STATE
OF
WEST VIRGINIA

TRAFFIC RECORDS ASSESSMENT

April 29 – May 04, 2012

National Highway Traffic
Safety Administration
Technical Assessment Team

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EXECUTIVE SUMMARY

The National Highway Traffic Safety Administration (NHTSA) assembled a team to conduct a traffic records assessment in response to a request from the West Virginia' Governor's Highway Safety Program (GHSP). GHSP carried out the logistical and administrative steps necessary for an onsite assessment. A team of professionals with backgrounds and expertise in the various traffic records data systems (crash, driver, vehicle, roadway, citation and adjudication, and injury surveillance) conducted the assessment April 29 through May 4, 2012.

The scope of this assessment included all of the components of a traffic records system. The purpose was to determine whether the traffic records system in West Virginia is capable of supporting management's need to identify the State's highway safety problems, to manage the countermeasures applied in attempts to reduce or eliminate those problems and to evaluate those efforts for their effectiveness.

Background

West Virginia last underwent a traffic records assessment in 2006; the report contained recommendations for improvement of the traffic records system. During this assessment, the State has demonstrated progress in its traffic records system that has resulted from implementation of some of the recommendations for improvement and the State's own initiative in identifying and seeking solutions, such as:

- A State-sponsored field data collection software has been provided to law enforcement agencies that has resulted in nearly 100 percent electronic crash reporting.
- An e-citation pilot project is underway at this time which will provide opportunities for additional efficiencies for law enforcement, as well as for courts.
- Four of the five injury surveillance datasets are being captured within the state, with electronic capture and transfer being widely used.
- The Division of Motor Vehicles driver licensing is compliant with federal ID requirements.

At this time, however, some opportunities remain to improve the ability of the present traffic records system to optimally support West Virginia's management of its highway safety programs. These are discussed in the summary below and the full report that follows.

Crash Records

The State has developed an electronic crash reporting system which has been made available to all law enforcement agencies. The software can be used on mobile data terminals or on desktop hardware inside the station. Adoption rates of the software are such that very nearly all of the crash reports submitted to the State crash repository are electronic data transmissions. Only about 50 paper reports are processed annually.

While electronic reporting has the benefit of improving timeliness, accuracy, and completeness of data due to immediate transmission of reports and embedded edits, the benefits of this upgrade and its wide acceptance have not been realized by data users within West Virginia. The database which houses the crash records does not present a user-friendly query capability, and those with access indicate that they are unable to perform analyses to suit their purposes.

An effort to mitigate this problem is underway at the time of this assessment and projected completion is several months away. Marshall University's Rahall Transportation Institute and one of its contractors are designing a web-based system which is expected to improve data availability and accessibility. Another effort which should improve analytical capabilities is the development by State information technology personnel of an enterprise safety data warehouse. As planned, the warehouse will include, in addition to crash data, roadway data, emergency medical data and driver and vehicle data. Completion is scheduled for 2013. Both these projects are eagerly anticipated by law enforcement, engineers, and researchers who use crash data on a regular basis and who have been limited by access to data that was generated six to eight years ago.

The software's chief limitation lies in the location data, in that the street name fields are free text in format, which makes aggregation by location more challenging and more time-consuming. Some officers were using GPS coordinates to locate crashes, but users reported that the locations were often not correct. Thus, an improved back-end database and a more workable location methodology or tool are two means by which the electronic data collection can be enhanced and made more useful and usable, as it was intended.

Roadway Data

The Division of Highways (DOH) developed a roadway information system that is used in the management of the State's roadway assets. The major components of the roadway information system are Road Inventory Log, Straight-Line Diagrams, and a Linear Referencing System GIS database.

The DOH is proceeding with an expansion of the GIS to establish new standards in the roadway enterprise data platform. The most promising development on this front is an Enterprise Resource Planning system (ERP) of which asset management and safety management are major components. The DOH is also updating and modernizing the Crash Records Database. Under this project a new user interface will be developed which will be accessible by a variety of highway safety data users.

When both the roadway and crash information systems upgrades are completed, the systems will be capable of an interface that would provide merged datasets of road and crash data. This will also provide the highway safety community at the State and local government levels with the information necessary for effective safety analysis and countermeasure development.

Driver and Vehicle Records

The Division of Motor Vehicles, within the West Virginia Department of Transportation, is responsible for issuing driver licenses and identification cards, and for the titling and registration of vehicles. The driver license is compliant with federal identification requirements and identity fraud is deterred in licensing through the use of facial recognition technology.

Applicants are requested to provide fingerprints, but at this time, it is not a mandate. Barcode and magnetic strip on the back of the license contain all the relevant data from the license face. License files are updated in real time, though the documents are centrally issued for security purposes.

Vehicle transactions are processed online and are timely. The State participates in the National Motor Vehicle Title Information System using batch mode.

Statewide Injury Surveillance System Records
West Virginia has access to four of the primary data sources in a comprehensive injury surveillance system, all of which are housed in the Department of Health and Human Resources (DHHR). These are:

Office of Emergency Medical Services (OEMS)	EMS data
Division of Trauma	Trauma Registry data
West Virginia Health Care Authority (WVHCA)	Hospital Inpatient data
Vital Registration Office	Mortality data

Unfortunately, emergency department data are not maintained on a statewide level and none of the ISS components are fully integrated into the traffic records system. The hospital inpatient and vital records data are maintained by the DHHR, but are not represented on the Traffic Records Coordinating Committee.

Since the previous assessment in 2006, significant progress has been made with regard to the EMS data system. Since October, 2009 all patient care reports are being collected and submitted to the OEMS electronically— a notable change from the previous paper-based system. The EMS database is NEMSIS-compliant and there are plans to submit West Virginia records to the national NEMSIS database in the future. The State trauma system is impressive with widespread cooperation, communication and submission of data to the DHHR Division of Trauma. Hospital inpatient data are submitted from all 62 hospitals across the State to the WVHCA and are available for research. All mortality records are collected by the DHHR Vital Registration office and shared with agencies upon request.

There were no reports of integration of traffic records system component databases; however, there are immediate plans to link EMS and trauma registry data through the upcoming Continuum of Care server that is under development. Both individually and together, through data linkage projects, injury surveillance datasets may be used for problem identification, program evaluation and traffic safety program planning.

Citation and Adjudication Records
The State of West Virginia not only has a single required Uniform Traffic Citation, but provides for some measure of accountability in processing those citations through central printing and issuance of citations to law enforcement and by requiring accounting for all citations. An audit of citations by the State Auditor's Office encourages compliance with reporting of voided and otherwise disposed/not issued citations.

Electronic citations are being used by some agencies and have been pilot-tested. After some initial problems with queuing on the server, solutions have been found and there is potential for a

fully automated system that would transmit the citation data from the officer to the court of record where the case could populate the case management system and create a docket. If electronic citations were to be sent concurrently to the DMV upon issuance, a citation tracking system could be created which would provide for a complete record of enforcement actions throughout the State and a comparison of charges versus convictions. This would also provide the State with a means of determining what percentage of initial charges are dismissed, deferred, or simply not reported to DMV by the courts. If dispositions were sent electronically by courts to the DMV and could automatically update the citation tracking system and the driver history file, a fully automated process would result. It would save resources for several agencies and provide a myriad of useful data. If citations were sent to the courts and DMV concurrently, it would also be possible for DMV to anticipate the administrative per se impaired driving cases and would make it clear if some officers or agencies were simply not forwarding administrative paperwork on DUI arrests, as well. The process would also ensure timely recognition and processing of citations issued to Commercial Drivers.

If the development and implementation of the e-citation were to mirror location formats used on crash reports, it would then be possible to do multi-layer analysis of the location and type of enforcement actions throughout the State, so that an effective gauge of the impact of various countermeasures (DUI and speed enforcement, for example) on crash occurrence could result.

The State courts are in the process of developing a single case management system to be shared by all courts that process traffic violations. Currently, an e-citation pilot project with Monongalia and Jackson Counties is underway in which the courts scan and mail the original citations with convictions to the DMV within ten days. Once all citations are sent to courts electronically, it would be possible, after adjudication, to transmit convictions to DMV electronically.

Traffic Records Coordinating Committee (TRCC)

The central role of the Traffic Records Coordinating Committee (TRCC) within a state is to facilitate information sharing and uniformity of data. The TRCC must be the source of decision-making about data systems that make up the component parts of the traffic records system, when issues touch more than one of the component systems, or when the needs of users, collectors, and owners within a single component of the system diverge.

West Virginia has a long-standing Traffic Records Coordinating Committee (TRCC), which was formalized with a Memorandum of Understanding in 1999. Although the Committee still exists, it has been inactive for a number of years; however, a Traffic Records Coordinator has recently been hired and plans to re-activate the Committee with regularly scheduled meetings.

Interviews at this assessment indicate that some officials feel that the Committee has remained active by virtue of the fact that the State is small and they have regular contact in venues other than a TRCC meeting. While this type of interaction can continue to facilitate the coordination, cooperation, and communication that are necessary for effective collection and use of traffic safety data, it fails to account for the Committee's responsibility to develop and carry out a Strategic Plan for Traffic Records Improvement. Generally, at each meeting, the Committee should review each of the projects that make up the Strategic Plan and monitor their progress.

Other issues that should be part of regular TRCC meetings include discussions of data quality and performance measures for each component of the traffic records system. These

communications should provide the opportunity to discuss means by which to mitigate or correct those problems. Lack of this formal interaction on a regular schedule makes it difficult to ensure that the State as a whole is providing optimal data to its traffic safety partners and participants for making data-driven and evidence-based decisions in terms of developing countermeasures and programs to address traffic safety concerns.

The new Traffic Records Coordinator should re-engage the Committee members in regular meetings and help to ensure that the executive level of the TRCC has input into the planning and the development of the Committee's mission and vision.

Strategic Planning

The existing Traffic Records Strategic Plan dated 2006 was a revision of a 2001 Plan based on the findings of a 1999 traffic records assessment. No revisions other than updates to the Section 408 grant applications have been made since that time. In 2007 West Virginia undertook the development of a Strategic Highway Safety Plan (SHSP) that included Highway Safety Data Improvements as an Emphasis Area. The SHSP is currently being revised and Highway Safety Data Improvement will remain an Emphasis Area. When complete, the Highway Safety Data Improvement Section of the updated SHSP is intended to serve as the basis for an updated Traffic Records Strategic Plan.

Statewide coordination of the implementation and evaluation of the State's SHSP is being overseen by the Highway Safety Management Taskforce (HSMT). The HSMT is a group of representatives from many state and federal agencies all of which have some area of highway safety responsibilities within their purview. The State has a TRCC; however, it technically has been inactive since 2006 primarily because there was no Traffic Records Coordinator. A Traffic Records Coordinator has recently been hired. Each Emphasis Area of the SHSP was assigned an implementation team, which routinely met to insure progress in its respective area. The TRCC is considered to be a subcommittee of the HSMT. Due to the overlap in interests, responsibilities, and membership it is envisioned that the Highway Safety Data Improvement Emphasis Area team and the TRCC will ultimately become one.

The 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 System

- ❑ Implement the planned web-based data analysis system. **(Section 2-A)**

- ❑ Implement a formal, comprehensive data quality management program including the features described in the report. At a minimum, this should incorporate a set of meaningful data quality metrics (measuring timeliness, accuracy, completeness, uniformity, integration, and accessibility) along with a set of processes for early identification of errors, specific feedback to law enforcement agencies, and links between the data quality management process and training for law enforcement officers. This will necessitate frequent data quality reviews throughout the year. **(Section 2-A)**

- ❑ Deploy a "Smart Map" feature in ReportBeam to automatically complete the location fields on the crash report based on officers clicking on a map. This utility should supply the street names, route and milepost numbers, latitude and longitude, and be compatible with the base map implemented in the West Virginia Division of Highways Geographic Information System. **(Section 2-A)**

Data Integration

- ❑ Support the Enterprise Resource Planning concept with explicit incorporation of that project into a new traffic records strategic plan and the Highway Safety Management Task Force recommendations. **(Section 1-C)**

Data Use and Program Management

- ❑ Resolve the disagreement and misunderstanding that is evident now between Traffic Engineering and Governor's Highway Safety Program (GHSP) concerning crash data access and analysis capabilities. **(Section 1-D)**

- ❑ Develop user-oriented online query tools and public-access databases for crash, roadway, and injury surveillance data (at a minimum). **(Section 1-D)**

- ❑ Develop training on data analysis as well as use of the analytic tools. **(Section 1-D)**

Citation and Adjudication Records

- ❑ Require restart of electronic transfer of citations from the State Police to the courts. The courts have a temporary fix that requires this reporting. **(Section 2-E)**

- ❑ Develop a citation tracking system that tracks a citation from the time of its distribution to a law enforcement officer or creation on the e-citations system, through its issuance to an offender, its disposition, and the posting of the conviction in the driver history database. Citations that do not result in conviction will remain at the court of adjudication and data concerning them will be readily available for citation audits. **(Section 2-E)**

Traffic Records Coordinating Committee (TRCC)

- ❑ Review the current Traffic Records Coordinating Committee (TRCC) Memorandum of Understanding (MOU) and update the document to give the membership updated direction and scope. Make the MOU available to all TRCC members and their agencies. **(Section 1-A)**

- ❑ Coordinate and oversee the development of quality control metrics for the various traffic records system components. Include discussion of these metrics as an item on each TRCC meeting agenda. Promote projects that address the data quality problems especially looking at the back-end of the processes. **(Section 1-A)**

- ❑ Review the makeup of the Traffic Records Coordinating Committee. Add additional traffic record stakeholders including: local traffic engineers, local law enforcement, emergency medical services, metropolitan planning organizations, universities, insurance companies, municipal courts and others. Seek input from all new members. **(Section 1-A)**

Driver and Vehicle Records

- ❑ Record the adverse driver histories from previous states of record on non-commercial drivers as required for commercial driver records. (Repeated from 2006) (**Section 2-C)**

Statewide Injury Surveillance System (SWISS)

- ❑ Increase the completeness and accuracy of E-codes in all medical records. E-codes are essential to effective traffic safety analyses because they allow the researchers to identify all hospital admissions that result from a traffic crash. This is critical because the injury severity level noted on the crash report is not always clinically accurate and some patients are not transported to the hospital by emergency medical services. **(Section 2-F)**

- ❑ Continue to explore a data collection system for emergency department records. A significant proportion of motor vehicle crash victims are treated in emergency departments and do not require admission to a hospital or trauma center, so capture of those records would enhance data analyses. **(Section 2-F)**

- ❑ Incorporate representatives and data from the West Virginia Health Care Authority into the traffic records system. Those medical records are an untapped resource that would benefit all component systems greatly. **(Section 2-F)**

Roadway Information

- ❑ Charge the Highway Safety Management Taskforce with the analysis of the findings of the *Roadway Safety Data Capability Assessment* and suggest promising projects for inclusion in the Traffic Records Coordinating Committee Strategic Plan for Traffic Records. **(Section 2-B)**

- ❑ Consider the inclusion of the Fundamental Data Elements of the Model Inventory of Roadway Elements (MIRE) into the roadway information system database. **(Section 2-B)**

Strategic Planning

- ❑ Charge the Traffic Records Coordinating Committee (TRCC) with the development of a new Traffic Records Strategic Plan (TRSP) addressing the recommendations in this traffic records assessment. Identify deficiencies apart from those noted in the traffic records assessment by canvassing each TRCC member and especially each traffic records system component custodian for their input. The TRSP should be developed apart from the preparation of the Section 408 Application. Ideally the Section 408 Application should be prepared based on the TRSP proposed projects. **(Section 1-B)**

ACKNOWLEDGMENTS

The Traffic Records Assessment Team would like to acknowledge Melissa Taylor, Grant Administration, Charleston Police Department and Catherine Bryant, Traffic Records Coordinator, Governor's Highway Safety Program for their support and able assistance in making this assessment possible.

The team would like to thank Joan Vecchi, team facilitator, for giving a national perspective to the assessment process and its goals. We would also like to thank our Administrative Assistant, Kathy Zogby.

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.

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INTRODUCTION

A complete traffic records system 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 system. 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 Association of Transportation Safety Information Professionals (formerly the 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 has published a *Traffic Records Program Assessment Advisory* 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 a State's traffic records strengths and accomplishments, and offers suggestions where improvements can be made.

Report Contents

In this report, the text following the "*Advisory*" excerpt heading was drawn from the *Traffic Records Program Assessment Advisory*. 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.

SECTION 1: TRAFFIC RECORDS SYSTEM MANAGEMENT

Advisory Excerpt: *Management of a State TRS requires coordination and cooperation. The data that make up a TRS reside in a variety of operational systems that are created and maintained to meet primary needs in areas other than highway safety. Ownership of these databases usually resides with multiple agencies, and the collectors and users of the data span the entire State and beyond.*

The development and management of traffic safety programs should be a systematic process with the goal of reducing the number and severity of traffic crashes. This data-driven process should ensure that all opportunities to improve highway safety are identified and considered for implementation. Furthermore, the effectiveness of highway safety programs should be evaluated. These evaluation results should be used to facilitate the implementation of the most effective highway safety strategies and programs. This process should be achieved through the following initiatives.

1-A: Traffic Records Coordinating Committee

Advisory Excerpt: *The National Highway Traffic Safety Administration's (NHTSA) 2004 Initiatives to Address Improving Traffic Safety Data Integrated Project Team report (hereafter referred to as the Data IPT Report) includes guidance on establishing a successful Traffic Records Coordinating Committee (TRCC). The following include recommendations from the Data IPT Report and additional items of an advisory nature:*

- ❑ *Establish a two-tiered TRCC.*
  There should be an executive and a working-level TRCC. The executive-level TRCC should be composed of agency directors who set the vision and mission for the working-level TRCC. The Executive TRCC should review and approve actions proposed by the Working TRCC. The Working TRCC should be composed of representatives for all stakeholders and have responsibilities, defined by the Executive TRCC, for oversight and coordination of the TRS. Together, the two tiers of the TRCC should be responsible for developing, maintaining, and tracking accomplishments related to the State's Strategic Plan for Traffic Records Improvement.

- ❑ *Ensure Membership is Representative.*
  TRCCs should be representative of all stakeholders, and each stakeholder representative must have support from their top management. When departments are considering changes to their systems, all TRCC members should be notified and departments should consider how to accommodate the needs of all the TRCC agencies.

- ❑ *Authorize Members.*
  The Working TRCC should have formal standing, recognition, and support of the administrators of participating agencies. This support will help the TRCC succeed in overcoming the institutional barriers, lack of focus, and lack of resources that prevent collaboration and progress in integrating highway safety data. The exact role and powers of the TRCC should be made explicit in its charter. Legislators, the governor, and top management of participating agencies should give authority to the TRCC members to make policy decisions and commit their agencies' resources to solve problems and approve the State's strategic plan for traffic records. The most important responsibility of the TRCC should be to provide the leadership necessary to ensure that available funds are sufficient to match stated needs. Despite challenges stemming from collective decision making by members from different agencies with competing priorities, TRCC members should speak with "one voice." The TRCC should have guidelines to determine who speaks for the TRCC and how its recommendations should be communicated.

- ❑ *Appoint an Administrator/Manager.*
  A single point of contact for managing a data improvement project is necessary to ensure leadership. The TRCC should designate a traffic records administrator or manager and provide sufficient time and resources to do the job. This person should be responsible for coordinating and scheduling the TRCC, in addition to tracking the progress of implementing the State's traffic records strategic plan. Uniform criteria should be established for monitoring progress. NHTSA can facilitate training for the TRCC administrator/manager regarding traffic record systems, program management, and data analysis.

- ❑ *Schedule Regular Meetings.*
  The TRCC should establish a schedule of regular meetings, not only to discuss data coordination issues and make progress on the strategic plan, but also to share success stories to aid in overcoming fears of implementation. The meetings should take place as required to deal with the State's traffic records issues and to provide meaningful coordination among the stakeholders. The TRCC should gain broader support by marketing the benefits of improved highway safety data. An example to provide data and analytical expertise to local government officials, legislators, decision makers, community groups, and all other stakeholders. TRCC meetings should include strategy sessions for such marketing plans.

- ❑ *Oversee Quality Control/Improvement.*
  The TRCC should have oversight responsibility for quality control and quality improvement programs affecting all traffic records data. Regularly scheduled presentations of quality control metrics should be part of the TRCC meeting agenda and the TRCC should promote projects to address the data quality problems that are presented.

- ❑ *Oversee Training for TRS Data Improvement.*
  The TRCC should have oversight responsibility for encouraging and monitoring the success of training programs implemented specifically to improve TRS data quality. Regularly scheduled presentations of training needs and training participation should be part of the TRCC meeting agenda, and the TRCC should promote projects to conduct training needs assessments and address the identified training needs.

1-A: Traffic Records Coordinating Committee Status

Establish a two-tiered TRCC

The State has a Strategic Traffic Records Coordinating Committee (TRCC); however, it technically has been inactive since the 2006 assessment as there has been no Traffic Records Coordinator to schedule "official" TRCC meetings. It was noted that West Virginia is a small tight-knit state where government agencies in most subject areas are also tight-knit, including traffic records. Each of the respective traffic records areas of expertise is generally staffed with a small number people and the leaders of each of those areas usually represent their area of expertise at all highway safety related functions and on all highway safety related committees. As such, while there were no formal TRCC meetings being held, regular meetings of the group and coordination of the efforts of the TRCC members never ceased.

It was also noted that the State's Strategic Highway Safety Plan (SHSP), adopted September 17, 2007, included Highway Safety Data Improvements as an emphasis area. Each emphasis area was assigned an implementation team, which routinely met to insure progress in its respective area. As the Highway Safety Data Improvement Team consisted of a significant portion of TRCC members, one could make the argument that these team meetings were in essence unofficial TRCC meetings. This Emphasis Area Team has been and is being led by the Strategic Safety Planning and Analysis Section of Traffic Engineering in the Division of Highways. This Section, among other things, acts as the custodian of the State crash records. The SHSP is currently being updated.

The State hired a new Traffic Records Coordinator in January of 2012. This person will be responsible for coordinating and scheduling, in addition to tracking the progress of implementing the State's traffic records strategic plan. This person will be the point of contact for managing data improvement projects to ensure a single point of leadership.

The executive/policy oversight group for the TRCC is the West Virginia Highway Safety Management Taskforce (HSMT). The HSMT is led by the Director of the Governor's Highway Safety Program (GHSP) and co-chairs the TRCC with the Division of Highways (DOH) Traffic Engineering Director. The leadership was selected based on their positions. The rest of the Committee is composed of agency directors and similar level executives who set the vision and mission for the working-level TRCC.

The TRCC established its own mission statement:

> The mission of the West Virginia Strategic Traffic Records Coordinating Committee (TRCC) shall be to ensure the compatibility of information, including traffic crash records, which are held and maintained by various state management information systems and to make that information available, to the extent possible, to state stakeholders. The TRCC mission will be accomplished through regular communication among stakeholders and through research in areas which will foster the compatibility and availability of this information.

There was no input into the mission statement by the HSMT (executive level TRCC). When the regular meetings of the TRCC were discontinued in 2006, the executive level committee had an opportunity to ensure that the team was, in fact, effectively monitoring data quality within the traffic records system and performing its core function of overseeing and evaluating the projects that make up the State's Strategic Plan for Traffic Records Improvement which could not be effectively reported upon and overseen in impromptu meetings and communications that took place in meetings other than the TRCC's.

A specific governance structure needs to be established for the Committee and the duties and responsibilities of the two levels of TRCC membership should be specified. Further, the mission and vision statements should be established with the input and direction of the executive level committee who are the state's policy makers and who have the authority to commit resources to the Committee and projects overseen by the Committee.

Ensure Membership is Representative

Below are lists of membership of the TRCC. There is very little representation from local agencies (law enforcement, courts, Metropolitan Planning Organizations, EMS, hospitals, etc.) or private sector organizations (universities, researchers, etc.). The Traffic Records Coordinator is also expected to be the support staff for the TRCC.

Various entities within government are represented on the TRCC including:

- Division of Motor Vehicles
- Federal Highway Administration
- Division of Highways
- OEMS/Trauma Division
- Department of Health and Human Services (DHHR)
- WV State Police
- Public Service Commission
- Federal Motor Carrier Safety Administration
- NHTSA
- WV Supreme Court of Appeals
- Governor's Highway Safety Program
- Local Law Enforcement

The Safety Management Taskforce is represented by:

- Division of Highways – Chair
- Governor's Highway Safety Program - Co-Chair
- State Police
- Division of Motor Vehicles (Driver Services)
- DHHR-Office of Emergency Medical Services

- Public Service Commission
- Insurance Commission
- Department of Education
- Parkways Economic Development & Turnpike Authority
- Federal Highway Administration
- National Highway Traffic Safety Administration
- Federal Motor Carrier Safety Administration

The following is the reported TRCC for 2012:

Last, First Name	Agency / Division	Program/Area of Responsibility
Bolyard, Dave	DOT / DMV	Driver Services
Brumfield, Ryan	Federal Highway Administration	WV Division FHWA Programs
Bryant, Catherine	DOT / DMV / GHSP	Traffic Records Coordinator
Burke, Maura	DOT / DOH / Traffic Engineering	FARS
Byrnside, Penny	DHHR / OEMS/Trauma Division	Trauma Designation and Categorization
Cavender, Larry	DOT / DMV	Driver Services
Fields, Debbie	DOT/ DMV	Driver Services
Dozier, Bob	DHHR / OEMS	EMS Data
Gallagher, Bill	WV State Police/Communications	E-Citation
Holmes, Mark	Division of Motor Vehicles	Assistant to the Commissioner
Kinsey, Chris	DOT/DOH/Traffic Engineering	Crash Records
Lassak, Robin	Public Service Commission/ Transportation Division	SAFETYNET/Commercial Motor Vehicles
Mays, Marsha	DOT / DOH / Traffic Engineering	Crash Records (Also represents Roadway Files)
Myers, Mike	FMCSA - WV Division	Commercial Motor Vehicles
Naff, Bill	NHTSA - Region 3	NHTSA Programs
Stoker, Caroline	Monongalia County Court	WV Supreme Court of Appeals
Thaxton, Wilbur	DMV/Director Information Services	Driver & Vehicle Systems
Tipton, Bob	DOT/DMV/GHSP Director	GHSP Programs
Twohig, Jo Ann	DOT/Information Services/DOH	Records Systems
Zerkle, Chris	WV State Police/Traffic Records SP	Traffic Records / State Law Enforcement

Due to the small size of State staffs, most members serve on both the TRCC and SMT. It should be noted that there is no representation from the local agencies. Municipal courts and local police would be two excellent additions to the TRCC. These agencies have successful case

management systems (CMS) and records management systems (RMS) that could serve as examples for the State.

Authorize Members

The TRCC has the authority and the responsibility to review any of the State's highway safety data and traffic records systems and to review changes to such systems before they are implemented.

The TRCC has not reviewed traffic records quality control programs. Currently, this is the responsibility of the agency responsible for the file.

There is a formal Memorandum of Understanding (MOU) between the various agencies that comprise the TRCC. The MOU empowers the TRCC to meet the requirements for Section 408 funding. This MOU is copied to the following page. The MOU was created in 1999 and should be updated to be consistent with today's issues.

AGREEMENT TO ESTABLISH A STATE TRAFFIC RECORDS STRATEGIC PLAN

Whereas, a comprehensive traffic records program is necessary for planning, operational management, and evaluation of West Virginia's highway safety activities;

Whereas, it has been demonstrated that, through the cooperation of all of the highway and traffic safety stakeholders, the most efficient and effective highway safety programs are developed;

Whereas, the sources of highway safety data or the productive uses of highway safety data are not restricted to any one agency or level of government;

Whereas, there is a demonstrated need for a coordination of resources currently being utilized in the collection, dissemination and analysis of highway safety data;

Therefore, we the agencies responsible for the various highway safety programs and activities do hereby agree to establish and support the formation of a Strategic Traffic Records Coordinating Committee to do the following;

1. Review and utilize as appropriate, the conclusions and recommendations of the recently conducted Traffic Records Assessment conducted in May, 1999 under the auspices of the West Virginia Governor's Highway Safety Program, with the assistance of the United States Department of Transportation's National Highway Traffic Safety Administration.

2. Make recommendations as to the best possible method of evaluation of potential solutions to streamlining the collection, compilation and dissemination of highway safety information to all highway safety stakeholders;

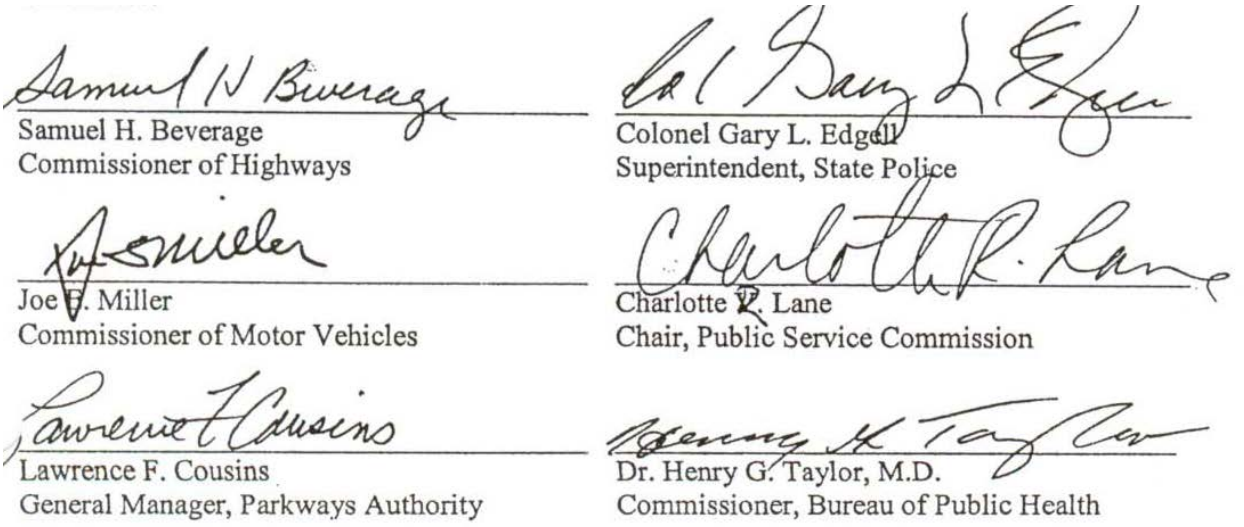
3. Provide oversight responsibility for the development of a strategic plan for state traffic records and oversight; and

4. Foster the cooperation of the all agencies involved in highway safety activities to implement as appropriate, the recommendations of the Traffic Records Assessment and the Strategic Traffic Records Coordinating Committee.

The Committee shall consist of the designees of the undersigned agencies as well as those representatives of county and municipal law enforcement agencies, academia, judicial, emergency medical services and highway safety advocates as determined by the Committee as necessary to accomplish the mission of the Committee but not to exceed a total of fifteen members.

The Committee shall initially meet at the call of the Governor's Representative for Highway Safety or designee who shall provide suitable facilities for the work of the Committee. The Committee shall meet at least quarterly.

The Committee is authorized to allocate such funds that it may obtain for the securing of such technological services and support services necessary to accomplish the mission of the Committee.



Samuel H. Beverage
Commissioner of Highways

Colonel Gary L. Edgell
Superintendent, State Police

Joe F. Miller
Commissioner of Motor Vehicles

Charlotte R. Lane
Chair, Public Service Commission

Lawrence F. Cousins
General Manager, Parkways Authority

Dr. Henry G. Taylor, M.D.
Commissioner, Bureau of Public Health

Appoint an Administrator/Manager
The coordinator of the STRCC is the appointed administrative manager of the TRCC. This person is responsible for coordinating and scheduling the TRCC, in addition to tracking the progress of implementing the State's traffic records strategic plan. The new coordinator assumed the position in January of 2012.

Schedule Regular Meetings
There are none at this time but the new TRCC coordinator plans to schedule regular meetings and fill positions from local agencies.

Oversee Quality Control/Improvement
Currently, the TRCC has no quality control related to traffic records system components. Any quality control is done at the local or State agency level. The TRCC should have oversight responsibility for quality control and quality improvement programs affecting all traffic records data. As of this report the TRCC has not developed or promoted quality control metrics. Regularly scheduled presentations of quality control metrics should be part of each TRCC meeting agenda, and the TRCC should promote projects to address the data quality problems that are presented.

Oversee Training for TRS Data Improvement
The TRCC has not identified any training needs or sponsored any training programs to improve TRS data quality. Regularly scheduled presentations of training needs and training participation should be part of the TRCC meeting agenda, and the TRCC should promote projects to conduct training needs assessments and address the identified needs.

Recommendations:

- ❑ Review the current Traffic Records Coordinating Committee (TRCC) Memorandum of Understanding (MOU) and update the document to give the membership updated direction and scope. Make the MOU available to all TRCC members and their agencies.

- ❑ Coordinate and oversee the development of quality control metrics for the various traffic records system components. Include discussion of these metrics as an item on each TRCC meeting agenda. Promote projects that address the data quality problems especially looking at the back-end of the processes.

- ❑ Review the makeup of the Traffic Records Coordinating Committee. Add additional traffic record stakeholders including: local traffic engineers, local law enforcement, emergency medical services, metropolitan planning organizations, universities, insurance companies, municipal courts and others. Seek input from all new members.

- ❑ Establish a schedule of regular Traffic Records Coordinating Committee meetings. Meetings should be structured with a preset agenda that deals with the State's traffic records issues and provides for meaningful discussion among the stakeholders, including presentations from data owners and users.

- ❑ Identify a need for and assist in the development of programs to improve traffic record system data quality.

- ❑ Take an active role in the review of traffic records quality control programs. Provide the Traffic Record Coordinating Committee with regular updates.

- ❑ Provide direction for the Traffic Records Coordinating Committee (TRCC). The executive level of the TRCC must be available and supportive of TRCC especially when it is lacking resources and leadership.

1-B: Strategic Planning

Advisory Excerpt: *The TRS should operate in a fashion that supports the traffic safety planning process. The planning process should be driven by a strategic plan that helps State and local data owners identify and support their overall traffic safety program needs and addresses the changing needs for information over time. Detailed guidance for strategic planning is included in the NHTSA Strategic Planning Guide and the FHWA Strategic Highway Safety Plan documents. The strategic plan should address activities such as*

- ❑ *Assign Responsibility for the Strategic Plan.*
  The strategic plan should be created and approved under the direction of the TRCC. The TRCC should continuously monitor and update the plan, to address any deficiencies in its highway traffic records system.

- ❑ *Ensure Continuous Planning.*
  The application of new technology in all data operational phases (i.e., data collection, linkage, processing, retrieval, and analysis) should be continuously reviewed and assessed. The strategic plan should address the adoption and integration of new technology as this facilitates improving TRS components.

- ❑ *Move to Sustainable Systems.*
  The strategic plan should include consideration of the budget for lifecycle maintenance and self-sufficiency to ensure that the TRS continues to function even in the absence of grant funds.

- ❑ *Meet Local Needs.*
  The strategic plan should encourage the development of local and statewide data systems that are responsive to the needs of all stakeholders.

- ❑ *Promote Data Sharing.*
  The strategic plan should promote identification of data sharing opportunities and the integration among federal, State, and local data systems. This will help to eliminate duplication of data and data entry, assuring timely, accurate, and complete traffic safety information.

- ❑ *Promote Data Linkage.*
  Data should be integrated to provide linkage between components of the TRS. Examples of valuable linkages for highway and traffic safety decision making include crash data with roadway characteristics, location, and traffic counts; crash data with driver and vehicle data; and crash data with adjudication data, healthcare treatment and outcome data (e.g., Crash Outcome Data Evaluation System [CODES]).

- ❑ *Coordinate with Federal Partners.*
  The strategic plan's budget-related items should include coordination between the State and the various federal programs available to fund system improvements. The data collection, management, and analysis items in the strategic plan should include coordination of the State's systems with various federal systems (e.g., the Fatality Analysis Reporting System [FARS], the Problem Driver Pointer System [PDPS] of the National Driver Registry [NDR], the Motor Carrier Management Information System [MCMIS], and the Commercial Driver License Information System [CDLIS]).

- ❑ *Incorporate Uniform Data Standards.*
  The strategic plan should include elements that recognize and schedule incorporation of uniform data elements, definitions, and design standards in accordance with national standards and guidelines. Current examples of these standards and guidelines include:

  - *Model Minimum Uniform Crash Criteria (MMUCC)*
  - *American National Standards Institute (ANSI) -D20.1 and ANSI-D16.1*
  - *National Governors Association (NGA)*
  - *Global Justice XML Data Model (GJXDM)*
  - *National Center for State Courts, Technology Services, Traffic Court Case Management Systems Functional Requirement Standards*
  - *Guidelines for Impaired Driving Records Information Systems*

- *National Emergency Medical Service Information System (NEMSIS) Data Dictionary*.

❑ *Plan to Meet Changing Requirements.*
To help the State meet future highway safety challenges, the strategic plan should include a periodic review of data needs at the local, State, and federal levels. It should be updated to include tasks to meet those needs as they are identified.

❑ *Support Strategic Highway Safety Planning and Program Management.*
The strategic plan should include elements designed to ensure that the State captures program baseline, performance, and evaluation data in response to changing traffic safety program initiatives. Additional elements should be present for establishing and updating countermeasure activities (e.g., crash reduction factors used in project selection and evaluation).

❑ *Strategic Planning of Training and Quality Control.*
The strategic plan should incorporate activities for identifying and addressing data quality problems, especially as these relate to training needs assessments and training implementation.

1-B: Strategic Planning Status

The existing Traffic Records Strategic Plan (TRSP) dated 2006 was a revision of a 2001 Plan based on the findings of a 1999 traffic records assessment. No revisions other than updates to the Section 408 grant applications have been made since that time. In 2007 West Virginia undertook the development of a Strategic Highway Safety Plan (SHSP) that included Highway Safety Data Improvements as an Emphasis Area. The SHSP is currently being revised and Highway Safety Data Improvement will remain an Emphasis Area. When complete, the Highway Safety Data Improvement Section of the updated SHSP is intended to serve as the basis for an updated TRSP.

Statewide coordination of the implementation and evaluation of the State's SHSP is being overseen by the Highway Safety Management Task Force (HSMT). The HSMT is a group of representatives from state and federal agencies all of which have some area of highway safety responsibilities within their purview. The State has a Traffic Records Coordinating Committee (TRCC); however, it technically has been inactive since 2006 primarily because there was no Traffic Records Coordinator. A Traffic Records Coordinator has recently been hired. Each Emphasis Area of the SHSP was assigned an implementation team, which routinely met to insure progress in its respective area. The TRCC is considered to be a subcommittee of the HSMT. Due to the overlap in interests, responsibilities, and membership it is envisioned that the Highway Safety Data Improvement Emphasis Area team and the TRCC will ultimately become one.

The following two paragraphs are taken from the 2006 SAFETEA-LU legislation.

> SHSPs will be used in the Highway Safety Improvement Program to identify and analyze highway safety problems and opportunities, include projects or strategies to address them, and evaluate the accuracy of data and the priority of proposed improvements. The SHSP must be based on accurate and timely safety data, consultation with safety stakeholders, and performance-based goals that address infrastructure and behavioral safety problems on all public roads.
>
> Section 2006 of SAFETEA-LU establishes a new program of incentive grants (under Section 408 of chapter 4 of Title 23) to encourage States to adopt and implement effective programs to improve the timeliness, accuracy, completeness, uniformity, integration, and accessibility of State data that is needed to identify priorities for national, state, and local highway and traffic safety programs; to evaluate the effectiveness of efforts to make such improvements; to link these State data systems, including traffic records, with other data systems within the State; and to improve the compatibility of the State data system with national data systems and data systems of other States to enhance the ability to observe and analyze national trends in crash occurrences, rates, outcomes, and circumstances. A State may use these grant funds only to implement such data improvement programs. To qualify for a first-year grant, a State must demonstrate the following:

- ❑ An established multi-disciplinary highway safety data and traffic records coordinating committee;…

These sections affirm the relationship between the SHSP and the Section 408 grant program, as well as the relationship between the Traffic Records Coordinating Committee and the eligibility for Section 408 grant funds.

Assign Responsibility for the Strategic Plan
The responsibility for the TRSP development is clearly stated in both the *Advisory* and the State's response in the Section 408 Application as residing with the TRCC. A TRCC spans several organizations at different levels of government and the private sector. Strategic planning is difficult under any circumstance, but especially so when involving several organizational cultures. The Governor's Highway Safety Program (GHSP) and the TRCC Coordinator attempt to satisfy the requirements of the *Advisory*, the Section 408 Application and the TRSP in conjunction with the TRCC.

Ensure Continuous Planning
There has not been a regular mechanism for updating the TRSP; however, as related to the assessment team, it has been determined that the SHSP will be updated every five years and that the Highway Safety Data Improvement Emphasis Area will serve as the TRSP. Therefore TRSP will also be updated every five years with interim revisions being incorporated through the Emphasis Area Action Plan, if necessary.

Move to Sustainable Systems
All traffic records projects, completed or on-going, in the State are very dependent upon federal funding. The lack of Section 408 funds would probably impede progress on several projects. The withdrawal of all federal funding for data would insure the rapid failure of current projects and abandonment of planned projects as well as making it difficult to maintain current systems.

Meet Local Needs
An overwhelming majority of data issues in the State are handled from a top down perspective. It is usually the State that has the need for the data and generally identifies the issue and develops and provides the solution. For example, the State wanted the crash data to be submitted electronically, so they provided the software package and, in most cases, the laptops to enable law enforcement officers to do this. The State intends to upgrade the roadway and crash data system to enable accessibility to local safety agencies that will provide them the safety data they require for problem identification and countermeasure development.

Promote Data Sharing
The Plan encourages compatibility of all traffic records related data and the sharing of the data amongst stakeholder agencies.

Promote Data Linkage
The TRSP does not address data linkage.

Generally the data linkage problems that exist are known and are being addressed as each of the data repositories is updated and modernized. Probably the best example is that the locations on crash and roadway databases were coded and entered in an entirely different manner in each, making the linking of the two databases extremely time consuming and difficult. To address this issue, when the crash form and accompanying database were updated in 2007, the methodology for locating a crash was changed to be reflective of that of the roadway file. Now the two files can more easily be tied together. This linkage continues to be improved as the roadway file is modernized to include GIS.

Further, the citation was developed to link to the roadway file in the exact same way as the crash form, thus all three databases are able to be linked via location. Crash and citation can also be linked through citation numbers, driver licenses, etc. EMS report numbers are included on the crash form so as to allow easy linkage of these two datasets.

Coordination with Federal Partners
The State personnel responsible for (or most knowledgeable of) each of these federal programs is included in the update process for any form or system that would impact these federal data systems. Data needed for federal programs is a priority for West Virginia.

Incorporate Uniform Data Standards
The Plan does not specifically reference any of these national data standards listed in the *Advisory*; however, the individuals responsible for each of the databases that would be impacted by them are responsible for being aware of the standards for their data and making decisions based upon them.

In the case of the Model Inventory of Road Elements, the State is most lacking in this area; however, efforts to modernize and bring the roadway file up to current standards are underway. The State recently worked with FHWA to complete a State Roadway Safety Data Capability Assessment, which served to identify the most severe deficiencies in this area.

Plan to Meet Changing Requirements
Per the response to pre-assessment questionnaires, both public and private data needs are considered in the planning of improvements to components of the traffic records system.

Support Strategic Highway Safety Planning and Program Management
These issues are viewed as the responsibility of the agency undertaking or overseeing the individual projects.

Strategic Planning of Training and Quality Control
Performance measures are being added to each Emphasis Area of the SHSP, and data quality is being considered as a possibility for the Highway Safety Data Improvement Emphasis Area. Some of the databases have existing quality metrics; most do not.

Many of the system components have quality control mechanisms in place through system and logic edits and manual quality assurance procedures. These mechanisms, in many instances, are not enough. The *Model Performance Measures for State Traffic Records Systems* has been published by NHTSA. The *Model* recommends quality metrics for each component of a traffic records system. The Model does not state that each of the quality metrics suggested for each component should be applied, but does suggest that these measures or others developed by the states should be considered to measure the quality of each component system and to be able to determine the effect of projects on the quality of the system component in general.

The *Model* provides definitions of the performance measures and examples of how the measures can be applied. It is recommended that these measures be reviewed in the strategic planning and the project selection processes and applied where appropriate. Consideration of quality control or quality metrics at the planning and implementation stages of a project has more potential for success in measuring quality for a particular system and evaluating the effectiveness of the projects selected. The results of the quality assurance and control mechanisms should be a primary source of information for ongoing and new training efforts relating to data collection, data entry and data use for each system component.

Recommendations:

- ❑ Charge the Traffic Records Coordinating Committee (TRCC) with the development of a new Traffic Records Strategic Plan (TRSP) addressing the recommendations in this traffic records assessment. Identify deficiencies apart from those noted in the traffic records assessment by canvassing each TRCC member and especially each traffic records system component custodian for their input. The TRSP should be developed apart from the preparation of the Section 408 Application. Ideally the Section 408 Application should be prepared based on the TRSP proposed projects.

- ❑ Assure that all Traffic Records Coordinating Committee members participate in the development of the Traffic Records Strategic Plan (TRSP) and the selection and priority setting of the projects in the Plan. Since the Traffic Records Strategic Plan will be developed in concert with the development of a new Strategic Highway Safety Plan. It is advisable to acquire the skills of a facilitator to conduct workshops for the joint TRSP and the Strategic Highway Safety Plan development.

- ❑ Include items in each Traffic Records Coordinating Committee (TRCC) meeting agenda that address progress reports on each system and project, as well as the status of the quality metrics developed by the TRCC following the guidelines in NHTSA's *Model Performance Measures for State Traffic Records Systems.*

1-C: Data Integration

Advisory Excerpt: *The Data IPT Report recommends that States integrate data and expand their linkage opportunities to track traffic safety events among data files. Integrated data should enable driver license and vehicle registration files to be updated with current violations, prevent the wrong driver from being licensed, or keep an unsafe vehicle from being registered. Integration should ensure that all administrative actions are available at the time of the driver's sentencing. Data linkage is an efficient strategy for expanding the data available, while avoiding the expense and delay of new data collection.*

State TRCCs should develop working relationships with the health care community to ensure that the causation, crash, emergency medical services, hospital, and other injury-related data linked during the event can be merged statewide. They should also link to other data such as vehicle insurance, death certificates, medical examiner reports, etc., to support analysis of State-specific public health needs.

Linkage with location-based information such as roadway inventory databases and traffic volume databases at the State level can help identify the kinds of roadway features that experience problems, allowing States to better address these needs through their various maintenance and capital improvement programs. Data integration should be addressed through the following:

- *Create and Maintain a Traffic Records System Inventory.*
  The TRS documentation should show the data elements and their definitions and locations within the various component systems. Ancillary documentation should be available that gives details of the data collection methods, edit/error checking related to each data element, and any known problems or limitations with use of a particular data element. The system inventory should be maintained centrally, ideally in a data clearinghouse, and kept up-to-date through periodic reviews with the custodial agencies. Funding for system development and improvement should include a review of existing systems' contents and capabilities.

- *Support Centralized Access to Linked Data.*
  The traffic records user community should be able to access the major component data files of the TRS through a single portal. To support this access, the State should promote an enterprise architecture and database, and develop a traffic records clearinghouse to serve as the gateway for users. The databases in the clearinghouse should be linked in ways that support highway safety analysis. At a minimum, this would include linkage by location, involved persons, and events.

- *Meet Federal Reporting Requirements.*
  The TRS, where possible, should link to or provide electronic upload files to federal data systems such as FARS, MCMIS/SafetyNet, Highway Performance Monitoring System (HPMS), and others.

- *Support Electronic Data Sharing.*
  The TRS should support standard methods for transporting data between systems. At a minimum, these should include a documented file structure and data definitions for information to be transferred to statewide databases. Standard information transfer formats and protocols, such as XML format and FTP, should be supported.

- *Adhere to State and Federal Privacy and Security Standards.*
  The TRS should make linked data as accessible as possible while safeguarding private information in accordance with State and federal laws. This includes security of information transferred via the Internet or other means.

1-C: Data Integration Status

There are no examples of data integration among statewide centralized databases. Several efforts are under consideration, including the Enterprise Resource Planning (ERP) system being designed by the West Virginia Office of Technology (OT). This system is scheduled for partial implementation in 2013 and will eventually contain all safety-related datasets including crash, roadway, driver, emergency medical and others.

In addition, the Department of Health and Human Resources is working toward integrating various health-related datasets as part of an injury surveillance/epidemiology effort.

Create and Maintain a Traffic Records System Inventory
There is no comprehensive traffic records system inventory. The data files in individual components seem to be well documented in that there are data dictionaries and process flow descriptions available for most of the databases. These are not compiled into a single resource.

Support Centralized Access to Linked Data
The ERP under development would eventually fulfill this element of the *Advisory.*

Meet Federal Reporting Requirements
West Virginia is meeting its federal reporting requirements under the Fatality Analysis Reporting System (FARS), Highway Performance Monitoring System (HPMS), and SafetyNet programs. These programs appear to have excellent access to data; however, the FARS analyst reported that she has been denied access to the EMS data. FARS is a program that has explicit authorization under federal regulations.

Support Electronic Data Sharing
Electronic field data collection and data submission capabilities exist for crash and emergency medical services data. Data from these sources as well as the trauma registries are shared electronically with their respective data custodians. An electronic citation system is being tested now and is likely to roll out statewide soon. This will include (eventually) electronic data sharing with municipal and magistrate courts. Some courts share data electronically with the Division of Motor Vehicles.

Adhere to State and Federal Privacy and Security Standards
West Virginia adheres to the provisions of the Driver Privacy Protection Act (DPPA) and the HIPAA as well as relevant State laws protecting personal information.

Recommendations:

- ❑ Grant the Fatality Analysis Reporting System analyst in the Division of Highways sufficient access to various healthcare-related datasets, in accordance with Federal Regulations. This should be accomplished through direct negotiation between the Division of Highways and the Department of Health and Human Resources; at the executive level if necessary.

- Support the Enterprise Resource Planning concept with explicit incorporation of that project into a new traffic records strategic plan and the Highway Safety Management Task Force recommendations.

- Create a traffic records system inventory to include all component systems' data dictionaries and process data flow descriptions. This inventory should serve as a resource for users who need access to the various datasets.

1-D: Data Uses and Program Management

Advisory Excerpt: *Data availability and quality directly affect the effectiveness of informed decision making about sound research, programs, and policies. Accurate, comprehensive, and standardized data should be provided in a timely manner to allow the agency or decision-making entities at the State or local levels to:*

- *Conduct Problem Identification.*
  Problem identification is the process of determining the locations and causes of crashes and their outcomes and of selecting those sites and issues that represent the best opportunity for highway safety improvements. States should be able to conduct problem identification activities with their traffic records system.
- *Develop Countermeasure Programs and Program Management Procedures.*
  States select and evaluate strategies for preventing crashes and improving crash outcomes. This requires that decision makers can select cost-effective countermeasures and that safety improvement programs and funds should be managed based on data-driven decision making.
- *Perform Program Evaluation.*
  States should be capable of measuring progress in reducing crash frequency and severity. Ideally, the effectiveness of individual programs and countermeasures should be evaluated and the results used to refine development and management processes.
- *Support Safety-Related Policies and Planning.*
  The States are responsible for developing SHSPs. These data should be available to support this and other policy and planning efforts such as development of agency-specific traffic safety policies, traffic records strategic planning, safety conscious planning, and others.
- *Access Analytic Resources.*
  Data users, and decision makers in particular, should have access to resources including skilled analytic personnel and easy to use software tools to support their needs. These tools should be specifically designed to meet needs such as addressing legislative issues (barriers as well as new initiatives), program and countermeasure development, management, and evaluation, as well as meeting all reporting requirements.
- *Provide Public Access to Data.*
  The TRS should be designed to give the public or general non-government user reasonable access to data files, analytic results, and resources, but still meet State and federal privacy and security standards.
- *Promote Data Use and Improvement.*
  The TRS should be viewed as more than just a collection of data repositories, and rather as a set of processes, methods, and component systems. Knowledge of how these data should be collected and managed, along with where the bottlenecks and quality problems arise, is critical to users understanding proper ways to apply the data. This knowledge should also aid in identifying areas where improvement is possible.

1-D: Data Uses and Program Management Status

Conduct Problem Identification

The Governor's Highway Safety Program (GHSP) is the organization in the Division of Motor Vehicles in the West Virginia Department of Transportation responsible for the highway safety programs under the guidance of the NHTSA and coordinated with the FHWA and the FMCSA. Traffic Engineering in the Division of Highways (DOH) manages the crash data required for identifying highway safety problems, provides analytic services for the GHSP, and is responsible for the Strategic Highway Safety Plan (SHSP) and the Highway Safety Improvement Plan (HSIP). Problem identification analyses are done within Traffic Engineering and appear to be more oriented to the SHSP/HSIP issues than to behavioral issues. High crash locations are readily identified, but the typical data tables and extracts for the GHSP programs are not available. Traffic Engineering is able to use current crash data, but the GHSP regional coordinators and the Metropolitan Planning Organization (MPO) representatives insist that the very latest data they are able to use is from 2006, while most rely on the *2003 West Virginia Crash Data Report*.

Electronic crash reporting has been implemented since the time of the previous traffic records assessment. Virtually all input to the crash file is electronic now –a major advance, but a data retrieval and management capability was not developed. None of the GHSP regional coordinators are able to access and analyze the crash file. Traffic Engineering responds to requests for data, but there is no dialog to enable the requester to explore the database. The GHSP regional coordinators are using published safety data from the earlier part of the last decade.

Develop Countermeasure Programs and Program Management Procedures

The GHSP personnel resources consist of eight regional coordinators who reside in the regions and a headquarters staff responsible for the emphasis areas, oversight of the regional coordinators, and some "cross-pollination" of both programmatic and geographic responsibilities. Program management was described as follows: "Program managers are in touch with project coordinators on a regular basis (no less than weekly). Monthly activity reports are submitted to the GHSP by all Coordinators. On-site monitoring is conducted at least once a year."

Perform Program Evaluation

The HSIP uses information from the Road Inventory File and the crash database to evaluate its projects and countermeasures. Traffic Engineering's Mobility and Safety Section performs the evaluations.

GHSP provided the following explanation: "More formal evaluations are done yearly. Performance measures used include reduction in fatalities, reduction in crashes, reduction in alcohol related crashes/fatalities, increased DUI arrests, increased seatbelt use."

Support Safety-Related Policies and Planning
Both the GHSP and DOH share the responsibility of establishing safety–related policies with the GHSP having primary responsibility for highway safety behavioral and enforcement programs and the DOH for highway safety infrastructure programs.

Both offices provide safety data to the legislature. Traffic records data is vital to several areas of legislation: graduated driver's licensing, CDL legislation, seatbelt legislation, as well as legislation related to driving records, traffic law convictions and the "point system".

Access Analytic Resources
All access to analytic resources and traffic records data is through direct contact with the relevant data custodial agency staff. There are no easily accessible online safety data analysis resources. Static reports (such as an annual crash data summary) generally do not exist. In the case of crash data reporting, this was discontinued as a result of resource limitations and an inadequate set of analysis tools included in the new electronic crash reporting system. Public use datasets and associated online analytic tools are being planned as part of several efforts—most notably the Enterprise Resource Planning system under development by the West Virginia Office of Technology, the Division of Highways (DOH) Geographic Information System, and an online query and analysis tool for crash data being developed under contract.

During the interviews for this assessment it was clear that several people with responsibilities that would require them to use crash data are relying on out-of-date information (e.g., the 2003 crash summary report available online) or insufficient data (e.g., the records of fatal crashes only). In at least some of these cases, the individuals mistakenly failed to understand their level of access to current crash data. State employees with a need for the data can have access to the data in the ReportBeam system, including the analytic features of that software. Many of these users already have access but reported not using the system. The Division of Highways hopes that a web-based analytic tool they are developing under contract will help to promote broader use of the data; however, it is clear that many of the intended users are not data savvy and will need more training than just on the use of the tool.

Provide Public Access to Data
Unfortunately, there is a dearth of traffic safety statistical analyses available to the public. Different agencies collect information on crash reports, traffic citations, and injuries resulting from crashes, but few produce factsheets or summary reports that are posted to the Internet for public use.

The Traffic Safety Planning and Analysis Section within the DOH produced annual factbooks in the past, but the most recent information available online is 2003, http://www.transportation.wv.gov/highways/traffic/Pages/default.aspx. Representatives from DOH reported that the *2006 West Virginia Crash Data Report* is near completion and will be posted online in the near future. Following that, work will commence on the 2005 and 2004 reports; more recent documents will be prepared as resources permit. Analysts also respond to data requests from the public, approximately 200 or more per year, and incorporate popular analyses into the annual factbook.

The Department of Health and Human Resources (DHHR) conducts analyses and produces reports on all components of the Injury Surveillance System. The DHHR Bureau of Public Health houses the Office of Emergency Medical Services (OEMS) and Division of Trauma. Those data are maintained by the DHHR, but there is no public access at this time. The offices hope to produce summary reports. The West Virginia Health Care Authority (WVHCA) manages hospital inpatient discharge data and provides summary tables online at http://www.hcawv.org/DataAndPublic/data.htm. An online query tool including hospital records is also available at http://www.hcawv.org/vs5HealthIQ2/, but users cannot drill down to crash–related injuries. Unfortunately, information from emergency department records is not centrally maintained on a statewide level. Vital records information is available from the Health Statistics Center in DHHR at http://www.wvdhhr.org/bph/hsc/statserv/publist.asp, including links to annual studies, of which the most recent year available is 2008, statistical briefs, county health data, and special reports. There are also plans to post statistical reports on the webpage of the Office of the Chief Medical Examiner at http://www.wvdhhr.org/ocme/index.asp.

Although the public does not have access to summary reports of recent traffic-related data, they may make requests to the GHSP, DOH, or local partners such as metropolitan planning organizations or law enforcement agencies. There is a coordinated system among the State agencies to direct requests to the appropriate analyst, most often the DOH.

Promote Data Use and Improvement

One of the most effective means by which to promote data use is to make the data readily available. The improvement of data is generally an outgrowth of the use of the data. The Traffic Records Coordinating Committee (TRCC) has the responsibility to ensure that data users have access to the available data to either perform research, make appropriate decisions about policies, or measure success or failure of efforts to improve traffic safety. The State reported that they have few requests for the data from researchers. This may increase if the State provides an increased number of data elements and improved access to the data. User responses indicate a real need for access to as much data as possible.

In the past, the DOH has used Microsoft Access and Excel to compile and analyze crash data; however, with the revision of the crash form in 2007 the number of data elements was expanded so drastically that it is no longer feasible to utilize Access or Excel for these purposes. As such, DOH currently has a contract with a developer to create a new back-end database in SQL, which will include a web-based interface for users to access data and run reports. The new web-based access will have some canned reports and the ability for users to do some basic searches for data. The canned reports that were available through Access will soon be available again (August 2012).

Most of the State agencies responsible for safety functions are in situations similar to that of DOH, where they also have a very limited number of employees available to conduct an ever growing number of responsibilities. As such, DOH has traditionally provided data reports and/or conducted analyses for a majority of crash data users in the State. This is largely because the State's staff is most familiar with the crash files and has more of the expertise required to retrieve

needed data from the database in an appropriate format. However, there is an outcry from some agencies to conduct analysis on their own. The State will use the new web-based interface to answer some of these requests and should expand access as much as possible.

The State is conducting meetings with identified user agencies to discuss their data/report needs so that the State can insure those needs are met by the final product. Agencies utilizing the web-based interface will also have the ability to develop (and save) reports.

The new e-citation should also aid the State in identifying areas where improvement of quality and availability of data is possible. This opportunity will allow the State to promote their data by supplying increased data to users.

Recommendations:

- ❑ Resolve the disagreement and misunderstanding that is evident now between Traffic Engineering and Governor's Highway Safety Program (GHSP) concerning crash data access and analysis capabilities.

- ❑ Develop user-oriented online query tools and public-access databases for crash, roadway, and injury surveillance data (at a minimum).

- ❑ Develop training on data analysis as well as use of the analytic tools.

- ❑ Encourage potential users to use NHTSA's web-based traffic records training available at www.trafficrecords101.net. In particular, the data analysis training modules in that system are intended as a basic primer on how to generate and use summary crash data.

- ❑ Task the Traffic Records Coordinating Committee to identify deficiencies apart from those noted in the traffic records assessment by canvassing collectors, users and managers of each of the traffic records system components.

- ❑ Create online query tools (as planned) that are open to the public to broaden and promote public access and use of the traffic records data. The traffic records system should be designed to give the public or general non-government user reasonable access to data files, analytic results, and resources but still meet State and federal privacy and security standards.

- ❑ Provide Data users, and decision–makers in particular, access to resources including skilled analytic personnel and easy to use software tools to support their needs. These tools should be specifically designed to meet needs such as addressing legislative issues (barriers as well as new initiatives), program and countermeasure development, management, and evaluation, as well as meeting all reporting requirements.

- ❑ Promote data use and improvement. The traffic record system should be viewed as more than just a collection of data repositories, and rather as a set of processes, methods, and

component systems. Knowledge of how these data should be collected and managed, along with where the bottlenecks and quality problems arise, is critical to users understanding proper ways to apply the data. This knowledge should also aid in identifying areas where improvement is possible.

- Perform program evaluation. States should be capable of measuring progress in reducing crash frequency and severity. Ideally, the effectiveness of individual programs and countermeasures should be evaluated and the results used to refine development and management processes.

- Revise the priorities for creation of the delayed traffic crash summary reports to focus more effort on the most recent years' data first and working backwards through time as staffing levels and available resources permit.

SECTION 2: TRAFFIC RECORDS SYSTEM COMPONENTS

Advisory Excerpt: *At the time of passage of the Highway Safety Act of 1966, State centralized TRS generally contained basic files on crashes, drivers, vehicles, and roadways. Some States added data on traffic safety-related education, either as a separate file or as a subset of the Driver File. As traffic safety programs matured, many States incorporated EMS and Citation/Conviction Files for use in safety programs. Additionally, some States and localities maintain a Safety Management File that consists of summary data from the central files that can be used 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 TRS needs to incorporate a view of information and information flow, as opposed to focusing only on the files in which that information resides.

Under this more distributed model, it does not matter whether data for a given system component are housed in a single database on a single computer or spread throughout the State on multiple local systems. What matters is whether the information is available to users, in a form they can use, and that these data are 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 major components of a TRS:

- ❑ *Crash Information*
- ❑ *Roadway Information*
- ❑ *Driver Information*
- ❑ *Vehicle Information*
- ❑ *Citation/Adjudication Information*
- ❑ *Statewide Injury Surveillance Information*

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

A frequently used overview of the contents of a TRS is the Haddon Matrix, named after its developer, William Haddon, the first NHTSA Administrator. It provides a valuable framework for viewing the primary effects of Human, Vehicle, and Environmental factors and their influence before, during, and after a crash event. Table 1 is based on the Haddon Matrix.

Table 1: Expanded Haddon Matrix With Example Highway Safety Categories

	Human	***Vehicle***	***Environment***
Pre-Crash	· *Age* · *Gender* · *Experience* · *Alcohol/Drugs* · *Physiological Condition* · *Psychological Condition* · *Familiarity with Road & Vehicle* · *Distraction* · *Conviction & Crash History* · *License Status* · *Speed*	· *Crash Avoidance* · *Vehicle Type* · *Size & Weight* · *Safety Condition, Defects* · *Brakes* · *Tires* · *Vehicle Age* · *Safety Features Installed* · *Registration*	· *Visibility* · *Weather/Season* · *Lighting* · *Divided Highways* · *Signalization* · *Geographic Location* · *Roadway Class, Surface, Cross-Section, Alignment, etc.* · *Structures* · *Traffic Control Devices, Signs, Delineations, and Markings* · *Roadside Appurtenances, Buildups, Driveways, etc.* · *Volume of Traffic* · *Work Zone* · *Animal Range Land & Seasonal Movements*

Crash	· *Belt Use* · *Human Tolerance* · *Size* · *Seating Position* · *Helmet Use*	· *Crash-Worthiness* · *Passenger Restraints* · *Airbags and Airbag Shutoff*	· *Guardrails* · *Median Barriers* · *Breakaway Posts* · *Rumble Strips and Other Safety Devices* · *Maintenance Status of Roadway and Devices*
Post-Crash	· *Age* · *Physical Condition* · *Insurance Status* · *Access to Health Care* · *Driver Control Actions* · *Court Actions* · *Probation*	· *Post Crash Fires* · *Fuel Leakage* · *Power Cell Securement* · *Hazardous Materials* · *Title*	· *Traffic Management* · *Bystander Care* · *EMS System* · *First Responders* · *Hospital Treatment* · *Long-Term Rehabilitation*

The Haddon Matrix has proven to be a meaningful way to examine primary effects of contributing factors on crash frequency and severity. It helps decision makers to consider countermeasures designed to address specific contributing factors. In recent years, with availability of more detailed data analyses, awareness has grown about the interactions among contributing factors. A good example of such interactions would be weather and drivers' skill or experience levels. To make the contribution of interaction effects more obvious, the matrix in Table 2 can be used to supplement the Haddon Matrix.

Table 1: Examples of the Interactions among Crash Characteristics

	Human	***Vehicle***	***Environment***
Human	· *Road Rage* · *Ped/Bike Behavior & Driver Behavior* · *Driver Age & Passenger Age & Number*	· *Familiarity with Vehicle & Training* · *License Class & Vehicle Type* · *Rollover Propensity & Driver Actions* · *Vehicle Ergonomics & Person Size*	· *Crash Avoidance* · *Vehicle Type* · *Familiarity with Roadway* · *Experience with Weather Conditions*
Vehicle		· *Vehicle Size Weight Mismatch* · *Under-Ride/Over-Ride* · *Shared Roads, No-Zone* · *Tire Inflation & Rollover Propensity*	· *Rollover Propensity & Road Configuration* · *Roadway Debris & Vehicle Size Weight* · *Vehicle Type & Weather Conditions* · *Vehicle Condition & Weather Conditions*
Environment			· *Congestion Interaction with Road Type* · *Congestion & Vehicle Mix & Lane Width* · *Animal Management Policies & Roadway Access & Seasons*

Taken together, these views of traffic safety factors offer a way of thinking about highway safety issues that is both conceptually robust and practical. For the purposes of this Advisory, the most important aspect of the TRS is that it supports high-quality decision making to improve highway safety. The remainder of this section of the Advisory presents details about the various components of the TRS.

2-A: Crash Data Component

Advisory Excerpt:

- *Description and Contents*
  The Crash Data Component should document the time, location, environment, and characteristics (e.g., sequence of events, rollover, etc.) of a crash. Through links to other TRS components, the Crash Data Component should identify the roadways, vehicles, and people (e.g., drivers, occupants, pedestrians) involved in the crash. These data should help to document the consequences of the crash (e.g., fatalities, injuries, property damage, and violations charged), support the analysis of crashes in general, and the analysis of 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)*
  - *the interaction of various components (e.g., time of day, day of week, weather, driver actions, pedestrian actions, etc.)*

  The Crash Data Component of the TRS contains basic information about every reportable (as defined by State statute) motor vehicle crash on any public roadway in the State.

- *Applicable Guidelines*
  Details of various data elements to be collected are described in a number of publications. The MMUCC provides a guideline for a suggested minimum set of data elements to be collected for each crash. Additional information should be collected for crashes involving an injury or fatality to meet the tracking and analysis requirements for the State and other systems (e.g., the FARS, SafetyNet).

- *Data Dictionary*
  Crash data should be collected using a uniform crash report form that, where applicable, has been designed and implemented to support electronic field data collection. Law enforcement personnel should receive adequate training at the academy and during periodic refreshers, to ensure that they know the purpose and uses for the data as well as how to complete each field on the form accurately.

  Information from the quality control program should be used to develop and improve the content of training. The training manual on crash reporting should be available to all law enforcement personnel. The instructions in the manual should match the edit checks that are performed on the crash data prior to its being added to the statewide crash database. The edit checks should be documented and sufficient to flag common and serious errors in the data. For example, these errors include missing or out of range values in single fields and logical inconsistencies between the data recorded in multiple fields (e.g., time of day is midnight and the lighting condition is coded as daylight). All data element definitions and all system edits should be shared with collectors, managers, and users in the form of a data dictionary that is consistent with the training manual and the crash report form.

- *Process Flow*
  The steps from initial crash event to final entry into the statewide crash data system should be documented in process flow diagrams. The diagram should be annotated to show the time required to complete each step and to show alternate flows and timelines depending on whether the reports are submitted in hardcopy or electronically to the statewide system. The process flow diagram should include procedures for error correction and error handling (i.e., returning reports to the originating officer/department, correction, resubmission, etc.). Process flow diagrams should show all major steps whether accomplished by staff or automated systems and should clearly distinguish between the two.

- *Interface with Other Components*
  The Crash Data Component has interfaces, using common linking variables shown in Table 3, to other TRS components to support the following functions:

- *Driver and vehicle data should be used to verify and validate the person and vehicle information during data entry and to flag records for possible updating in the driver or vehicle files when a discrepancy is identified. Key variables such as driver license number, vehicle identification number (VIN), license plate number, name, address, and date of birth should be available to support matching of records among the files. The Driver Data Component should also enable access to drivers' histories of crashes and convictions for traffic violations.*
- *Crash data should be linked to roadway inventory and other roadway characteristics based upon location information and other automated and manual coding methods. This linkage supports location-based analysis of crash frequency and severity as well as crash rate calculations based on location-specific traffic counts.*
- *Law enforcement personnel should be able to link crash, contact, incident, citation, and alcohol/drug test results through their own department's records and/or a secure law enforcement information network. For agencies with computer-aided dispatch and/or a records management system, the crash data should be linked to other data through incident, dispatch, and/or crash numbers and by names and locations to support analysis at the local level.*
- *Linkage to injury surveillance data should be possible either directly or through probabilistic linkage in order to support analysis of crash outcomes and overall costs of treatment. Key variables for direct linkage include names of injured persons or EMS run report number. Key variables for probabilistic linkage include the crash date and time, crash location, person characteristics such as date of birth and gender, EMS run report number, and other particulars of the crash.*

Table 3: Common Linking Variables between Crash And Other Data Components of a Traffic Records System

Crash Linkages to Other Law Enforcement and Court Files	- *Incident Number* - *Location (street address, description, coordinates, etc.)* - *Personal ID (name, address, DL number, etc.)*
Crash Linkages to Roadway Information	- *Location Coding (linear referencing system, reference post, coordinates, local street codes)*
Crash Linkages to Driver and Vehicle Information	- *Driver License Number* - *Vehicle Identification Number* - *Personal Identifiers (name, address, date of birth, etc.)*
Crash Linkages to Statewide Injury Surveillance System Information	- *Personal Identifiers (where allowed by law)* - *Crash Date, Time, Location* - *EMS Run Report Number* - *Unique Patient ID Number*

Furthermore, there should be data transfer and sharing linkages between State and local crash databases. The State crash data system should support the electronic transfer of crash data from a variety of law enforcement agencies' (LEAs) records management systems. The State's crash data system management should publish the specifications and editing requirements for generating the outputs from the various agency systems that can be processed into the official State crash data system.

- ❑ *Quality Control Program*

The crash data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the information in the Crash Data Component should be assured based on a formal program of error/edit checking as the data are entered into the statewide system. In addition, the custodial agency and the TRCC frequently work together to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The crash data managers should receive periodic data quality reports. There should be procedures for sharing the information with data collectors through individual and agency-level feedback, as well as training and changes to the crash report instruction manual, edit checks, and data dictionary. Example measurements are presented in Table 4

Table 2: Examples of Quality Control Measurements for Crash Data

Timeliness	- *# days from crash event to receipt for data entry on statewide database* - *# days for manual data entry* - *# days for upload of electronic data* - *Average # of days to enter crashes into the system* - *Average # of days of backlogged crash reports to be entered*
Accuracy	- *% of crashes "locatable" using roadway location coding method* - *% VINs that are valid (e.g., match to vehicle records that are validated with VIN checking software)* - *% of interstate motor carriers "matched" in MCMIS* - *% crash reports with uncorrected errors* - *% crash reports returned to local agency for correction*
Completeness	- *% LEAs with an unexplained drop in reporting one year to the next* - *% LEAs with expected number of crashes each month* - *% FARS/MCMIS match* - *% FARS/State Crash fatality match*
Consistency	- *% time that an unknown code is used in fields with that possible value* - *% logical error checks that fail* - *% compliance with MMUCC guidelines*

The measures in Table 4 are examples of high-level management indicators of quality. The crash file managers should have access to a greater number of measures and be prepared to present a standard set of summary measures to the TRCC on a periodic schedule, such as monthly or quarterly.

2-A: Crash Data Component Status

While some of the characteristics of the crash data component have degraded since the previous assessment in 2006, the State has achieved the notable advance of 100 percent electronic data collection and electronic data submission for crash reports. Only about 50 reports are submitted by law enforcement agencies using a paper form, while some 40,000-to-50,000 reports are collected and transmitted electronically. This achievement has set the stage for multiple advances in the future; however, it has resulted in some temporary loss of capabilities in the crash system at the State level. This situation arises in part because the software chosen for the statewide field data collection has only limited analytic capabilities. The other related issue is that a necessary update to the back-end database at the West Virginia Department of Transportation (DOT), Division of Highways (DOH), Traffic Engineering Division has been delayed making it difficult for DOH staff and others to access the data and generate reports.

Through a partnership with the Marshall University Rahall Transportation Institute (RTI) and a contractor working for the RTI, the DOH is implementing a web-based system scheduled for August 2012 which is designed to meet multiple users' needs for data. In particular, the DOH will be able to use the new system to generate annual reports of crash experience (the most recent report available now is from 2003) and users within State and local agencies (especially law enforcement agencies and metropolitan planning organizations) will once again have access to data for analysis. In addition, the DOH staff continues to produce ad hoc reports of crash data upon request—some 200 requests are received and completed each year. It is hoped that the new web-based system will result in a reduced burden on the DOH staff and simultaneously improve access to the data for a broad variety of users.

There is a statewide initiative to combine data systems into functionally-related enterprise systems. One of these, the Enterprise Research Planning (ERP) system is being designed now to encompass safety related data including crashes, emergency medical, roadway, driver and other data sources. This effort is separate from and somewhat overlapping with the efforts within DOH to develop a user-friendly web-based analysis tool for crash data. The ERP is slated for initial implementation in 2013, with expansion planned over time. The intent is to create a system that will support all highway safety analyses, including those described in the *Highway Safety Manual*.

Applicable Guidelines

The West Virginia Uniform Traffic Crash Report (UTCR-DOH form 17-C; rev. 02/2007) is fully MMUCC-compliant. The DOH has reviewed the soon-to-be-released 4th edition of the MMUCC guideline and intends to maintain its high level of compliance.

There are two years of data (2007 and 2008) for which the crash database is split between records matching the new MMUCC-compliant form and those matching the older form. At present this creates some concerns over the time and effort required to reconcile the two datasets in order to create a single annual database for each year. As time passes, the importance of this issue should diminish since most safety analyses in the State use four years of data (current year plus three prior years).

Data Dictionary
The crash system data dictionary and data collection manual are current, complete, and accurate. The process of generating these documents is somewhat simplified by the adoption of the MMUCC guideline and associated data definitions.

Process Flow
There is no process flow diagram describing the data management procedures related to creation of the centralized crash database. The process was described in detail during the Assessment interviews as follows:

1. The law enforcement officer goes to the scene of a crash. Either they have ReportBeam (over 99 percent) or they do a paper report (approximately 50 reports per year).
2. Paper reports are mailed direct to DOH and they are data entered directly into ReportBeam. All the edit checks for this have been stripped off in order to get the data in. Paper reports are scanned as attachments into the record of the crash created in ReportBeam.
3. If the law enforcement officer has access to ReportBeam it will either be via a laptop computer in the vehicle or a desktop computer, depending on the agency. Information gathered at the scene is entered by the officer into ReportBeam.
4. When the officer has completed the report, it is submitted to the server at the individual law enforcement agency. At that point it is added to the queue for supervisory approval.
5. Reports that are rejected by the supervisor are generally sent back to the originating officer, but they may be assigned to another officer to complete at the supervisor's discretion.
6. Upon approval the report is instantly sent to the statewide ReportBeam server. For agencies that write fewer than 100 crash reports per year, DOH has instituted an automatic, immediate approval process so that the data are shared with the statewide server immediately upon submission by the officer. For larger agencies (those that contribute more than 100 reports per year), the approval process times out at 60 days from the date that the crash is submitted to the agency server. At that point, if it has not already been approved, the data will be automatically uploaded to the statewide server.
7. Crash ID number is assigned at the point of transfer into the statewide server. Law enforcement agencies have the option of recording their own crash report numbers but cannot access or change the State-assigned crash ID numbers.
8. All edit checking is performed prior to submission by the officer to the law enforcement agency server. There are no additional edit checks at the point of transfer to the statewide server.
9. Electronic crash reports that require an update (e.g., when a BAC value is obtained after the original report was submitted or when an injured person later dies) must be rejected by a supervisor and reassigned to an officer for completion and resubmittal. This process is reportedly not well understood by law enforcement agencies and is viewed as too cumbersome. The DOH, as a consequence, limits its requests for updates.

Post processing within the DOH has been minimal since the adoption of the ReportBeam software. In the future, the DOH plans to re-institute a series of data validation analyses as part of the annual reporting process. At present DOH is working on generating the 2006 crash summary report. Once that is finished, DOH staff will work on completing the reports for 2005, 2004, and (later) 2007 through 2011. As mentioned earlier, the reports for 2007 and 2008 present special challenges because some of the data in each year were collected using the older form and some were collected using the new MMUCC-compliant form. A reconciled database has been created for 2007 and a similar effort will be required for 2008's data.

The Fatality Analysis Reporting System (FARS) analyst within DOH enters records of fatal crashes based on the UTCR and data supplied by medical examiners, emergency medical services (EMS) providers, and the vital records (death certificate) manager. The analyst indicated that she is having some difficulty obtaining BAC and drug test results on surviving drivers. West Virginia law requires that all fatally injured persons in crashes be tested for alcohol and these data are generally available for entry into FARS. West Virginia shares data with neighboring states, but the FARS analyst reported having some difficulty obtaining timely data on people who are injured in crashes in West Virginia but transported across the border for treatment and later die. The update process for law enforcement reporting is also not working very well.

The process of reporting commercial motor vehicle (CMV) crashes in the Federal Motor Carrier Safety Administration's SafetyNet system is entirely manual at present. The SafetyNet analyst within the Public Service Commission has access to the statewide ReportBeam server and receives notification of crashes that include a truck/bus supplement—the only indication currently that a potentially reportable crash has been submitted. Based on the information provided in the interview, there are several edit checks that could be applied to the data as they are collected in the field that would help to ensure that officers provide complete and accurate information about CMV crashes in accordance with the SafetyNet data standards. The DOH also expressed interest in eventually establishing an automated process to upload CMV crashes into SafetyNet in lieu of the manual data entry process. It was also clear that training may be required for some law enforcement agencies.

Location coding is a separate manual process. The ReportBeam software includes location information, but the key data fields are not sufficiently constrained to ensure accuracy. Most importantly, the on-street and cross-street name fields were implemented as free text fields allowing the officer to type rather than pick the correct street from a uniform list of possibilities (a pick list). The State has explored other methods of obtaining more accurate location data, but has had only limited success with collecting latitude/longitude coordinates using GPS data entered by law enforcement agencies (either from GPS devices or entered manually by agency records management staff). The ReportBeam software does not currently offer a "Smart Map" capability that would enable officers to point and click on the crash location with automatic completion of all relevant location fields on the form.

Interface with Other Components
In the field version of the ReportBeam software, officers have the capability to collect driver and vehicle data by scanning bar codes on the driver license and registration. Some agencies also have GPS receivers that can supply latitude/longitude coordinates electronically.

The statewide centralized crash data do not interface with any other traffic records components. This is due to the difficulties in getting data out of the ReportBeam system. The DOH has difficulty generating data extracts from ReportBeam and has generally stopped providing datasets to other users. This situation should be resolved with the web-based system being developed through RTI and planned for an August 2012 roll-out. Assuming this new system works as designed, users with appropriate authority should be able to generate their own data extracts. The DOH should also regain the ability to generate data extracts upon request. This should improve the ability to interface crash data with other traffic records databases.

Quality Control Program
The crash data quality control program is not truly functional or complete. There are multiple edit checks in the field data collection system which have helped to improve overall accuracy and completeness of the crash data; however, there are no measurements of accuracy or completeness that can quantify this improvement or serve as management indicators of day-to-day performance of the system. Overall timeliness is measured, but the design of the time stamping function within the ReportBeam software makes it impossible to reliably measure the duration of any processes other than initial submission.

The following provides a description of an ideal data quality management program as developed in draft form for the upcoming traffic records advisory revision. All are presented for consideration by the State. These are not to be interpreted as formal requirements but rather as best practices gleaned from experience in other states. The word "yes" precedes those that are part of the existing quality management practices in West Virginia. A "no" precedes those that are not part of the process, and "partial" precedes those for which the State meets a portion of the described data quality management practice.

(Yes) **Automated edit checks/validation rules that ensure entered data falls within the range of acceptable values and is logically consistent between fields.**
Edit checks are applied when the data are submitted by the law enforcement officer to their agency server. There are no additional checks at the point of data transfer to the DOH.

(Partial) **Limited state-level correction authority granted to quality control staff working with the statewide crash database to correct obvious errors and omissions without returning the report to the originating officer.**
DOH has limited staff time to correct obvious errors in crash reports, but will do so as such errors are noted. This is often in lieu of returning the reports to the law enforcement agency for correction—a process that is generally limited to updating the injury level from injury to fatality in cases where a crash-involved person dies sometime after transport from the scene.

(No) **Processes for returning rejected crash reports in place to ensure the efficient transmission of rejected reports between the state-level database and the collecting official as well as tracking resubmission of corrected reports.**
The DOH does not make a practice of rejecting reports that contain an error. At present, it is assumed that the edit checks are doing a sufficient job of trapping errors. Once the DOH is able to conduct annual data cleansing analyses in preparation for producing annual crash summaries, it is anticipated that they will discover a number of errors that will require correction. Because this will involve data that are several years old, it is not feasible to return the reports to the law enforcement agencies at that point.

(No) **Performance measures tailored to the needs of data managers and address the concerns of data users. Measures can be aggregated for collectors, users, and the State TRCC.**
There are relatively few data quality metrics in place and none appear to be used for day-to-day management of the crash system or for informing collectors and users of the level of quality achieved in the system. The RTI is developing a set of data quality measurements; however, this project is still in its infancy so it was not possible to assess its sufficiency.

(No) **Numeric goals for each performance measure established and regularly updated by the State in consultation with users via the TRCC.**
The data quality metrics that do exist generally relate to overall timeliness and are reported primarily as part of the annual update to NHTSA in the Section 408 grant funding process. There is no comprehensive data quality management process and the metrics that do exist appear to be used only for the purposes of qualifying for future grant funding.

(No) **Performance reporting that provides specific feedback to each law enforcement agency on the timeliness, accuracy, and completeness of their submissions to the statewide database relative to applicable State standards.**
None of the data quality metrics are reported at the level of individual law enforcement agencies.

(No) **Quality control reviews comparing narrative, diagram, and the coded contents of the report considered part of the data acceptance process for the statewide database.**
The DOH crash data management process does not include this level of careful comparison of the narrative, diagram, and coded portions of the form. DOH is not staffed to a level that would support this activity. It is assumed that supervisors within each law enforcement agency conduct this type of review as part of the crash report approval process, but there is no way to know for certain which agencies make this a regular practice and which do not.

(N/A) **Periodic independent sample-based audits conducted for the reports and related database contents for that record.**
Because the crash reports are all submitted electronically, this type of audit is not applicable in West Virginia.

(Partial) **Periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions.**
This type of analysis is being conducted now by DOH. It has not been done in several years but the recent assignment of a staff person to compile the annual crash summary reports (starting with 2006) has resulted in a revival of year-end data cleansing analyses. It is unclear whether or not the DOH has the capability to run this type of analysis periodically during a year rather than waiting until it is time to produce the annual summary reports.

(No) **Data quality feedback from key users regularly communicated to data collectors and data managers. This feedback will include corrections to existing records as well as comments relating to frequently occurring errors. Data managers disseminate this information to law enforcement officers as appropriate.**
When users outside of the DOH crash data management process identify errors with reports, those errors are generally corrected locally by the data analyst who discovered them and not communicated to or mirrored by the DOH. This may change with the implementation of a formal data quality management process being developed by RTI, but it is too soon to tell what the components of that process will be.

(No) **Data quality management reports provided to the State TRCC for regular review. The State TRCC uses the reports to identify problems and develop countermeasures.**
The TRCC is not active. When it was active, the TRCC's role did not include regular review of the quality of crash data or any other traffic records component.

Specific data quality measurements are provided as examples in the *Advisory*. In their response the DOH presented information on MMUCC compliance (100 percent). The State's Section 408 and strategic plan updates include measurements of timeliness and accessibility. Information about these and other data quality attributes is presented below:

Timeliness:
The 2012 Strategic Plan update available on the NHTSA online TRIPRS cites an average of just over seven days from crash event to submission for 2009. More recent data would certainly show a lower number as that value reflected roughly 40 percent of crashes still being submitted on paper forms whereas today less than 1 percent of reports are submitted on paper. In addition, electronically submitted crash data are immediately available for analysis so that the "less than seven days" value should also apply to overall timeliness, not just the timeliness of data submission. This represents a substantial improvement over the baseline pre-2008 where the average days to submission was 45 and overall timeliness would have had to reflect the time required for data entry as well.

Accuracy:
There are no measures of accuracy reported.

Completeness:
There are no measures of completeness reported.

Consistency:
The UTCR is described as 100 percent MMUCC compliant.

Integration:
There are no measures of data integration.

Accessibility:
In its Section 408 grant request for 2012, the State reports the number of users accessing the "data warehouse" has increased from 25 in 2010 to 101 in 2011. It is unclear what system these users are accessing as it was clearly stated in the pre-assessment questionnaires and the interviews that crash data are accessed only through the ReportBeam servers at present. This implementation does not constitute a data warehouse.

Recommendations:

- ❑ Develop a safety data plan and data governance process that will help to avoid duplication of effort and ensure maximum resource sharing. This should be a joint project of the Traffic Records Coordinating Committee and the Highway Safety Management Taskforce, with special emphasis on coordinating crash analysis improvement and Enterprise Resource Planning system efforts. A well-constructed traffic records strategic plan may meet the spirit of this recommendation. Alternatively, a formal data business plan developed by the West Virginia Office of Technology staff may be required.

- ❑ Revise the priorities for creation of the delayed traffic crash summary reports to focus more effort on the most recent years' data first and working backwards through time as staffing levels and available resources permit.

- ❑ Deploy a "Smart Map" feature in ReportBeam to automatically complete the location fields on the crash report based on officers clicking on a map. This utility should supply the street names, route and milepost numbers, latitude and longitude, and be compatible with the base map implemented in the West Virginia Division of Highways Geographic Information System.

- ❑ Implement a formal, comprehensive data quality management program including the features described in the report. At a minimum, this should incorporate a set of meaningful data quality metrics (measuring timeliness, accuracy, completeness, uniformity, integration, and accessibility) along with a set of processes for early identification of errors, specific feedback to law enforcement agencies, and links between

the data quality management process and training for law enforcement officers. This will necessitate frequent data quality reviews throughout the year.

- ❑ Implement the planned web-based data analysis system.

- ❑ Reinstitute annual crash summary reports. Eventually the annual report should become available on a set schedule a specified number of months after the end of a calendar year.

- ❑ Develop a formal process for identifying needed edit checks to include broad representation of crash data collectors and users. This effort should be conducted by a subcommittee of the Traffic Records Coordinating Committee.

- ❑ Task the Traffic Records Coordinating Committee with a formal role in quality review of the data from crash and all other traffic records component systems.

- ❑ Develop closer relationships with university-based transportation research centers if possible. This investment should be pursued in order to reach a point where the university-based researchers can serve as effective adjuncts to the Division of Highways staff and as a potential recruitment tool to help the Division of Highways (DOH) fill critical vacancies in the safety area. One possibility would be to assign the task of creating back-year crash data summaries to a university-based research team rather than relying on the DOH staff to conduct all of the pending analyses.

2-B: Roadway Data Component

Advisory Excerpt:

- ❑ *Description and Contents.*
  Roadway information includes roadway location, identification, and classification, as well as a description of a road's total physical characteristics and usage. These attributes should be tied to a location reference system. Linked safety and roadway information are valuable components that support a State's construction and maintenance program development. This roadway information should be available for all public roadways, including local roads.

  The State Department of Transportation (DOT) typically has custodial responsibility for the Roadway Data Component. This component should include various enterprise-related files such as:

  - *Roadway Inventories*
    - *Pavement*
    - *Bridges*
    - *Intersections*
  - *Roadside Appurtenances*
    - *Traffic Control Devices (TCD)*
    - *Guard Rails*
    - *Barriers*
  - *Traffic*
    - *Vehicle Miles Traveled (VMT)*
    - *Travel by Vehicle Type*
  - *Other*
    - *Geographic Information Systems (GIS)*
    - *Location Reference System (LRS)*
    - *Project Inventories*

- ❑ *Applicable Guidelines*
  The major guideline that pertains to the Roadway Data Component is the HPMS. This provides guidance to the States on standards for sample data collection and reporting for traffic volume counts, inventory, capacity, delay, and pavement management data elements. Guidelines and tools that address roadway data, as well as identifying which of these are expected to have the greatest correlation with crash incidences, should be considered part of this advisory. Examples of these resources are the Highway Safety Manual, Safety Analyst, and the Interactive Highway Safety Design Model. In addition, the American Association of State Highway and Transportation Officials (AASHTO) is developing a series of guides for its Strategic Highway Safety Plan. This multi-year cooperative effort includes guidelines relevant to several TRS components.

- ❑ *Data Dictionary*
  Roadway information should be available for all public roads in the State whether under State or local jurisdiction. The contents of the Roadway Data Component should be well documented, including data definitions for each field, edit checks, and data collection guidelines that match the data definitions. Procedures for collection of traffic data and calculation of vehicle miles traveled (VMT) should be documented as well.

- ❑ *Process Flow*
  The steps from initial event to final entry onto the statewide roadway data system should be documented in process flow diagrams for each file that are part of the Roadway Data Component. The diagrams should be annotated to show the time required to complete each step and to show alternate flows and timelines depending on whether data are submitted in hardcopy or electronically to the statewide system. The process flow diagram should include processes for error correction and error handling (i.e., returning reports to the original source for correction, resubmission, etc.). Process flow diagrams should show all major steps whether accomplished by staff or with automated systems and clearly distinguish between the two.

- ❑ *Interface with Other Traffic Records System Components*
  A location reference system should be used to link the various components of roadway information as well as other TRS information sources, especially crash information, for analytical purposes. Compatible location coding methodologies should apply to all roadways, whether State or locally maintained. When using a GIS, translations should be automatic between legacy location codes and geographic coordinates. This process should be well

established and documented. Compatible levels of resolution for location coding for crashes and various roadway characteristics should support meaningful analysis of these data.

- *Quality Control Program*
  The roadway data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the roadway data should be assured based on a formal program of error and edit checking as the data are entered into the statewide system and procedures should be in place for addressing the detected errors. In addition, the custodial agency and the TRCC should frequently work together to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The roadway data managers should receive periodic data quality reports. There should be procedures in place for sharing the information with data collectors through individual and agency-level feedback, as well as training and changes to the applicable instruction manuals, edit checks, and roadway data dictionary. Audits and validation checks should be conducted as part of the quality control program to assure the accuracy of specific critical data elements. Example measurements are shown in Table 5.

Table 3: Examples of Quality Control Measurements for Roadway Data

Timeliness	- *% of traffic counts conducted each year* - *# days from crash event to location coding of crashes* - *# days from construction completion to roadway file update*
Accuracy	- *% of crashes locatable using roadway location coding method* - *% errors found during data audits of critical data elements*
Completeness	- *% traffic data based on actual counts no more than 3 years old* - *% public roadways listed in the inventory*

The measures in Table 5 are examples of high-level management indicators of quality. The managers of individual roadway files should have access to a greater number of measures. The custodial agency should be prepared to present a standard set of summary measures to the TRCC monthly or quarterly.

2-B: Roadway Data Component Status

The West Virginia State Highway System is an integrated system of State, federal, municipal, and toll roads. The West Virginia Division of Highways (DOH) is responsible for the maintenance of the more than 34,500 mile State road system. The DOH developed a roadway information system that is used in the management of these roadway assets. The major components of the roadway information system are Road Inventory Log, Straight-Line Diagrams, and a Linear Referencing System GIS database.

The State does not maintain information on the entire 4,100 mile non-state roadway system. An effort is ongoing by the DOH to develop a GIS layer to include the non-state maintained roadways. Municipal public road information is maintained in Access databases. Updates to the local road system are collected annually from each municipality.

Data from the roadway files combined with crash data are routinely used for safety analysis including the development of the annual 5% Report and the identification of high crash locations. Additionally, the DOH has analyzed horizontal curve crashes, immersion crashes, cross-median crashes occurring on divided highways, intersection crashes, and other roadway features that emerge through the problem identification process.

The Highway Safety Improvement Program (HSIP) uses information from the Road Inventory File and the Crash Records Database to evaluate its projects and countermeasures. Traffic Engineering produces annual reports that discuss use of federal highway funds for the Highway Safety Improvement Program, Highway Rail Crossing Program, the Transparency Report, and evaluation of completed projects. The Governor's Highway Safety Program primarily uses the Crash Records Database for the management of behavioral and enforcement safety programs.

The DOH is proceeding with the expansion of the GIS to establish new standards in the roadway enterprise data platform. The most promising development on this front is an Enterprise Resource Planning system of which asset management and safety management are major components. The DOH is also updating and modernizing the Crash Records Database. Under this project a new user interface will be developed, which will be accessible by a variety of highway safety data users.

When both the roadway and crash information systems upgrades are completed, the systems will be capable of an interface that would provide merged datasets of road and crash data. This will also provide the highway safety community at the State and local government levels with the information necessary for effective safety analysis and countermeasure development.

The Federal Highway Administration (FHWA) recently conducted a capabilities assessment for the DOH in terms of the collection, management, and use of roadway safety data. This project is part of the Roadway Safety Data Partnership (RSDP), a collaborative effort between the FHWA and States to ensure that they are best able to develop robust data-driven safety capabilities. The RSDP is meant to be an overarching framework that provides a foundation for roadway data improvement efforts. Following are some of their findings:

Regarding the completeness of collecting roadway data, the DOH maintains a moderate level of detail for roadway segments and a lower level of detail for alignment descriptors. To upgrade these factors the FHWA noted that old data systems need to be modernized.

Regarding the accuracy of collecting roadway data, aside from some basic cross-checking queries, the DOH does not regularly use a series of internal checks (beyond data type edits) of its data. There is also not a systematic process to ensure external accuracy using field measurements, aerial imagery, etc. Efforts are underway to improve accuracy with the use of external verifications to investigate identified areas in question; once these areas have been addressed, then the external verifications are expected to be extended to random samples of data entries.

Regarding linkage, some key safety data sources are not linked. More than one location coding method is used and there are some incompatibilities among them. A desired level to achieve would be that key roadway inventory and supplemental databases are linked and a single method of location coding is used. The FHWA assessors believed that reaching the desired level is doable, but maintaining it may be a challenge.

Regarding data management and governance, there is no formal data governance board in the DOH, but the SHSP Emphasis Area Highway Safety Management Taskforce (HSMT) seems to play this role. The period during which the TRCC Coordinator position was vacant had an adverse effect on the updates to the safety data improvement plan, but a new TRCC Coordinator is now in place. It is expected that the new TRCC Coordinator will be working to update the strategic traffic records improvement plan through the SHSP revision process, which will fall under the oversight of the HSMT.

Regarding uniformity/consistency, data received from local agencies are not coded consistently and must be "cleaned up" before being entered in the roadway inventory database. (Minimal clean-up is required for data received from DOH District Offices.) DOH is presently unable to verify consistent coding across years or verify site addresses across years; however, it was noted that efforts are underway that will enable DOH to track both in the future.

Applicable Guidelines

Guidelines and standards were taken into consideration with the development of the roadway data systems especially with respect to the FHWA's Highway Performance Monitoring System (HPMS). The HPMS is a national guideline for reporting to FHWA certain road data on federally aided roads. The HPMS provides guidance to the states on standards for sample data collection and reporting for traffic volume counts, inventory, capacity and delay, and pavement management data elements.

Another guideline, the Model Inventory of Roadway Elements (MIRE), provides a structure for roadway inventory data elements through the use of common consistent definitions and attributes. Most states and local transportation agencies currently do not have all the data needed to use analysis tools such as SafetyAnalyst and the Interactive Highway Safety Design Model (IHSDM), and other procedures identified in the *Highway Safety Manual* (*HSM*). The MIRE provides a structure for roadway inventory data that will allow State and local transportation agencies to use these analysis tools with their own data. The Traffic Engineering Division of DOH is aware of the analytic software tools recommended in the *HSM*.

A subset of the MIRE roadway and traffic data elements that are fundamental to support the Highway Safety Improvement Program (HSIP) is referred to as the Fundamental Data Elements for HSIP (FDE/HSIP). The fundamental data elements are a basic set of elements an agency would need to conduct enhanced safety analyses regardless of the specific analysis tools used or methods applied. The elements are based on findings in the FHWA *Background Report: Guidance for Roadway Safety Data to Support the Highway Safety Improvement Program.* Definitions of fundamental data elements may be found in this background report. The fundamental data elements have the potential to support other safety and infrastructure programs, in addition to the HSIP.

Data Dictionary
The DOH maintains a data dictionary for the roadway files that defines each individual data element and contains data definitions and data collection guidelines.

Process Flow
Process flow diagrams were not provided for any of the roadway files.

Interface with Other Traffic Records System Components
The DOH uses county, route and milepost as the prime location reference system (LRS) for the State highway system. The road files also include latitude/longitude coordinates as supplemental LRS. This allows the capability for linkage but the process is very cumbersome to the extent that very few personnel attempt to use this capability.

Quality Control Program
The quality of the roadway information system is addressed in the *Roadway Safety Data Capability Assessment.*

Recommendations:

- ❑ Charge the Highway Safety Management Taskforce with the analysis of the findings of the *Roadway Safety Data Capability Assessment* and suggest promising projects for inclusion in the Traffic Records Coordinating Committee Strategic Plan for Traffic Records.

- ❑ Consider the inclusion of the Fundamental Data Elements of the Model Inventory of Roadway Elements (MIRE) into the roadway information system database.

- ❑ Expedite the full development of the Division of Highways' Enterprise GIS Roadway Database.

2-C: Driver Data Component

Advisory Excerpt:

- *Description and Contents*
  Driver information should include data about the State's population of licensed drivers, as well as data about convicted traffic violators who are not licensed in that State. Information about persons licensed by the State should include: personal identification, driver license number, type of license, license status, driver restrictions, convictions for traffic violations in this State and the history of convictions for critical violations in prior States, crash history whether or not cited for a violation, driver improvement or control actions, and driver education data.

  Custodial responsibility for the Driver Data Component usually resides in a State Department or Division of Motor Vehicles. Some commercial vehicle operator-related functions may be handled separately from the primary custodial responsibility for driver data. The structure of driver databases should be typically oriented to individual customers.

- *Applicable Guidelines*
  The ANSI D-20 standard should be used to develop data definitions for traffic records-related information in the driver and vehicle files. Driver information should be maintained to accommodate information obtained through interaction with the NDR via the PDPS and the CDLIS. This enables the State to maintain complete driving histories and prevent drivers from circumventing driver control actions and obtaining multiple licenses. Data exchange for PDPS and CDLIS should be accomplished using the American Association of Motor Vehicle Administrators (AAMVA) Code Dictionary. Security and personal information verification should be in accordance with the provisions of the Real ID act.

- *Data Dictionary*
  At a minimum, driver information should be available for all licensed drivers in the State and for all drivers convicted of a serious traffic violation (regardless of where or whether the person is licensed). The contents of the driver data files should be well documented with data definitions for each field, and where applicable, edit checks and data collection guidelines that match the data definitions. Procedures for collecting, reporting and posting of license, conviction, and license sanction information should be documented.

- *Process Flow*
  The steps, from initial event (licensure, traffic violation, etc.) to final entry onto the statewide driver and vehicle data files, should be documented in process flow diagrams for each file that is part of the Driver Data Component. The diagram should be annotated to show the time required to complete each step and to show alternate flows and timelines depending on whether the data are submitted in hardcopy or electronically to the statewide system. The process flow diagram should include processes for error correction and error handling (i.e., returning reports to the original source for correction, resubmission, etc.). The process flow should also document the timing, conditions, and procedures for purging records from the driver files. Process flow diagrams should show all major steps whether accomplished by staff or automated systems and clearly distinguish between the two. The steps also should be documented in those States that have administrative authority to suspend licenses based on a DUI arrest independent of the judicial processing of those cases.

- *Interface with Other Traffic Records System Components*
  The Driver Data Component should have interfaces (using common linking variables shown in Table 6) to other TRS components such that the following functions can be supported:

  - *Driver component data should be used to verify/validate the person information during data entry in the crash data system and to flag records for possible updating in the driver or vehicle files when a discrepancy is identified. Key variables such as driver license number, name, address, and date of birth should be available to support matching of records among the files. Social Security Numbers should be validated for interstate records exchange.*

  - *Driver and vehicle owner addresses are useful for geographic analyses in conjunction with crash and roadway data components. Linkage in these cases should be based on conversions of addresses to location codes and/or geographic coordinates in order to match the location coding method used in the roadway data component and in the GIS.*

  - *Links between driver convictions and citation/adjudication histories are useful in citation tracking, as well as in systems for tracking specific types of violators (DUI [Driving Under the Influence] tracking systems, for example). Even if a citation tracking system is lacking, there is value in being able to link to data from enforcement or court records on the initial charges in traffic cases. These linkages should be based usually on driver name and driver license number but other identifiers may be used as well. The National Center for State Courts (NCSC) is looking for these identifiers in addition to methods to improve data sharing. "NCSC offers solutions that enhance court*

operations with the latest technology; collects and interprets the latest data on court operations nationwide; and provides information on proven best practices for improving court operations." (http://www.ncsconline.org/)

- *Linkage to injury surveillance data should be possible either directly or through probabilistic linkage in order to support analysis of crash outcomes and crash risk associated with specific driver characteristics (e.g., the driver's history of violations or crash involvement). Key variables should include names, date of birth, dates, times, and locations of crashes and citations.*

Table 6: Common Linking Variables between Driver And Other Data Components of a Traffic Records System

Driver Linkages to Other Law Enforcement & Court Files	- *Citation Number & Case Number* - *Location (street address, description, coordinates, etc.)* - *Personal ID (name, address, DL number, date of birth, etc.)*
Driver Linkages to Roadway Information	- *Driver Addresses (location code, coordinates)*
Driver Linkages to Crash Information	- *Driver License Number* - *Personal Identifiers (name, address, date of birth, etc.)*
Driver Linkages to Statewide Injury Surveillance System Information	- *Personal Identifiers (where allowed by law)* - *Crash Date, Time, Location*

❑ *Quality Control Program*

The driver data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the information in the Driver Data Component should be assured based on a formal program of error/edit checking as data are entered into the statewide system and procedures should be in place for addressing the detected errors. In addition, the custodial agency (or agencies) and the TRCC should work together frequently to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The driver data managers should receive periodic data quality reports. There should be procedures in place for sharing the information with data collectors through individual and agency-level feedback, as well as through training and changes to the applicable instruction manuals, edit checks, and the driver and vehicle data dictionaries. Audits and validation checks to assure the accuracy of specific critical data elements should be conducted as part of the formal quality control program. Example measurements are presented in Table 7.

Table 3: Examples of Quality Control Measurements for Driver Data

Timeliness	- *Average time to post driver licenses* - *Average time to post convictions after receipt at DMV* - *Average time to forward dispositions from court to DMV*
Accuracy	- *% of duplicate records for individuals* - *% "errors" found during data audits of critical data elements*
Completeness	- *% drivers records checked for drivers moving into the State* - *% of driver records transferred from prior State*
Consistency	- *% of SSN verified online* - *% of immigration documents verified online* - *% violations reported from other States added to driver history*

The measures in Table 7 are examples of high-level management indicators of quality. The managers of individual driver files should have access to a greater number of measures. The custodial agency should be prepared to present a standard set of summary measures to the TRCC monthly or quarterly.

2-C: Driver Data Component Status

Description and Contents

The driver file, maintained by the Division of Motor Vehicles (DMV) of the West Virginia Department of Transportation has records on over 1.2 million drivers. Almost six percent of those are commercial driver licenses (CDLs). These records are stored on the legacy data system. The CDLs are maintained in the same database. There is an Enterprise Resource Planning (ERP) effort underway to integrate all of the transportation safety data systems.

License examinations and issuance are through the DMV's 23 regional offices and two exam centers. Licensing personnel are all employees of the DMV. When an applicant appears to apply for a license or identification card, a photograph is taken that enables the DMV personnel to verify that a test applicant is the same person who appeared for the application. When the applicant qualifies for a license or identification card, a temporary license with the driver's photo and barcode is provided for the time it takes to process further inquiries and to produce and mail the permanent license.

In examining a driver license application and validating the proof of identity document, the NDR PDPS and the SSOLV are checked, and the SAVE file is checked for non-US citizens. The CDLIS is *also* checked for commercial driver license applicants, and any prior driver record for the commercial driver is transferred to the West Virginia DMV.

Basic Characteristics

At the time of the previous traffic records assessment in 2006 a new digital driver license had been recently implemented. Another version was produced from July 2011 through December 2011, and those will remain valid until they expire. Now a new "gold star" license that meets the requirements for federal identification is being produced. A variant that does not meet the new identification requirements (and is clearly so marked) is being produced also. Distinctive graduated driver licenses with restrictions clearly stated on the license were produced for the latter part of 2011, and they will remain in use until expired.

Personal identification is authenticated through the required documentation and established uniquely by fingerprints (if provided voluntarily) and a photograph taken for facial recognition that is run nightly for the license applications processed during the day. The driver license number consists of one alpha character and nine numeric characters. Nothing in the driver license number is significant. The barcode and magnetic strip are on the reverse.

Driver education for initial licensing is not recorded in the driver history, but completion of defensive driver courses is recorded to enable a reduction in points. The point system triggers driver improvement actions as needed, and the DMV also has administrative authority to revoke or suspend licenses for drivers arrested for DUI.

BAC information is recorded in conjunction with a DUI arrest. No record of crash involvement appears in the driver history, but failure to maintain mandatory auto liability insurance will result

in suspension of the driver license. The DMV receives the crash reports that do not show that the required liability coverage is current.

Convictions and Courts

Conviction reports for a CDL holder sent from another state for a conviction in that state are received electronically—a function of the one-license-one-record concept. Pursuant to a pilot test convictions from 23 counties are being submitted electronically. Although electronic citation reporting is widely used by law enforcement, the courts cannot receive a data stream to populate the court documents. The electronic records are printed for the courts. The court procedures cannot now convey the convictions to the DMV electronically although there is a test of relaying convictions electronically. Courts also may offer to withhold a conviction from the DMV if the offender attends a driver class, but the option is not supposed to apply to a CDL holder or graduated license holder.

Also, it was reported in the interviews that it is not uncommon for a municipal court to convict a traffic offender (including for DUIs), collect the fine, and end there—failing to report the conviction to the DMV. While the convictions for CDL holders from the Magistrate Courts are given priority handling, it is often difficult to convey those to the DMV within the ten day requirement. Commentary on this follows later.

The shielding of in-state convictions from the DMV makes the driver histories incomplete. The deficiency is compounded by the failure to obtain and retain driver histories from previous states of licensure for non-commercial drivers. With respect to drivers licensed elsewhere and coming into West Virginia, the process should follow the basics of CDLIS processing.

A commercial driver license is intended to exist only in the state that issues the license, and that state is specified as the "State of Record (SOR)" so that there is supposed to be one and only one valid CDL for an individual. When licensing a commercial driver who has been licensed in another state, West Virginia becomes *the* SOR and all states previously licensing that driver are *prior SORs*. The commercial driver license record retains the history of convictions from any prior SORs in accordance with the nature of the convictions, some of which are for the driver's lifetime. Thus there is one and only one CDL driver history record.

There may be a misunderstanding about what results from a check of the NDR PDPS. The *West Virginia Driver's Licensing Handbook* states in part the following:

> All driver's license applicants are subject to a review of their driving records through the Problem Driver Point System (PDPS), a national driver registry designed to track violations and suspensions from state to state. All drivers who renew their driver's license will be reviewed through PDPS as well.

Actually, the PDPS returns a "hit" on drivers currently under suspension or revocation. The NDR can but seldom does receive convictions (not violations) for "serious offenses." In any case, there is no information in the PDPS other than a pointer to the state of record. An inquiry to the reporting state(s) is the only way to obtain the record.

CDLIS requires the transfer and relay of such information—a best practice that should be applied to all driver license types. Making that change was recommended in the previous traffic records assessment; it has not been done. Doing so is important for identifying problem drivers, especially those with a history of DUI convictions.

Unless a driver were currently under suspension or revocation, it is very unlikely that a PDPS inquiry would return a pointer to that driver's state.

Here is the commentary referenced on the previous page discussing the CDL delay:

- The DMV cannot be faulted for omissions from the courts.
- Looking further into some of the problems encountered by the courts, they are hampered by the inability to identify violations by CDL holders so they can provide a timely conviction report to the DMV.
- Their inability results from the failure of the arresting officer to identify the driver as a CDL holder.
- The officer cannot readily identify a CDL license because the license is neither distinctive nor unmistakably clear otherwise that it is a CDL.

Being a CDL is not explicit on the license face. The example license shows four numbered elements that might possibly signify a CDL: *Item 5.* (a lengthy string); *Item 9. Cl:* (3); *Item 9a. En:* (NONE); and *Item 12. Re:* (A). An officer should not be required to interpret the meanings of those items if any are the CDL indicator. The most likely would seem to be *Item 9. Cl:* possibly meaning "class of license". But the list of classifications or endorsements has single alpha characters only.

This problem arising after the installation of a new driver license could have been avoided if all directly affected traffic safety partners had reviewed the specifications before finalizing the design (preferably under the guidance of the TRCC).

The problem is of sufficient importance to correct it now.

Applicable Guidelines
The AAMVA Code Dictionary (ACD) and the Motor Vehicle Record Access and Decoder Digest are used for translations and manual lookups. The records are compatible with the requirements of the AAMVA applications.

Data Dictionary
There is no data dictionary document for the driver file that defines each data field and specifies the values for each field. Driver Handbooks and practice test sites are used for training and reference. Security and Investigations personnel conduct the training, and examiners are trained for fraudulent document recognition.

Process Flow
Process flow diagrams, including error identification and corrections, were reported as follows for the following functions:

a. License application to license issuance. *No*
b. Receipt of conviction information to posting on the correct record. *Yes*
c. License suspension based on a DUI arrest. *Yes*
d. Request for non-routine statistics from the driver file. *No*
e. Production of periodic management reports and summaries. *Annual Report*

Interface (Integration) with Other Traffic Records System Components
The driver file does not interface with any of the other traffic records system components.

Quality Control Program
It was reported that there is a formal program of error/edit checking as data are entered into the driver file, but no quality reports are prepared for management review or analysis.

The following was the only quality detailed information provided by the DMV.

Quality Control Measurements for Driver Data

Timeliness	– Average time from accepted application to create driver record = Immediate – Average time to mail license to driver from time of application = In Person Unless Federal ID – 2 weeks – Average time to post convictions after receipt at DMV = Average 5 days – Average time from court disposition to receipt at the DMV = Average 16 days
Accuracy	– % of duplicate records for individuals requiring correction = 2% DL records Less than 1% of conviction duplication require correction – Frequency of audits to assure data validity = N/A – % of errors found during audits of critical data elements = N/A
Completeness	– % of records checked for drivers moving into the state = 100% – % of driver records requested from prior state = 0%. Do online prints. – % of driver records received from prior state = None on regular driver 100% on CDL
Consistency	– % of SSN verified online = 100% – % of immigration documents verified online = 100% – % non-CDL violations reported from other states added to driver history = Not tracked

Recommendations:

❑ Record the adverse driver histories from previous states of record on non-commercial drivers as required for commercial driver records. (Repeated from 2006)

- ❑ Include crash involvements in the driver record. (Repeated from 2006)

- ❑ Change the driver license to enable law enforcement to readily identify CDLs and so note the license type on crash and citation reports. Coordinate the change with law enforcement and court representatives.

2-D: Vehicle Data Component

Advisory Excerpt:

- *Description and Contents*
  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 vehicle history (including odometer readings) in order to produce the information needed to support analysis of vehicle-related factors that may contribute to a State's crash experience. Such analyses would be necessarily restricted to crashes involving in-State registered vehicles only.

  Custodial responsibility for the vehicle data usually resides in a State Department or Division of Motor Vehicles. Some commercial vehicle -related functions may be handled separately from the primary custodial responsibility for all other vehicle data. The structure of vehicle databases is typically oriented to individual "customers."

- *Applicable Guidelines*
  Title and registration information, including stolen and salvage indicators, should be available and shared with other States. The National Motor Vehicle Title Information System (NMVTIS) facilitates such exchanges. In addition, some States empower auto dealers to transact vehicle registrations and title applications following the Business Partner Electronic Vehicle Registration (BPEVR) guidelines from AAMVA. The International Registration Plan (IRP), a reciprocity agreement among U.S States and Canadian provinces, administers the registration processes for interstate commercial vehicles.

- *Data Dictionary*
  Vehicle information should be available for all vehicles registered in the State. The contents of the Vehicle Data Component's files should be well documented, including data definitions for each field, and where applicable, edit checks and data collection guidelines that match the data definitions. Procedures for collection, reporting and posting of registration, title, and title brand information should be documented.

- *Process Flow*
  The steps from initial event (registration, title, etc.) to final entry onto the statewide vehicle data files should be documented in process flow diagrams for each file that is part of this component. The diagram should be annotated to show the time required to complete each step and to show alternate flows and timelines depending on whether the data are submitted in hardcopy or electronically to the statewide system. The process flow diagram should include processes for error correction and error handling (i.e., returning reports to the original source for correction, resubmission, etc.). The process flow should also document the timing, conditions, and procedures for purging records from the vehicle files. Process flow diagrams should show all major steps whether accomplished by staff or automated systems and should clearly distinguish between the two.

- *Interface with Other Traffic Records System Components*
  The Vehicle Data Component has interfaces (using common linking variables shown in Table 8) to other TRS components such that the following functions should be supported:

  - *Vehicle data should be used to verify/validate the vehicle information during data entry in the crash data system, and to flag records for possible updating in the vehicle files when a discrepancy is identified. Key variables such as VIN, license plate number, names, and addresses should be available to support matching of records among the files.*

  - *Vehicle owner addresses are useful in geographic analyses in conjunction with crash and roadway data. Linkage in these cases should be based on conversions of addresses to location codes and/or geographic coordinates in order to match the location coding method used in the Roadway Data Component and in the GIS.*

  - *As with crash data, linkage to injury surveillance data should be possible either directly or through probabilistic linkage in order to support analysis of crash outcomes and crash risk associated with specific driver characteristics (e.g., the driver's history of violations or crash involvement). Key variables should include names and dates, date of birth, times, and locations of crashes.*

Table 8: Common Linking Variables between Vehicle And Other Data Components of a Traffic Records System

Vehicle Linkages to Other Law Enforcement & Court Files	- *Location (street address, description, coordinates, etc.)* - *Personal ID (name, address, DL number, etc.)*
Vehicle Linkages to Roadway Information	- *Owner Addresses (location code, coordinates)*
Vehicle Linkages to Crash Information	- *Vehicle Identification Number* - *Personal Identifiers (name, address, date of birth, etc.)*
Vehicle Linkages to Statewide Injury Surveillance System Information	- *Personal Identifiers (where allowed by law)* - *Crash Date, Time, Location*

- *Quality Control Program*

  The vehicle data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the vehicle data should be assured based on a formal program of error/edit checking as the data are entered into the statewide system and procedures should be in place for addressing the detected errors. In addition, the custodial agency (or agencies) and the TRCC should work together frequently to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The vehicle data managers should receive periodic data quality reports. There should be procedures in place for sharing the information with data collectors through individual and agency-level feedback, as well as training and changes to the applicable instruction manuals, edit checks, and the driver and vehicle data dictionaries. Audits and validation checks should be conducted to assure the accuracy of specific critical data elements as part of the formal Quality Control Program. Example measurements are presented in Table 9.

Table 9: Examples of Quality Control Measurements for Vehicle Data

Timeliness	- *Average time for DMV to post title transactions* - *% title transactions posted within a day of receipt*
Accuracy	- *% of duplicate records for individuals* - *% errors found during data audits of critical data elements* - *% VINs successfully validated with VIN checking software*
Completeness	- *% of records with complete owner name and address*

The measures in Table 9 are examples of high-level management indicators of quality. The managers of individual vehicle files should have access to a greater number of measures. The custodial agency should be prepared to present a standard set of summary measures to the TRCC monthly or quarterly.

2-D: Vehicle Data Component Status

Description and Contents
The Division of Motor Vehicles (DMV) in the West Virginia Department of Transportation administers the title and registration files through its 23 regional offices and two exam centers. The vehicle files include commercial and non-commercial vehicles.

Authorized automobile dealers can also process registrations and title applications for the vehicles they sell. Software used by dealers may be from commercial services or through the Vehicle Registration System, an Internet-based application developed by the DMV Information Services. Owners can process registration renewals via the Internet.

Basic Characteristics
Vehicle transactions are processed online and are timely although the quality information requested was not submitted. The system has been operated well for many years but is not yet capable of the real-time functions of the National Motor Vehicle Title Information System (NMVTIS). West Virginia submits title information to NMVTIS in batch mode.

A system upgrade was anticipated at the time of the 2007 traffic records assessment, but no specific plans had been developed for those hopes. At present, upgrades to the vehicle system are dependent upon an enterprise development for the DMV or possibly for the Department of Transportation.

The VINA program is run nightly at DMV headquarters to validate the VINs, and the vehicle characteristics may be either extracted from the VIN for the file or entered manually. Vehicle characteristics extracted from the VIN are weight, horsepower, platform (frame type), model, body type, engine and model year.

Vehicle characteristics and descriptive data meet the requirements of the *Advisory*. The registration document includes a PDF417 bar code.

Odometer readings are recorded when issuing titles, upon ownership transfers, and in the case of dealer reassignment. Auto liability insurance is mandatory.

Law enforcement enters and withdraws a variety of stop codes including “levy stops, return plate, stolen plate, insurance, bad check, stolen vehicle, refund.”

Applicable Guidelines
The vehicle file content is consistent with NCIC codes, VINA terminology, and NMVTIS.

Data Dictionary
There is no data dictionary for the vehicle file, but a file structure contains the information that would be included in a data dictionary: listing of each data field with values for each field. A separate data dictionary could and likely would be produced when a system upgrade is undertaken. Edit checks would probably be documented in the resulting data dictionary.

Registration and title personnel are employees of the DMV, and managers train the personnel.

Process Flow
No process flow information was provided.

As in the previous traffic records assessment report, summary reports are produced periodically, and ad hoc statistical queries can be processed upon request. Outside entities send a written request with justification and applicable WV code statute to DMV Information Services for review, and the release of information is made following the restrictions of the Driver Privacy Protection Act (DPPA).

Interface with Other Traffic Records System Components
The vehicle file does not interface with any other file.

Quality Control Program
The VIN validation program was the only reference provided for quality control, and no other information pertaining to quality control was answered.

Recommendations:

- ❑ None at this time.

2-E: Citation/Adjudication Data Component

Advisory Excerpt:

- ❑ *Description and Contents*
  Information, which identifies arrest and adjudication activity of the State, should be available, including information that tracks a citation from the time of its distribution to a law enforcement officer, through its issuance to an offender, its disposition, and the posting of conviction in the driver history database. Case management systems, law enforcement records systems, and DMV driver history systems should share information to support:

  - *citation tracking*
  - *case tracking*
  - *disposition reporting*
  - *specialized tracking systems for specific types of violators (e.g., DUI tracking systems)*

  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 and should be available at the local level.

  The information should be used in determining the level of enforcement activity in the State, for accounting and controlling of citation forms, and for detailed monitoring of court activity regarding the disposition of traffic cases.

  Custodial responsibility for the multiple systems that make up the Citation/ Adjudication Data Component should be shared among local and State agencies, with law enforcement, courts, and the Department of Motor Vehicles (DMV) sharing responsibility for some files (e.g., portions of the citation tracking system). State-level agencies should have responsibility for managing the law enforcement information network (e.g., a criminal justice information agency), for coordinating and promoting court case management technology (e.g., an administrative arm of the State Supreme Court), and for assuring that convictions are forwarded to the DMV and actually posted to the drivers' histories (e.g., the court records custodian and the DMV).

- ❑ *Applicable Guidelines*
  Data definitions should meet the standards for national law enforcement and court systems. Applicable guidelines are defined for law enforcement data in:

  - *National Crime Information Center (NCIC)*
  - *Uniform Crime Reporting (UCR)*
  - *National Incident-Based Reporting System (NIBRS)*
  - *National Law Enforcement Telecommunication System (NLETS)*
  - *Law Enforcement Information Network (LEIN)*
  - *Traffic Court Case Management Systems Functional Requirement Standards*

  Applicable guidelines should be defined for court records in the National Center for State Courts (NCSC), and jointly for courts and law enforcement in the GJXDM (with specific Traffic Processing Standards created through a national committee). Tracking systems for citations (i.e., a citation tracking system) and for specific classes of violators (e.g., a DUI tracking system) should meet the specifications for such systems published by NHTSA.

- ❑ *Data Dictionary*
  The citation/adjudication data files should be well documented, including data definitions for each field and where applicable, edit checks and data collection guidelines that match the data definitions. Procedures for collection, reporting and posting of license, registration, conviction, and title brand information should be documented.

  Law enforcement personnel should receive adequate training at the academy and during periodic refreshers to ensure they know the purpose and uses for the data. Training also should ensure that officers know how to access information on violators and process citations and arrests properly. The training manual should be available to all law enforcement personnel and the instructions should match, as appropriate, the edit checks that are performed on the data prior to its being added to the local records management system and statewide databases. The edit checks should be documented and both common and serious errors in the data should be flagged, including missing or out-

of-range values and logical inconsistencies. The data element definitions and system edits should be shared with all collectors, managers, and users in the form of a data dictionary that is consistent with the training manual and the crash report form. Court case management systems and tracking systems (citation tracking and DUI tracking) should be well documented to include definitions of all data elements and corresponding edit checks to ensure accuracy.

- *Process Flow*
  The processing of traffic violations, citations, arrests, and court cases should be documented in a series of flow diagrams showing the typical procedures and their average time to completion for each step. The administrative handling of payment in lieu of court appearance should be shown separately from those violations that are not handled administratively. The processes for detecting drugs or collecting blood alcohol concentration (BAC) values through various methods (breath test, blood or urine tests) should also be documented. The processes for tracking DUI cases in a DUI tracking system should also be included in the set of process flow diagrams. Processes for paper and electronic filing and reporting should be shown separately. Process flow diagrams should show all major steps whether accomplished by staff or automated systems and clearly distinguish between the two.

- *Interface with other traffic records system components*
  NCIC, GJXDM, NIBRS, LEIN, and NLETS guidelines all define methods and data standards for information transfer and sharing at the State and national level. Typically, there are State-level equivalents of the various networks and standards governing the sharing of law enforcement and court-related data. For the purposes of safety analysis at a State and local level, linkage between the Citation/Adjudication Data Component and other components of the TRS is important because it is useful for analyzing the geographic distribution of traffic violations and incidents, as well as monitoring the effectiveness of countermeasures that involve enforcement or court processes. It also enables the creation and updating of adverse driver histories for the purpose of driver control. Key linkages within the TRS for citation/adjudication information are listed in Table 10.

Table 10: Common Linking Variables between Citation/Adjudication and Other Data Components of a Traffic Records System

Citation/Adjudication Linkages to Other Law Enforcement Files and Tracking Systems	- *Computer Aided Dispatch (CAD) Record Number* - *Citation/Arrest/Incident Number, Court Case Number* - *Location (street address, description, coordinates, etc.)* - *Personal ID (name, address, DL number, etc.)*
Citation/Adjudication Linkages to Driver/Vehicle Files	- *Driver and Owner Names, Driver License Number* - *Driver & Owner Addresses (location code, coordinates)* - *Vehicle Plate Number, VIN*
Citation/Adjudication Linkages to Statewide Injury Surveillance System Information	- *Personal Identifiers (where allowed by law)* - *Crash-Related Citation/Arrest Date, Time, Location*

- *Quality Control Program*
  The citation/adjudication data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the citation/adjudication data should be assured based on a formal program of error/edit checking as the data are entered into the statewide system, and procedures should be in place for addressing the detected errors. In addition, the custodial agency (agencies) and the TRCC should frequently work together to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The data managers receive regular, periodic data quality reports. There should be procedures in place for sharing the information with data collectors through individual and agency-level feedback as well as training and changes to the applicable instruction manuals, edit checks, and the driver and vehicle data dictionaries. Audits and validation checks should be conducted to assure the accuracy of specific critical data elements as part of the formal Quality Control Program. Example measurements are presented in Table 11.

Table 11: Examples of Quality Control Measurements for Citation/Adjudication Data

Timeliness	- *Average time for citations to be sent from LEAs to courts* - *Average time for convictions to be sent to DMV*
Accuracy	- *% errors found during data audits of critical data elements* - *% violations narratives that match the proper State statute*
Completeness	- *% of cases with both original charges and dispositions in citation tracking system*
Consistency	- *% traffic citations statewide written on a single uniform citation*

The measures in Table 11 are examples of high-level management indicators of quality. The managers of individual citation/adjudication files should have access to a greater number of measures. The custodial agency should be prepared to present a standard set of summary measures to the TRCC monthly or quarterly.

2-E: Citation/Adjudication Data Component Status

The West Virginia Administrative Office of the Supreme Court of Appeals (AOSCA) has the administrative judicial oversight function for the State.

The Supreme Court of Appeals (SCA) is West Virginia's highest court and the court of last resort. The five Supreme Court justices hear appeals of decisions over all matters decided in the circuit courts, including criminal convictions affirmed on appeal from Magistrate Court and appeals from administrative agencies. The justices also have extraordinary writ powers and original jurisdiction in proceedings of habeas corpus, mandamus, prohibition, and certiorari. They also interpret the laws and Constitutions of West Virginia and the United States. The Court's appellate jurisdiction is entirely discretionary. It may either grant or refuse review of any case.

The circuit courts are West Virginia's only general jurisdiction trial courts of record. Circuit courts have jurisdiction over all civil cases at law over $300; all civil cases in equity; proceedings in habeas corpus, mandamus, quo warrant, prohibition, and certiorari; and all felonies and misdemeanors. The circuit courts receive appeals from magistrate and municipal courts. The circuit courts receive recommended orders from judicial officers who hear mental hygiene and juvenile matters. The SCA receives appeals of circuit court decisions. West Virginia's 55 counties are divided into 31 circuits with 65 circuit judges. The circuits range in size from one with seven judges to 11 with one judge. Although as few as one or as many as four counties comprise a circuit, each county has a courthouse where the circuit judge presides. Circuit judges are elected in partisan elections to eight-year terms. They must have practiced law for at least five years. The governor appoints circuit judges to fill vacancies. An appointee who wishes to remain in office must run in the next election.

There are 158 magistrates statewide, with at least two in every county and 10 in the largest county. Magistrates' Courts issue arrest and search warrants, hear misdemeanor cases, conduct preliminary examinations in felony cases, and hear civil cases with $5,000 or less in dispute. Magistrates also issue emergency protective orders in cases involving domestic violence. The circuit courts hear appeals of Magistrate Court cases. Magistrates run for four-year terms in partisan elections. They do not have to be lawyers. Circuit judges appoint magistrates to fill vacancies. An appointee who wishes to remain in office must run in the next election. Most traffic cases are heard in these courts.

The jurisdiction of Municipal Courts is constitutionally limited to those cases involving ordinance violations including municipal traffic code. Municipal courts are administered by local courts or county Magistrate Courts.

There is one approved traffic citations in West Virginia. State Statute requires all law enforcement agencies (LEA) that issue citations for violation of the State Motor Vehicle Code to use the approved uniform citation. The sole vendor of the approved citation is "Prison Industries". They manage distribution of all uniform citations. The Director of the Governor's Highway Safety Program (GHSP) has to approve all agencies' authority to issue citations and

maintains an inventory of all citations purchased by law enforcement. Each citation has a unique citation number. Agencies are required to maintain a record of voided citations. Periodic citation audits are performed by the State Auditor's Office at the local LEAs.

There is no central record keeping function that tracks all citations from printing, through adjudication, to posting on the driver file. There is some partial tracking between the courts and the Division of Motor Vehicles (DMV). LEAs reported that they maintain citation tracking and record management systems (RMS) internally. However, at this time most local agencies do not track the effectiveness or results of traffic enforcement and cannot determine the effectiveness of countermeasure patrols.

Most agencies in the State are ready to participate in e-citation. Most have adequate software and hardware to do so thanks to the GHSP.

The GHSP has a database that accounts for all funding granted for enforcement efforts. They require handwritten reports from law enforcement as soon as an officer completes their grant-funded task. This report is entered into the GHSP web-based system by one of eight Regional Coordinators. GHSP uses this enforcement information (Citations/Arrest) as a performance measurement. When the statewide electronic citation becomes a reality, it should enhance these reporting capabilities. Under the current system they account for 57,807 hours of enforcement activities, 2,679 DUI Arrests, 34,465 Citations, and 3,038 Driving Under Suspended/Revoked Operators License for 1,487 Officers and 197 reporting agencies.

The West Virginia State Police (WVSP) is currently beta testing an e-citation in two counties, Jackson and Monongalia. This test involves the State Police electronically collecting citation data and sending all citations to the appropriate court electronically. This process was working well on the collection end but problems arose when the courts could not process citations fast enough to prevent a backup at the courts. The WVSP have another problem that concerns officers not downloading citations daily. The WVSP and Division of Highways (DOH) have held discussions concerning the DOH assuming responsibility of completion of the e-citation project. Without daily downloads, the violator could show up at the court to pay fines prior to the court having a record of the citation. These problems have led to the suspension of electronic transfer of the citations. The officers involved in the beta test are now making hard copies of all citations and sending them to the courts. However, the courts have requested that the WVSP continue electronic transfer of citations. Electronic transfer will allow the test courts to retrieve all citations daily and auto-populate a data screen at the court. DMV will then be able to pull citations from the court site. This will keep citations as timely as possible especially commercial driver citations that, pursuant to the Motor Carrier Safety Improvement Act, must be posted to the driver history within ten days of conviction. The court's information technology section is working on the problems and hopes to have a solution soon in order that the entire State can go to the e-citation by the end of the year.

Many LEAs in the State, including the WVSP, use ReportBeam software to collect e-citation data and this is the approved method for all agencies that use e-citation. Local LEAs reported that many of them are ready for electronic transfer of citations to the courts. They reported that

their municipal courts will have few problems in accepting e-citations and moving them to the court's case management system (CMS) in a timely manner. Local LEAs will also have no problem downloading e-citations to their RMSs.

The State has no single CMS for the courts. Circuit and Magistrate Courts have similar but not identical systems. Municipal Courts have their own case management systems. All State court driving under the influence (DUI) convictions are reported by the State courts to the DMV. Each report includes the original charge and the conviction charge. Cases that are dismissed or found "not guilty" for any reason are not sent to the DMV. This practice will not impact any possible citation tracking system as the courts maintain a record of these citations. Most courts have internal summary reports, but for the most part, these reports are not shared with other agencies. Adjudication reports are sent to the DMV in both electronic and hard copy. The current e-citation project will result in the entire State reporting all adjudications to the DMV electronically.

The AOSCA is currently developing a unified judicial application case management data system that will eventually unite the Family, Circuit and Magistrate Courts into one shared data system. It was reported that 23 of the State's 55 counties are currently sending electronic case files to the Division of Motor Vehicles. The DMV and AOSCA are pushing for the expansion of this program. The system will have the ability to electronically communicate with other authorized State agencies and the counties. This will improve the courts' ability to determine prior convictions and outstanding charges statewide rather than just at the county level. It could also serve as a DUI Tracking System thereby reducing case deferrals and improper penalties such as the $1,500 fine that was reportedly levied in one municipal court, accompanied by a commitment that the adjudication would not be forwarded to the DMV. The system will also have the ability to generate a wide range of statistical data. The current test is at the Magistrate Court level and the State plans to complete a statewide roll–out within a year.

Currently the courts do not report final adjudication results to the issuing officer. This information may be available for review as a result of the new e-citation.

Officers are reportedly failing to complete the driving under the influence (DUI) form 314 and sending it to the DMV. Failure to process the report results in no administrative action being taken on DUI cases, which may allow a problem driver to continue to drive without sanction for months while the DUI case is working its way through the criminal court system. The administrative sanction's purpose is to take swift action in suspending or revoking a driver's license or driving privilege in order to remove dangerous drivers from the road more quickly. The new e-citation will provide automatic population and transfer of form 314 to the DMV and should solve this problem.

Training on completion of the State citation is provided by the West Virginia State Police (WVSP) and was reported to be complete and consistent. The State has also developed a *Citation Training Manual* as a quick reference in the field.

Applicable Guidelines
The State reported meeting the following guidelines: NCIC, GJXDM, NIBRS, LEIM and NLETS, but not the Traffic Court Case Management Systems Functional Requirement Standards.

Data Dictionary
The *West Virginia Uniform Citation Database File Layout and Codes 2008 Revision* serves as the State's data dictionary for citations.

Interface with Other Traffic Record System Programs
Currently, it is difficult to link paper citations with other files. The e-citation will link to other files using the variables listed below. Linkage is not being tested at this time.

Common Linking Variables between Citation/Adjudication and Other Data Components of a Traffic Records System

- Computer Aided Dispatch (CAD) Record Number
- Citation/Arrest/Incident Number, Court Case Number
- Location (street address, description, coordinates, etc.)
- Personal ID (name, address, DL number, etc.)

Citation/Adjudication Linkages to Driver/Vehicle Files

- Driver and Owner Names, Driver License Number
- Driver & Owner Addresses (location code, coordinates)
- Vehicle Plate Number, VIN

Citation/Adjudication Linkages to Statewide Injury Surveillance System Data

- Personal Identifiers (where allowed by law)
- Crash-Related Citation/Arrest Date, Time, Location

Metropolitan Planning Organizations reported that they have been unable to get usable citation data since 2006.

Quality Control Program

Quality Control Measurements for Citation/Adjudication Data

Timeliness	– Average time citations sent from LEA to courts = varies greatly but on average from several days to a month._____ – Average time convictions sent to DMV from courts = 5 to 10 days._____
Accuracy	– % "errors" found during data audits of critical data elements = _____ – % violations narratives that match the proper state statute = _____
Completeness	– % of cases with both original charges and dispositions in citation tracking system = 100 % for Magistrate Courts_____
Consistency	– % traffic citations statewide written on a uniform citation = 80% for Magistrate Courts._____

It was reported in the assessment interviews that more than 99 percent of the State's citations are written on the State approved uniform citation. Also, 100 percent of citations are not reported to the DMV, due to the fact that only convictions are reported.

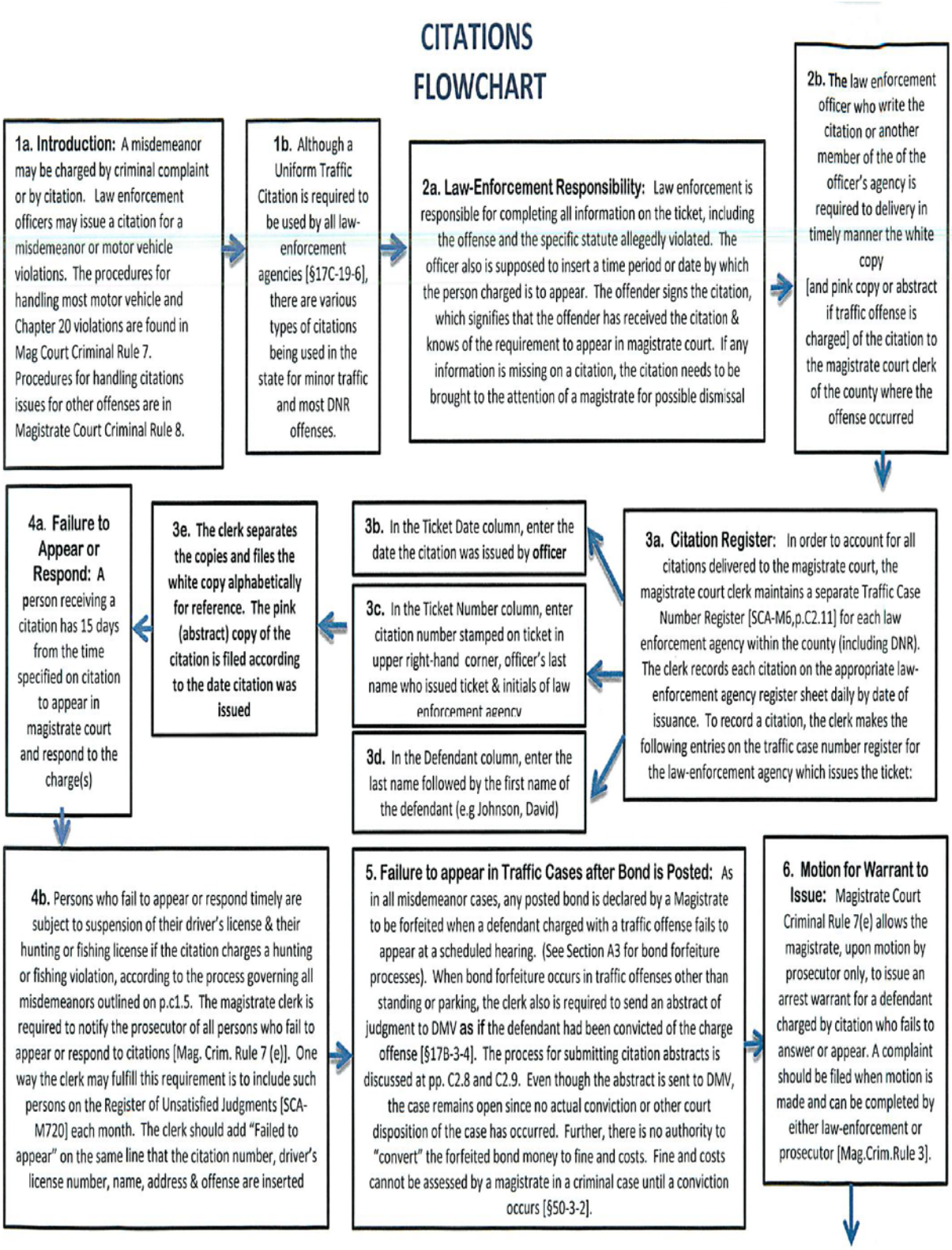
Many handwritten citations in the State have errors. Some errors are corrected through a supervisor review while others are not. Citations with errors can be dismissed by the courts. The e-citation will resolve this problem.

The new e-citations include edit checks.

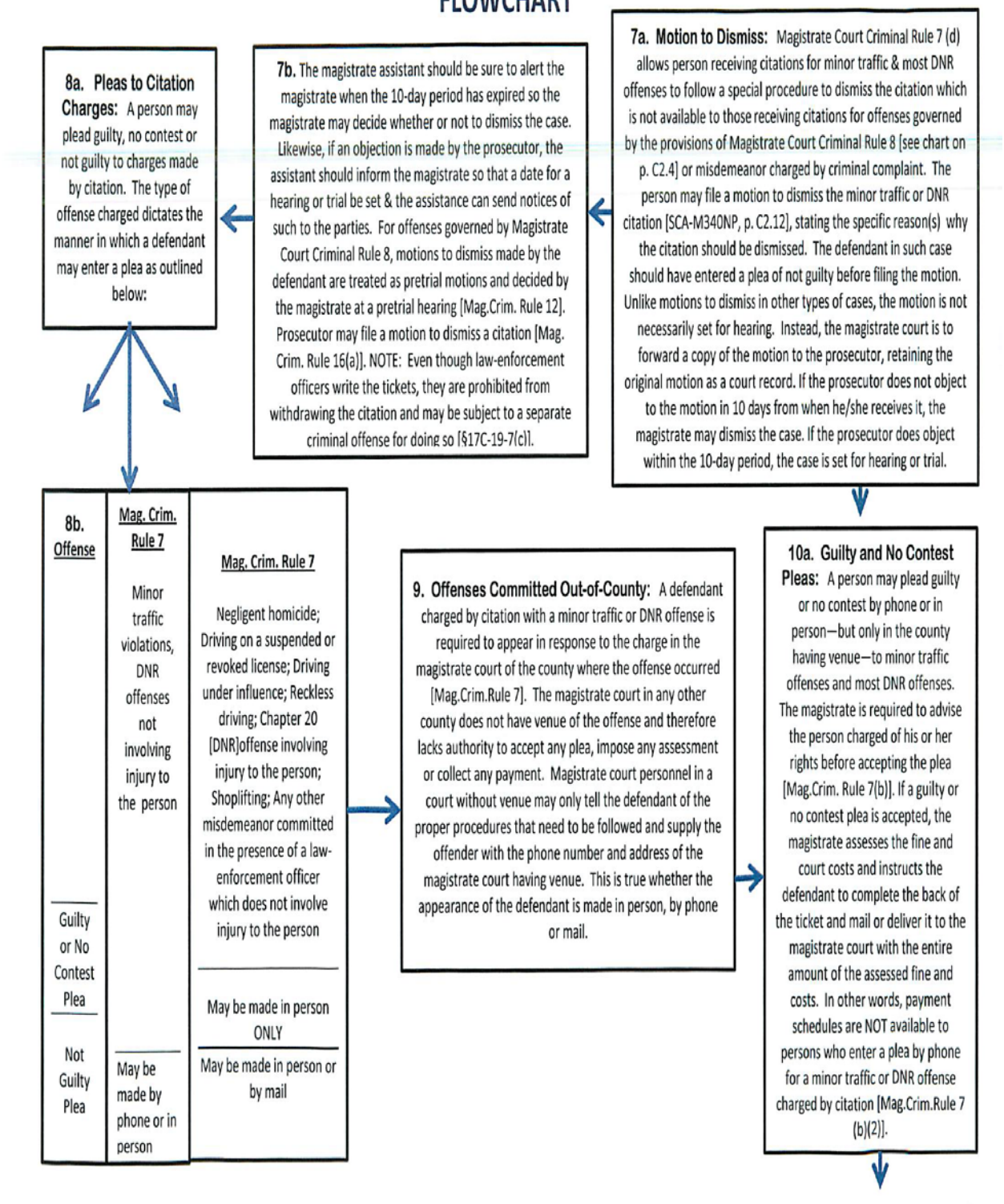
Process Flow

Following is a process flow chart provided by the State. This flow chart is very complete but it was reported that there is an update concerning electronic transfer that needs to be made.

CITATIONS FLOWCHART



CITATIONS FLOWCHART



CITATIONS
FLOWCHART

12a. Assessments: Assessment of costs, fines, fees, forfeitures, restitution and penalties for offenses charged by citation are treated the same way as a misdemeanor case charged by criminal complaint; that is, the magistrate is responsible for making the assessment upon conviction. A conviction occurs either when a person enters a guilty or no contest plea or is found guilty by bench or jury trial. For such pleas accepted by phone as authorized by Magistrate Criminal Rule 7, conviction occurs at the time of the phone call. In additional to an appropriate fine, the usual assessments a magistrate imposes upon conviction totaling $67 including:

12b.

Amount	Fund	Comment
$10.00	Magistrate Court Fund [MCF]	
$5.00	Court Security Fund [FCF]	
$40.00	Regional Jail Fund [RJA]	
$10.00	Crime Victims' Compensation Fund [CVC]	Not assessed for non-moving violations; additional CVC Assessment for DUI convictions based on the amount of the fine imposed [See Section C.4]
$2.00	Law-Enforcement Training Fund [LET]	

11. No Guilty Pleas: Regardless of the type of offense charged by citation, a person may enter a not guilty plea in person or by mail. When a not guilty pleas is entered, the magistrate may set bail and schedule the matter for hearing or trial. A criminal complaint must be filed by a law-enforcement officer or prosecutor prior to trial. If a magistrate finds a probable cause on the complaint, a misdemeanor file is opened and a case number is assigned by the magistrate clerk. The citation becomes a part of the misdemeanor file; the only document on which further action is taken in the case is the criminal complaint and not the citation. If a citation is contested, the assistant should make a notation on the daily activity sheet, cross-reference the case number with the citation number (for example, 99M-165 was citation number 76319). The magistrate Clerk should made a similar reference on the traffic case number register

10b. NOTE: If a person pleads guilty to the offense by phone but the waiver of rights & signature of the offender is not submitted with the payment of the assessment, the payment may not be accepted. The clerk must return the payment with an explanation that either a summons copy of the ticket or a signed and dated waiver statement has to accompany the payment. A person charged by citation with any of the following offenses may enter a plea of guilty only by appearing in person before a magistrate: Negligent homicide; Driving on a suspended or revoked license; Driving under the influence; Reckless driving; Chapter 20 [DNR] offenses involving injury to the person; Shoplifting; Any other misdemeanor committed in the presence of a law-enforcement officer.

12c. When payment is received on a citation, the magistrate assistant immediately completes an official receipt for the appropriate fine and costs. One copy of the official receipt is given or mailed to the defendant, and another copy is forwarded to the magistrate court clerk with the defendant's copy of the ticket. This process is the same whether the magistrate imposes the assessment over the phone or in person.

To record this transaction on the daily activity report, the assistant makes the following (assume that a $10.00 **fine has been imposed in addition to $67.00 court costs and that all court-imposed assessments are being paid by the defendant):**

1. In the Receipt Date column, enter the date appearing on the receipt.
2. In Case Number column, enter the citation number, which is located at the upper right-hand corner of the traffic citation.
3. In the Plaintiff/Complainant column, enter the last name of the law-enforcement officer who wrote the citation followed by the officer's agency initials (e.g., Cole/DPS).
4. In the Defendant column, enter the last name followed by the first name of the defendant (e.g. Johnson, David).

CITATIONS
FLOWCHART

13. Citation Abstracts: When a conviction occurs in cases involving the licensing or operation of any motor vehicle or because a defendant has failed to appear after posting bond in a case involving a traffic violation other than a parking or standing offense, the magistrate clerk is to mail the abstract [pink copy of the citation; see p. C2.13] to DMV within 72 hours. If an actual conviction occurs, the clerk submits the abstract **after** the 20-day appeal period has run [§§17B-3-4 (certified abstracts); 50-5-13 (automatic stay upon appeal)]. The motor vehicle offenses for which abstracts are not submitted to DMV are "standing" and parking violations [§17B-3-4], offenses of failing to use seat belts [§17C-15-49(e)] and offenses involving size, weight and load violations under §17C-17-1 *et seq.* [discussed in more detail below]. Submission of certified copies of court records for DUI convictions is addressed in Section C4.

The magistrate clerk makes the following entries on the abstract: the plea or finding; the fine amount; the amount of costs; the total sentence; the date of conviction **[not** the date the abstract is completed or forwarded]. The magistrate clerk then signs the abstract before submitting it to DMV.

If a motor vehicle violation is not charged by citation or if the pink copy of the citation is missing, an alternative abstract [SCA-M725NP; p. C2, 13] is to be completed by the clerk.

12c. continued

5. In the Case Action column, enter the type of case ("T" for Traffic or "DNR" for Chapter 20 violations).
6. In the Receipt Number column, enter the official receipt number (e.g., 99-101).
7. In the Receipt Total column, enter the total amount of money collected and receipted in this transaction ($77.00).
8. In the Court Costs column under the Magistrate Fund hearing, enter $10.00.
9. In the Fines column under the School Fund hearing, enter the amount of the fine ($10.00).

[If a replacement fee for illegal kill of game is collected, the amount of the fee would be entered in the Department of Natural Resources column.]

10. In the CVC column under the State Treasury heading, enter $10.00.
11. In the LET column under the State Treasury heading, enter $2.00.
12. In the CR-RJA column under the State Treasury heading, enter $40.00.
13. In the Other column under the Clearing Account heading, enter $5.00 "FCF".

At the end of the business day, the assistant deposits the money collected in the designated bank account and forwards to the clerk the summons (copy of the ticket), the clerk's copy of the receipt, and a copy of the bank deposit slip along with the daily activity report.

The clerk, upon receipt of the daily activity report, posts the transaction to the traffic case number register as follows:

1. In the Action column, enter the defendant's plea ("G" for Guilty; "NC" for No Contest; "DM" for Dismissed; or "NG" for Not Guilty).
2. In the Receipt Number column under the Costs Information heading, enter the official receipt number (e.g. 99-101).
3. In the Date Paid column under the Costs Information heading, enter the date appearing on the receipt.
4. In the Fine column under the Costs Information heading, enter the amount of the fine assessed by the magistrate ($10.00).
5. In the Court Costs column under the Costs Information heading, enter the amount of court costs ($10.00).
6. In the Arrest Fee column under the Costs Information heading, enter the arrest fee only if an actual arrest is made by the sheriff's department.
7. In the Other column under the Costs Information heading, enter all other costs and fees ($57.00).
8. In the Total column under the Costs Information heading, enter the total amount of the receipt ($77.00).

CITATIONS
FLOWCHART

14. Imposition of Penalties Other Than or in Addition to a Fine: If a person pleads guilty to an offense charged by citation and a magistrate imposes another type of penalty in addition to or instead of a fine (that is, jail or alternative sentence), a misdemeanor number is to be assigned to the case and a case file initiated; the citation is inserted in the file as the charging document and a case history is completed as with any misdemeanor case file. If the local practice is that the magister clerk opens all misdemeanor files, the magistrate assistant will need to inform the clerk any time that a penalty other than assessment of fine and costs occurs.

15. Offenses Involving Size, Weight and load Violations: Citations issued for these offenses [§17C-17-1 *et seq.*] deserve special mention because they involve violations by an **owner** rather than a driver. Although the driver has been pulled over and his or her name and license information appear on the citation, **only the owner** of the vehicle is subject to the jurisdiction of the court for these offenses.

In almost every case where a citation is issued for a §17C-17-1 *et seq.*, violation, the issuing officer is an authorized employee of the Division of Highways (DOH) rather than a state trooper or other law-enforcement officer. The citations used for these offenses also have a block checked indicating that the vehicle is a commercial vehicle.

Since the driver is not personally liable for the offense, the magistrate clerk needs to carefully review all citations issued by DOH officials to ensure that the license of the driver is not mistakenly suspended because of the owner's failure to appear or failure to pay the entire fine. In cases involving **overweight offenses only,** if the owner fails to appear or fails to pay the fine (or defaults after appearing and tendering partial payments), then the magistrate may impound the vehicle upon motion by the prosecutor [§17C-17-14].

The DOH has requested to be informed of any failure to appear or failure to pay court-imposed assessments in cases involving §17C-17-1 *et seq.* violations so that the DOH may contact the prosecutor. The easiest way for the magistrate clerk to notify DOH in these instances is to send the pink copy or abstract of the citation to the DOH at the following address:

Division of Highways
State Capitol Complex
Bldg. 5, Room 311
Charleston, WV 25305-0430

If the magistrate clerk has sufficient information on the owner to initiate suspension of his or her drivers' license, then the process of notifying DMV in order to suspend the owner's license should also be followed [see pp.C1.5,C3.4].

Recommendations:

- Develop a citation tracking system that tracks a citation from the time of its distribution to a law enforcement officer or creation on the e-citations system, through its issuance to an offender, its disposition, and the posting of the conviction in the driver history database. Citations that do not result in conviction will remain at the court of adjudication and data concerning them will be readily available for citation audits.

- Require officers to complete the driving under the influence (DUI) form 314 and send it to the Division of Motor Vehicles. Impress upon them reasons for the 314 action and that failure to do so may result in no record of the case going to the driver file.

- Work with Metropolitan Planning Organizations and other stakeholders to find what data are needed to identify problem locations. Provide these data to these stakeholders.

- Require restart of electronic transfer of citations from the State Police to the courts. The courts have a temporary fix that requires this reporting.

- Use Traffic Record Coordinating Committee meetings as a resource to report on ongoing projects, project problems and concerns. This could alleviate misunderstandings (such as the discontinuance of citation transfers) and speed project completion.

- Deploy a "Smart Map" feature in ReportBeam to automatically complete the location fields on the citation based on officers clicking a map. This utility should supply the street names, route and milepost numbers, latitude and longitude and be compatible with the base map implemented in the West Virginia Division of Highways Geographic Information System.

2-F: Statewide Injury Surveillance System (SWISS) Data Component

Advisory Excerpt:

- *Description and Contents*

  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 that drive the development of a SWISS. These systems typically incorporate pre-hospital (EMS), trauma, emergency department (ED), hospital in-patient/discharge, rehabilitation and morbidity databases to track injury causes, magnitude, costs, and outcomes. Often, these systems rely upon other components of the TRS to provide information on injury mechanisms or events (e.g., traffic crash reports). The custodial responsibility for various files within the SWISS typically is distributed among several agencies and/or offices within a State Department of Health.

  This system should allow the documentation of information that 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 SWISS should support integration of the injury data with police reported traffic crashes and make this information available for analysis to support research, public policy, and decision making.

  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 SWISS should be integrated into the injury control programs within traffic safety, and other safety-related programs at the State and local levels.

- *Applicable Guidelines*

  NHTSA has produced the National Emergency Medical Service Information System (NEMSIS) to serve as a guideline for a uniform pre-hospital dataset. It applies to all EMS runs, not just those related to traffic crashes. The American College of Surgeons (ACS) certifies trauma centers and provides guidelines for trauma registry databases and for a National Trauma Databank. Emergency Department and in-patient data guidelines (UB-92) are available from the US Department of Health and Human Services. The National Center for Health Statistics, within the Centers for Disease Control (CDC), sets ICD-9 codes and E-codes for injury morbidity/mortality. These codes are updated as needed and the ICD-10 codes are expected by the fall of 2007. The CDC also sets standards for reporting to their injury database and for use of the Public Health Information Network for data sharing.

- *Data Dictionary*

  The contents of the SWISS Data Component's files should be well documented to include data definitions for each field, and where applicable, edit checks and data collection guidelines that match the data definitions. Procedures should be documented in instruction manuals for collection, reporting, and posting of EMS run data on a uniform run report, uniform data in various hospital and trauma databases, and for tracking morbidity and mortality for each system.

  Training should include (where applicable) data collection, data entry, use of various injury coding systems (ICD and E-codes) as well as injury and trauma severity scoring systems such as the Injury Severity Score (ISS), Revised Trauma Score (RTS), and Abbreviated Injury Score (AIS) scales.

- *Process Flow*

  The information and processes involved in transport and treatment of victims of crash-related injuries should be documented in a series of flow diagrams showing the typical data collection and management processes and their average time to completion for each step in the data flow process. Processes for paper and electronic filing and reporting should be shown separately. Process flow diagrams should show all major steps whether accomplished by staff or automated systems and clearly distinguish between the two.

- *Interface with other Traffic Records System Components*

  Data transfer and sharing between local systems and the SWISS should be governed by data definitions, quality control requirements, and data transfer protocols defined by the custodial agencies. Transfer and sharing between SWISS files and the relevant national databases are governed by the data definitions, quality control requirements, and data transfer protocols for those systems (e.g., National Trauma Database).

  The CODES project is the primary example of data sharing and integration between SWISS and the other components of a TRS. It can take the form of direct linkage using personal identifiers or probabilistic linkage using other data elements such as incident time, date, date of birth, and locations, responding officer/agency, and others. Key linkages within the TRS for SWISS information are listed in Table 12.

Table 12: Common Linking Variables between SWISS And Other Data Components of a Traffic Records System

Linkages Internal to the SWISS data on injury and healthcare treatments/outcomes	- *Patient name* - *Patient ID number* - *EMS run report number* - *Social Security Number*
Linkages between SWISS data and Crash Data	- *Personal Identifiers: Name, address, date of birth (direct linkage)* - *CODES linking variables (probabilistic linkage)* - *EMS run report number* - *Crash Report Number*
Linkages between SWISS data and other (non-Crash) components of the traffic records system	- *Name & SSN linked to driver file (direct linkage)* - *Location/address* - *Event & treatment date and time*

- *Quality Control Program*

  The SWISS data should be timely, accurate, complete, and consistent and these attributes should be tracked based on a set of established quality control metrics. The overall quality of the information in the SWISS Data Component should be assured based on a formal program of error/edit checking as the data are entered into the statewide system and procedures should be in place for addressing the detected errors. In addition, the custodial agency (or agencies) and the TRCC should work together frequently to establish and review the sufficiency of the quality control program and to review the results of the quality control measurements. The data managers should receive periodic data quality reports. There should be procedures in place for sharing the information with data collectors through individual and agency-level feedback, as well as to provide modifications to applicable training and instruction manuals, edit checks, and the SWISS data dictionaries. Audits and validation checks to assure the accuracy of specific critical data elements should be conducted as part of the formal Quality Control Program. Example measurements are presented in Table 13.

Table 13: Examples of Quality Control Measurements for the Statewide Injury Surveillance System

Timeliness	- *Average time for EMS run reports to be sent to governing agency* - *% EMS run repots sent to governing agency in the prescribed time* - *Average time from treatment & discharge from ED to record availability in the ED discharge database* - *Average time from patient discharge to record availability in the hospital discharge database* - *Average time from date of incident to record appearing in the trauma registry* - *# days from death to appearance of record on mortality database*
Accuracy	- *% EMS run locations that match statewide location coding* - *% correct ICD-9 and E-codes* - *% "errors" found during data audits of critical data elements in EMS, ED, trauma registry, hospital discharge, & mortality databases*
Completeness	- *% of traffic crash-related EMS runs in the EMS database* - *% of ED visits for crash-related injuries recorded in ED discharge database.* - *% of trauma cases represented in the trauma registry* - *% of SCI/TBI cases represented in the SCI/TBI registries*
Consistency	- *% correct ICD-9 and E-codes (see also accuracy)* - *CODES match rate (where applicable)* - *% crash-related deaths with motor vehicle crash in cause of death field on death certificate*

The measures in Table 13 are examples of high-level management indicators of quality. The managers of individual medical data files should have access to a greater number of measures. The custodial agencies should be prepared to present standard sets of summary measures to the TRCC monthly or quarterly.

2-F: Statewide Injury Surveillance System (SWISS) Data Component Status

A successful statewide injury surveillance system uses several key components to monitor the incidence of, risk factors for, and costs of fatal and non-fatal injuries. 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. Data collected by these agencies provides a wealth of patient care, intervention, and prevention information that can be used to evaluate current treatment modalities and injury prevention activities. A comprehensive surveillance system provides crucial healthcare and injury prevention information to local, State, and regional health agencies, providers, and planners.

Integrating injury surveillance with other State traffic records system components benefits all entities. Motor vehicle crash data can supply much of the pre-event and event information for the Haddon Matrix to be used for injury prevention program planning initiated by the public health professionals. Alternatively, providing traffic safety programs and engineers with medical outcomes for motor vehicle crashes enables them to augment their understanding of crash severity beyond the typical five-point scale captured on most crash reports.

Description and Contents

West Virginia has access to four of the primary data sources in a comprehensive injury surveillance system. They are all managed within the Department of Health and Human Resources: emergency medical services data by the Office of Emergency Medical Services (OEMS), trauma registry by the Division of Trauma, hospital inpatient records by the West Virginia Health Care Authority (WVHCA), and mortality data by the Vital Registration Office (VRO). Unfortunately, information from emergency department records are not collected and maintained comprehensively on a statewide level.

Emergency Medical Services (EMS)

Description and Contents

The West Virginia Office of Emergency Medical Services (OEMS) is an agency within the Department of Health and Human Resources Bureau of Public Health. They are responsible for licensing and regulating EMS agencies in the State, as well as overseeing data submission. There are approximately 160-170 agencies that respond to emergency calls and three air medical agencies operating in West Virginia. It was estimated that 1,000-1,500 patient care reports are submitted daily, totaling close to 1,160,000 records currently in the State database.

Applicable Guidelines

Statute declares that all agencies must comply with reporting rules established by the commissioner; those rules mandated that a full implementation of electronic reporting was to be accomplished on October 31, 2009. There is no uniform patient care record (PCR), but there is a minimum set of variables that all agencies are required to submit to the State EMS database in order to comply with regulations. That dataset is compliant with NEMSIS version 2.2.1. Four EMS agencies and three hospitals have volunteered to participate in a beta testing team for the

upcoming NEMSIS4 data wrapper standard, further incorporating West Virginia emergency care providers on national committees.

Data Dictionary
A data dictionary was provided to the assessment team and is available on the OEMS website, http://www.wvoems.org/files/temis/epcr/wv-data-dictionary.

Process Flow
All patient care reports (PCR) are completed electronically in one of two ways, 1) entered directly into the Prehospital Medical Information System (PreMIS) or 2) entered into State-approved vendor software. Third-party vendors must undergo a series of certifications to become approved by the OEMS, including certification of the software and installation. The vendors must develop an XML transfer of the required data elements to the EMS Performance Improvement Center (EMSpic) to meet State requirements. All PCRs are transmitted directly to the EMSpic and then sent in batch to the OEMS nightly. It was reported that 30-40 percent of all PCRs are submitted within 24 hours of the unit returning to service and close to 80 percent are submitted within 72 hours, which is the time set by regulations.

PreMIS was developed by the EMSpic, a consortium based in the Emergency Medicine Department at the University of North Carolina at Chapel Hill. EMSpic coordinates PCR data collected in North Carolina, South Carolina, West Virginia and Mississippi.

Data analyses may be run at the State level and OEMS began generating summary reports in mid-2011 as a means to provide data back to provider agencies on a monthly basis. West Virginia believes that the data belong to the agencies, not the State, so PCR-specific requests are transferred back to the response agency and not handled by the OEMS.

Interface with other Traffic Records System Components
A representative from the OEMS is active on the TRCC. Although there is no interface between the EMS and trauma systems, there is an exchange of information (referred to as a 'dropsheet') that may be written or verbal and varies among EMS agencies and trauma hospitals. The Bureau of Public Health has established a minimum set of elements that must be exchanged. There are plans to implement a Continuum of Care server that would integrate and interface EMS and trauma registry data to facilitate patient transfers and enhance analyses.

Quality Control
Each PCR submitted to the EMSpic is assigned a Data Quality Score on a scale of 1 to 5. That score depicts compliance with the NEMSIS standard, not necessarily data quality as the NEMSIS data dictionary includes attributes such as 'not known' or 'not recorded'. It was reported that the average Data Quality Score is 2.3, which is satisfactory to OEMS. Currently, there are no penalties for non-compliance with reporting regulations aside from license revocation, which is not generally practiced. However, the OEMS is exploring options for monetary penalties for agencies not complying with rules and regulations.

Emergency Department Data and Hospital Discharge Data System

Description and Contents

The West Virginia Health Care Authority (WVHCA) in the DHHR does collect and manage inpatient discharge records from all 62 State-licensed hospitals. The WVHCA also manages records from the five rehabilitation hospitals in the State. Unfortunately, no information from emergency department records is captured and maintained on a comprehensive statewide level because the WVHCA does not have authority over emergency departments.

Emergency department records are valuable data and access should be pursued. As an example, of all people involved in a crash, more injured people are treated in an ED than the number admitted to a hospital which is still larger than the number that are killed. Therefore, merely analyzing those people who are admitted for treatment or killed in a crash does not account for a significant proportion of persons involved in a crash.

Applicable Guidelines

Since 1983 the WVHCA has been responsible for the Certificate of Need and rate review programs, under State Codes §16-2D and §16-29B-1, respectively. To accomplish those tasks, among several others under the WVHCA, all hospital inpatient records are collected and analyzed. All data are collected using the UB04 standard set forth by the National Uniform Billing Committee and the American Hospital Association.

Data Dictionary

A data dictionary was not available to the assessment team, but the data standard was noted to be UB04. That includes information related to patient demographics, nature of injury, mechanism of injury (E-codes), length of stay, date of admission and facility code. It was reported that E-codes are not 100 percent complete for admissions with a primary ICD-9 diagnosis code of 800-959.9 denoting an injury. E-codes, or external cause of injury codes, are part of the ICD-9 coding system and are relied upon by analysts to identify injury mechanisms. In a comprehensive traffic records system, data related to all hospital admissions resulting from a motor vehicle crash may be used to quantify the severity and cost of traffic crashes as well as the long-term outcomes associated with the various types of crashes. Selection of traffic-related admissions based on E-codes is an important step in subsetting injury cases as well as identifying cases for a linkage process. Accurate completion of E-codes is valuable for traffic safety research.

Process Flow

All records are entered into an electronic database at the hospital and transmitted to the WVHCA using a batch upload process. The WVHCA is transitioning to the Social and Scientific Systems, Inc. software for receipt of the batch files, which are configured in the ANSI 837 format and submitted monthly. All records must be submitted to WVHCA by June 30 of the following year for rate-setting purposes. The file is not available for research at that time, but shortly thereafter.

There are plans to move the system to an All-Payor Claims Database in the future.

Interface with other Traffic Records System Components
There is no representation from the WVHCA on the TRCC and the hospital inpatient database has not been integrated with any component of the traffic records system. Direct access to the database has been granted to the Chronic Disease Division and files have been provided to the Maternal and Child Health Division. The representative from WVHCA is interested in working with the traffic safety community and explained that access to inpatient records is possible with approval from the WVHCA board.

Quality Control
At the point of upload, compliance checks are performed to ensure that the file conforms to parameters set forth by the WVHCA, including record length, reported variables, etc. If the file does not pass those checks, it is immediately rejected and the hospital has the opportunity to fix the problem and re-upload. Once the batch file is received into the electronic database, edit and logic checks are performed to check the data completeness and accuracy. Finally, as the file is used by WVHCA staff for rate-setting and other analyses, errors may be identified and incorporated into the Quarterly Reconciliation Process. This process includes feedback, training and interaction between the WVHCA and hospital staff to encourage better data capture. There is the potential to assess a fine if a hospital does not comply with the monthly submission requirements or data correction procedures; however, this penalty has not been enforced.

Trauma Registry

Description and Contents
The West Virginia State Trauma and Emergency Medical System (STEMS) was mandated by State Code §64-27-1 to designate various health care facilities in the State of West Virginia. The Division of Trauma in the DHHR is responsible for collecting and maintaining the State Trauma Registry (STR). There are two Level I, five Level II, one Level III, and many Level IV trauma centers in West Virginia.

Applicable Guidelines
All trauma centers are certified by STEMS and Levels I to III centers are also verified by the American College of Surgeons (ACS). Each ACS-verified trauma center submits data to the National Trauma Data Bank (NTDB) and facilities of all levels are required to submit records to the STR to maintain certification.

Data Dictionary
A data dictionary was not made available to the assessment team, but the data are compliant with NTDB standards. It was reported that information related to patient demographics, nature of injury, mechanism of injury (E-codes) and length of stay are captured. The medical records also include injury codes, such as ICD-9 and AIS.

Process Flow
The STR data collection system was developed in 2003 and has evolved into a coordinated, efficient process. Each Level I to III trauma center collects medical information electronically, using any appropriate software package, and submits that information to the STR on a quarterly

basis. Level IV trauma centers submit records directly to the State using the web-based Digital Innovations "Collector" software. Any hospital desiring a State trauma center designation must capture and submit six months of data electronically as part of the application, ensuring that all trauma records are collected and submitted electronically.

There is a series of penalties outlined for cases where trauma centers have outdated registries. Initially the hospital is placed on probation and may ultimately be suspended for not submitting the required data elements in a timely fashion. By State statute, there is a $500,000 lawsuit cap for all hospitals designated as trauma centers; this is a powerful incentive for those facilities to comply with data collection and submission guidelines because hospitals under suspension are not covered with that lawsuit cap.

STR data are available for research purposes; all requests are reviewed by the Research Committee to ensure protection of personally identifiable information.

Interface with other Traffic Records System Components
A representative from the Division of Trauma is active on the TRCC. As previously mentioned, there is an exchange of information through a 'dropsheet'. There is currently a beta program where the trauma centers may receive a batch file from the OEMS to match records. Also, there are plans to implement a Continuum of Care server that would integrate and interface EMS and trauma registry data to facilitate patient transfers and enhance analyses.

Quality Control
Digital Innovations software includes logic and validation checks; the trauma center uses those capabilities to ensure complete and accurate data are submitted to NTDB and STR. There are additional quality checks performed at DHHR; the Division of Trauma is recruiting for a new position to assist with data quality and analysis.

Vital Records

Applicable Guidelines
The Vital Registrations Office (VRO) in the DHHR Health Statistics Center collects and maintains all mortality records for West Virginia. The VRO gathers information about each death that occurs in West Virginia and on all deaths to residents of the State that occur in other states or countries. There is a centralized medical examiner system with an Office of the Chief Medical Examiner (OCME) and trained death investigators, who are certified by the OCME, in each county.

Data Dictionary
West Virginia is not using the current version of the US Standard Certificate of Death from the National Center for Health Statistics (NCHS). The older death certificate currently being used does not include specific information about the mechanism of injury, which would offer important information for traffic safety-related studies.

Information including date and time-of-death and cause-of-death are required on all death certificates. Similar to other states, all cause-of-death information is classified in accordance with the ICD-10 standard. West Virginia employs five Registrars and two nosologists to review and file all death certificates and assign all cause-of-death codes. Multiple cause-of-death codes are applied by the National Center for Health Statistics (NCHS).

Process Flow
Death certificates are initiated by medical staff at hospitals, funeral directors, and death investigators representing the OCME. The certificates are all paper-based and submitted directly to the State Registrar. Upon certification and acceptance into the State file, the death certificate is sent back to the county office as they are the custodians of that record. There are plans to move to an Electronic Death Registration System (EDRS) in the near future; funding has been secured for this transition, and it should come to fruition within the next two to three years. There is demand for such a system among the users, and it would be able to integrate with the OCME database.

For the past 10–12 years, West Virginia has partnered with Virginia and Maryland in an electronic exchange of records to facilitate capture of death certificates for West Virginia residents who died in those states. West Virginia also participates in the State and Territorial Exchange of Vital Events (STEVE), developed by the National Association for Public Health Statistics and Information Systems (NAPHSIS), which currently has approximately 22 states participating and plans to include all 50 states by 2014.

All fluid samples collected by the OCME during a death investigation are sent to a central toxicology unit and findings are applied to the death certificate. The OCME reported investigating any positive toxicology findings to determine if the levels found were due to prescribed medication or some form of abuse. This is of particular interest because such investigative work and capture of findings is not general practice in all states.

Interface with other Traffic Records System Components
At this time, mortality data are not directly integrated in other datasets. On a monthly basis, paper listings of all traffic-related fatalities are shared with the Fatality Analysis Reporting System (FARS) analyst as a cross-check of all fatalities in the State. Also, mortality and autopsy data are used throughout the divisions of DHHR and shared with the State social agencies (child and adult protective services, health facilities) and the Social Security Administration for identity fraud prevention purposes.

Quality Control
Each death certificate is reviewed by one of five State Registrars for completeness and accuracy before entering the information into the State file. Any errors are returned to the submitting person for correction or completion. Once the data are entered into the electronic database, further quality checks are run and when the records are transmitted to NCHS for multiple cause of death coding they undergo further quality review. It was reported that very few errors are found by NCHS, indicating a sound quality control process on the state level. Common errors are incorporated into annual training that the VRO conducts for medical examiners; the State

Registrar is also developing a training module for all professionals who initiate a death certificate to increase data quality. The pilot training has been given at some hospital grand rounds seminars and received positive feedback.

Crash Outcome Data Evaluation System (CODES)

West Virginia does not have a CODES program. Without access to comprehensive hospital and crash report data files, it may not be possible to conduct problem identification and program evaluation analyses to target traffic safety problems, improve EMS response, evaluate the trauma system, or conduct injury surveillance. Integration of all components of the traffic records system would be necessary for a comprehensive Injury Surveillance System.

Integrated databases have the ability to supply traffic safety engineers and researchers with a more complete description of the level of injury sustained by persons involved in a motor vehicle crash. This information can be used for problem identification, program evaluation and to help inform decisions about targeted enforcement campaigns and roadway design issues. Similarly, injury surveillance data linked to motor vehicle information can provide public health researchers with access to valuable event information missing in many hospital-based databases. The further inclusion of licensing, registration, citation, and roadway information can provide an invaluable resource for identifying and preventing injuries and deaths associated with motor vehicle crashes.

Recommendations:

- ❑ Support the development and implementation of the Continuum of Care server that will integrate and interface emergency medical services and trauma registry data.

- ❑ Increase the completeness and accuracy of E-codes in all medical records. E-codes are essential to effective traffic safety analyses because they allow the researchers to identify all hospital admissions that result from a traffic crash. This is critical because the injury severity level noted on the crash report is not always clinically accurate and some patients are not transported to the hospital by emergency medical services.

- ❑ Continue to explore a data collection system for emergency department records. A significant proportion of motor vehicle crash victims are treated in emergency departments and do not require admission to a hospital or trauma center, so capture of those records would enhance data analyses.

- ❑ Incorporate representatives and data from the West Virginia Health Care Authority into the traffic records system. Those medical records are an untapped resource that would benefit all component systems greatly.

- ❑ Support the development and implementation of an Electronic Death Registration System. Capturing death records electronically and integrating those data with autopsy records from the Office of the Chief Medical Examiner will enhance the traffic records system and provide an additional, real-time resource for fatality analysis.

APPENDFIX A

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APPENDIX B

Abbreviations and Acronyms

AAAM	Association for the Advancement of Automotive Medicine
AAMVA	American Association of Motor Vehicle Administrators
AASHTO	American Association of State Highway and Transportation Officials
ACS	American College of Surgeons
AIS	Abbreviated Injury Score
ANSI	American National Standards Institute
ATSIP	Association of Transportation Safety Information Professionals
BAC	Blood Alcohol Concentration
BPEVR	Business Partner Electronic Vehicle Registration
CDC	Center for Disease Control
CDLIS	Commercial Driver License Information System
CODES	Crash Outcome Data Evaluation System
DMV	Department of Motor Vehicles
DOT	Department of Transportation
DUI	Driving Under the Influence
ED	Emergency Department
EMS	Emergency Medical Service
FARS	Fatality Analysis Reporting System
FHWA	Federal Highway Administration
GES	General Estimates System
GIS	Geographic Information System
GJXDM	Global Justice XML Data Model
GPS	Global Positioning System
HPMS	Highway Performance Monitoring System
ICD	Injury Coding System
IRP	International Registration Plan
ISS	Injury Surveillance Score
LEIN	Law Enforcement Information Network
MCMIS	Motor Carrier Management Information System

MMUCC	Model Minimum Uniform Crash Criteria
NCIC	National Crime Information Center
NCSC	National Center for State Courts
NDR	National Driver Registry
NEMSIS	National Emergency Medical Service Information System
NGA	National Governor's Association
NHTSA	National Highway Traffic Safety Administration
NIBRS	National Incident-Based Reporting System
NLETS	National Law Enforcement Telecommunication System
NMVTIS	National Motor Vehicle Title Information System
PDPS	Problem Driver Pointer System
RTS	Revised Trauma Score
SHSP	Strategic Highway Safety Plan
SWISS	Statewide Injury Surveillance System
TCD	Traffic Control Devices
TRCC	Traffic Records Coordinating Committee
TRS	Traffic Records System
UCR	Uniform Crime Reporting
VIN	Vehicle Identification Number
VMT	Vehicle Miles Traveled

TEAM CREDENTIALS

CYNTHIA BURCH, MPH

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University of Maryland Baltimore
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Professional Experience

Ms. Burch has been an epidemiologist at the University of Maryland's National Study Center for Trauma and EMS (NSC) since 2005. Prior to that she was a Research Analyst at the NSC and an epidemiologist at the Governor's Office of Highway Safety in Georgia. She has been working in the fields of injury epidemiology and traffic safety research for close to 10 years. During her career, she has gained considerable experience and understanding in the analysis and use of large datasets relating to motor vehicle crashes and injury. She has co-authored a number of journal articles on highway safety and has presented results from independent research projects at local and national health and injury conferences. She is currently working on the Crash Outcome Data Evaluation System (CODES) and the Crash Injury Research and Engineering Network (CIREN) projects funded by the National Highway Traffic Safety Administration (NHTSA). She also works closely with the Maryland Highway Safety Office and serves on their statewide taskforces.

Organizations

Association of Traffic Safety Information Professionals
Maryland Partnership for Injury Prevention
Maryland Traffic Records Coordinating Committee – Technical Committee

Education

Bachelor of Science, Biology, Emory University	1999
Master of Public Health, Epidemiology	2000

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Experience

- Consultant – Transportation Safety and Criminal Justice – 2009-Present
- Data Nexus Inc., Director of Public Safety Services 2003 – November 2009
- National Highway Traffic Safety Administration Region VIII, Law Enforcement Liaison 2002 -2003
- Colorado State Patrol Major 1990 – June 2002
- Colorado State Patrol Lieutenant and Captain 1984 – 1990
- Colorado State Patrol Sergeant 1981- 1984
- Instructor Coordinator, Colorado Law Enforcement Training Academy 1979-1981
- Colorado State Patrol Trooper 1973-1979

Education and Credentials

- Bachelor of Science – Adult Technical Education specializing in Criminal Justice – Colorado State University 1990
- Certificate - School of Police Staff and Command - Northwestern University 1985
- Certificate - Management in State Government - State of Colorado 1987
- Coordinator/Instructor for the Colorado Law Enforcement Training Academy and Colorado State Patrol Academy
- Instructor, Colorado Institute of Law Enforcement Training at Colorado State University
- Colorado Police Officer Standards and Training (POST), Certified Trainer
- Technical Crash Investigation – Northwestern University 1979

Professional Activities

- Executive Board, Association of Transportation Safety Information Professionals, National Safety Council, 1987- 2003
    - 2001 Program Chair, 2002 1st Vice Chair, 2003 Chair
- Member, ANSI D-16 Committee on Motor Vehicle Accident Classification
- Chair, Steering Committee, Law Enforcement Section, Colorado Safety Management System
- Co-Chair and Member, Colorado State Traffic Records Advisory Committee
- Member, National Agenda for Traffic Records Committee, National Safety Council

- Representative for National Highway Transportation Safety Administration (NHTSA) and the National Safety Council (NSC) to promote the Association of Transportation Safety Information Professionals (ATSIP)
- Member, Intelligent Transportation Systems, Archived Data User Program Committee, Federal Highway Administration
- Co-Chair, Highway Safety Program Advisory for Traffic Records Panel, Data Nexus, Inc. for National Safety Council
- Member, Project Panel/Advisory Group, Project #NCHRP 17-12 (Improved Safety Information to Support Highway Design) Northwestern University Traffic Institute
- Member, Project Panel/Advisory Group, National Center for Highway Research Projects
    - Reducing Crashes in Construction Zones
    - Developing Basic Training for Transportation Safety Information Users
    - Data needs for Transportation Information Professionals
- Member, Colorado Department of Transportation RFP Review committee for Intelligent Transportation Systems
- Member, NHTSA Traffic Records Assessment Team (Number Denotes Number of Assessments for the State); Kansas(4), South Carolina(2), Nebraska, Louisiana(3), Arizona (2), Iowa (2), New Mexico(2), Wisconsin(3), North Dakota(2), South Dakota(3), Connecticut, Idaho, Oregon(4), Tennessee(3), Delaware(2), Kentucky, Mississippi(3), Missouri(3), New Jersey, Montana, Idaho, Nevada, Ohio(2), Illinois, Massachusetts(2), Wyoming(3), Virginia, Vermont, Maryland (2), San Carlos Reservation, White River Reservation, Menominee Reservation
- Co-Chair, National Safety Council, Association of Highway Safety Information Professionals, Marketing and Honest Broker Committee
- Member, Transportation Research Board – Law Enforcement Committee and Traffic Record Committee
- Member, Colorado State Patrol Diversity Committee
- Member of NHTSA Impaired Driving Assessment team: Vermont, Nevada, Massachusetts, California, Indiana, Oregon, Tennessee, Delaware, Louisiana, Alaska, Florida, Maine, Missouri
- President and Member, Northern Colorado Peace Officers Association
- Member, Committee on Guidelines for Transportation Safety Information Management Systems and files, National Safety Council and National Highway Traffic Safety Administration
- Member National Academy of the Sciences (NAS), National Center for Highway Research Projects (NCHRP) Committee: Project 17-40 Model Curriculum for Highway Safety Core Competencies, Project 03-80 Traffic Enforcement Strategies for Work Zones

  Member, NHTSA Occupant Protection Assessment Team; South Dakota

ROBERT A. SCOPATZ, PH.D.

Years of Experience: 25, with Current Employer: 14

*Dr. Bob Scopatz, D*irector of Research and Government Services for DNI, has 25 years experience in performance monitoring and improvement using psychological, statistical, and operations research techniques. He directed numerous states' traffic records system audit and strategic planning efforts and has been instrumental in developing subject matter content for both Instructor-based and Internet-based courses about using transportation data for decision-making. He designed and conducted field and acceptance testing for automated data collection systems and enhanced software to collect roadway condition surveys and traffic volume/classification counts. He has adapted standards for the physical layout and design of the human/ computer interface for an advanced traffic management center environment. He has also conducted research on the human/computer interface for instructor stations in pilot training and fleet coordination simulators, including review of existing interfaces and human-computer interface standards for graphical user interfaces, embedded help, and training/wizard-based task completion. Dr. Scopatz has served as a media expert on issues related to safety impact of unlicensed drivers and other traffic safety issues.

Relevant Project Experience

Traffic Records Data Improvements

Facilitated the original and follow-up revisions to the NHTSA Traffic Records Program Advisory and Traffic Records Assessment procedures

Participated in numerous state traffic records assessments, many including multiple assessments

Provided planning and technical support to the multi-agency US DOT TRCC

Developed and evaluated a model court records system to meet the traffic safety needs of judges and prosecutors

Designed a statewide OVI Tracking System and a Citation Tracking System for Ohio

Conducted state crash data process audits to identify current practices and make recommendations for improvement

Evaluated options for using technologies for data collection for all US DOT modal agencies

Evaluated the state of the art for state data collection for long commercial vehicle crashes

Training, Retreats, and Workshops

Developed Instructor-based and Internet-based training for highway safety programs and use of traffic records data

Developed guidelines for user interface and data presentation chapters of Advanced Traffic Management System control center handbook

Facilitate strategic planning for Safety Management Systems and Traffic Records Coordinating Committees in numerous states, as well as strategic planning retreats for the US DOT TRCC and some states.

Deliver periodic Webcasts for ITE for a Roadway Safety Course developed by DNI.

Designed and developed a course module on Applied Statistics for the US Air Force School of Aerospace Medicine

Conducted Technical Analysis of Quality Assurance & Revalidation Program for Navy pilot physiological training devices

Analysis and Evaluation using Local, State, and National Data

Developed standard operating procedures for field collection of transportation data for the New York City DOT, and implemented annual condition assessments for local surface streets

Researched and established policies for 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.

Conducted field video study of intersection traffic control effects on traffic flow.

Used NASS, CDS, GES, as well as various state motor vehicle crash files to conduct analyses to compare the rollover propensity of various makes/models of sports utility vehicles and light trucks and to identify the differential outcomes of occupants using various seatbelt design “generations” in cars

Conducted a methodological study of between-states comparisons in terms of the .08% BAC law evaluation

Used the Long-Term Truck Crash Causation Study database to determine patterns of prior inspection violations that predict violations associated with crashes; analyzed indicators of driver contributions to the critical reason for a crash and the post-crash inspection of vehicles and drivers

Analyzed national and state data for safety risks posed by those who drive without a valid license.

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

Education

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

Professional Certifications and Affiliations

National Safety Council - Traffic Records Committee; Association of Transportation Information Professionals (ATSIP) (Executive Board and President 2005-2006, Executive Board Secretary, to present)

AASHTO/TRB – Highway Safety Manual content review panel.

TRB/US DOT – Data Needs for SAFETEA-LU ad-hoc outreach panel.

TRB Committee on Statistical Methodologies, Statistical Computer Software in Transportation Research (A5011 past member), Committee on Safety Data, Analysis and Evaluation (ANB20 – current member), Committee on Truck and Bus Safety Data (ANB70)

State of Florida Safety Management System Committee (past member) and co-developer of the

Safety Management System Truck/Bus Subcommittee's Research Agenda
NCHRP Panel Member: Project 20-05, Synthesis Topic 31-02 "Statistical Methods for Highway Safety Analysis"

Relevant Publications

Traffic Records Curriculum, web-based training for NHTSA, URL: www.trafficrecords101.net w/ B. H. DeLucia

Mining the Large Truck Crash Causation Study for Non-Crash "State of the Fleet" Information. Presented and published TRB, 2006.

Traffic Records Program Advisory and Assessment Workbook – 1998 and 2006 update. NHTSA, US DOT with B.H. DeLucia, C.E. Hatch, et al.

NCHRP Synthesis 305. Crash Records Systems, National Cooperative Highway Research Program, TRB, with B.H. DeLucia as lead author (2006).

Unlicensed to Kill: The Sequel, AAA Foundation for Traffic Safety, with B.H. DeLucia, C.E. Hatch, and K.A. Tays (2003).

Project 9 - Exploring Options for Using Technology in Data Collection, Bureau of Transportation Statistics, with B.H. DeLucia, M.R. Crouse, and K.A. Tays, (2002).

Long Commercial Vehicle: Data Collection. AAA Foundation for Traffic Safety, with B.H. DeLucia (2000).

NHTSA Traffic Records Assessments and Strategic Plans for several states with various team members.

Top Ten Program: Evaluation of Program Effectiveness. Prepared for the Federal Highway Administration, Office of Motor Carrier, and Highway Safety (1999).

Methodological Study of Between-States Comparisons with Particular Application to .08% BAC Law Evaluation. Presented at 77th Annual Meeting of the Transportation Research Board, Washington D.C. Available on TRB Pre-print CD-ROM (1998).

2000 By 2000: Mayor's Traffic Safety Program to Save 2000 Lives by the Year 2000. New York City Department of Transportation with D. Steinberger, S. King, H. Klinger, A.L. Scharf, P. Obanor, R. Freeman, and L.D. Magid (1989).

Limited Access Highway Safety Equipment: Condition Assessment, Cost to Repair, and Lives Saved. New York City Department of Transportation with O. Russell and A.L. Scharf (1988).

A*nalysis of Quality Assurance and Revalidation (QA&R) Criteria for Support of Physiology & Water Survival Training Devices*. Prepared for U.S. Navy Naval Air Warfare Center Training Systems Division with Greear, J. (1994).

DISO Migration Rehearsal Report. Defense Information Services Organization with A.L. Wooldridge, R.R. Turner, and T.M. Mortellaro (1994).

First Edition Human Factors Handbook for Advanced Traffic Management Systems, Traffic Management Center Design. Prepared for Federal Highway Administration with T. O'Neill and S. Van Hemel (1993).

U.S. Customs Service Training Needs Report. Final Technical Report for U.S. Customs Service (1993).

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PROFESSIONAL EXPERIENCE

Mr. Spell entered his professional career in traffic records systems and data exchange over 50 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

JOHN J. ZOGBY, PRESIDENT

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Summary of Experience

Mr. Zogby has over 40 years experience in highway safety engineering and 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. He was appointed Deputy Secretary of Transportation for Safety Administration in February of 1979, a position he head 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 Business Experience

- 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(06A) for the Transportation Research Board.
- Subcontract with ISG, a systems integration consulting company, conducting a re-engineering 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 team member conducting Traffic Records Assessments with states in assessing their Traffic Records capabilities to address highway safety program management needs
- 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 (ITE).
- Member Emeritus of the Transportation Research Board (TRB) Committee on Transportation Safety Management.
- Member of Association of Transportation Safety Information Professionals.
- Past President of the Mid-Atlantic Section of ITE.
- 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 Chair of the Governing Board of the International Registration Plan.
- Past Chair of a subcommittee of the NGA Working Group on State Motor Carrier Taxation and Regulation.
- Completed six year tenure as the 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