STATE OF NORTH CAROLINA

TRAFFIC RECORDS ASSESSMENT

JANUARY 29 – FEBRUARY 2, 2007

National Highway Traffic
Safety Administration
Technical Assessment Team

Leslie Nelson-Taullie
Bob Scopatz
Langston A. Spell
Carol Wright
Jack Zogby

NOTES AND DISCLAIMERS

NOTE: The terms "Highway Safety Information System" and "Traffic Records System" are interchangeable. This Advisory uses the term, "Traffic Records System" to be consistent not only with its traditional use, but also with references in many of the publications and documents listed at the back of this Advisory, as well as its use in various pieces of legislation.

NOTE: The term “crash” is used in lieu of the term “accident” in this document. Many of the references cited in this document use the term “accident” as do many of the laws defining crashes or accidents at the state level. This advisory recommends that states begin to use the term “crash” and to reflect that change in legislation.

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EXECUTIVE SUMMARY

Upon request by the Director of North Carolina's Governor's Highway Safety Program (GHSP), the National Highway Traffic Safety Administration (NHTSA) assembled a team to facilitate a traffic records assessment. Concurrently the GHSP carried out the necessary logistical and administrative steps in preparation for the onsite assessment. A team of professionals with backgrounds and expertise in the several component areas of traffic records data systems (crash, driver/vehicle, traffic engineering, enforcement and adjudication, and injury data systems) conducted the assessment January 29 to February 2, 2007.

The scope of this assessment covered all of the components of a traffic records system. The purpose was to determine whether North Carolina's traffic records system is capable of supporting management's needs to identify the State's safety problems, to manage the countermeasures applied to reduce or eliminate those problems, and to evaluate those programs for their effectiveness. The following discusses some of the key findings regarding the ability of the present traffic records system to support the management of the State's highway safety programs.

Crash Records System

The State of North Carolina processes approximately 300,000 crash reports annually. Crash data are entered into the Crash Reporting System (CRS) managed by the Division of Motor Vehicles (DMV) within the North Carolina Department of Transportation (NCDOT). Crash reports are received by DMV's Traffic Records Branch in both paper and electronic format, although at present almost all reports are received on paper. State law defines the crash reporting threshold as any crash involving an injury, fatality, or property damage of $1000 or more. The users of the crash component are reasonably confident that the system contains data on almost all reportable crashes.

The North Carolina Highway Patrol (NCHP) has been using field data collection software for many years, and all but about one-sixth of the patrol units have some form of mobile computer capability. No letter of agreement has yet been signed with the DMV to provide TraCS software for field data collection of crash reports. However, NCDMV remains supportive of NCHSP's efforts to identify resources to equip troopers. There have been no discussions at this time between NCHSP and NCDMV regarding an implementation timeline.

In addition to TraCS support, the DMV has resolved to support electronic data transfer into CRS from any crash reporting system that can meet their data requirements. To that end, they have produced a third party vendor package that includes documentation of the CRS data validation rules and the XML format required for uploading data into CRS. Non-TraCS users will be able to use the same upload process as TraCS users. DMV hopes to achieve 65 percent electronic crash data submission during 2007, with the largest implementation beginning in March as the NCHP rolls out TraCS to the troopers.

At the time of this Assessment, the 2004 Crash Facts report was the most recent edition available. Due to a backlog of 2005 crash data and the retirement of a key person, the 2005

report was not ready for final publication, but it was in final production (ready for typesetting and printing).

Driver and Vehicle Information

The driver and vehicle files satisfy and actually exceed all of the recommendations of the Advisory. Both files are updated in real time, share a Citizens Table with the personal identification of drivers and vehicle owners, and participate in the relevant AAMVAnet applications: NDR/PDPS, CDLIS, the National Motor Vehicle Title Information System, and a special AAMVAnet pilot to test image sharing with other states. The driver file is being perfected through a special project in which facial recognition software is a major factor in selecting possible duplicate records which are then further analyzed.

Injury Surveillance System

North Carolina has many of the key components of a comprehensive functional statewide Injury Surveillance System (ISS):

- Pre-Hospital Medical Information System (PreMIS)
- Trauma Patient Care data
- North Carolina Hospital Emergency Surveillance System (NCHESS)
- North Carolina Hospital Discharge Data System (NCHDDS)
- Mortality data

Not all of these components function with the same degree of maturity and comprehensiveness. However, it should be noted that North Carolina's injury data systems will emerge to become a truly comprehensive Injury Surveillance System in the near future if the current data collection and analysis initiatives come to fruition.

Citation Records System

The Administrative Office of the Courts (AOC) has been aggressively pursuing the development of systems that account for and track citations and contain the information necessary to evaluate the level of enforcement activity in the state and to monitor the Judiciary's processing of traffic cases. The present capabilities in place, such as the Automated Criminal and Infraction System (ACIS) case management system and the eCitation® application, allow the state to track the life cycle of a traffic citation from the distribution of the forms (or electronic batches of numbers) to an officer, to their issuance to offenders, to their disposition by a court, and their electronic transfer (where appropriate, e.g., convictions) to the DMV for placement on the driver history file.

The citations issued via the eCitation® application account for approximately 60 percent of the total citations submitted to the courts for adjudication.

Roadway Information System

North Carolina is experiencing rapid growth in population, vehicle miles traveled, and its economy. Vehicle miles traveled (VMT) on the State's public road system increased by nearly 40 percent from 1990 to 2000. This growth, along with other demographic trends and shifts in the economy, add to the State's transportation capacity challenges. These challenges are compounded by the fact that the North Carolina Department of Transportation (NCDOT) is

responsible for the second-largest state highway system in the country. The state-maintained system comprises over 79,000 miles of the 103,000 miles of public roads.

To address these challenges NCDOT developed several initiatives that will greatly enhance the ability of safety officials to fulfill their highway safety goals. These are: developing a uniform location reference system; establishing the GIS as the enterprise data system for NCDOT; and implementing the *Local Roads Data Collection and Dissemination* project.

Traffic Records Coordinating Committee

North Carolina's Traffic Records Coordinating Committee (TRCC) has been in existence since the mid1990s. In 2002 members of the committee began meeting informally to discuss solutions to address the challenges associated with the availability of traffic records data. However, the TRCC was reorganized and formally established in 2006, and it meets every two months.

The Committee includes an executive level and a technical level. This two-tiered level TRCC is critical for the state to properly develop, maintain, and track the progress of projects identified in the state's traffic records strategic plan that was required by the SAFETEA-LU legislation.

Administrative support for the Committee is provided by the Governor's Highway Safety Program (GHSP). Members of the Traffic Safety Unit of the Department of Transportation and the University of North Carolina's Highway Safety Research Center (HSRC) serve as the TRCC's co-chairs. Additionally, the state has a designated traffic records coordinator on the GHSP staff.

Strategic Planning

Overall the submitted Plan represents a valiant effort considering the time and resource restraints under which it was conducted. However, it will be difficult to show measurable progress for the projects submitted with the currently described tasks for each project. The tasks need more detail and should be presented in an appropriate project management format. Project management software, GANNT charts, or other project management tools should be examined for use by the TRCC.

Further, project managers should be identified by name rather than by title or by agency. Accountability is an important attribute in strategic planning to assure some level of achieving success for each project.

Following are the major recommendations for improvements to the State's traffic records system. The references indicate the sections of the report from which the recommendations are drawn.

MAJOR RECOMMENDATIONS

Crash Records Information System

Develop a life-cycle cost plan to maintain electronic crash reporting at the NCHP. **(Section 1-A)**

Establish a formal data quality control process for crash reports to include measurements of timeliness, completeness, and accuracy. Produce standard quality reports on a routine basis for use by the crash data managers, the TRCC, and major users. **(Section 2-A)**

Driver & Vehicle Records System

None

Injury Surveillance System

Obtain legislative budget support for the daily operation and maintenance of the PreMIS and Trauma Registry Systems. **(Section 1-F)**

Expedite the creation of a statewide electronic trauma registry data collection and data repository system. **(Section 2-F)**

Collaborate with all data sharing partners in developing protocols, memorandums of agreements, and data sharing methodologies that will enable the injury prevention and traffic safety community to conduct analytical and research activities as authorized users. This should be done under the guidance of the TRCC. **(Section 2-F)**

Citation Records System

None

Roadway Information Systems

Establish the GIS as an enterprise data system for NCDOT. **(Section 1-B)**

TRCC

Involve the Executive Level members more directly in the oversight of the TRCC's activities. **(Section 4-A)**

Encourage someone from among the membership of the Executive Committee to champion a comprehensive traffic records system. **(Section 4-A)**

Strategic Planning

Use this Assessment to identify deficiencies, and begin the process for the second year update and the 2007 408 grant submission. **(Section 4-B)**

Develop benchmark and performance measures in future *Plan* updates collaboratively with the project manager, other traffic records partners that may be affected by the project results, and the Traffic Records Coordinator to assure consensus is reached on the appropriate measures to be monitored for progress. **(Section 4-B)**

ACKNOWLEDGMENTS

The Traffic Records Assessment Team would like to acknowledge and thank Darrell Jernigan, Director, Governor's Highway Safety Program, for his support and able assistance in making this assessment possible.

Also, the team would like to recognize the contributions of Shannon Bullock, Highway Safety Specialist, Governor's Highway Safety Program for her expert guidance, planning, logistical arrangements and support in making this assessment effort a success.

Kay Banks support during the preparation phase of this report was especially appreciated. The team wishes to recognize her patience, skills, cooperative spirit, and sense of humor.

The team would like to thank Clayton Hatch, team facilitator, for giving a national perspective to the assessment process and its goals. The team would also like to thank Karen Scott, NHTSA Headquarters for her contributions.

The team would also like to thank the principal participants in the assessment for the time invested, the information they presented, and their candor in answering the many questions put forth by the team.

List of Presenters

Darrell Jernigan
Director
Governor's Highway Safety Program
(GHSP)

Don Nail
Assistant Director
GHSP

John Stokes
Grant Specialist
GHSP

Cornelia Kensak
Contract Manager
Division of Motor Vehicles

Sridhar Narasimhan
Programmer/Analyst
Division of Motor Vehicles

Ethel Keen
Assistant Director
Division of Motor Vehicles

Phil Worthington
Sergeant, Traffic Safety
Greenville Police Department

Bob Stevens
Lieutenant, Traffic Safety
Garner Police Department

John Farley
GIS Technology Section Manager
North Carolina Department of
Transportation (NCDOT)

Kevin Lacy
State Traffic Engineer
NCDOT

L. C. Smith
GIS Unit Director
NCDOT

Hardee Cox
Data Compilation Manager
NCDOT

Brian Murphy
Traffic Safety Project Engineer
NCDOT

Sharon Schiro
Director
NC Trauma Registry

Kay Sanford
Head, Injury & Violence Prevention Branch
NC Division of Public Health

Tony Spence
Assistant Director
Division of Motor Vehicles

Paula Windley
AO II
Division of Motor Vehicles

Barbara Webb
Assistant Director of Adjudication
Division of Motor Vehicles

Brenda Freeman
Assistant Director, Driver Services
Division of Motor Vehicles

Alison Roach
Vehicle Registration
Division of Motor Vehicles

Marvin Shelton
Manager
Division of Motor Vehicles

Michael Farmer
Information Technology Services
NCDOT

Srinivasarao Kandimalla
Information Technology Services
NCDOT

Cheryl Leach
Information Technology Services
NCDOT

Don Ferrier
Deputy Director
Driver & Vehicle Services

Doug Haynes
IT Manager, Driver
NCDOT

Carolyn Broadney
Technical Project Manager
NCDOT

Basil McVey
Court Services Director
North Carolina Administrative Office of the Courts (NCAOC)

Wanda R. Whitmore
Assistant Clerk
Granville County Superior Court

Connie Porter
Clerk of Court
Forsyth County Superior Court

Chekesha Hukins
Assistant District Attorney
Craven, Pamlico, and Carteret Counties

Bruce Lille
Assistant District Attorney
Mecklenburg County District Attorney's Office

Wanda Thomas
Applications Development Manager
NCAOC-Technology Services

Janet Greene
Applications Assistant Administrator
NCAOC

Beverly Gregory
eCitation Project Manager
NCAOC

Steve Kulig
eCitation Lead Programmer
NCAOC

Paul Cash
ACIS Project Manager
NCAOC

Jerry Burton
Sergeant
North Carolina State Highway Patrol

Bobby Croom
Senior Transportation Engineer
City of Raliegh

Stan Polanis
Director of Transportation
City of Winston-Salem

Joan Tuttle
Program Assistant V
Division of Motor Vehicles

Patsy Champion
Data Capture Supervisor
Division of Motor Vehicles

Bill Hall
Occupant Protection Manager
University of North Carolina Highway Safety Research Center (UNCHSRC)

Kelly Ransdell
Director
Safe Kids North Carolina

Ron Hughes
Program Director
Institute for Transportation Research and Educations

Eric Rodgman
Senior Database Analyst
UNCHSRC

Chad Lohmaier
Data Manager
Office of Emergency Medical Services

List of Observers

Joseph P. Geigle
Traffic Operations & Safety Engineer
Federal Highway Administration

INTRODUCTION

A complete traffic records program is necessary for planning (problem identification), operational management or control, and evaluation of a state's highway safety activities. Each state, in cooperation with its political subdivisions, should establish and implement a complete traffic records program. The statewide program should include, or provide for, information for the entire state. This type of program is basic to the implementation of all highway safety countermeasures and is the key ingredient to their effective and efficient management.

As stated in the *National Agenda for the Improvement of Highway Safety Information Systems*, a product of the National Safety Council's Traffic Records Committee:

> "Highway safety information systems provide the information which is critical to the development of policies and programs that maintain the safety and the operation of the nation's roadway transportation network."

A traffic records system is generally defined as a virtual system of independent real systems which collectively form the information base for the management of the highway and traffic safety activities of a state and its local subdivisions.

Assessment Background

The Traffic Records Assessment is a technical assistance tool that the National Highway Traffic Safety Administration (NHTSA), the Federal Motor Carrier Safety Administration (FMCSA) and the Federal Highway Administration (FHWA) offer to state offices of highway safety to allow management to review the state's traffic records program. NHTSA, FMCSA and FHWA have co-published a Highway Safety Program Advisory for Traffic Records which establishes criteria to guide state development and use of its highway safety information resources. The Traffic Records Assessment is a process for giving the state a snapshot of its status relative to that Advisory.

This assessment report documents the state's traffic records activities as compared to the provisions in the Advisory, notes the state's traffic records strengths and accomplishments, and offers suggestions where improvements can be made.

Methodology

The assessment process follows a "peer" review team approach. Working with the NHTSA Regional Office, the FHWA Division Office, FMCSA, and the State's Highway Safety Office, the NHTSA selected a team of individuals with demonstrated expertise in major highway safety program areas including: law enforcement, engineering, driver and vehicle services, injury surveillance systems, and general traffic records development, management, and use. Credentials of the assessment team are listed in the Team Credentials section of this report. The state officials who were interviewed during this assessment are listed in the List of Presenters section. Throughout the assessment, NHTSA, FMCSA, and FHWA representatives served as observers and are also listed in the Acknowledgments section.

Recommendations

The recommendations in the sections following may include suggestions on how they might best be achieved, based on the experience of team members and information provided.

Report Contents

In this report, the text following the "*Advisory*" excerpt heading was drawn from the Highway Safety Program Advisory for Traffic Records. The "*Advisory*" excerpt portion is in italics to distinguish it from the "Status and Recommendations" related to that section which immediately follows. The status and recommendations represent the assessment team's understanding of the state's traffic records system and their suggestions for improvement. The findings are based entirely on the documents provided prior to and during the assessment, together with the information gathered through the face-to-face discussions with the listed state officials. Recommendations for improvements in the state's records program are based on the assessment team's judgment.

It is recognized that, based on resources and other program priorities, the recommended improvements would be considered for implementation through a strategic plan established by the State Office of Highway Safety in coordination with all affected state and local agencies.

The report will follow the outline in the Advisory and present the "*Advisory*" excerpt followed by the "Status" and "Recommendation" for each section and subsection of the Advisory. Section 1-A would present the text from the Advisory related to Crash Information followed by a statement of the findings and the recommendations for improvements to crash information. Section 1-B would repeat for Roadway Information, etc.

SECTION 1:
TRAFFIC RECORDS SYSTEM INFORMATION COMPONENTS

At the time of passage of the Highway Safety Act of 1966, state central traffic records systems generally contained basic files on crashes, drivers, vehicles, and roadways. Some states added data on highway safety-related education, either as a separate file or as a subset of the Driver File. As highway safety programs matured, many states added Emergency Medical Services (EMS) and Citation/Conviction Files. Additionally, some states and localities also maintain a Safety Management File, which consists of summary information from the central files useful for problem identification and safety planning.

As the capabilities of computer hardware and software systems increased and the availability of powerful systems has expanded to the local level, many states have adopted a more distributed model of data processing. For this reason, the model of a traffic records system needs to incorporate a view of information and information flow, as opposed to focusing on the files in which that information resides. Figure 1 displays this view of distributed data processing in a traffic records system.

Under this more distributed model, it doesn't matter whether data for a given system component are housed in a single file on a single computer or spread throughout the state on multiple local systems. What matters is whether or not the information is available to users, in a form they can use, and that this information is of sufficient quality to support its intended uses. Thus it is important to look at information sources. These information sources have been grouped to form the following major components of a traffic records system (see also Table 1):

- ❑ Crash Information
- ❑ Roadway Information
- ❑ Vehicle Information
- ❑ Driver Information
- ❑ Enforcement/Adjudication Information
- ❑ Injury Surveillance Information

Together, these components should provide information about places, property, and people involved in crashes and about the factors that may have contributed to the events described in the traffic records system. The system should also contain information that may be used in judging the relative magnitude of problems identified through analysis of data in the traffic records system. This should include demographic data (social statistics about the general population such as geographic area of residence, age, gender, ethnicity, etc.) to control for differences in exposure (normalization) and cost data for benefit/cost and cost effectiveness determinations. Performance level data should be included to support countermeasure management.

Further descriptions of these types of information are provided in the following sections.

Figure 1: Model of Distributed Data Processing in a Traffic Records System

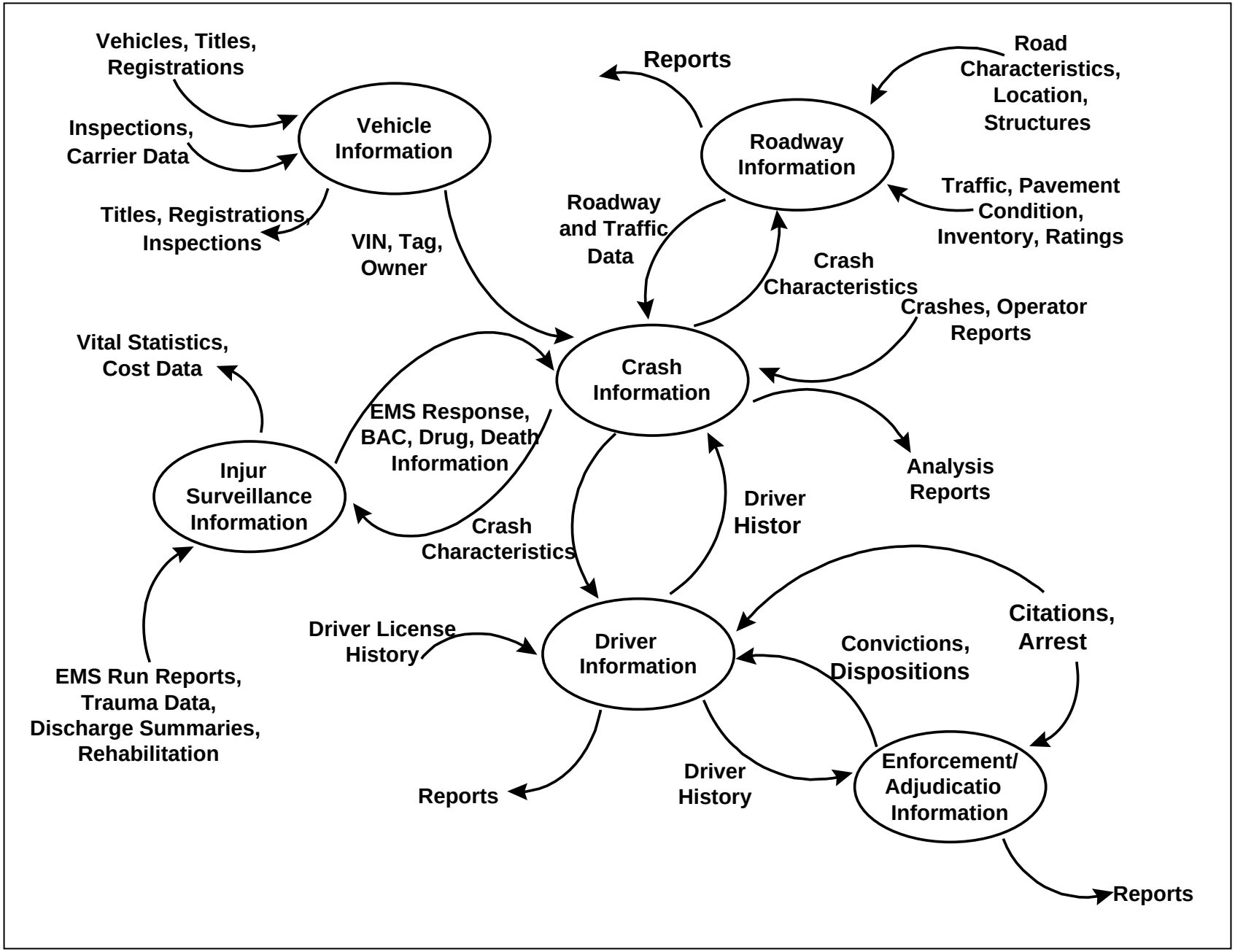

Table 1. Components of a Traffic Records System		
COMPONENTS		EXAMPLES
Crash		• Weather conditions and pavement • Illumination • Time of Day, Day of Week • Avoidance maneuvers • Violation of traffic law (speed, turns, failure to obey, reckless driving) • Number and severity of injuries or level of property damage • Number of vehicles involved • Manner of collision and speed • Object struck • Person type (driver, occupant, pedestrians) • Substance abuse • Safety device use
Injury Surveillance System		• EMS response time for driver/pedestrian/pedacyclist • Hospital assessment of injury severity • Hospital length of stay and cost • Rehabilitation time and cost
Roadway		• Location referencing system • Roadway character (jurisdiction, classification, surface, geometries) • Structures (bridges, tunnels) • Traffic control devices, signs, delineations, and markings • Roadside features (hardware, conditions, bike lanes, sidewalks, land use) • Rail grade crossings • Traffic volume and characteristics
Vehicle	All	• Type and configuration • VIN • Age/model year • Weight • Registration information/Plates • Defects • Owner information • Safety devices (type and condition)
	Commercial	• Carrier information • Hazardous materials/Placards • Inspection/Out of Service Records
Driver		• Age/DOB • Gender and Ethnicity • Experience, driver education • License status • Conviction history
Enforcement/Adjudication		• Citation tracking • Traffic case volume • Conviction • Sentencing • Case tracking

Section 1-A: Crash Information

Advisory Excerpt: *The Crash Component documents the time, location, environment, and characteristics (sequence of events, rollover, etc.) of a crash. Through links to the crash-involved segments of Roadway, Vehicle, and Driver Information, the Crash Component identifies the roadways, vehicles, and people (drivers, occupants, pedestrians) involved in the crash and documents the consequences of the crash (fatalities, injuries, property damage, and violations charged). In addition to providing information on a particular crash, the Crash Component supports analysis of crashes in general and crashes within specific categories defined by: person characteristics (e.g., age or gender), location characteristics (e.g., roadway type or specific intersections), vehicle characteristics (e.g., condition and legal status), and the interaction of various components (e.g., time of day, day of week, weather, driver actions, pedestrian actions, etc.).*

The Crash Component of the Traffic Records System should contain some basic information about every reportable motor vehicle crash on any public roadway in the state. Details of various data elements to be collected are described in a number of publications. The Model Minimum Uniform Crash Criteria (MMUCC) provides a guideline for a suggested minimum set of data elements to be collected for each crash. Additional information should be collected (as necessary) for crashes involving an injury or fatality to meet the requirements for tracking and analysis for the state, and other systems (e.g., the Fatality Analysis Reporting System [FARS], General Estimates System [GES]).

Status

Through data collected by law enforcement officers using the North Carolina Crash Report Form, DMV-349 (Rev 3/2001), the crash component documents the time, location, environment, and characteristics (sequence of events, rollover, etc.) of crashes. Crash data are entered into the Crash Reporting System (CRS) managed by the Division of Motor Vehicles (DMV) within the North Carolina Department of Transportation (NCDOT). Crash reports are received by DMV's Traffic Records Branch in both paper and electronic format, although at present the electronic submission of crash reports is done on a limited basis and does not account for a large proportion of the data. Digital images of the crash reports are used to support manual data entry performed by clerks in the Crash Reports Unit. Reports of crashes involving a fatality are copied so that the Fatality Analysis Reporting System (FARS) analysts may begin their data entry processes at the same time that the crash is being processed in the CRS.

Through data collected on the crash report forms and links between the CRS and other NCDOT and DMV systems, the crash component identifies the roadways, vehicles, and people (drivers, occupants, pedestrians) involved in crashes and documents the consequences of crashes (fatalities, injuries, property damage, and violation charges). The crash component supports analysis of crashes in general and crashes within specific categories defined by person characteristics, location characteristics, vehicle characteristics, and the interaction of various components. The CRS data entry process includes links to the DMV's driver and vehicle records in order to validate names and addresses of drivers and vehicle owners. The CRS data

are mirrored on a nightly basis with the NCDOT roadway files. This linkage helps to improve the location coding information in CRS and provides NCDOT engineers with access to up-to-date crash information tied to specific locations for use in analysis.

State law defines the crash reporting threshold as any crash involving an injury or fatality, or property damage of $1000 or more. The users of the crash component are reasonably confident that the system contains data on almost all reportable crashes. In fact, the DMV has a policy of entering data from any crash report received by the Traffic Records Branch, including any below-threshold crashes. While it may be that a small number of reportable crashes are missing from the data, the impression of users is that the data are sufficient for valid analysis.

Analysis of crash component data is supported in a number of ways. The DMV Traffic Records Branch has the capability to run standard and ad hoc queries and answers "thousands" of such requests each year. The NCDOT, Traffic Engineering Branch, Traffic Safety Unit maintains the mirror database of crash information linked to roadway inventory information. Multiple years of crash data are accessible through the Traffic Engineering Accident Analysis System (TEAAS) providing a series of standard queries to produce aggregate data analysis reports. TEAAS supports limited ad hoc queries – the user selects variables to use in one-way or two-way frequency table reports. Reports may be run on one or more years of data and separately for various political jurisdictions (cities, counties or statewide). Local and state engineers as well as other authorized users can run queries online using the TEAAS tool. The University of North Carolina (UNC), Highway Safety Research Center (HSRC) maintains multiple years of crash data in a SAS data format and performs analyses on behalf of the Governor's Highway Safety Program (GHSP) and others. The HSRC maintains a web-based analysis tool for public use – the North Carolina Crash Data Query Website at http://www.hsrc.unc.edu/crash/. The user interface and data reporting capabilities are very similar to the TEAAS application, with the major difference being that the HSRC application is working with older data at present. TEAAS also includes reports that are useful for identifying high crash locations whereas the HSRC analysis tool will not produce reports for specific roadway locations—county or district level aggregate reporting are the smallest geographic areas possible.

In addition to these various analytic resources, DMV makes copies of the data available to authorized users who can then perform their own analyses using the raw data. In most cases, the data are supplied without personal identifiers (names, addresses, etc.). Finally, the DMV Traffic Records Branch and Division of Highways, Traffic Engineering Branch, Traffic Safety Unit cooperate to produce the annual *Crash Facts* report. At the time of this Assessment, the 2004 *Crash Facts* report was the most recent edition available. Due to a backlog of 2005 crash data and the retirement of a key person, the 2005 report was not ready for final publication, but it was in final production (ready for typesetting and printing). The schedule for production of the 2006 *Crash Facts* report is not set, but because the data entry backlog has been resolved, it is at least possible for that report to be completed with fewer delays than were experienced in 2004 and 2005. The various analytic support efforts available to users of the crash data continue even when the *Crash Facts* report is delayed, so that users needs can be met.

The Assessment included numerous examples of field data collection of crash report information. The North Carolina Highway Patrol (NCHP) has been using field data collection

software for many years, and all but about one-sixth of the patrol units have some form of mobile computer capability. The oldest of these units are running a form-completion program that does not feed data to any of the Patrol's databases but is useful in providing a legible copy of the crash report for submission to the NCHP records unit and DMV. A more modern software product, eCrash®, has been implemented on many of the more modern laptop units in the vehicles. This software was provided to the Patrol for evaluation purposes by the vendor working on the statewide electronic citation project. The eCrash® software is not certified to send data electronically to the DMV and has no financial backing within the state for further enhancement or evaluation. No letter of agreement has yet been signed with the DMV to provide TraCS software for field data collection of crash reports. However, NCDMV remains supportive of NCHSP's efforts to identify resources to equip troopers. There have been no discussions at this time between NCHSP and NCDMV regarding an implementation timeline.

The DMV is also promoting TraCS use by any other interested law enforcement agencies in the state. DMV will supply the software, training, and second tier support for free. The law enforcement agencies are expected to provide their own computers and designate a TraCS administrator to serve as first tier support. Agencies using TraCS will be able to upload their crash data directly to CRS in the near future. There has been a pilot test to verify that the TraCS system works, but a more extensive pilot to be funded by FMCSA, is being scheduled to verify that the TraCS system will work on a statewide program to include agencies other than the NCHSP. In addition to TraCS support, the DMV has resolved to support electronic data transfer into CRS from any crash reporting system that can meet their data requirements. To that end, they have produced a third party vendor package that includes documentation of the CRS data validation rules and the XML format required for uploading data into CRS. Non-TraCS users will be able to use the same upload process as TraCS users. DMV hopes to achieve 65 percent electronic crash data submission during 2007 with the largest implementation beginning when the NCHP rolls out TraCS to the troopers.

Funding for the purchase of equipment required to implement TraCS in the NCHP is in the form of grants from FMCSA and the NHTSA's 408 program. It was clear during the interviews that this money is viewed as a one-shot source of funding. There are no plans in place to ensure that funding is available in future years to keep TraCS going throughout its lifecycle. The DMV and NCHP are highly committed to the implementation for the long run but do not have a good plan in place to ensure that the level of automation achieved in 2007 with grant funds can be maintained in the future.

Recommendations

- ❑ Develop a life-cycle cost plan to maintain electronic crash reporting at the NCHP.

- ❑ Schedule the annual Crash Facts report publication for no later than 6 months after the end of the year – two-to-three months after the crash data entry is considered complete for that year. If the report cannot be produced in that time-frame, publish the core data tables online at the DMV website in a timely fashion with a "preliminary data" warning.

- Enhance the ad-hoc query capabilities of the HSRC web-based public crash data analysis system and the TEAAS limited-access utility. Ideally, users should be able to specify multi-level tabular analyses using any data fields (other than personal identifiers) in the database. User-specified filters (case inclusion/exclusion criteria) should also be enhanced.

Section 1-B: Roadway Information

Advisory Excerpt: *Roadway information includes roadway location, identification, and classification, as well as a description of a road's total physical characteristics and usage, which are tied to a location reference system. Linked safety and roadway information are valuable components in support of a state's construction and maintenance program development.*

Roadway information should be available for all public roads in the state whether under state or local jurisdiction. A location reference system should be used to link the various components of roadway information as well as other information sources (e.g., Crash/Environment information, EMS records) for analytical purposes.

Status

North Carolina is experiencing rapid growth. The State's population grew by over 35 percent from 1980 to 2000. Vehicle miles traveled (VMT) on the State's public road system increased by nearly 40 percent from 1990 to 2000. By 2020 North Carolina's population is expected to expand an additional 25 to 30 percent. This growth along with other demographic trends and shifts in the economy add to the State's transportation capacity challenges.

This challenge is compounded by the fact that the North Carolina Department of Transportation (NCDOT) is responsible for the second-largest state highway system in the country. The state-maintained system comprises over 79,000 miles of the 103,000 miles of public roads. Some significant safety issues about the State's transportation challenges discovered during the development of the 2004 Statewide Transportation Plan include:

- Over 225,000 crashes occur annually on the public road system.
- Nearly 80 percent of all fatal crashes on North Carolina state maintained highways occurred on rural routes.
- North Carolina ranks 22nd in pedestrian fatalities — this is an above-average rate compared to peer states of similar size and population.
- Nearly 32,000 miles of NCDOT highways have significant pavement condition deficiencies, and nearly 7,000 bridges are deficient.
- Many of the State's roadways are antiquated — nearly 8,800 miles have narrow lanes and shoulders, and many facilities require a variety of safety upgrades.

The NCDOT adopted a Strategic Highway Safety Plan (SHSP) in 2004 to address these highway safety issues. A vital component in any successful SHSP is access to quality crash data and other traffic records. With 103,000 miles of state and local maintained roads, having an accurate up to date traffic records system is imperative for identifying highway safety problems and developing appropriate countermeasures.

The NCDOT uses several roadway information files to provide data to support their safety programs. The Universe File contains 55 road attributes that

identify cross-section, traffic volume, and geometry on the 79,000-mile state-maintained road system. The Department envisions making the Geographic Information System (GIS) the foundation of NCDOT roadway data. Layer files of road features, traffic, pavement, bridge, traffic control devices, and crash data would provide the Department a powerful tool for safety analysis and programming.

The Traffic Engineering Accident Analysis System (TEAAS) is the tool utilized to perform standard crash analysis. TEAAS provides an easy-to-use interface for producing standard reports and crash rates and is capable of producing these for both intersection and section analysis. TEAAS can also provide city and county wide "canned" summary reports for various queries such as: 1) Accident types and violations, 2) Age and sex of driver, 3) Alcohol, Ambulance and Vision, 4) High Accident Intersections, 5) Injuries and Restraint Usage, and others. TEAAS is available to authorized users and only requires a PC with a Windows operating system, an Internet connection, and the TEAAS software. The NCDOT provides free training and support for all users.

A uniform location reference system for all state maintained roads is being developed and a system for local maintained roads is being planned that would provide the link to integrate all data to road segment locations. The National Spatial Data Infrastructure (NSDI) Framework Transportation Identification Standard being considered will provide a logical data model for identifying unique road segments which are independent of cartographic or analytic network representation. These road segments will form the basis for maintenance of framework road data (through transactions or other means) and for establishing links among road segments and attribute data.

The *Local Roads Data Collection and Dissemination* project will address the absence of a unified and consistent process to efficiently allow the collection and exchange of digital geospatial local road data among various State and local agencies. This project will utilize modern technology and the Internet to provide an ongoing mechanism for the collection, storage, documentation, and exchange of this information.

The implementation of the above initiatives will greatly enhance the ability of NCDOT safety officials to fulfill their highway safety goals.

Recommendations

- ❑ Continue the development of a uniform location reference system.
- ❑ Establish the GIS as an enterprise data system for NCDOT.
- ❑ Support the implementation of the *Local Roads Data Collection and Dissemination* project.

Section 1-C: Vehicle Information

Advisory Excerpt: *Vehicle information includes information on the identification and ownership of vehicles registered in the state. Data should be available regarding vehicle make, model, year of manufacture, body type, and miles traveled in order to produce the information needed to support analysis of vehicle-related factors which may contribute to a state's crash experience. Such analyses would be necessarily restricted to crashes involving in-state registered vehicles only.*

This information should also be available for commercial vehicles and carriers which may be registered in other states, but which are licensed to use the public roadways in the state.

Status

The North Carolina Department of Transportation, Division of Motor Vehicles (DMV) administers vehicle registration and titling using the State Titling and Vehicle Registration System (STARS) which is a dB2 database. Commercial vehicles are included in the database. STARS includes temporary registrations and stolen vehicle information.

STARS contains approximately 20 million vehicle records of which about seven million are active registrations. Vehicle registrations and title applications may be processed through the 119 Vehicle and License Plate Renewal Offices (contracted tag offices) throughout the State and at the DMV facilities. Renewals may be processed through the Internet. Automobile dealers also process registrations and title applications. These facilities are all on-line.

The scope of descriptive information on vehicles meets the recommendations of the *Advisory*, and the data scope is adequate for participation in portions of the American Association of Motor Vehicle Administrators (AAMVA) applications. VINs are validated using the R. L. Polk VINA program.

Registrations are classified by vehicle type (make and model), configuration (body style, fuel code, number of axles, and other features), title status, registration status, and use code. These are not the same classifications as those on the crash report form.

STARS provides data for the National Motor Vehicle Title Information System (NMVTIS) in batch mode but will be moving to on-line capabilities when resources permit.

Odometer readings are required when vehicles are titled. Updates may be made when titles are updated with additional information, but such updates are not mandatory. In locations where emissions inspections are required, those transactions require updating the odometer reading.

Vehicle salvage information is obtained from insurance companies. Title brands from other states are retained in the vehicle file. Some mismatches in the definitions require the DMV to apply the closest description using the North Carolina code set.

Personal information is restricted for public inquiries according to the provisions stipulations of the Driver Privacy Protection Act (DPPA) and the North Carolina GS 20-43.1.

Authorized users access the vehicle database electronically and by submitted requests. Various North Carolina agencies and non-State organizations use registration and title data. Enforcement has direct access through the Criminal Justice Information Network. The crash system also accesses STARS.

Year-end vehicle registration summaries and standard reports (e.g., registrations by county and monthly sales statistics) are produced routinely, and special requests are processed.

The vehicle file and the driver file share the Citizen Table that contains the legal name, address, and other personal identification.

Recommendations

- ❑ None

Section 1-D: Driver Information

Advisory Excerpt: *Driver information includes information about the state's population of licensed drivers. It should include: personal identification, driver license number, type of license, license status, driver restrictions, convictions for traffic violations, crash history, driver improvement or control actions, and driver education data.*

Driver information should also be maintained to accommodate information obtained through interaction with the National Driver Register (NDR) and the Commercial Driver License Information System (CDLIS) to enable the state to maintain complete driving histories and to prevent drivers from circumventing driver control actions and obtaining multiple licenses.

Status

The North Carolina Department of Transportation, Division of Motor Vehicles (DMV) issues driver licenses and administers programs for driver control and improvement. Driver examinations and licenses may be processed through the DMV headquarters or in Driver License and School Bus Offices located throughout the State—106 full time offices, 12 part-time, and 26 mobile units. The driver file, the State Automated Driver License System (SADLS), contains approximately 12 million records of which about 6.5 million are on currently licensed drivers.

The driver records contain identification and descriptive information about the drivers in a "Citizen Table" containing 20 data elements of personal identification information. Details of licenses issued (dates of issuance and expiration, license restrictions, and license class) and information on suspensions, revocations, and crash reports are maintained in "self descriptive" tables that append variable record types as required for the driver histories. The information satisfies the recommendations of the *Advisory.*

North Carolina has a graduated license program, administrative license revocation authority, and information on learner permits and provisional licenses. Driver education information is maintained in the driver history. The DMV has authority to cancel a license if application information is falsified.

SADLS contains traffic conviction information including information on juvenile offenses. Most of the courts report convictions electronically. Until recently, the electronic conviction record did not show the original charge on records received from most courts. Those submitted on paper require input processing at the DMV, and those (older) records include the original charge. The DMV has coordinated with the courts, and the courts are now beginning to include the original charge in the electronic submissions. This means that essentially all conviction information will contain the original charge and the adjudicated charge from now on.

There is a point system leading to a withdrawal of licenses. Information about points and the consequences is available on the DMV web site and in the driver license handbook (that can be downloaded).

The driver file also records all crash involvements. The information is posted automatically

from the crash file daily processes. Those records include BAC results.

Driver histories from previous states of licensing are included in the driver file for all drivers, not commercial vehicle operators only. The licensing process queries the NDR/PDPS and the CDLIS.

The driver licensing procedures include the Social Security On-Line Verification process. The SAVE file on resident aliens is not checked now because the request from the DMV to use that system (sent some 18 months ago) has not been honored.

Within the constraints of the DPPA, the driver file is accessible to authorized users such as the Selective Service and law enforcement. Major users of the records are prosecutors and the courts; they have electronic access to the driver records. Paper documents were required for certified records prior to December 2006, but the courts can now accept electronic records.

The driver file links with the DMV's State Titling and Vehicle Registration System (STARS), the Administrative Office of the Courts, vital statistics, and the AAMVAnet processes (the Social Security On-Line Verification, the NDR/PDPS, and the CDLIS).

Summary data from the driver file provide management and statistical information.

The driver license document contains a 2D bar code but no magnetic stripe. Enforcement officers are able to query the driver and registration files with the ability to determine the status of the driver or vehicle. A project has begun to equip 100 Highway Patrol with mobile data computers with the ability to retrieve the photo of the driver on whom a query is made.

North Carolina has taken steps to implement Real ID and is using facial recognition software to prevent driver license issuance from fraudulent applications and to identify problem records in the file—duplicate records, fraudulent licenses issued when personal identification was less controlled, and any other problem situations. The DMV has 26 million images on file and is participating in an AAMVAnet project with five other states to exchange images.

A new licensing system is planned for late 2008 that will incorporate as many Real ID features as possible, and the process will change from over-the-counter issuance to central issuance. Processing time for license issuance will greatly increase, but security will also greatly increase—a circumstance that has become supremely important.

Recommendations

- ❑ None

Section 1-E: Enforcement/Adjudication Information

Advisory Excerpt: *Information should be available which identifies arrest and conviction activity of the state, including information which tracks a citation from the time of its distribution to an enforcement jurisdiction, through its issuance to an offender, and its disposition by a court. Information should be available to identify the type of violation, location, date and time, the enforcement agency, court of jurisdiction, and final disposition. Similar information for warnings and other motor vehicle incidents that would reflect enforcement activity are also useful for highway safety purposes.*

This information is useful in determining level of enforcement activity in the state, accounting and control of citation forms, and monitoring of court activity regarding the disposition of traffic cases.

Status

The Administrative Office of the Courts (AOC) has been aggressively pursuing the development of systems that account for and track citations and contain the information necessary to evaluate the level of enforcement activity in the State and to monitor the Judiciary's processing of traffic cases. The present capabilities in place, such as the Automated Criminal and Infraction System (ACIS) case management system and the eCitation® application, allow the State to track the life cycle of a traffic citation from the distribution of the forms (or electronic batches of numbers) to an officer, to their issuance to offenders, to their disposition by a court, and their electronic transfer (where appropriate, e.g., convictions) to the Division of Motor Vehicles for placement on the driver history file.

A uniform traffic citation is used by all law enforcement officers in North Carolina to document traffic violations of state statutes and municipal ordinances. Oversight for the citation's design and content is the responsibility of the Administrative Officer of the Courts according to state statute §15A-302 which prescribes the content of the state's citation form. The information being collected on the form meets the requirements of the *Advisory*.

The use of electronic technology for collecting and processing citation information was driven by the North Carolina Highway Patrol (NCHP). They partnered with the AOC to develop an electronic citation application. The AOC and NCHP are to be commended for having the vision to address the use of electronic citations by establishing the eCitation® infrastructure to accept data from automated citation applications.

The eCitation® is an application that includes a process for capturing citation information electronically in the field. The application also allows for data from the driver's license and vehicle files to populate the majority of the form. The citation information is then uploaded wirelessly using the Criminal Justice Information Network (CJIN). The eCitation® application resides on a server at the AOC which uploads the information to ACIS. It is a client-based application whose functionality includes accounting for the citation form from the point of distribution (unique number generation) to an officer through disposition of a case.

Additionally, it has the capability to provide any software upgrades and changes directly to the mobile data computers (MDC) in the agency vehicles.

A statewide system that tracks the complete "life cycle" of a traffic citation (distribution to an officer, to its issuance to an offender, to its disposition by the court, and its placement on the driver history file) is presently available in North Carolina. The state's traffic safety community has the information necessary to evaluate the effectiveness of enforcement activities and the Judiciary's processing of traffic cases.

It must be noted that as law enforcement expands software applications on the MDCs, a long term financial plan will be needed.

Recommendation

- ❑ Establish a long term financial plan to support future maintenance, upgrades, and new applications.

Section 1-F: Injury Surveillance System Information

Advisory Excerpt: *With the growing interest in injury control programs within the traffic safety, public health, and enforcement communities, there are a number of local, state, and federal initiatives which drive the development of Injury Surveillance Systems (ISS). These systems typically incorporate pre-hospital (EMS), emergency department (ED), hospital admission/discharge, trauma registry, and long term rehabilitation databases to track injury causes, magnitude, costs, and outcomes. Often, these systems rely upon other components of the traffic records system to provide information on injury mechanisms or events (e.g., traffic crash reports).*

This system should allow the documentation of information which tracks magnitude, severity, and types of injuries sustained by persons in motor-vehicle related crashes. Although traffic crashes cause only a portion of the injuries within any population, they often represent one of the more significant causes of injuries in terms of frequency and cost to the community. The ISS should support integration of the ISS data with police reported traffic crashes. The EMS run reports and roadway attributes are the first critical steps in the identification of a community's injury problem, and in turn, the identification of cost-effective countermeasures which can positively impact both the traffic safety and health communities.

The use of these data should be supported through the provision of technical resources to analyze and interpret these data in terms of both the traditional traffic safety data relationships and the specific data relationships unique to the health care community. In turn, the use of the ISS should be integrated into the injury control programs within traffic safety, and other safety-related programs at the state and local levels.

Status

There are several key components of a comprehensive functional statewide Injury Surveillance System. These components are: emergency medical services, acute care, trauma and rehabilitation facilities, and vital records. Oversight for these entities' activities may be governed by local, state, and regional authorities. Collection of data from these entities provides a wealth of patient care routing, intervention, and prevention information that can be used to evaluate current treatment modalities and injury prevention activities. A comprehensive functional statewide injury surveillance system provides crucial healthcare and injury prevention information to local, state, and regional healthcare providers and policy making partners.

North Carolina has many of the key components of a comprehensive functional Statewide Injury Surveillance System (ISS):

- Pre-hospital Medical Information System (PreMIS) Patient Care Report (PCR) data – North Carolina Office of Emergency Medical Services (OEMS)
- Trauma Patient Care data – North Carolina Trauma Registry Regulatory Authority in the OEMS and University of North Carolina (UNC) – Chapel Hill maintain the State Trauma Registry

- North Carolina Emergency Department Database (NCEDD) – North Carolina Division of Public Health
- North Carolina Hospital Discharge (In-Patient) Data System (NCHDDS) – North Carolina Center for Health Statistics
- Mortality data – North Carolina Department of Health and Human Services (DHHS), Division of Vital Records
- State Injury Surveillance and Prevention – North Carolina Injury and Violence Prevention Branch of DHHS

Not all of these components function with the same degree of maturity and comprehensiveness. However, it should be noted that North Carolina's ISS will emerge as a truly comprehensive ISS in the future if the current data collection and analysis initiatives come to fruition.

EMS

The North Carolina Department of Health and Human Services, Division of Public Health, Office of Emergency Medical Services (OEMS) has regulatory authority over 16,000 pre-hospital personnel throughout the state that respond to over 870,000 events (transports).

PreMIS is the electronic data collection system that provides a method for each EMS provider in North Carolina to enter patient care data into a central database. While this system was created in 2002, a new version was implemented in 2006 and is compatible with third party software applications that EMS providers can use for data collection and submission.

The OEMS has adopted the NHTSA National EMS Information System (NEMSIS) Version 2.2.1 Data Set (400 data elements-Gold Standard) as the state preshospital data set (200 data elements). Effective January 31, 2007, all EMS Systems must collect and provide daily electronic data for every OEMS defined EMS event using the NHTSA Version 2.2.1 dataset and XML standard. The last complete year of data is 2006.

Trauma registry data is collected and maintained under regulatory authority of the OEMS. The registry is maintained by the UNC - Chapel Hill Dept. of Surgery under contract from OEMS. In this capacity, UNC also assists with research endeavors, processes pre-hospital system reports, and provides some in-state training.

Trauma Registry

The OEMS has statutory responsibility for the maintenance of the statewide trauma system, which includes the trauma registry. A hospital's trauma registry is vital for the state's use in conducting thorough site visits for initial or renewal designations. North Carolina's trauma registry (an office, not actually a trauma registry system) has been in operation since late 1987, with the state requiring every trauma center to record data on its trauma patients through utilization of the current state-approved software. Originally, North Carolina used a customized software package but, in 1994, migrated to the NTRACS® software originally offered through the American College of Surgeons. As of May 2005, this software is now supported by Digital Innovations, Inc. The hospitals that use NTRACS® have the ability to enter over 250 data points on each trauma patient and, currently, 17 hospitals (including all fifteen trauma centers) use this software. For those non-trauma centers OEMS developed a data collection process

using the already existing hospital billing software system (UB-92) form that uploads the data nightly free of charge, a mechanism to capture a smaller version of the larger trauma registry from these hospitals. With approximately 35 data points, this mechanism (called ISSAC) of the registry is now in use by 17 hospitals. Approximately 26,000 trauma cases are submitted annually to the state trauma registry. This does not reflect the overall statewide trauma case volume but is reflective of the sample population. The last complete year of data is 2005.

To assist with the registry, OEMS currently subcontracts with UNC - Chapel Hill to serve as the primary data collection agency. In this capacity, UNC also assists with research endeavors, processes trauma registry reports, provides some in-state training, recruits new hospitals to the registry, etc. OEMS also contracts with Digital Innovations for day-to-day technical support for any hospital in North Carolina using NTRACS®.

Emergency Department Data

A partnership in 2002 between the North Carolina Hospital Association (NCHA) and the North Carolina Division of Public Health (NCDPH) created the North Carolina Hospital Emergency Surveillance System (NCHESS), a system to electronically collect, report, monitor, and investigate Emergency Department (ED) and hospital data in near-real time from 90 of the 120 hospitals in North Carolina. The first complete year of data is 2006.

NCHA and its subcontractors manage data collection for the NCHESS. NCHESS downloads aggregated (ED) data every 12 hours from a subcontractor of the NCHA.

NCHESS collects data from all ED visits, not just trauma visits. The broad definition of trauma visits to the ED make up roughly 25 percent of total ED visits – approximately 2 million cases in 2006. NCHESS also aims to collect data from all EDs in the state, not just designated trauma center hospitals. NCHESS also focuses exclusively on routinely collected electronic data and does not rely on manual chart extractions or patient interaction for data collection.

Hospital Discharge Data

The NCHA and the NCDPH partnership created the North Carolina Hospital Discharge Data System (NCHDDS) which is maintained at the NCDPH State Center for Health Statistics. Data are collected electronically quarterly based on the patient's date of discharge or visit. Each facility submits data electronically. The last complete year of data is 2004.

These data are submitted using a state data format that is inclusive of the standard Uniform Billing (UB-92) data format, which is used by hospitals to bill for their charges. These data include information on patients who spent at least 24 hours as in-patients but do not include patients who were treated in the emergency room and released. The NCHDDS collects three types of discharge data from 120 inpatient healthcare facilities.

Mortality Data

North Carolina state law mandates that all death data be filed with the DHHS Division of Vital Records. All Medical Examiners, funeral home directors, justices of the peace, and healthcare facilities are reporting data to the state data repository. Death records are sent to the state data repository.

The death certificate data provide information on the frequency of deaths of North Carolina residents, demographic characteristics of the decedents, and the conditions leading to mortality, including deaths that may have occurred outside of the State of North Carolina.

Mortality data include the demographic data of the individual, occupation, gender, age, date of birth, age at death, place of death, manner of death, state of residence, and cause of death (identified by ICD-10, International Classification of Disease codes). The ICD-10 system is used to code and classify mortality data from death certificates.

Statewide Injury Surveillance System

North Carolina Injury and Violence Prevention Branch (IVPB) of DHHS is the state public health injury surveillance and prevention authority. The IVPB uses the expertise of a research analyst, (serving as an epidemiologist, an injury prevention specialist, and a traffic safety specialist) to assist them in their research projects and legislative initiatives.

IVPB uses the following data files for analysis: mortality, hospital discharge, emergency department, and EMS. In the future IVPB will have access to the Medical Examiners, the Controlled Substance, the Trauma Registry and the Disaster Registry electronic data bases. At this time IVPB does not have access to any FARS data.

Recommendations

- ❑ Obtain legislative budget support for the daily operation and maintenance of the PreMIS and Trauma Registry Systems.
- ❑ Consider introducing the new NEMSIS data set incrementally and in phases. This may provide the EMS providers the opportunity to gain confidence in the system therefore not overwhelming them with the large data set.
- ❑ Provide data back to the hospitals that will assist them in evaluation of their agencies' performance and quality improvement activities. This will assist in increasing participation.
- ❑ Seek methods to enlist those non-trauma centers to send data to the state trauma registry. Consider collaborating with the North Carolina Hospital Association to feature a "Hospital of the Quarter" for outstanding data submission.
- ❑ Expedite the collection of timely and quality statewide Hospital Discharge data.
- ❑ Promote the components of the North Carolina ISS data to traffic safety partners and stakeholders.
- ❑ Assure that all managers of the North Carolina ISS components participate fully in the North Carolina Traffic Records Coordinating Committee.

SECTION 2:
INFORMATION QUALITY

A state's traffic records information should be of an acceptable level of quality to be useful and should be maintained in a form that is readily accessible to users throughout the state. The quality of information in a state's traffic records system is determined by the following characteristics:

- ❑ Timeliness
- ❑ Consistency
- ❑ Completeness
- ❑ Accuracy
- ❑ Accessibility
- ❑ Data integration with other information

The definition of each of these attributes and their relative significance may vary for each information area (crash, roadway, etc.). For example, while a high degree of timeliness may be crucial for entry of actions in a driver history database, it may not be as significant for certain roadway related data. Also, while the various information sources may exist separately, these sources should be easily tied together. This integration can eliminate the need to duplicate data, thus reducing data collection, entry, and storage costs.

2-A: Crash Information Quality

Advisory Excerpt:

- ❑ *Timeliness – The information should be available within a time frame to be currently meaningful for effective analysis of the state's crash experience, preferably within 90 days of a crash.*

- ❑ *Consistency – The information should be consistent with nationally accepted and published guidelines and standards, for example:*

  - ➢ *Model Minimum Uniform Crash Criteria (MMUCC).*
  - ➢ *Manual on Classification of Motor Vehicle Traffic Accidents, 6th Edition, ANSI D16.1-1996.*
  - ➢ *Data Element Dictionary for Traffic Records Systems, ANSI D20.1, 1993.*
  - ➢ *EMS Data Dictionary (Uniform Pre-Hospital Emergency Medical Services Data Conference).*

  The information should be consistent among reporting jurisdictions; i.e., the same reporting threshold should be used by all jurisdictions and the same set of core data elements should be reported by all jurisdictions.

- ❑ *Completeness – The information should be complete in terms of:*

  - ➢ *All reportable crashes throughout the state are available for analysis.*
  - ➢ *All variables on the individual crash records are completed as appropriate.*

- ❑ *Accuracy – The state should employ quality control methods to ensure accurate and reliable information to describe individual crashes (e.g., feedback to jurisdictions submitting inaccurate reports) and the crash experience in the aggregate (e.g., edit checks in the data entry process).*

- ❑ *Accessibility – The information should be readily and easily accessible to the principal users of these databases containing the crash information for both direct (automated) access and periodic outputs (standard reports) from the system.*

- ❑ *Data Integration – Crash information should be capable of linkage with other information sources and use common identifiers where possible and permitted by law.*

Status

Timeliness

North Carolina Statute 20-166.1 requires investigating agencies to submit a crash report to the DMV within 10 days of completion of their investigation. It was reported that most agencies meet this requirement. Approximately 300,000 crash reports are received by the DMV Traffic Records Branch annually, of which about 250,000 are reportable according to the established threshold. Crash data timeliness in the Crash Reporting System (CRS) is currently within two months of the crash event. This represents a major improvement over prior years' data backlogs

and is considered acceptable for most users of the data. Further improvements in timeliness are anticipated in 2007 as the DMV Traffic Records Branch promotes electronic data transfer into CRS. While the DMV plans to ultimately accept electronically transmitted data from a variety of software products in use at various law enforcement agencies, the early gains in timeliness will be realized through a planned rollout of the TraCS software in the North Carolina Highway Patrol (NCHP). That implementation is scheduled to begin in March, 2007 and will result in every trooper having access to a laptop and field data collection software for crashes (TraCS) and citations (eCitation®). It is anticipated that by the end of 2007, as many as 65 percent of all crash reports will be received electronically into CRS.

There were timeliness problems during 2005 and 2006, and the process of clearing up that backlog contributed to delays in producing the 2004 and 2005 *Crash Facts* reports. The reports were also delayed because of retirement of a key staff person previously responsible for the final production of a publication-ready copy of the report. It is hoped that the 2005 *Crash Facts* report will be sent for printing in the next few weeks (13 months after year end) and that the 2006 report will be published in a more timely manner.

Timeliness of FARS data is considered to be quite good. The state is meeting the needs for "Fast FARS" using a 24-hour notification system for minimal information. The FARS analyst reported getting access to most reports of fatal crashes well within the targets set by NHTSA. Until recently, truck and bus crash data entered into the Motor Carrier Management Information System (MCMIS) via SAFETYNET were considered to have poor timeliness. The main problem had to do with failures in uploading the information. These problems were reported to have been solved, and the recent upward movement in MCMIS data quality ratings is partially due to improved timeliness.

Consistency

The report form and data definitions are consistent with the MMUCC guidelines and the ANSI D-16.1 standard. A May, 2006 review of the crash report form and data dictionary found that the form contains 74 of 77 MMUCC data elements, and the form's data element attributes include 411 of the 622 recommended in MMUCC. The data dictionary contains 80 of the 111 recommended data elements, and those elements cover 469 of the 787 recommended data element attributes. The form is not currently being revised, but the state has a track record of strong stakeholder involvement in crash report revisions. It is anticipated that future form revisions will include consideration of increasing the level of MMUCC compliance.

In order to promote consistency among law enforcement agencies in completing the crash report form, the DMV produces the *North Carolina DMV-349 Crash Report Instruction Manual.* The manual is very thorough and includes instructions for the completion of each field on the crash report form, annotations for special consideration on key fields, and an extensive glossary. Training on completing the crash report form includes initial academy training and specific refresher training for selected agencies when data quality problems are identified. Examples of such special follow-up training include commercial motor vehicle crash reporting and follow-up training based on quality reviews by DMV and the Traffic Safety Unit.

There are, however, no standardized measures of data quality. Even timeliness of reporting is not tracked by DMV at the agency level (individually for each law enforcement agency). The need for training or follow-up with individual agencies is identified on an ad hoc basis, usually as the result of one of the staff in DMV or Traffic Safety Unit noticing that a problem is recurring. Some trend analyses are run periodically to spot unexpected changes in reporting from one year to the next, but these are not part of a formal quality assurance or data quality measurement process. Data quality metrics were not available for review during the Assessment.

Completeness

State statute establishes the crash reporting threshold as any crash involving an injury or fatality, or at least $1000 property damage. The crash data managers and users are in agreement that the crash data are complete -- that is, they are confident that a high percentage of reportable crashes are represented in the CRS data. In fact, it was reported that the DMV enters any crash report they receive, even if the crash does not meet the statewide reporting threshold. Periodic checks of the data throughout the year are helpful in identifying any law enforcement agencies that are failing to turn in crashes to the DMV. However, the completeness of crash reports is not measured as part of an overall quality assurance or formal data quality measurement process. Measures of completeness were not available for review during the Assessment.

Accuracy

Accuracy problems in crash reporting were judged by the primary users to be relatively minor. The Traffic Safety Unit uses an automated process to assign location codes to crash reports, and the failure rate of that automated process is one indication (albeit only for location information) of the accuracy of information collected. Recent results show that approximately 76 percent of crash locations can be matched to a NCDOT location code. Performance of slightly less than 100 percent match is expected since the roadway location database is always slightly out of date because of new roadway construction. Location data alone, however, are not the full story on data quality. Other data fields, in particular those related to identification of commercial motor carriers, are known to pose particular problems for law enforcement officers and have contributed to an overall poor rating for North Carolina's data quality ratings by the FMCSA in MCMIS. The rating was recently raised to "fair" as the result of improved upload processes, but the motor carrier identification problems have reportedly persisted. A joint project of the NCHP and the Institute for Transportation Research and Education (ITRE) has begun to address this problem through a process of targeted training with local law enforcement. The true level of crash data quality in North Carolina must be judged as "unknown" because there is no formal data quality measurement process. It should be noted that most users (with the exception of the motor carrier area) are satisfied with the quality of the crash data. It is unlikely that there are major problems with crash data quality, but there is no way to provide an objective assessment of the quality. The lack of a formal quality control process means that it is also difficult to set quality improvement objectives, measure progress, or target training to demonstrated quality problems.

Accessibility
North Carolina has a long tradition of being a leader in making crash data available to users. The DMV, Traffic Records Section shares data with the Traffic Engineering Branch on a nightly basis so that the mirror file of crash data linked to roadway information is essentially identical to the CRS data. Users within the department's firewall are afforded multiple methods of access to current data and reports. Users outside the department can obtain up-to-date information by requesting data reports from DMV or the Traffic Safety Unit, but, as of September 8, 2006, direct access by non-state users has been cut off as the result of security procedures implemented by the Department's IT staff in response to an executive order to all agencies regarding security for legal and privacy concerns. It was reported that methods of reestablishing access are under consideration, As a result, the primary contractors who support the Governor's Highway Safety Program – the University of North Carolina (UNC) Highway Safety Research Center (HSRC) -- can no longer perform quick turn around analyses on current data. Since the HSRC traditionally supports local agencies in developing the data-based justification for highway safety grant funding, the lack of access affects the GHSP's processes for problem identification, program evaluation, and especially, grant request development.

Data Integration
The crash data entry process is linked to driver, vehicle, and roadway data, and the quality of all four systems is improved as a result. Links to the driver licensing file are used during data entry to validate driver information on the crash report. This also saves key strokes because the information, if accurate, can be brought in to auto-populate the corresponding fields in CRS. Similarly, vehicle owner information on the crash report can be validated through real-time links to the registration database, and that information can be used to auto-populate the corresponding fields in CRS. When location information is entered into CRS, an automated system applies location codes consistent with the Department's roadway inventory milepoint system. Unlike the current statewide roadway inventory, the automated location coding system includes codes for local roadways as well as state-maintained roads. The resulting location codes are shared between the Traffic Safety Unit's mirror database and CRS so that both files are brought into agreement.

Integration of crash data with traffic records data other than those mentioned above has not been as successful. The State does not have a Crash Outcome Data Evaluation System (CODES) project or similar effort linking medical and crash data, for example.

Recommendations

- ❑ Solve immediately the problem of access by HSRC and other authorized external users through a dialog between the NCDOT IT staff and the senior management of the agency. Ensure that in the future the IT policies of the Department serve the crucial functions of the Department rather than the reverse.

- ❑ Establish a formal data quality control process for crash reports to include measurements of timeliness, completeness, and accuracy. Produce standard quality reports on a routine basis for use by the crash data managers, the TRCC, and major users.

- ❑ Schedule the annual Crash Facts report publication for no later than 6 months after the end of the year – two-to-three months after the crash data entry is considered complete for that year. If the report cannot be produced in that time-frame, publish the core data tables online at the DMV website in a timely fashion with a "preliminary data" warning.

- ❑ Ensure that the next form revision process includes consideration of increasing compliance with MMUCC.

- ❑ Work toward integration of crash and medical outcome data (e.g., CODES).

2-B: Roadway Information Quality

Advisory Excerpt:

- *Timeliness – The information should be updated as required to produce valid analysis. This implies that changes on the roadway (e.g., construction, sign improvements) should be available for analysis as soon as the project is completed.*

- *Consistency – The same data elements should be collected over time and for various classes of roadways.*

- *Completeness – The information should be complete in terms of the miles of roadway, the trafficway characteristics, the highway structures, traffic volumes, traffic control devices, speeds, signs, etc.*

- *Accuracy – The state should employ methods for collecting and maintaining roadway data that produces accurate data and should make use of current technologies designed for these purposes.*

- *Accessibility – The information should be readily and easily accessible to the principal users of these databases containing the roadway information for both direct (automated) access and periodic outputs (standard reports) from the files.*

- *Data Integration – In order to develop viable traffic safety policies and programs, the roadway information must be linked to other information files through common identifiers such as location reference point. Integration should also be supported between state and local systems.*

Status

Timeliness
Design features and road characteristics are archived annually through as-built construction plans upon project completion. Division and District offices of the North Carolina Department of Transportation (NCDOT) provide updates through road addition and abandonment petitions, annual paving reports, and construction details. Construction project plans and traffic ordinances regarding primary route changes are also provided.

Consistency
Road characteristics are comparable from year to year on all state-maintained roads.

Completeness
Completeness varies for road data especially traffic volumes by class of road. Traffic counts are taken on the Interstate Highway System and rural primary highways annually, on primary highways, secondary roads, and local roads in urban planning areas every two years, and on secondary roads in rural areas and urban clusters every two years. The Highway Performance Monitoring System data are reported on an annual basis. Local street characteristics are the responsibility of the municipality and vary in completeness.

Accuracy
Accuracy of most roadway data is satisfactory. Problems exist in accurate location data and on local streets off the state maintained system. Mileposts are not posted except on Interstate and a few non-Interstate arterials.

Accessibility
Data from the Department's Universe File is accessed via the mainframe terminal. Also, the data can be accessed and queried and reports generated from an Oracle database. Downloads of the Universe data are available from the GIS unit.

Data Integration
The Department is planning to establish a GIS enterprise platform that will serve as the foundation for spatially enabled decision support systems and data warehouses, including road characteristics and crash data.

Recommendations

- ❑ See recommendations in Section 1-B.

2-C: Vehicle Information Quality

Advisory Excerpt:

- ❑ *Timeliness – The information should be updated at least annually.*

- ❑ *Consistency – The same data elements should be collected over time and they should be consistent with the data elements contained in the other components of the traffic records system.*

- ❑ *Completeness – The information should be complete in terms of the vehicle ownership, registration, type, VIN, etc. Information on vehicle miles traveled (VMT) by type or class of vehicle should be available. For commercial vehicles, completeness also involves collection and availability of standard data elements (such as the NGA elements, a set of data developed and recommended by the National Governors' Association for collection of data from crashes involving commercial vehicles).*

- ❑ *Accuracy – The state should employ methods for collecting and maintaining vehicle data that produces accurate data and should make use of current technologies designed for these purposes.*

- ❑ *Accessibility – The information should be readily and easily accessible to the principal users of these databases containing the vehicle information for both direct (automated) access and periodic outputs (standard reports) from the system, within the parameters of confidentiality.*

- ❑ *Data Integration – Vehicle information should be capable of linkage with other information sources and use common identifiers (e.g., VIN, Crash Reports Number, etc.) where possible and permitted by law.*

Status

Timeliness
The registration file is updated in real time. Title transactions are normally processed in 10 days; rush transactions may be completed in the same day but only in the DMV offices.

Completion of a title transaction depends upon receipt of the imaged document and clearance of payment.

Title brands that match the North Carolina brand descriptions are posted immediately. Those that do not match are processed by a special unit that determines what North Carolina brand is the closest equivalent.

Consistency
The file contains the data recommended by the *Advisory* and required for AAMVAnet support.

Completeness

The records are complete.

Accuracy
Accuracy of vehicle title information is high. The DMV uses VINA to enhance accuracy.

A task force to determine duplicate records and merge any duplicates is applying efforts to eliminate the duplication, determine the correct identification to keep, and then merge the records into a single record. The fact that the DMV recognizes and is correcting the file is to the credit of the DMV. Most states do not have the awareness of the duplications or the means to apply the corrections. This is discussed in more detail in Section 2-D.

Accessibility
The file information is accessible to authorized users, and is available to other users consistent with the requirements of the Driver Privacy Protection Act.

Data Integration
The file is linked with the driver file and the crash data file.

Recommendations

- ❑ None

2-D: Driver Information Quality

Advisory Excerpt:

- ❑ *Timeliness – Routine license issuance information should be updated at least weekly. Adverse actions (license suspension, traffic conviction) should be posted daily.*

- ❑ *Consistency – Information maintained on the state's Driver File should be compatible for exchange with other driver-related systems such as the National Driver Register (NDR), the Commercial Driver License Information System (CDLIS), and other applications for interstate exchange of driver records, especially those facilitated via the American Association of Motor Vehicle Administrators Telecommunications Network (AAMVANet).*

- ❑ *Completeness – The information should be complete in terms of data elements (e.g., unique personal identifiers and descriptive data such as name, date of birth, gender) and complete in terms of all prior driving history, especially adverse actions received from other states either while licensed elsewhere or while driving in other states.*

- ❑ *Accuracy – The state should employ methods for collecting and maintaining driver information which makes use of current technologies (e.g., bar codes, magnetic stripes).*

- ❑ *Accessibility – The information should be readily and easily accessible to the principal users of these databases, including driver licensing personnel, law enforcement officers, the courts, and for general use in highway safety analysis. The information should be available electronically for individual record access, and technology should be available to support automated downloading of summary data sets for analytical purposes, providing safeguards are in place to protect confidentiality within the guidelines established by the state.*

- ❑ *Data Integration – Driver information should be capable of linkage with other information sources and use common identifiers (e.g., driver license number, citation number, crash report number) where possible and permitted by law. Updates of driver information from courts should be accomplished through linkages, preferably electronic, to the driver history data.*

Status

Timeliness
The file is updated continuously in real time with newly issued and renewed licenses. Convictions are normally posted in batch overnight for those received electronically and within 24 to 48 hours for those received on paper.

Consistency
Data content meets the requirements of the NDR, CDLIS, and other applications of AAMVAnet and the recommendations of the *Advisory*.

Completeness

The data contain all of the descriptive elements for all drivers and all conviction information including adverse histories from previous states of record, convictions for unlicensed and out-of-state drivers, and convictions of North Carolina drivers received from other states. The North Carolina processes appear to lack nothing.

Accuracy
The Social Security On-Line Verification process is used to promote accuracy. The SAVE system would be used if access were established as requested by the DMV. The DMV has a special section working to identify duplicate records using facial recognition software and any other method that might be effective for the effort.

Accessibility
Authorized users obtain records in accordance with procedures defined for commercial and citizen access in compliance with the Driver Privacy Protection Act.

Data Integration
The driver file links with the DMV's State Titling and Vehicle Registration System (STARS), the Administrative Office of the Courts, vital statistics, and the AAMVAnet processes (the Social Security On-Line Verification, the NDR/PDPS, and the CDLIS).

In summary the North Carolina driver file can serve as a model that satisfies and exceeds all of the recommendations of the *Advisory*.

Recommendations

- ❑ None

Section 2-E: Enforcement/Adjudication Information Quality

Advisory Excerpt:

- ❑ *Timeliness - Information from an issued citation should be recorded on a statewide citation file as soon as the citation is filed in the court of jurisdiction. Information regarding the disposition of a citation should be entered on the citation file, as well as on the driver history record, immediately after adjudication by the courts.*

- ❑ *Consistency - All jurisdictions should use a uniform traffic citation form, and the information should be uniformly reported throughout all enforcement jurisdictions.*

- ❑ *Completeness - All citations issued should be recorded in a statewide citation file with all variables on the form completed including the violation type; the issuing enforcement agency; violation location; a cross reference to a crash report, if applicable; and BAC, where applicable, etc. All dispositions from all courts should be forwarded for entry on the driver history record.*

- ❑ *Accuracy - The state should employ quality control methods to ensure accurate and reliable information is reported on the citation form and updated on the citation and driver history files.*

- ❑ *Accessibility - The information should be readily and easily accessible to the principal users, particularly:*

  - ➢ *driver control personnel -- to take timely license sanction actions when appropriate.*
  - ➢ *law enforcement personnel -- for operational analysis and allocation of resources.*
  - ➢ *agencies with administrative oversight responsibilities related to the courts under its jurisdiction.*
  - ➢ *court officials -- to assess traffic case adjudication workload and activity.*

- ❑ *Data Integration - Citation information should be capable of linkage with other information sources, such as the crash and driver history data, and use common identifiers (e.g., crash report number, driver license number) where possible and permitted by law.*

Status

Timeliness

All of the Courts in North Carolina are using the Automated Criminal and Infractions System (ACIS) application for managing court cases. Currently, all of the district courts are submitting all disposition information electronically through the ACIS application to the Division of Motor Vehicles (DMV) nightly.

Consistency
There is a standard citation form used by law enforcement in North Carolina. The form contains data elements to identify the type of violation, location, date and time, the enforcement agency, court of jurisdiction, and final disposition.

In addition to the paper citation, law enforcement officers are using an electronic citation application to submit citations to the court. These electronic citations currently account for approximately 60 percent of the total citations submitted to the courts for adjudication.

Completeness
An integrated centralized repository for citations, to determine a citation's status (e.g., pending, adjudicated) is available from the eCitation® and ACIS applications. These two applications have established internal controls and procedures for tracking the complete "life cycle" of a traffic citation (distribution to an officer, to its issuance to an offender, to its disposition by the court, and its placement on the driver history file).

Accuracy
The case management application, ACIS, that is being used by North Carolina's courts does contain quality control procedures and edits to identify errors made by law enforcement officers and data entry personnel.

The electronic citation application that has been implemented in North Carolina (the eCitation® application) contains quality control procedures and edits. This application collects citation data in the field, transfers the data wirelessly to the Criminal Justice Information Network (CJIN), uploads to the ACIS, and sends the convictions electronically to the DMV.

Accessibility
Information about statewide violations and convictions is accessible to all authorized users. The District courts, where traffic cases are adjudicated, are using the ACIS application. It is intended to provide judicial staff with information on the current status of a citation case (open, closed, and disposition) and to account for the forms issued to law enforcement agencies. The ACIS application resides in an IMS and DB2 database and provides judges and prosecutors with information about any pending cases that an individual may have in another state-level court.

Data Integration
Executive and Judicial Branches have not cooperatively developed a standard protocol and schemas to facilitate the exchange of information between various data systems in the two branches. While the Judicial branch has standardized on the GJXDM and NIEM protocol, the Executive branch has not. This is a significant decision in that it will impact the establishment of edits and validation routines between the existing custodial databases. It is needed to make it possible for any future interfaces with any statewide or local systems maintained by the two branches.

There are common identifiers such as the driver license number and location on the citation that could be used to link with other data sources.

Recommendation

- ❑ Cooperatively develop, between the Judicial and Executive branches, the formats, protocols, and schemas to facilitate the exchange of information between various data systems. The preferred national standard is Global Justice XML Data Model (GJXDM).

2-F: Injury Surveillance Systems Information Quality

Advisory Excerpt:

- ❑ *Timeliness - Ideally, the medical data on an injury should be available within an Injury Surveillance System (ISS) in the same time frame as data about the crash is available elsewhere within the traffic records system. However, the medical record on the individual may be incomplete initially because local protocols dictate that the medical record is only placed in the ISS when the patient leaves the health care system (e.g., discharged). Every effort should be made to integrate the ISS record with the crash data as soon as the medical records become available.*

- ❑ *Consistency - The reporting of EMS run data, hospital ED and admission data, trauma registry data, and long term health care data should be consistent with statewide formats which should follow national standards such as ICD-9-CM, as published by the Centers for Disease Control (CDC), the use of Injury Severity Scale standards, etc.*

- ❑ *Completeness - Although a trauma registry based ISS can provide a valuable source of ISS information, it cannot provide a complete picture of the injuries within a community or state. Where possible, the ISS should represent a consensus of all injuries that occur within the community. The ISS should, where feasible, be maintained at a state level but, at a minimum, should be maintained at the local level.*

- ❑ *Accuracy - The state should provide local heath care providers with training and support in the accurate coding of injuries and should foster the proper use of the resulting ISS data through education of data users in proper interpretation of these data.*

- ❑ *Accessibility - Recognizing the issues of patient and institutional confidentiality, there should be mechanisms in place to balance the demands for data accessibility from end users and the requirements of state and local privacy rules. At a minimum, the traffic safety and injury control communities should be able to access these data in summarized reports designed to address specific needs, including injury type and severity cost data. Ideally, the system should support the creation of "sanitized" extracts of the ISS data for use in research, problem identification, and program evaluation efforts.*

- ❑ *Data Integration - The true power of the ISS is recognized when the ISS data are integrated with other traffic records system data such as traffic crash, roadway, and crime data, as well as internally between EMS runs, hospital/ED admission data and discharge data. The ISS should be implemented in a fashion that supports this integration in as efficient a manner as possible. Often GIS systems provide the ideal platform for linkage and interpretation of the ISS and traditional traffic records system data. The use of common identifiers whenever possible within the traditional traffic records system and ISS data systems will facilitate this integration effort.*

Status

Timeliness

EMS

All EMS providers are to send the required data set electronically to the state. The State is in the process of moving toward deploying a new software application that will assist the provider with data submission. In addition the Office of Emergency Medical Services (OEMS) has moved to a more stringent reporting requirement for EMS providers to submit their data within 24 hours from the time of the patient care incident, effective January 2007. Approximately 10-15 percent of providers submit data within 24 hours of patient care incidents, 70 percent submit data within 48 hours of patient care incidents, and 100 percent submit data within 72 hours of patient care contacts. Reporting is a mandatory requirement, and penalties may be levied for non-compliance. Data are complete through 2006.

Trauma Registry

All designated trauma centers submit patient care data electronically to the State Trauma Registry on a quarterly basis. This is an essential criterion of the trauma designation process. All trauma centers are compliant with reporting requirements. Those hospitals that have completed a letter of intent to achieve designation are required to submit six months of data prior to their trauma survey.

The NC Trauma Registry (NCTR) is an electronic data collection and repository system. Data from the trauma centers are submitted from NTRACS. Data from the non-trauma centers are submitted daily in multiple formats, which are then converted to the NCTR standard, stored as a SAS dataset, and maintained on the NCTR server. Non-trauma center data are complete through 2006.

The non-trauma centers submit data using an automated nightly submission process to send data to the State Trauma Registry (the ISSAC data collection system). Data are complete through 2006.

Emergency Department Data

All of the 90 Emergency Departments that are participating in the statewide ED data collection process are using an automated nightly submission process to send data to the state data repository. The first year of complete data is 2006.

Hospital Discharge Data

All 120 acute care hospitals in the state are required to send data to the state data repository. Information related to the timeliness of the data submissions was not available at the time of this assessment. However, it was reported that the last year of complete data is 2004.

Mortality Data

Information related to the timeliness of the data submissions was not available at the time of this assessment. However, it was reported that the last year of complete data is 2005.

Consistency and Accuracy

EMS

North Carolina has adopted the NHTSA National EMS Information System (NEMSIS) Version 2.2.1 Data Set. There is a published EMS data dictionary and data standards. EMS providers may choose to use a locally developed or commercial non-PreMIS based EMS data collection system. To electronically submit data using a non-PreMIS system, the NEMSIS Version 2.2.1 XML data standards must be used as a vehicle to send data to the state.

There are four methods of data entry into the PreMIS database: 1) web browser using the Internet, 2) customized application on a PDA, 3) a written form that will be faxed into the database, and 4) import from an established database.

The new PreMIS electronic data collection system has inherent edit and logic checks that assist with the collection and submission of quality data. Data are not rejected at this time if an error has been identified by the system upon submission. However, data quality error issues are presented to the providers as a quality improvement and system improvement process. Data quality reports are automated and provided by the system upon each data submission.

Trauma Registry

North Carolina has adopted the American College of Surgeons NTRACs® trauma data set that is incorporated into the software application. There is a published data dictionary. Verified/designated trauma centers and non-designated trauma centers may send data using many data formats at this time.

The data set includes ICDM 9 Codes 800.0 – 959.9, E – Codes (Mechanism of Injury Codes), Abbreviated Injury Severity (AIS) Codes and Injury Severity Score (ISS). These assist in maintaining uniformity and consistency in the reporting and evaluation of a trauma patient's injuries and probability for survival.

The Trauma Registry analyst reviews and prepares the data for analysis. This is a very time consuming and laborious task that is not fully automated and requires manipulation of many data formats into one single useable data base for analysis. This could jeopardize data quality and data accuracy.

Emergency Department Data

North Carolina Emergency Department data are submitted electronically to the state data repository using a uniform data set. The National Center for Injury Prevention and Control (NCIPC) developed uniform specifications for data entered in Emergency Department (ED) patient records. The initial product is Data Elements for Emergency Department Systems, Release 1.0 (DEEDS) and has been adopted by the State. There is a published data dictionary. Information related to the electronic data systems data quality and edit checks were not available during the assessment.

Hospital Discharge Data

The acute care hospitals are required to submit the standard Uniform Billing (UB-92) data format that is used to bill for their hospital charges. These data include records on patients who spent at least 24 hours as an inpatient but do not include patients who were released from the emergency room. These data identify billed charges, not the actual payments received by the hospital. Data include demographic information, diagnoses, (identified by ICD-9, International Classification of Disease codes), diagnostic and operative procedures, billed charges, length of hospital stay, and discharge destination. The ICD-9 system is used to code and classify morbidity (the rate at which an illness occurs) data from inpatient records.

Mortality Data

Mortality data submitted to the DHHS Division of Vital Records include the demographic data of the individual: occupation, gender, age, date of birth, age at death, place of death, manner of death, state of residence, and cause of death (identified by ICD-10, International Classification of Disease codes). The ICD-10 system is used to code and classify mortality (the number of deaths) data from death certificates.

Completeness

EMS

There is a process that tracks compliance with data reporting requirements, and it was reported that 100 percent of the 860 EMS providers are compliant with the reporting requirement. There are penalties or punitive actions levied against the EMS providers not compliant with the data reporting requirements.

All future funding initiatives administered through the North Carolina Office of EMS will require compliance with the EMS data submission requirements. EMS systems not in compliance are not eligible for grants or other EMS funding initiatives. These include but are not limited to the HRSA Hospital Preparedness and Rural AED grant programs. EMS systems which are not in compliance with the EMS Data Submission requirements may also be subject to disciplinary action as defined in North Carolina EMS law and regulation by the North Carolina Department of Health and Human Services.

All EMS providers must collect and submit data to the state through their EMS system if they provide the following types of service:

- Any provider which is the primary EMS service dispatched by 911 and responsible for primary patient care with or without transport.
- Any provider performing a patient evaluation functioning at the ALS level.
- Any provider transporting a patient
- Any provider providing the primary patient care for a patient who has been defibrillated by an AED prior to arrival by EMS (this includes First Responder and Lay Public defibrillation).

Trauma Registry
There is a process that tracks compliance with data reporting requirements or deficits in reporting to the state. The reporting of trauma patient care data is an essential criterion for trauma verification/designation. Data are submitted to the state trauma registry electronically. It was reported that 100 percent of the 15 designated trauma centers are compliant with the state reporting requirement. Data quality feedback is provided to the Trauma Centers

Emergency Department Data
Information related to the completeness of the data submissions was not available at the time of this assessment.

Hospital Discharge Data
Information related to the completeness of the data submissions was not available at the time of this assessment.

Mortality Data
Information related to the completeness of the data submissions was not available at the time of this assessment.

Accessibility
Protected patient care data are released in compliance with state and national patient privacy and protection regulations. Patient identifiable data are removed from data released in statistical reports.

EMS
EMS data are used for pre-hospital system evaluation and quality improvement activities. The current data set is new but comprehensive and could provide a platform for data integration and linking in the future with other healthcare and traffic safety data partners' data files. However, there is only 1 year of complete data (2006).

Data are available upon request in a prepared report format. Access to raw data files or patient identifiable information is not available. This is in compliance to HIPAA and patient privacy protection regulations.

Trauma Registry
Trauma Registry data are used for injury prevention and injury surveillance activities. The data are a subset of the total statewide trauma cases and do not reflect the effects of trauma on the state.

Data are available upon request in a prepared report format. Access to raw data files or patient identifiable information is not available. This is in compliance to HIPAA and patient privacy protection regulations.

Emergency Department Data

Emergency Department data is relatively new and the first year of complete data is 2006. These data are available upon request in a prepared report format. Access to raw data files or patient identifiable information is not available. This is in compliance to HIPAA and patient privacy protection regulations.

Hospital Discharge Data

Hospital Discharge data are not very widely used at this time by academia or the local and state injury prevention community due to existing issues concerning the timeliness of the data and the very limited number of data elements that are available at this time renders the data virtually unusable for any analytical studies or projects. The last year of complete data was 2005 and the data file available to researchers contains approximately 15 data elements. Access to raw data files or patient identifiable information is not available. This is in compliance to HIPAA and patient privacy protection regulations.

Mortality Data

Mortality data files are available in both paper and electronic data format to the research community for analytical and research activities. However, it was reported that the last year of data available is 2005.

Linkage/Integration

With the exception of an attempt to obtain and use hospital data in a Senior Pedestrian Safety Project, there are several obstacles to achieve linkage of ISS data with other ISS data sets or with other traffic records data. Currently there are traffic records data systems still using a paper-based data collection method (crash), several electronic data collection systems that are less than three years old, and several electronic data collection systems being developed at this time. In addition, the lack of quality data; timely, complete and accessible medical and healthcare data; and statewide trauma data is a critical injury surveillance system deficiency. These prohibit evaluating the major impact of motor vehicle crashes and debilitating injuries on the economy of the state in relation to loss of revenue and uncompensated care dollars.

In addition, the EMS, trauma, hospital discharge, Emergency Department, mortality, and crash data files whether linked or used separately can provide a platform to launch legislative initiatives, traffic safety and injury prevention activities that can have a positive impact on the health and welfare of the citizens and the State of North Carolina.

The following issues are contributing factors in not having a comprehensive data linking project and comprehensive functional statewide injury surveillance system. These are:

1. Lack of mandatory reporting of trauma patient care data by all hospitals
2. Lack of compliance with the uniform trauma patient care data format
3. Lack of common data variables that can follow a patient/victim from the scene of an accident through the healthcare system, discharge or death
4. Lack of access to comprehensive medical and healthcare data files by authorized data partners (through signed agreements and data sharing practices) for research and injury prevention activities

5. Lack of a stable fiscal foundation for the EMS and a Trauma Registry data collection systems for maintenance, hardware, software, and sustainability

Once these barriers are overcome, North Carolina will be in the position to apply for many funding opportunities that can assist them in combating traffic safety, injury prevention, and healthcare issues. In addition, the state will see the creation of a statewide traffic records system that will be proactive and innovative in addressing highway safety and injury prevention issues.

Recommendations

- ❑ Seek legislation to support the EMS and a trauma data collection system.
- ❑ Establish rules that mandate the reporting of trauma data to the state by all hospitals.
- ❑ Adopt one trauma registry data format and data submission standard for all hospitals to use in submitting data to the state.
- ❑ Ensure edit checks and data validation rules are built into a new trauma software application.
- ❑ Incorporate EMS providers, Trauma Coordinators, physicians, and stakeholders in trauma registry data planning, development, implementation, and deployment activities.
- ❑ Expedite the timely submission of hospital discharge data to the state data repository by all hospitals.
- ❑ Collaborate with all data sharing partners in developing protocols, memorandums of agreements and data sharing methodologies that will enable the injury prevention and traffic safety community to conduct analytical and research activities as authorized users. This should be done under the guidance of the TRCC.
- ❑ Assure that <u>all</u> managers of the North Carolina Statewide Injury Surveillance System components participate fully in the TRCC.

SECTION 3:
USES OF A TRAFFIC RECORD SYSTEM

The end purpose of a state's traffic records system is to establish a base of information and data that is available and useful to its customers, including operational personnel, program managers, analysts and researchers, policy makers, and the public. To be of optimal value to its customers, the system should provide for efficient flow of data to its users and be used in support of a wide range of activities. The traffic records system should support the needs of users at all levels of government (state & local), as well as the private sector and the public. The information demands from this wide range of professions and interests is driven by the need for operational data, as well as planning and evaluation information. Examples of uses are provided in the following sections.

3-A: Program Management and Evaluation

Advisory Excerpt: *Fiscal limitations make it imperative that existing resources (time, staff, funding) be used efficiently. The safety programs at all levels should be accountable for demonstrating the impact of their countermeasures. This places demands on the traffic records system for information to monitor progress and evaluate the impact of countermeasure programs (e.g., monitoring of construction zone crashes during a project, and changes in alcohol-related injuries as a result of an enforcement project).*

Status

The mission of the Governor's Representative for Highway Safety is to reduce the number and severity of traffic crashes on the State's roadways that result in deaths, injuries, and economic losses from property damage. Each year the office is required to review and update its goals and objectives to accomplish the mission. Strategies are developed and implemented as countermeasures to address identified traffic safety problems. These strategies become projects with performance measures that must be evaluated using traffic records data to study pre- and post-project conditions. Projects should be evaluated either administratively or for impact using traffic records data and other pertinent information.

The Governor's Highway Safety Program (GHSP) has extensive resources available to define its highway safety problems and countermeasures. In addition to its staff, the GHSP has cooperative arrangements with the North Carolina Department of Transportation (NCDOT), the Highway Safety Research Center (HSRC), and the Institute for Transportation Research and Education (ITRE). HSRC at the University of North Carolina has "conducted interdisciplinary research aimed at reducing deaths, injuries and related societal costs of roadway crashes." ITRE is an institute administered by North Carolina State University and is used for defined projects. North Carolina and its university resources has been a major resource for the nation and, of course, for the GHSP.

The GHSP funds crash data analysis capabilities of the HSRC. "North Carolina Crash Data" is a website (http://www.hsrc.unc.edu/crash/about.cfm) that enables anyone with web access to produce simple reports—currently the 2001 through 2004 crashes—for public access. HSRC has the 2005 data for GHSP use. The following is the cautionary explanation about using the data:

> "The information shown on this site is based on a static copy of 2001-2004 crashes extracted from the NCDOT live crash database. The numbers may not precisely match what is in the live database, as that information is continually being updated. Data like these are typically used to develop general descriptions of crashes. This process is sometimes referred to as the problem identification stage. For a detailed review of crashes in specific locations (e.g., corridors or certain intersections within a community), it will be necessary to obtain such information at the local level. Likewise, development of specific treatments or countermeasures normally takes place after discussions with knowledgeable local officials. The accuracy of any report or opinion based on the use of these data tables is the responsibility of the user. **If you need help, please contact**…."

Note: Bolding was added to note that HSRC will provide additional depth as needed.

HSRC has had (until September 2006) the capability of producing any array or analysis of the data through direct access to all of the data—1990 to the current update. In September, a new security policy in the DOT blocked all non-State direct access, not recognizing the UNC as a State agency. DOT Traffic Engineering is providing partial updates while working on enabling direct access again for HSRC.

Program managers perform the evaluations. The GHSP has a web site with extensive and detailed information on highway safety topics, grant management, news items, and its initiatives:

> "The GHSP plans and supports several highway safety initiatives each year. "**Click It or Ticket**" began in 1993 and has become the national model for an enforcement and education campaign of the same name operated by the National Highway Traffic Safety Administration. Since then, the agency has led law enforcement officers and other highway safety advocacy groups in initiatives such as "**Booze It & Lose It**," "**R U Buckled**," "**Nuestra Seguridad**" and pilot **DWI Processing Court** programs. In 2006, GHSP plans to kick off a new speed campaign, "**No Need 2 Speed**." Please click on the above links to read more about each of these programs."

A capsule description of each of the initiatives is provided. Finally, an Online Reporting capability is provided for reporting the results of the campaigns in operation.

Recommendation

- ❑ Assist in the effort to re-enable HSRC to have direct access to the crash database and provide analytic services without any compromise arising from inability to access the full, up-to-date historic crash file.

3-B: Research and Program Development

Advisory Excerpt: *Data-driven planning decisions within the highway and traffic safety communities necessitates identification of trends and baseline measures. In order to identify safety problems and trends, the traffic records system should provide comparable data, over time, that can be easily linked and analyzed, and that data should be made available to a wide range of users (e.g., State Traffic Safety Offices for development of the safety plan, local police agencies for identification of enforcement zones, etc.).*

Status

The charge of the Governors Highway Safety Program (GHSP) is to reduce the number and severity of traffic crashes on the state's roadways that result in deaths, injuries, and economic losses from property damage. GHSP provides leadership by developing, promoting, and coordinating programs; influencing public and private policy; and increasing public awareness about highway safety issues.

The GHSP utilizes the researchers at North Carolina's Department of Transportation's Traffic Safety Unit and the University of North Carolina's Highway Safety Research Center to conduct statistical analysis and publish research reports addressing traffic safety issues. The researchers make use of the information from various traffic record files for highway safety planning and program development. They obtain and use information from the crash file, driver license file, roadway files, trauma file, and the citation file for problem identification and to develop strategic initiatives for all of the program areas in highway safety.

Recommendations

- ❑ None

3-C: Policy Development

Advisory Excerpt: *Informed decision making to support highway and traffic safety policy decisions is only possible with timely, accurate, and accessible information. Traffic records systems data should also be available to promptly respond to legislative and executive requests.*

Status

Currently requests for data to support safety policy decisions are directed to a number of agencies in the State and their supporting contractors.

Many decisions at the policy level require safety information from other traffic record sources. The State's Traffic Records Coordinating Committee (TRCC) would seem to be the logical forum to coordinate the development of data systems to support highway safety policy decisions. This does not imply that the current practices of obtaining data should be stopped but the TRCC should be coordinating and supporting the sharing and dissemination of highway safety data to assure all legitimate safety stakeholders' data needs are met.

Recommendation

- ❑ Task the TRCC with publishing a dictionary of all safety data systems and contacts.

3-D: Private Sector and Public Requests

Advisory Excerpt: *The traffic records system, through a combination of information sources, technical staff, and public records access policies, should be capable of producing scheduled and ad hoc reports. The media, advocacy groups, safety organizations, the general public, and internal (state and local) users have demands for regular reporting as well as for unforeseen ad hoc reports and access to data extracts. There should be a mechanism in place for establishing what data should be available to public and private sector users, within the laws protecting individual privacy and proprietary information.*

Status

The North Carolina Traffic Records Branch, Division of Motor Vehicles (DMV) is the official crash file custodian. The DMV and the Department of Transportation (DOT) through a collaborative process produced *2004 North Carolina Crash Facts* that is available to the public at the DOT website http://www.ncdot.org/dmv/other_services/recordsstatistics/CrashReports.html.

The North Carolina Governors Highway Safety Program contracts with the University of North Carolina Highway Safety Research Center (HSRC) to provide analytical and statistical expertise in responding to legislative data requests, and to conduct research and traffic safety activities. This has lead to the creation of a "Rapid Response Unit" that responds to high priority data requests or special projects. Traffic safety reports and information are available to the public on the HSRC website. The website also offers a portal to an innovative web query tool where the public can perform simple queries and obtain information related to bicycle and pedestrian crashes (**North Carolina Bicycle & Pedestrian Crashes http://www.pedbikeinfo.org/pbcat/).**

The North Carolina Safe Kids Coalition and the Department of Health and Human Services Injury and Violence Prevention Branch request traffic safety data from the HRSC on a routine basis. An example of one such data request and research project for the Safe Kids Coalition is the *Injuries to North Carolina Children and the Roles of the Safe Kids* that was conducted at the HSRC.

The North Carolina Highway Patrol (NCHP) responds to data requests related to motor vehicle crashes that are investigated on the state highways and that involve commercial motor vehicles. Traffic safety data and information are available to the public on the NCHP website at http://www.nccrimecontrol.org/Index2.cfm. In addition, there are commercial motor vehicle statistics available on the website.

Recommendations

- ❑ None

SECTION 4:
MANAGEMENT INITIATIVES

The development and management of safety programs should be a systematic process with the goal of reducing the number and severity of traffic crashes. This process should ensure that all opportunities to improve highway safety are identified, considered, and implemented. All implemented highway safety activities should be evaluated. The evaluation results should be used to improve and facilitate the selection and implementation of the most efficient and effective highway safety strategies and programs. This process can be achieved through the following initiatives.

4-A: Coordination

Advisory Excerpt: *There should be a statewide traffic records coordinating committee (STRCC) with representation of the interests from all levels of public and private sector traffic safety stakeholders, as well as the wide range of disciplines that have need for traffic safety information. This committee should be formed within state policy and legal guidelines and institutionalized and empowered with the responsibility (through formal agreements) to recommend policy on traffic records. The state should provide a mechanism to ensure support for the administration and continuance of the coordinating committee, as well as technical guidelines. The STRCC should be responsible for adopting requirements for file structure and data integration, assessing capabilities and resources, establishing goals for improving the traffic records system, evaluating the system, developing cooperation and support from stakeholders, and ensuring that high quality and timely data will be available for all users.*

Status

The leveraging of resources is one of the inherent benefits of having continuous communications between and among members of the traffic safety community. An active Traffic Records Coordinating Committee (TRCC) facilitates this effort.

Any improvements to the state's traffic records system are dependent on multi-agency coordination. North Carolina's Traffic Records Coordinating Committee (TRCC) has been in existence since the mid1990s. In 2002 members of the committee began meeting informally to discuss solutions to address the challenges associated with the availability of traffic records data. However, the TRCC was reorganized and formally established in 2006, and it meets every two months.

The Committee includes an executive level and a technical level. This two-tiered level TRCC is critical for the state to properly develop, maintain, and track the progress of projects identified in the state's traffic records strategic plan that was required by the SAFETEA-LU legislation.

Administrative support for the committee is provided by the Governor's Highway Safety Program (GHSP). Members of the Traffic Safety Unit of the Department of Transportation and the University of North Carolina's (UNC) Highway Safety Research Center (HSRC) serve as the TRCC's co-chairs. Additionally, the state has a designated traffic records coordinator on the GHSP staff.

An executive level is necessary to establish policies, set strategic goals for project development, approve projects, and authorize funding. Presently the involvement of the executive level is limited, and a member has not been designated to champion the cause for traffic records. This is critical if the state is to develop a comprehensive integrated traffic records system with the necessary data linkages between and among existing and proposed traffic record files.

Technical level committee membership includes representation from most stakeholder agencies and is charged with providing technical support, project implementation, and collaboration. These members are the collectors, managers, and users of traffic records data from state and local organizations. Although most of the state's traffic safety agencies participate,

representation was lacking from the executive level of another stakeholder agency, the Department of Administration, Information Management Division.

The Committee's primary focus for the last year has been the preparation of a traffic records strategic plan as part of their application for a 408 grant to the National Highway Traffic Safety Administration (NHTSA). The purpose for this action was to meet the requirements of a NHTSA grant program to improve state traffic safety information systems under Section 2006 of the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA–LU).

The committee functions as a working group, and its primary purpose is to serve as a forum for the various stakeholder agencies to discuss and provide status reports regarding traffic records initiatives that are occurring within their agencies. The TRCC is limited in its ability to provide more project level guidance and support for traffic record initiatives.

The TRCC is about to undertake numerous initiatives one of which is the implementation of the Traffic and Criminal Software (TraCS) within the North Carolina Highway Patrol (NCHP) to capture information about motor vehicle crashes electronically. All of the projects shown in the strategic plan are going to need support and direction if they are to benefit the entire traffic safety user community.

A properly constituted TRCC provides for its members the opportunity to coordinate all traffic records projects and become informed about the component parts of, and data sets within, a traffic records system. The strategic implementation of the various tenets of the traffic records system will result in economies of scale through joint purchase power, eventual integration of new systems, and the cooperative development of data elements and data dictionaries.

Recommendations

- ❑ Expand the existing TRCC to include representation from the Management Information Division in the Department of Administration.
- ❑ Involve the Executive Level members more directly in the oversight of the TRCC's activities.
- ❑ Encourage someone from among the membership of the Executive Committee to champion a comprehensive traffic records system.
- ❑ Develop project governance for these initiatives that place the TRCC executive level group in the accountability and decision-making role.

4-B: Strategic Planning

Advisory Excerpt: *The traffic records system should be operated in a fashion that supports the traffic safety planning process. The planning process should be driven by a traffic records system strategic plan which helps state and local data owners support the overall safety program needs within the state. This plan should address such activities as:*

- ❑ *A continuous review and assessment of the application of new technology in all phases of its data operations: collection, processing, retrieval, and analyses. The strategic plan should address the adoption and integration of new technology, as such change is feasible and desirable in improving the traffic records system.*
- ❑ *Promotion of local data systems that are responsive to the needs of local stakeholders.*
- ❑ *Identification and promotion of integration among state and local data systems to eliminate duplication of data and to help assure current, reliable information.*
- ❑ *Data integration to provide linked data between components of the traffic records system (e.g., Crash Outcome Data Evaluation System [CODES]).*
- ❑ *Coordination of the federal systems (e.g., FARS, NDR, CDLIS) with the state records systems.*
- ❑ *Recognition and incorporation, where feasible, of uniform data elements and definitions and design standards in accordance with national standards and guidelines (e.g., MMUCC, ANSI-D20.1, ANSI-D16.1, NGA, EMS Data Dictionary, etc.).*
- ❑ *Changing state and federal requirements.*
- ❑ *Capture of program baseline, performance, and evaluation data in response to changing safety program initiatives.*
- ❑ *Establishment and updating of countermeasure impacts (e.g., crash reduction factors used in project selection and evaluation).*

The strategic plan should be endorsed by, and continually updated through the activities of, the statewide traffic records coordinating committee.

Status

The Director of the Governor's Highway Safety Program (GHSP) in the North Carolina Department of Transportation (NCDOT), the designated Governor's Highway Representative for the State, submitted a strategic plan entitled *North Carolina's Traffic Records Coordinating Committee Implementation Guide June 2006* which was the application for a 408 grant to the NHTSA. The impetus for this action was to meet the requirements of a NHTSA grant program to improve State traffic safety information systems under Section 2006 of the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA–LU).

The application and accompanying *Plan* has been favorably reviewed by NHTSA to determine whether the SAFETEA-LU requirements were met. The following comments are intended as an aid to the Traffic Records Coordinating Committee (TRCC) in future strategic planning activities to achieve successful implementation of selected projects. It is not to be viewed as an endorsement of the submitted *Plan* nor should this be viewed as part of the NHTSA grant approval process for the submitted *Plan*.

Following is an Assessment team review of the *Plan* with consideration to the provisions set forth in SAFETEA-LU and the development process used by the TRCC. SAFETEA-LU provides that a Strategic Plan for Traffic Records improvement shall be:

a) approved by the State's TRCC;
North Carolina's TRCC satisfies the requirement in SAFETEA–LU that a State TRCC must have a multidisciplinary membership that includes, among others, managers, collectors, and users of traffic records and public health and injury control data systems, and the authority to approve the State's Strategic Plan.

Although the certification documents were not present in the *Plan* reviewed, appendices indicate that the TRCC was in charge of the development and approval of the submitted *Plan*, and that authority was vested in the TRCC by the Cabinet level Executive Committee for Highway Safety.

(b) address existing deficiencies in a State's highway safety data and traffic records system;
In the absence of a formal independent review process (traffic records assessment) within the past five years the TRCC undertook an examination of all major traffic records system components to identify and define deficiencies in safety data needs.

(c) specify how deficiencies in the system were identified;
The deficiencies identified through the review process mentioned above focused on the quality characteristics suggested in the *Federal Register—State Traffic Safety Information System Improvement Grants.*

Projects were identified by each agency to address deficiencies in a traffic records system component, the data collection process (accuracy, completeness), achieving necessary compliance, customer service improvements (availability of data), or improving the timeliness of the data. Projects involving the linking of data for improved utilization and establishing partnerships were also being identified. Projects were to address all federal and state laws or policies concerning the privacy or protection of information.

In addition, the TRCC examined the utility of the data systems reviewed and the adequacy of the systems' architectures.

(d) prioritize the needs and set goals for improving the system;
The TRCC used the NHTSA-suggested four-box priority method to categorize projects by costs and expected benefits. Initially all projects submitted

were classified as Low Cost - High Payoff, Low Cost - Low Payoff, High Cost - Low Payoff, High Cost - High Payoff.

After all projects were submitted a prioritization sheet was distributed to each member agency. Each member agency ranked the projects with number one being used to identify the highest ranked project. In this manner, each project received a rank with the low number determining the highest ranked project.

While the method described above is appropriate, bias is introduced through the separate ranking by each agency without the benefit of discussion in open forum with the full TRCC membership. After discussion ranking can then be done in a modified Delphi method.

The TRCC acknowledged that many projects or strategies will be easier to implement and may yield high payoff and have few obstacles to achieve relatively quick success. A more thorough prioritization method should be developed and adopted by the TRCC for future updates and 408 grant submissions.

(e) identify performance-based measures by which progress towards those goals will be determined;

This was the weakest area in the submitted *Plan.* Using the first Project *Provide for Electronic Submission of Crash Reports (DMV-349) from SHP* to illustrate, the goals or deficiencies listed describe abstractly what this project will achieve with regard to quality characteristics. However, to measure progress on how this project will achieve these goals or objectives, these measures must be quantifiable. Further, a benchmark for each must be established that reflects current status. A listing of expected benefits/impacts is shown and can be the basis for developing the performance measures.

A project timeline is also shown that indicates milestones for various action items. These can be expanded to show resources required by activity and costs relating to each action item. Doing so will enable the estimate to be calculated. This information can then be used to show budget impact and the source of all funds identified.

(f) specify how the State will use section 408 and other funds of the State to address the needs and goals identified in its Strategic Plan.

This area is another weakness in the *Plan* that needs to be addressed. It was touched upon in the previous paragraph. Total project costs from all sources need to be identified. This includes in-house matching funds and resources required for each milestone action item.

The project descriptions and format used may be adequate for the grant submission, but much more detail and adherence to project management processes will be necessary for the project manager and the TRCC to monitor progress and to adjust and modify projects.

Further, project managers should be identified by name rather than by title or by agency. Accountability is an important attribute in strategic planning to assure some level of achieving success for each project.

Overall the submitted *Plan* represents a valiant effort considering the time and resource constraints under which it was conducted. However, it will be difficult to show measurable progress for the projects submitted with the currently described tasks for each project. The tasks need more detail and should be presented in an appropriate project management format. Project management software, GANNT charts, or other project management tools should be examined for use by the TRCC.

Recommendations

- ❑ Task the TRCC with the responsibility to follow up on the NHTSA review of the 2006 grant submission, and consider the suggested concerns cited above.

- ❑ Use this Assessment to identify deficiencies, and begin the process for the second year update and the 2007 408 grant submission.

- ❑ Apply project management procedures to each project.

- ❑ Establish a progress reporting and monitoring system to track all projects listed in the *Plan* regardless of funding sources.

- ❑ Develop benchmark and performance measures in future *Plan* updates collaboratively with the project manager, other traffic records partners that may be affected by the project results, and the Traffic Records Coordinator to assure consensus is reached on the appropriate measures to be monitored for progress.

4-C: Training and Staff Capabilities

Advisory Excerpt: *Throughout the data gathering, interpretation, and dissemination process, there is a need for training and technical support. A training needs analysis should be conducted for those highway safety professionals involved in program development, management, and evaluation. Training should be provided to fulfill the needs identified in this analysis. There should also be an ongoing outreach program for users of traffic safety program information to assure that all users are aware of what is available and how to use the information to fulfill their needs.*

Status

The North Carolina Division Motor Vehicles (DMV) provides crash report training sessions related to data quality issues and trends on a routine basis. There were two law enforcement training sessions held in October 2006 and two scheduled sessions planned for February 2007.

In addition, the DMV has a new Operations and Support Unit that provides training to local and state law enforcement personnel. In addition to training, the Unit staff (four full time staff) will respond to the help desk technical assistance calls when the TraCS (electronic crash reporting) is deployed at local and state law enforcement agencies in March 2007. This will include training the agencies' administrators who will be train-the-trainers or level-one support for TraCS.

The North Carolina DMV-349 Crash Report Instruction Manual, publication date 1999, is available at

http://www.ncdot.org/doh/preconstruct/traffic/teppl/Topics/C-34/C-34-man.pdf

and the 2004 DMV-349 Crash Report Form Codes are available at

http://www.ncdot.org/doh/PRECONSTRUCT/traffic/TEPPL/Topics/C-34/C-34_f.pdf.

Both of these resources are available to assist law enforcement personnel with the correct completion of the DMV-349. In addition, the DMV-349 Crash Report Form (last revision 2002) may be downloaded from the DMV website at

http://www.ncdot.org/doh/PRECONSTRUCT/traffic/TEPPL/Topics/C-34/C-34_cf.pdf.

All of these resources are available to assist with the collection of consistent quality crash data.

Recommendations

- ❑ None

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GLOSSARY OF TERMS AND ACRONYMS

AADT	Average Annual Daily Traffic
AAMVANet	American Association of Motor Vehicle Administrators Telecommunications Network
ADT	Average Daily Traffic
ANSI	American National Standards Institute
ANSI D16.1	Manual on Classification of Motor Vehicle Traffic Accidents
ANSI D20.1	Data Element Dictionary for Traffic Record Systems
BAC	Blood Alcohol Concentration
CCSRS	Comprehensive Computerized Safety Record-keeping System
CDC	Centers for Disease Control
CDLIS	Commercial Driver License Information System
CODES	Crash Outcome Data Evaluation System
ED	Emergency Department
EMS	Emergency Medical Services
FARS	Fatality Analysis Reporting System
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
GIS	Geographic Information Systems
GPS	Global Positioning System
ICD-9-CM	International Classification of Diseases, Volume 9, Clinical Modification
ISS	Injury Surveillance Systems
MMUCC	Model Minimum Uniform Crash Criteria
NDR	National Driver Register
NGA	National Governors' Association
NHTSA	National Highway Traffic Safety Administration
NSC	National Safety Council
STRCC	Statewide Traffic Records Coordinating Committee
TEA-21	Transportation Equity Act for the 21st Century
TRB	Transportation Research Board
VIN	Vehicle Identification Number
VMT	Vehicle Miles Traveled

TEAM CREDENTIALS

LESLIE NELSON-TAULLIE
Colorado State Patrol (CSP)
700 Kipling Street
Lakewood, Co 80215

Telephone Number: 303-239-4542
Fax Number: 303-239-4673
E-mail Address: Leslie.nelson@cdps.state.co.us

Title: Manager Grants and Analysis Section

The Grants and Analysis Section provides technical guidance, information, and recommendations primarily to the Chief's Office of the Colorado State Patrol. The purpose is to:

- Secure and manage federal and state grants awards.
- Establish manpower and resource needs.
- Provide professional analysis on existing, pilot, and potential CSP programs in order to create efficiencies and establish sound performance metrics.
- Respond to requests for information from CSP members, governmental agencies, and the general public.
- Foster partnerships with critical internal and external stakeholders.

Experience

She is the Grants Administrator for the Colorado State Patrol and is responsible for advocating the CSP's position with the federal and state partners. She participates in project and contract negotiations with the oversight agencies. She represents the CSP on inter-agency initiates.

She has twenty-seven years experience in the area of data collection, data management, and data analysis. Specific areas of expertise are crash data, citation/conviction data, and crime data.

Organizations

- Colorado State Traffic Records Committee (STRAC)
- Association of Transportation Safety Information Professionals (past Executive Board member)
- National Grants Management Association
- Association of Colorado State Professionals

ROBERT A. SCOPATZ, PH.D.

Data Nexus, Inc.
P.O. Box 11770
College Station, TX 77842-1770

Director Of Research & Consulting Services

SUMMARY

Dr. Scopatz has over 25 years of experience in the design and analysis of research studies using statistical and operations techniques. Over 20 years of his experience has been in traffic safety, traffic records systems, and safety analyses in support of motor carriers, pavement, bridge, and traffic management programs. His expertise includes data analysis methodology, user-interface design, strategic planning, human factors, human/computer interaction, group performance improvement, learning, motivation, customer service evaluation, system performance improvement, and organizational change Recent work includes development of web-based training in traffic records systems, revision of the NHTSA Traffic Records Program Advisory and Assessment, and research on crash data quality and process improvement. Dr. Scopatz has served as a media expert on issues related to safety impact of unlicensed drivers and other traffic safety issues.

EXPERIENCE

1996 to Present **Data Nexus, Inc.**

Director of Research and Government Services

- Maintains responsibility for strategic planning, data base development, survey design, and data analysis projects
- Participates in design and development of software modules for public safety management and data analysis/reporting, user interface design, and evaluation from a human factors perspective
- Conducts training needs assessments and training course development
- Participates in state-level strategic planning efforts and was recently a panel member for a NHTSA Assessment of Traffic Records in Idaho and Delaware

Recent projects include: revision of the NHTSA Traffic Records Advisory, development of web-based training in Traffic Records data and analysis, Traffic Records Audits and Strategic Plans for Oregon, Wyoming, and Missouri, participation in numerous NHTSA state Traffic Records Assessments, development and implementation of a method for auditing crash report quality used for Federal Motor Carrier Safety Administration (FMCSA) and AAA Foundation for Traffic Safety projects; support for FMCSA's Commercial Vehicle Analysis & Reporting project (CVARS); and the *Unlicensed to Kill: The Sequel* project examining driving without a valid license for the AAA Foundation for Traffic Safety.

1991 to 1996 **Star Mountain, Inc**

Research Scientist

- Maintained responsibility for data analysis, data base development, training evaluation and design, literature reviews, employee knowledge and attitude assessment, experimental design and technical reporting in support of system performance improvement, Human Factors, and training projects
- Designed and developed a course module on Applied Statistics for the US Air Force School of Aerospace Medicine
- Researched and wrote guidelines for the user interface and online data presentation chapters of a Human Factors Handbook for Advanced Traffic Management System's control center design
- Performed data collection and analysis evaluating employees' knowledge of IRS modernization programs
- Researched Human Factors Guidelines for online aiding of computer use
- Conducted a Technical Analysis of the Quality Assurance and Revalidation Program for Navy pilot physiological training devices

Projects included development and evaluation of a model court records system to meet the needs of judges and prosecutors for the National Highway Traffic Safety Administration (NHTSA), development of a NHTSA traffic records analysis training course, strategic planning for Safety Management Systems in several states, and development of a career development system in the Defense Information Systems Agency (DISA).

1985 to 1990 **New York City Department of Transportation**

Acting Assistant Commissioner

- Directed the agency's central analytic office
- Automated field data collection for the Pavement Management System by creating a laptop-based condition assessment procedure and geo-coded street index
- Standardized data collection methodologies based on accepted principles of statistical data analysis and valid research techniques
- Revised and published training protocols for the complete array of traffic field surveys
- Developed and managed the agency's customer service evaluation and improvement program
- Implemented quality control procedures for numeric information
- Developed automated, paperless reporting systems for all agency monthly indicators
- Performed mathematical and statistical analyses to model traffic flow and infrastructure condition over time in support of policy-making for capital expenditures and traffic enforcement programs

Projects included: implementation of an annual condition assessments for surface streets; research and production of a policy statement comparing bridge infrastructure spending strategies' effects on traffic flow, air quality, and economic vitality; a simulation study of parking enforcement's effect on midtown traffic speeds in support of congestion pricing initiatives; and a field video study of intersection traffic control effects on traffic flow.

EDUCATION

Ph.D.	Experimental Psychology	Columbia University	1992
M.A.	Experimental Psychology	Columbia University	1982
B.S.	Psychobiology	University of Southern California	1980

AFFILIATIONS/PROFESSIONAL ASSOCIATIONS

- National Safety Council - Traffic Records Committee; Association of Transportation Information Professionals (ATSIP) (Executive Board and President 2005-2006)
- AASHTO/TRB – Highway Safety Manual content review panel.
- TRB/USDOT – Data Needs for SAFETEA-LU ad-hoc outreach panel.
- Transportation Research Board; Committee on Statistical Methodologies, Statistical Computer Software in Transportation Research (A5011 past member)
- Transportation Research Board; Committee on Safety Data, Analysis and Evaluation (ANB20 – current member)
- State of Florida Safety Management System Committee (past member) and co-developer of the SMS Truck/Bus Subcommittee's Research Agenda
- NCHRP Panel Member: Project 20-05, Synthesis Topic 31-02 "Statistical Methods For Highway Safety Analysis"

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Traffic Records Training: Traffic Records Systems Audit and Strategic Data Improvement Plan. Prepare for the Louisiana Department of Public Safety, Office of Highway Safety and Planning with B.H. DeLucia, R.Q. Brackett, M.L. Edwards, and M.R. Crouse (1997).

Use of Driver and Criminal Records for Judges and Prosecutors. Prepared for publication by the Transportation Research Board with B.H. DeLucia and M.L. Edwards. *Transportation Research Record (No. 1581, Safety and Human Performance).* Transportation Research Board, Washington, D.C., (1997).

Use of Driver and Criminal Records for Judges and Prosecutors. Presented at the Transportation Research Board, Washington, D.C. with B.H. DeLucia and M.L. Edwards (1997).

Traffic Records Training: Traffic Records Systems Audit and Strategic Data Improvement Plan. Prepared for the Massachusetts Governor's Highway Safety Bureau with B.H. DeLucia (1997).

Instructor's Guide and Participants' Manual for Traffic Records Data Analysis Training Course. Prepared for the National Highway Traffic Safety Administration with M.L. Edwards and B.H. DeLucia (1996).

Action Plan for the State Traffic Records Advisory Council. Prepared for the Colorado Department of Transportation, Office of Transportation Safety with B.H. DeLucia (1996).

Traffic Records Training: Traffic Records Systems Audit and Strategic Data Improvement Plan. Prepared for the Commonwealth of Virginia, Department of Motor Vehicles with B.H. DeLucia (1996).

Final Report: Use of Driver and Criminal Records for Judges and Prosecutors. Prepared for the National Highway Traffic Safety Administration with B.H. DeLucia and M.L. Edwards (1996).

Customer Service in Government. Seminar conducted in the Current Topics course for Industrial/Organizational Psychology graduate program, University of Central Florida.

Customer Service: The Bottom Line. Paper presented at the 21st International Forum for Traffic Records and 4th NHTSA Conference on Collection and Analysis of State Highway Safety Data. Milwaukee, WI. August 7, 1995.

Traffic Records Training: Traffic Records Systems Audit and Strategic Data Improvement Plan. Prepared for the Minnesota Department of Public Safety, Office of Traffic Safety with B.H. DeLucia, R.Q. Brackett, and M.L. Edwards (1995).

Traffic Records Training: Traffic Records Systems Audit and Strategic Data Improvement Plan. Prepared for the Wisconsin Department of Transportation, Office of Transportation Safety with B.H. DeLucia, R.Q. Brackett, M.R. Crouse, and M.L. Edwards (1995).

Traffic Records Training: Traffic Records Systems Audit and Strategic Data Improvement Plan. Prepared for the Michigan Department of Public Safety, Office of Highway Safety Planning with B.H. DeLucia, R.Q. Brackett, M.R. Crouse, and M.L. Edwards (1995).

Strategic Traffic Records Training: Traffic Records Systems Audit and Strategic Data Improvement Plan. Prepared for the Colorado Department of Transportation, Office of Transportation Safety with B.H. DeLucia, R.Q. Brackett, M.R. Crouse, and M.L. Edwards (1995).

Strategic Traffic Records Improvements: Traffic Records Systems Audit and Strategic Data Improvement Plan. Prepared for the Arkansas Highways and Transportation Department, Traffic Safety Section with B.H. DeLucia, R.Q. Brackett, M.R. Crouse, and M.L. Edwards (1995).

Applied Statistics. US Air Force School of Aerospace Medicine with J.F. Greear, R.M. Baker, and C.B. Galante (1995).

Use of Driver and Criminal Records for Judges and Prosecutors. Paper presented at the 20th International Forum for Traffic Records and 3rd NHTSA Conference on Collection and Analysis of State Highway Safety Data. Based on a National Highway Traffic Safety Administration project with B.H. DeLucia, Tucson, AZ. (1994).

LANGSTON A. (LANG) SPELL

1883 Tower Lakes Blvd.
Lake Wales, FL 33859-4807
E-mail: Lang_Spell@yahoo.com

Independent Consultant

Professional Experience

Mr. Spell entered his professional career in traffic records systems and data exchange over 45 years ago. He is nationally recognized for his work in development of traffic records systems, especially interchange (NDR and CDL) of information amongst various users and the development and promulgation of data standards in information processing.

He served as a member of D16.1 committee. He developed the AAMVA Violations Exchange Code or "ANSI" code (predecessor of the AAMVAnet Code Dictionary or ACD which he also co-developed) while employed with AAMVA and later served as the Accident (Crash) Subcommittee Chairman for the ANSI D-20 Standard, A States Model Motorist Data Base, while employed with the National Highway Traffic Safety Administration.

While employed with NHTSA he created the original reporting forms and file structure for the Fatality Analysis File which was renamed in 1975 as the Fatal Accident Reporting System (FARS) and later renamed again, the Fatality Analysis Reporting System (FARS). He and his staff conducted the training for all of the original analysts.

As an independent consultant, he conducted the NHTSA Uniform Traffic Ticket Study to determine the extent and details of emerging Citation Tracking Systems. He conducted all aspects of the study including on-site State visits and assessments to determine the extent of control being exercised in citation issuance, processing of conviction information through the courts, and recording conviction dispositions in driver history files.

In the private sector, he developed numerous Crash Report forms, instruction manuals for crash reporting, data input procedures, all edits to assure data quality, and reporting and analysis procedures for problem identification. He also developed the EMS Run Report for Kentucky.

He designed the graphical user interface for the Highway Traffic Records Information System for the Virginia Department of Transportation (VDOT) and provided training in the use of the system to the district offices of VDOT.

He was involved in the design and developmental efforts for the Commercial Driver Licensing Information System (CDLIS) and its AAMVAnet environment and was a member of the AAMVAnet "Tiger Team" that made the assessments of selected states to become pilots and eventual founding states in the National Motor Vehicle Title Information System. His background, experience and interested cover the entire spectrum of traffic records systems.

History

1992 – "present"	Independent Consultant (now essentially retired)
1977 – 1992	Senior Traffic Records Analyst National ConServ, Inc. (but 1980 to 1983: Independent Consultant)
1974 – 1977	Vice President GENASYS (Systems Division) (now Keane, Inc.)
1968 – 1974	Chief, Information Systems, NHTSA, US Department of Transportation
1966 – 1968	Director of Data Systems for the AAMVA
1958 – 1966	Staff Specialist in MVRs (driver histories) for Retail Credit Co. (now Equifax) Atlanta, GA

Memberships in Professional Associations (former)

- ❑ Traffic Records Committee, Transportation Research Board
- ❑ American National Standards Institute, D-16, D-20, and X3L8 Committees
- ❑ Executive Board, Traffic Records Committee, National Safety Council
- ❑ Society of Automotive Engineers Committee on Standardization of Vehicle Identification Numbers

Education

Boston University ..... S.T.B., 1956
Duke University ..... A.B., 1953

CAROL WRIGHT, R.N.

149 Lazy Lane
Red Rock, TX 78662
Voice: 830-839-4103 or 512-581-2900
E-mail: carol-sunshine@yahoo.com
clwrn54@aim.com

Current Activities

EMS & Trauma Systems Consultant,
Graduate school (Nurse Practitioner Program)
Clinical Nursing (ER & Trauma) at Acute Care Facility

Professional Experience

2000 – 2004 Texas Department of State Health Services Austin, Texas
Injury Epidemiology & Surveillance
Program Administrator II EMS/Trauma Registry

- Responsible for Grant resource and oversight
- Liaison to legislative staff advocacy groups
- Supervise registry staff
- Program Budget, schedules, travel coordination
- Development of new web-based EMS/Trauma Registry System (TRAC-IT)
  Review RFP, JAD/JRP collaboration
- Data schema analysis
- Development of EMS & Trauma Data Dictionaries
- Staff stakeholder and town hall meetings
- Facilitate EMS provider & trauma registry workgroup
- Staff support and liaison for Governor's EMS & Trauma Advisory Committee
- Resource for EMS/Trauma development and registry issues
- Clinical and technical resource for EMS/Trauma Systems Development

1997 – 2000 Texas Department of Health Austin, Texas
Bureau of Emergency Management
Trauma Designation Specialist

- Survey Trauma Facilities Level 1 – Level 4
- Reviewed designation applications & forward recommendations to Bureau Chief
- Developed revised designation applications
- Developed Quality Improvement Process
- Developed Pediatric Categorization applications and categorization process
- Trained surveyors
- Staff support for Governors Advisory Council
- Liaison with Center For Rural Initiatives and EMS/Trauma Registry

- Presenter at Texas EMS Conference 1998 & 1999
- Developed Grant RFP, grant quarterly & annual reports

1995 - 1997 Memorial Hospital of Gonzales Gonzales Texas

Trauma Coordinator/Nurse Educator/ ED Director

- Developed Trauma Program
- Developed Trauma Quality Improvement Program
- Developed Trauma Designation & ED policies and procedures
- Developed and taught orientation, advanced cardiac life support, trauma nurse core course prep, emergency nurse pediatric prep, oncology
- Developed and taught EKG course, dosage calculation course, arterial blood gas course
- Facilitated trauma administrative meetings
- Supervised staff
- Developed and presented statistical reports to hospital Medical Executive Committee and Hospital Board of Directors
- Resource and mentorship of Area "P" trauma coordinators

1994 – 1995 Smithville Regional Hospital Smithville. Texas

Director Quality improvement/ Infection Control/ E.D.

- Supervised Staff
- Budget/Staffing/Staff Training
- Developed and presented statistical reports to hospital Medical Executive Committee and Hospital Board of Directors
- Developed Quality Improvement Program for hospital and three rural clinics
- Developed Infection Control Program for hospital and three rural clinics

1988 – 1994 Medical Center Hospital Odessa Odessa, Texas

Assistant DON Skilled Nursing Facility/Patient Care Coordinator/ED nurse/ Charge nurse/ Critical Care nurse

- Started employment as an LVN and obtained RN
- Supervised staff
- Budget
- Trained nurses
- Developed and presented statistical reports
- Liaison to Administrator
- Facilitated executive meetings
- Critical and emergency patient care (ICU/CCU/ED)
- Oncology nursing

Education

Graduate School Nursing/Health Administration currently enrolled
Odessa College Nursing Degree –ADN Registered Nurse 1989
Certified Emergency Nurse

Current Education

Trauma Nurse Certification
Advance Life Support
Advance Trauma Life Support

Professional Affiliations

- Texas Trauma Coordinators Forum
- Emergency Nurses Association
- National Trauma Society
- Emergency Pediatric Nurse Association
- American Trauma Society
- Association of Transportation in Information Programs

Additional Information

Presenter and Lecturer:

- Annual Texas EMS Conference
- Bi National Traffic Records Conference
- SWT Suicide and Psychology Class
- Texas Trauma Coordinators Course
- Suicide Prevention Lecture "Let's Talk"
- CODES "A Collaborative Partnership"
- Trauma Designation Surveyor Course
- EMS & Trauma Data "Why Do I Send This Stuff"

JOHN J. ZOGBY, PRESIDENT

Transportation Safety Management Systems
1227 North High Street
Duncannon, PA 17020
Voice: (717) 834-5363
E-mail: jzogby@paonline.com

Summary of Experience

Mr. Zogby has over 40 years experience in highway safety engineering, management, and motor vehicle and driver licensing administration.
Mr. Zogby's transportation career began in the Bureau of Traffic Engineering in the Pennsylvania Department of Highways, where he was responsible for the statewide application of highway signs and markings. He was instrumental in developing the State's first automated accident record system in 1966. In the late 1960's, he helped initiate and was project director for the statewide safety improvement program and the State's in-depth accident investigation function.
Mr. Zogby worked in the private sector in traffic safety research for several years before returning to public service as the Director of the Bureau of Accident Analysis in the Pennsylvania Department of Transportation (PennDOT). He was appointed Deputy Secretary of Transportation for Safety Administration in February of 1979, a position he held for 13 years, until his retirement from public service in December 1991.
Since his retirement from State government, Mr. Zogby has been engaged as a consultant on management and policy issues for federal, State and local government agencies in the area of transportation safety and motor vehicle/driver licensing services.

Professional and Business Experience

Contract with the Governor's Highway Safety Association to update the Model Minimum Uniform Crash Criteria (MMUCC)

Subcontract with TSASS under contract with NHTSA to assist in the implementation of the Section 408 provisions of SAFETEA-LU.

Subcontract with GeoDecisions Consulting on a Safety Analysis Management System (SAMS) for the state of Mississippi.

Subcontract with iTRANS Consulting Inc. on NCHRP project 17-18 (05), Integrated Management Process to Reduce Highway Injuries and Fatalities Statewide for the Transportation Research Board.

Contract with the National Academy of Sciences (NAS) to provide AASHTO Strategic Highway Safety Plan - Case Studies (17-18(06)) for the Transportation Research Board.

Subcontractor with ISG, a systems integration consulting company, conducting a reengineering

contract with the Pennsylvania Department of Transportation in the area of motor vehicle processes.

Subcontractor with the Pennsylvania State University to research the impact of an education provision in State law governing novice drivers.

Conducted a three-week course on safety management for the Ministry of Communications in the Kingdom of Saudi Arabia.

Subcontractor with a Moroccan Engineering firm to develop a national highway safety plan for the Country of Morocco.

Completed a study for the State of Mississippi, Department of Public Safety, to develop a Strategic Plan for Highway Safety Information.

Contracted by the Federal Highway Administration, Office of Motor Carrier Safety, to help in the final implementation phase of the Commercial Driver License (CDL) program.

Participated as a member of a Traffic Records Assessment Team to review Traffic Records Systems in states. In addition, completed Traffic Records Assessments for three Indian Nations in Arizona.

Project director and principal instructor for a Federal Highway Administration (FHWA) contract to develop, implement, and instruct a training program for the Highway Safety Management System.

Professional Societies and National Committees

Member Institute of Transportation Engineers.

Member Emeritus of the Transportation Research Board (TRB) Committee on Transportation Safety Management.

Member of the Association of Transportation Safety Information Professionals.

Past Chair of the National Safety Council's Traffic Records Committee.

Past President of Region 1 of the American Association of Motor Vehicle Administrators.

Past President of MidAtlantic Section, Institute of Transportation Engineers.

Chaired the Governing Board of the International Registration Plan.

Chaired a subcommittee of the NGA Working Group on State Motor Carrier Taxation and Regulation.

Completed six-year tenure as Chair of the TRB committee on Planning and Administration for Transportation Safety.

Community

President, Duncannon Area Revitalization, Inc.

Pastoral Associate, St. Bernadette Church, Duncannon, PA

Education

B.S., Economics, Villanova University

MPA, Penn State University