost control; ran off road	Near intersection of N Tongass Hwy & Reville Rd
18	21-May-13	19-May-13	8:12 AM	State Troopers	Van driving west struck deer that was crossing road; collided with driver's side headlight & door	Revilla Rd, approx 1/4 mi from N Tongass Hwy
19	21-May-13	19-May-13	11:32 AM	State Troopers	Driving pickup truck west; shifted gears; engine died, steering locked up while on curved section of road. Struck embankment & overturned	Ward Lake Rd
20	24-May-13	22-May-13	2:41 AM	State Troopers	Crashed while riding motorized bicycle	32 yr old Ketchikan man
21	5-Jun-13	4-Jun-13	morning	?	Truck carrying concrete overturned on shoulder	East Hines Lane

Ketchikan 2013 Media Discourse Analysis						
Traffic Accidents						
flb 24Nov2017						
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22	6-Jun-13	1-Jun-13	6:45 AM	State Troopers	21 yr old Hydaburg man driving sport utility vehicle east;; hit guardrail	Near mi 15 Klawock Hollis Hwy
23	6-Jun-13	2-Jun-13	7:17 AM	State Troopers	38 yr old Ketchikan woman driving light utility vehicle north; struck deer	S Tongass Hwy near Mountain Point
24	11-Jun-13	8-Jun-13	11:07 AM	State Troopers	27 yr old Saxman man drove van off road & into utility pole	Killer Whale Ave
25	14-Jun-13	13-Jun-13	4:50 PM	State Troopers	28 yr old Craig man drove van off road	Mi 2.5 Port Saint Nicolas Rd in Craig
26	18-Jun-13	16-Jun-13	10:45 AM	State Troopers	20 yr old Ketchikan man misjudged the turn and drove into ditch	Intersection of Franklin Rd & S Tongass Hwy
27	25-Jun-13	19-Jun-13	6:00 PM	State Troopers	17 yr old Ketchikan boy driving pickup truck north; tried to slow down but brake pedal went to the floor; hit sport utility vehicle that was slowing to turn off highway, driven by 67 yr old woman	Near mi 8 N Tongass Hwy
28	25-Jun-13	21-Jun-13	8:15 AM	State Troopers	22 yr old Hydaburg woman driving pickup truck west; traveling too fast; lost control at a curve; crossed centerline; hit guardrail; flipped over into a ditch.	Mi 15.5 Klawock-Hollis Hwy
29	25-Jun-13	23-Jun-13	2:45 PM	State Troopers	18 yr old Ketchikan man texting while driving van north; drove off road and crashed into some trees	Mi10 N Tongass Hwy
30	27-Jun-13	24-Jun-13	4:30 PM	State Troopers	17 yr old California man driving rented light utility vehicle; speeding; lost control; went into ditch; rolled onto its side	Near mi 8 Harriet Hunt Rd
31	27-Jun-13	26-Jun-13	1:00 AM	State Troopers	Vehicle traveling north; left road; struck several mailboxes; was gone by the time troopers arrived	Mi 11 N Tongass Hwy
32	2-Jul-13	28-Jun-13	?	State Troopers	Industrial accident -- forklift driver lost control at a business; rolled onto its side	Bear Claw Ave in Saxman
33	3-Jul-13	1-Jul-13	7:05 AM	State Troopers	63 yr old Ketchikan woman driving south crossed centerline; collided with truck driven by 43 yr old Ketchikan man driving north	Near mi 7.2 N Tongass Hwy
34	5-Jul-13	2-Jul-13	1:30 PM	State Troopers	19 yr old Ketchikan man driving south; lost control while turning	Mi 10.7 S Tongass Hwy
35	9-Jul-13	8-Jul-13	2:25 PM	State Troopers	57 yr old Anchorage woman traveling north; lost control; left road; flipped over into ditch	Mi 4.3 Boundary Rd, Klawock
36	27-Jul-13	25-Jul-13	4:00 PM	State Troopers	56 yr old Naukati man drove off road	Near Naukati
37	21-Aug-13	19-Aug-13	9:00 AM	State Troopers	74 yr old Coffman Cove man driving pickup truck north crashed when he swerved to avoid hitting a deer; struck a rock wall	Near mi 8.5 Coffman Cove Rd
38	29-Aug-13	27-Aug-17	4:34 PM	Ketchikan Police	57 yr old Ketchikan man drove vehicle that struck another moving vehicle; left area driving west, and was involved in second accident	Corner of Deermount & Stedman Streets
39	29-Aug-13	27-Aug-13	4:34 PM	Ketchikan Police	57 yr old Ketchikan man drove vehicle that struck another moving vehicle	2200 block Tongass Ave
40	17-Sep-13	15-Sep-13	6:45 PM	Ketchikan Police	Truck ran over 6 mailboxes; 55 yr old Ketchikan man	3.3 Mi S Tongass Hwy
41	9-Oct-13	8-Oct-13	5:20 PM	Fire Department	Red Pontiac caught fire	Parking lot of Ketchikan Public Library, 1110 Copper Ridge Lane
42	22-Oct-13	18-Oct-13	8:00 AM	State Troopers	17 yr old Naukati boy driving toward Hollis; brake failure; left road; struck utility pole	17.5 mi Craig-Klawock Hwy

Ketchikan 2013 Media Discourse Analysis						
Traffic Accidents						
flb 24Nov2017						
Incident No.	Ketchikan Daily News Publish Date	Occurrence Date	Occurrence, Report or Response Time	Reported by	Description	Location
43	25-Oct-13	6-Oct-13	6:41 PM	Ketchikan Police	Vehicle struck another vehicle; 25 yr old Ketchikan man	Thomas Basin establishment
44	25-Oct-13	22-Oct-13	1:46 AM	Ketchikan Police	Vehicle struck building; 19 yr old Ketchikan man	Fair St address
45	5-Nov-13	2nov13 (or 3rd?)	6:55 PM	State Troopers	50 yr old Naukati man driving sport utility vehicle; left road; entered ditch; re-entered roadway; crossed both lanes; struck embankment of opposite ditch	near mi 22.5 North Island Rd
46	20-Nov-13	19-Nov-13	late afternoon	School superintendent & fire dept	School bus "slipped a little because of snow conditions;" bumped a vehicle that was stopped so a youth could get in; vehicle's door started to close, causing minor injuries	6200 block Roosevelt Dr
47	20-Nov-13	14-Nov-13	3:00 PM	State Troopers	66 yr old Ketchikan man driving north; left road & rolled down embankment	Mi 3.2 Thorne Bay Rd
48	18-Jan-14	24-Dec-13	8:41 PM	Ketchikan Police	"traffic accident"; 44 yr old Ketchikan man	N Yorktown Dr

Ketchikan 2					
Traffic Acci					
flb 24Nov2					
Incident No.	Name(s)	Injuries	Follow-up/Treatment	Damage $	Notes/comments
1		Not given	Driver taken by a good samaritan to Alicia Roberts Medical Ceter, Klawock, for treatment		
2		Uninjured		$6,000 est	
3					20 yr old Ketchikan man caused accident; issued misdemeanor citation for driving without a license
4		"minor"	Taken by ambulance to hospital; gone by the time police arrived		No charges filed
5					Arrested for driving with suspended license & violating conditions of his release; booked at Ketchikan Correctional Center; $500 bail
6	Kevin Dau, 38	Yes	Taken to Alicia Roberts Medical Center for treatment	Yes; not expected to be a total loss	Wet conditions but otherwise not hazardous
7		Refused medical treatment at scene	Given ride to local medical clinic; treated & released	$8000 est	Was wearing seat belt
8		Declined medical treatment or transport		$5000 est	Was wearing seat belt
9		No injuries		"Moderate" damage but drivable	Driver & passenger were wearing seat belts.
10		No injuries		Both vehicles towed from scene	Van driver drunk & driving w revoked license. Arrested & taken to Ketchikan Correctional Center
11					Driver had drug paraphernalia; crystal substance; street drug; "Troopers are investigating."
12		None to driver or his 19 yr old passenger		Car towed from the scene	Driver said they were wearing seat belts; passenger said they weren't. Two citations: speeding & driving in violation of his learner's permit.
13				Both vehicles sustained "moderate" damage but remained functional.	Klawock man cited for negligent driving and failure to provide proof of insurance.
14				Both had moderate damage but were able to drive away.	Both were wearing seat belts.
15	Nicholas Staller, 25	Driver & passenger uninjured		Vehicle a total loss; $7000 loss to Coffman Cove grid (power pole)	Staller arrested for drunk driving & failure to report an accident; taken to Craig jail; released. Both were wearing seat belts (they said).
16		Driver transported to clinic in Klawock; passenger uninjured		Total loss	Driver cited for failure to use due care.
17	Kristin Peterson, 23	Fire dept transported her to hospital; neck & back pain			Was wearing seat belt
18	Kristin Buchanan, 25	None to driver or passenger; fatal to deer			Both were wearing seat belts. Deer salvaged by local charity
19	Austin Dixon, 18	None		Total loss	Was wearing seat belt. Cited for failuire to show proof of insurance
20		Head & facial injuries	Troopers provided first aid; N Tongass Fire Dept then took him to Ketchikan Medical Center		
21					No one was in the truck when it overturned.

Ketchikan 2					
Traffic Acci					
flb 24Nov2					
Incident No.	Name(s)	Injuries	Follow-up/Treatment	Damage $	Notes/comments
22		None		Est $3000 to vehilce & $2000 to guardrail	Driver & passengers were wearing seatbelts. Driver cited for collision & failure to show proof of insurance. 21 yr old passenger arrested for having consumed alcohol in violation of conditions of his relapse -- taken to Craig jail
23		None to driver; fatal to deer		Side bumper, fender flaring & quarter panel; est $1000	Wearing seat belt. Deer salvaged by local charity
24		None		Est $2000 to vehicle	Was wearing seatbelt. Damage to pole & electric line to house undetermined at press time
25		Minor	Taken to clinic in Klawock	Minor damage	Van impounded for further investigation
26		None reported		None reported	Cited driver for driving without a license
27		No injuries		Truck towed from the scene	Pickup driver cited for defective brakes
28		Yes	Taken to nearby clinic for treatment	Est $6000 to vehicle; $2000 to guardrail	Was wearing seat belt. Cited for speeding
29		Driver treated at scene for minor injuries	2 child passengers taken to Ketchikan Medical Center for evaluation as a precaution	Total loss	All were wearing seat belts.
30		None		"Substantial damage;" towed from scene	Driver and passengers were wearing seat belts. Driver cited for speeding
31					
32		Yes	S Tongass Volunteer Fire Dept transported driver to Ketchikan Medical Center		
33		Neither driver required medical attention		"Disabling damage" to both vehicles -- quartier panels & driver's side tires	Cited woman for negligent driving & failure to provide proof of insurance; cited man for driving without a seat belt
34		None			Driver & passenger were wearing seat belts. Driver cited for speeding
35		Possible injuries	Driver taken to hospital for possible injuries	Est $8000	Was wearing seat belt
36					Driver arrested for drunk driving; taken to Craig jail; released
37		Un injured; refused medical treatment		Est $10,000	
38					Same driver; 2 accidents investigated 4:34 PM 27aug13
39				Minor damage to both vehicles	Same driver; 2 accidents investigated 4:34 PM 27aug13; after 2nd accident, arrested for drunk driving; taken to Ketchikan Correctional Center; released
40				$105 est	Arrested for drunk driving & 4 counts of reckless endangerment. Held at Ketchikan Correctional Center on $1500 bail. 2 children under 10 in truck with him
41	Leta Trask	None		Entire front end; scorch marks on pavement	Is this an "accident?"
42		Driver received minor injuries		Total loss	Driver & passenger were wearing seat belts.

Ketchikan 2					
Traffic Acci					
flb 24Nov2					
Incident No.	Name(s)	Injuries	Follow-up/Treatment	Damage $	Notes/comments
43					Arrested driver for drunk driving & 2 counts of reckless endangerment; taken to Ketchikan Correctional Center; released
44					Arrested driver for drunk driving; taken to Ketchikan Correctional Center; released
45			Taken to Ketchikan Medical Center for treatment		"believe alcohol was a factor ...;" Not wearing seatbelt. Driver had been arrested earlier that day for domestic assault; held at Craig jail until arraignment and release
46		Minor to youth	Transported to hospital	Both vehicles were able to leave the area	
47		Yes	Flown to Ketchikan Medical Center for treatment		
48					Arrested driver for drunk driving & leaving the scene; taken to Ketchikan Correctional Center; released