



STATE OF ILLINOIS

TRAFFIC RECORDS ASSESSMENT

April 04 – 08, 2011

National Highway Traffic
Safety Administration
Technical Assessment Team

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EXECUTIVE SUMMARY

The National Highway Traffic Safety Administration (NHTSA), in response to a request by the Illinois Department of Transportation's (IDOT) Division of Traffic Safety (DTS), assembled a team to conduct a traffic records assessment. The DTS 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 EMS/injury surveillance) conducted the assessment April 3 through 8, 2011.

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 Illinois is capable of supporting management's needs to identify the State's highway safety problems, to manage the counter-measures applied in attempts to reduce or eliminate those problems, and to evaluate those efforts for their effectiveness.

Background

Illinois underwent a traffic records assessment in 2006, during which deficiencies were identified that were the basis for recommendations enumerated in that report. During this assessment, the State has demonstrated notable progress in each component of the 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.

Crash data has improved in several ways that make analyses more easily accomplished and more useful as well. Ten months have been shaved off the time needed to finalize the crash database for use following the end of the calendar year. As a by-product of electronic reporting and system improvements, as well as continued staff intervention, crash data quality continues to improve.

Accessibility of crash data has been improved dramatically as well, through the availability of the external online Safety Data Mart which provides capabilities to produce a variety of reports as well as map-based output from the IDOT GIS. The Safety Data Mart is an interactive query tool that provides users with the ability to generate their own statistics and maps using a series of drop down menu selections. Data may be queried at the crash, person, and vehicle levels.

Accessibility of Statewide roadway information has been improved by moving the Illinois Roadway Information System application from a mainframe environment to a SQL server database. The new database allows management of the system using the ArcGIS desktop editor improving data updates.

The Secretary of State (SOS) Driver Services Department (DSD) employs facial recognition technology to all new applicants; thus preventing the issuance of multiple licenses to individuals as noted in the previous assessment. In addition, the SOS, DSD has reduced the processing time for the financial responsibility suspension notification process from two weeks to five days.

Electronic capture of enforcement data is anticipated through an effort to add a citation component to the electronic crash systems that are currently in use in the State by developing and distributing Traffic and Criminal Software (TraCS) to law enforcement agencies Statewide. A pilot project is underway in several counties that may be used as a proof of concept for future development of electronic citation systems.

Illinois has recently revised its EMS data collection system to one that is NEMSIS compliant and that will allow agencies to submit data electronically via software provided by the State or by their own third-party vendor. This revision will allow the Illinois Department of Public Health (IDPH) to begin receiving data from all agencies across the State for the first time in several years. This effort will allow Illinois to fill a significant void and make tremendous improvements in the timeliness, completeness, accuracy, and uniformity of the State's EMS data.

At this time, however, some issues and deficiencies remain and continue to impact the ability of the present traffic records system to optimally support Illinois' management of its highway safety programs. These are discussed in the summary below and the full report that follows.

Roadway Component Records

The State has demonstrated notable progress in the roadway component of the traffic records system since the 2006 traffic records assessment. The most notable of the improvements was in the Illinois Roadway Information System (IRIS) by the Illinois Department of Transportation (IDOT).

IRIS was moved from a mainframe application to a SQL server database. The new database allows management of the system using the ArcGIS desktop editor, improving data updates and accessibility to statewide roadway information.

The IRIS provides the tools and processes to share roadway features data on all public roads in the State. The file allows access to road and crash data for use by federal, State, and especially local safety officials for highway safety problem identification and the development of appropriate countermeasure projects.

Driver and Vehicle Records

The Illinois Secretary of State's Office administers the driver licensing and vehicle registration and titling services for the State. The integrity of the driver file is enhanced by the use of facial recognition technology to identify those applicants who may already have a driver license under some other identity. The Social Security On-line Verification and the Systematic Alien Verification for Entitlements systems are checked prior to license issuance as well.

Most conviction data is sent to the driver history file from circuit courts in the State electronically; currently 90 of 102 counties are using this process, with the remaining 12 counties continuing to process convictions on paper.

Driver records completeness suffers somewhat from the courts' ability and willingness to allow convictions to be diverted from a driver history for attendance at a driver improvement school or for performance of community service. These opportunities decrease the overall completeness of the driver file. However, the State does post all crash involvement to the driver records and linking to the vehicle file is possible through the driver license number.

The Vehicle Services Department maintains complete vehicle records that meet appropriate standards, and records include appropriate indicators such as stolen and salvage. The National Motor Vehicle Title Information System (NMVTIS) facilitates exchanges of such information between States and helps to prevent title and odometer fraud by making such information available nationwide. Illinois is currently the only State that is not a participant in the NMVTIS system.

Statewide Injury Surveillance System (SWISS) Records

Illinois has a very robust injury surveillance system consisting of multiple datasets collected or managed under the direction of the Illinois Department of Public Health (IDPH). These data sets include:

- Pre-hospital EMS data
- Emergency Department data
- Hospital Discharge data
- Trauma Registry data
- Vital Statistics data
- Head and Spinal Cord Registry data

Since the 2006 assessment, the State has made significant improvements in the type, quality, and completeness of injury data. In 2008, collection of E-Codes was strongly encouraged in the hospital discharge data. Then, in 2009, the IDPH began to receive emergency department data from the State's hospitals. Finally, in 2010, the Division of Emergency Medical Services, with section 408 funding support from IDOT, began the implementation of a new NEMSIS Gold compliant pre-hospital data collection system. Collectively, these improvements represent significant progress in correctly identifying persons injured as the result of a motor vehicle crash and also begin restoring availability of statewide EMS data that has been lacking since 2005. Each one of these enhancements also improves the ability of the State's CODES program to integrate multiple injury surveillance systems with the crash database, a process that is already underway.

Citation and Adjudication Records

The State of Illinois uses a uniform citation and police agencies reported stringent inventory and record keeping requirements, with management of distribution based within each agency. Missing citations are noted by the agencies that process citations during the various phases of their traverse from the officer to the driver history file, but no formal audit process exists to determine the fate of those missing citations.

Traffic cases within the State are heard by circuit courts, but case data is maintained on a number of different case management systems used in the 23 circuits within the State, which makes compilation of data all but impossible at this time, meaning that prosecutors and adjudicators do not always have access to information about whether defendants in their courtrooms have pending cases elsewhere in the State.

Additionally, there is no centralized database of traffic enforcement actions within the State that would provide a clear picture of the type and level of traffic enforcement conducted and could provide for a means by which to evaluate the success of the various countermeasures applied to traffic safety problems.

Traffic Records Coordinating Committee (TRCC)

The Illinois Traffic Records Coordinating Committee has a large and diverse membership, and reportedly has two tiers, both executive and working level groups. Lack of full participation at both levels hampers its potential to act as a catalyst for improved traffic safety data, technological innovation, planning for emerging issues and data-sharing throughout the state, all of which could work to improve highway safety and decrease risks to road users.

The working group operates at various levels of engagement and many do not attend meetings regularly. The difficulty of coordinating schedules among top executives impairs the ability to schedule ITRCC meetings. The importance of the mission of this endeavor might be made more apparent by an annual report to the executive group outlining the projects that have been completed over the past five years, the progress achieved in each traffic records component, the impacts of traffic safety legislation during that period and the costs of traffic crashes and loss of lives and productivity. The working group might be more engaged if each grant were accompanied by a requirement to provide in-person (or telephone/webinar) status reports about the project progress and performance measures on a quarterly or semiannual basis.

Potentially, a full time traffic records coordinator could be the means to ensure continued and regular coordination and communication among the various components of the traffic records system.

Crash Records

Approximately 400,000 crash reports are completed by law enforcement and processed by the State each year. These reports continue to be generated using several types of electronic field data collection software or are manually generated by law enforcement officers. Numerous projects and system improvements have led to more timely and accurate crash data, and have improved the accessibility and linkage of that data for analytic purposes. Transition to the TraCS software package will open the potential for the State to have totally electronic data collection and transmission within the next five years. This effort is dependent upon a complete survey of the technological capability of all Illinois law enforcement agencies that report crashes in the State. Once determined, a marketing effort to encourage electronic crash reporting would serve to inform agencies of its availability and encourage its use.

The Chicago Police Department accounts for one quarter of the total number of crash reports in the State and is currently planning for electronic crash collection. It is imperative that the State collaborate and prepare for transmission of those reports to the CIS, providing for the potential to save personnel resources currently used for data entry that can be transitioned to functions that enhance data quality and integrity.

IDOT staff capture and use measures of data quality to manage the crash records system. They have used numerous innovative approaches to ensure that errors are minimized through the data entry process. It is apparent that quality control and improvement are among the priorities within the section.

Strategic Planning

A Strategic Plan for Traffic Records Improvement should be the combined voice of the representatives of all components of a traffic records system. It should, therefore, reflect the State's vision in terms of its future image of highway safety. As such, the strategic plan is a precursor to the determination of the most promising ways to allocate available funding for traffic safety and data improvement projects.

In Illinois, due to the lack of commitment of some members of the Traffic Records Coordinating Committee, much of the responsibility for drafting, updating, and maintaining the Plan has fallen to the Illinois Department of Transportation, Division of Traffic Safety (DTS). It is not clear, therefore, that the Plan is comprehensive and based on a solid and cohesive vision, but it appears that it is little more than a compilation of projects that the various traffic safety entities have developed, based on specific individual wants or needs.

Constrained budgets and manpower resources would demand that representatives of each aspect of the traffic records system meet to discuss needs, deficiencies, potentials for improvements through integration and resource and data-sharing, and conduct a complete environmental scan that takes future problems, risks, and opportunities into account. This coordination provides the best means of choosing projects that can move several initiatives forward, while providing economies of scale and demonstrating responsibility to the taxpayer. It is imperative that broader accountability for development and maintenance of the strategic plan be embraced and that regular reporting of progress and performance measures be required, so that the benefits and the hard work associated with continuing to drive down crash rates are shared among all who have responsibility and input into the process.

MAJOR RECOMMENDATIONS

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.

Roadway Information

- Evaluate the additional data requirements of the SafetyAnalyst and HSM tools and consider adding the data to the IRIS database based on MIRE guidelines.

Driver and Vehicle Records

- Pursue authorization to allow previous traffic conviction history to be retained for new license applicants moving to Illinois from another State.
- Make driver history data available for use in Safety Analysis and linkage to other traffic records components.

Citation and Adjudication Records

- ❑ Establish a Statewide citation tracking system that would include all citations within the State and their dispositions—which would include convictions as well as non-convictions.
- ❑ Develop XML data standards to support data exchange with electronic citation systems, court case management systems, the Secretary of State’s driver history file and police records management systems, as well as any future Statewide citation tracking system.

Traffic Records Coordinating Committee (TRCC)

- ❑ Formalize an Executive Group that consists of individuals who can feasibly meet on a regular basis to provide overall direction and leadership for ITRCC activities.
- ❑ Continue to engage the Planning Subcommittee to conduct planning activities for the ITRCC, including meeting planning, in a collaborative fashion that includes a representative set of agency participants in ITRCC meetings and activities.

Crash Records System

- ❑ Accomplish the implementation of electronic field data collection and reporting by the Chicago Police Department.
- ❑ Formalize the quality control program. In particular, the following features of the current quality control program could be enhanced:
 - Feedback to law enforcement both on a case-by-case basis and reflecting aggregate analysis of error logs.
 - Tracking of reports returned for correction to ensure that they are resubmitted in a timely fashion.
 - Periodic audits of crash reports for logical consistency between the narrative, diagram, and the coded information on the form.
 - Development of additional data quality metrics to address various aspects of accuracy, completeness, and accessibility that are not fully measured now. Use of the Safety Data Mart should be included among the accessibility measures.
 - Data quality reporting to stakeholders including the Illinois Traffic Records Coordinating Committee, users of the Safety Data Mart, and safety decision makers who are using the crash data.
- ❑ Implement the TraCS replacement of MCR. Develop a more detailed implementation plan showing the month-by-month expected deployment by specific law enforcement agencies and the corresponding level of electronic data submission to be achieved.

Strategic Planning

- ❑ Create a data quality improvement project for each component of the traffic records system as part of the 2011 strategic plan update. Ensure that each custodial agency works with the ITRCC to develop a set of data quality metrics designed to measure overall system performance independent of any other projects that might be included in the strategic plan.

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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 Illinois Traffic Records Coordinating Committee (ITRCC) was established in 2005. Nominally, it is a two-tiered committee, consisting of a “Working Group” and an “Executive Group.” There is a formalized MOU that guides the structure and scope of the ITRCC.

Members of the Executive Group include the Secretary of Transportation, Director of Driver Services at the Office of the Secretary of State (SOS), Director of the Illinois Department of Public Health (IDPH), Director of the Illinois Department of Transportation Division of Traffic Safety, and representatives from FHWA and NHTSA. However, the Executive Group has never met and does not function as an active group. A particular barrier to the functioning of the Executive Group is that it is virtually impossible to convene a meeting because of the level of the individuals involved. It is noted that there is informal executive participation in ITRCC (although not at the level of the Executive Group), but no formal, functioning committee at the executive level.

The Working Group consists of representatives from IDOT (Crash and Roadway), IDPH (Hospital Discharge, Trauma registry and EMS), SOS (Driver and Vehicle), Illinois State Police (ISP), city and county police, Administrative Office of Illinois Courts (AOIC), data processing staff, GIS staff, safety engineering, IDOT Division of Traffic Safety, city and county engineers, and many other users. There are approximately 50 people that make up the Working Group. The Working Group contains a number of sub-committees that address specific traffic safety focus areas.

While the Working Group appears to be functioning adequately, participation is heavily skewed toward IDOT personnel. With the recent direction of the Planning Subcommittee to plan meeting agendas and provide organization to the overall Working Group, participation by non-IDOT agencies has improved. This collaborative planning effort needs to continue, with a focus on finding agenda and committee activities that involve non-IDOT agencies. Further, the ITRCC would benefit from a more formal active Executive Group; such a group could define high-level committee goals and find positive value propositions to encourage all agencies to participate at the Working Group level.

Authorize Members

The ITRCC is guided by an MOU that outlines its purpose and mission. This MOU authorizes agencies and committee members to participate in ITRCC activities.

Ensure Membership is Representative

The ITRCC incorporates a large group of personnel from a wide variety of agencies in State government which own, collect or use traffic records data. These agencies are noted above. The ITRCC also includes membership from local agencies with interest and involvement in traffic safety.

Oversee Quality Improvement

Continuous improvement of State traffic data systems is part of the ITRCC's activities, although it is mostly directed by preparation requirements for Section 408 grant applications. Quality metrics are established and monitored by the committee with respect to the Section 408 projects that it supports and manages.

Appoint an Administrator

The chair of the ITRCC is chosen from IDOT Division of Traffic Safety personnel as selected by the Director of the Division of Traffic Safety. Currently, the chair is the Special Studies Manager for the Division of Traffic Safety. While this arrangement is certainly adequate, a full-time traffic records coordinator could potentially dedicate additional time to the facilitation of this committee. This could result in increased participation by committee members.

Schedule Regular Meetings

Meetings of the Working Group take place once per quarter. The Executive Group does not meet.

Oversee Training for Traffic Records System Data Improvement

There is regular training on performance measures and their application to various committee projects.

Recommendations

- Continue to engage the Planning Subcommittee to conduct planning activities for the ITRCC, including meeting planning, in a collaborative fashion that includes a representative set of agency participants in ITRCC meetings and activities.
- Formalize an Executive Group that consists of individuals who can feasibly meet on a regular basis to provide overall direction and leadership for ITRCC activities.
- Hire a full-time dedicated traffic records coordinator.

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

Assign Responsibility for the Strategic Plan

The Illinois Traffic Records Coordinating Committee (ITRCC) is nominally responsible for production and updating of the traffic records strategic plan. In practice much of the effort devolves to the Illinois Department of Transportation, Division of Traffic Safety (DTS). DTS staff supports the ITRCC and manages the Section 408 grant process, which sets both the content requirements and deadlines for submittal of annual updates to the strategic plan. Working within these constraints, the DTS solicits project ideas, schedules meetings of the full ITRCC and the Planning Subcommittee, and ensures that agencies proposing a project for inclusion in the strategic plan have an opportunity to present their ideas to the ITRCC. The Planning Subcommittee is responsible to make recommendations to the full ITRCC. The voting members of the ITRCC are called upon to rank-order project proposals. DTS compiles the project rankings and develops a final strategic plan for approval by the key State agencies. The approved plan is submitted to NHTSA along with the annual Section 408 grant request.

Ensure Continuous Planning

The DTS staff is responsible for monitoring progress, updating the plan, and producing the annual progress report. Project managers are required to submit monthly updates for all active projects included in the strategic plan; however, most do not do so. The result is that the DTS staff has to gather the data in order to produce the annual progress report. Updates to the NHTSA online tracking system—the Traffic Records Improvement Program Reporting System (TRIPRS)—are sporadic.

Move to Sustainable Systems

The strategic plan includes a project to transition the state-supported field data collection system from the Mobile Capture and Reporting (MCR) system to an Illinois version of the Traffic and Criminal Software (TraCS) system. This move is designed to save money and shift some of the system maintenance burden from the IDOT Bureau of Information Processing (BIP) and its contractors to a different contractor supporting TraCS generally. The TraCS system includes multiple reports in addition to crash whereas adding new report forms (such as citation) to MCR would likely increase the cost of the system's maintenance beyond a sustainable level.

There are, however, several programs and major projects that have not moved to a sustainable status. In fact, many of the most promising efforts designed to improve traffic records are grant funded and would be endangered if the grant funding were cut. The strategic plan does not include plans for reducing the reliance on grants for any of these programs.

Meet Local Needs

The strategic plan addresses, and many of the State agencies with custodial responsibility for traffic records components are working to improve, local agencies' access to data. The IDOT Safety Data Mart and the expanded IDOT GIS tools are good examples of efforts designed to make it easier for local enforcement and engineering agencies to obtain data extracts and run analyses that are specific to their jurisdiction or geographic region. The data cube within the Safety Data Mart, for example, allows users to drill down to county- and municipality-level data to generate summary data tables relevant to a number of safety program areas. The GIS and

spatially located crash data support local agencies' needs with respect to identifying locations with high crash counts.

Promote Data Sharing

The strategic plan includes projects designed to increase electronic data sharing. The most important of these is the project with the Chicago Department of Transportation to provide assistance to the Chicago Police Department in implementing electronic field data collection and electronic submission of crash reports. Other data sharing initiatives in the plan include the Emergency Medical Services for Children (EMSC) program run cooperatively by the Illinois Department of Public Health (IDPH) and the Loyola University Medical School under contract to IDOT.

Promote Data Linkage

The strategic plan addresses data linkage through the Crash Outcome Data Evaluation System (CODES) project as well as the EMSC program. Both of these support users' needs for merged data linking crash and injury surveillance information.

Coordinate with Federal Partners

The Federal Highway Administration (FHWA) Division office and the NHTSA regional office are involved in the ITRCC and have played a role in previous strategic planning efforts. This relationship appears to be working well.

Incorporate Uniform Data Standards

The strategic plan addresses compliance with MMUCC and NEMSIS. More recent projects, such as the implementation of SafetyAnalyst, incorporate at least a departmental review of the Model Inventory of Roadway Elements (MIRE) guideline.

Plan to Meet Changing Requirements

The planning process is designed to meet the requirements of the *Advisory*. A possible deficiency may arise from the lack of attendance by some members of the ITRCC. Without their input, it may not be possible for that body to maintain an awareness of user needs in key areas. The DTS staff attempts to engage all ITRCC members, especially during the months leading up to the completion of the annual strategic plan. When specific user groups fail to attend the meetings, the risk of the ITRCC being unaware of their needs increases.

Support Strategic Highway Safety Planning and Program Management

The Strategic Highway Safety Plan (SHSP) includes an emphasis area related to data needs. This section of the SHSP appears to be well coordinated with the content of the traffic records strategic plan.

Strategic Planning of Training and Quality Control

The strategic plan includes a section on training needs. The problem of chronic lack of attendance by some ITRCC members also makes it difficult to incorporate their training needs into the strategic plan.

Quality control programs, with the exception of crash and injury surveillance data, fall short of the ideal. In the other traffic records system components there do not appear to be standardized measures of data quality that are used in day-to-day management of the systems, nor are there metrics reported to the ITRCC for those systems except for those related to specific projects funded through the Section 408 grant process. This project-level—as opposed to system-level—data quality monitoring is insufficient. The strategic plan does not address this issue.

Recommendations:

- ❑ Reduce the reliance on IDOT DTS staff for maintenance of the strategic plan. In particular, project managers must commit to monthly status reports for the projects included in the strategic plan, and must ensure that all required performance measures are submitted in a timely manner.
- ❑ Create a data quality improvement project for each component of the traffic records system as part of the 2011 strategic plan update. Ensure that each custodial agency works with the ITRCC to develop a set of data quality metrics designed to measure overall system performance independent of any other projects that might be included in the strategic plan.
- ❑ Consider use of webinar technology to increase participation in the ITRCC meetings, especially those related to development of the strategic plan. Systems including video interaction may encourage participation by remote agencies more effectively than the teleconference methods already being used.
- ❑ Add a section to the plan designed to address sustainability. This section should address the need to move projects from grant funding sources to State funding where possible. It is recognized that in the current fiscal climate it may not be possible to move many (or any) programs away from grant funding, but the plan can address how that movement might happen in the future and how much it would cost to do so.

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

Create and Maintain a Traffic Records System Inventory

A traffic records system inventory does not exist. Illinois state agencies maintain an impressive list of traffic safety-related websites where partial descriptions of the traffic records components are found. The following list of web sites potentially provides data for the development of a system inventory that could be centrally maintained, ideally in a data clearinghouse, and kept up-to-date through periodic reviews with the custodial agency:

- Illinois Department of Transportation (IDOT)
 - Traffic Safety: <http://www.dot.state.il.us/safety.html>
 - Evaluation: <http://www.dot.il.gov/trafficsafety/tsevaluation.html>
 - Traffic Records/CODES: <http://www.dot.il.gov/trafficsafety/IRTCC.html>
 - Roadway File: <http://www.dot.il.us/opp/planning.html>
- Illinois Department of Public Health (IDPH)
 - IDPH: <http://www.idph.state.il.us/>
 - EMS Reporting: <http://www.idph.state.il.us/emsrpt/>
- Secretary of State (SOS)
 - Secretary of State: <http://www.cyberdriveillinois.com/>
 - Driver Services: <http://www.cyberdriveillinois.com/departments/drivers/home.html>
 - Vehicle Services: <http://www.cyberdriveillinois.com/departments/vehicles/home.html>
- Illinois State Police: <http://www.isp.state.il.us/>
- Illinois Administrative Office of Courts: <http://www.state.il.us/court/Administrative/Contact.asp>

The only information available to describe the components of Illinois' traffic record system is in NHTSA's Traffic Records Improvement Program Reporting System (TRIPRS).

A complete system inventory, as called for in the *Advisory*, would include data element lists for each of the systems in each traffic records component area and would provide contact information for users to obtain detailed data dictionaries or data users' guides. More importantly, the inventory would be written for and available to all potential data users.

Support Centralized Access to Linked Data

There are few current examples of centralized access to linked data. However, some efforts are underway that may result in the creation of linked datasets. Many users have access to a merged dataset containing both crash and roadway inventory information. This dataset is made possible through the location coding process for crashes managed by the Division of Traffic Safety (DTS) at IDOT. The system provides a linked dataset for all 140,000 miles of Illinois public roadways through the use of GIS and linear referencing systems.

Illinois is a Crash Outcome Data Evaluation System (CODES) state. CODES has developed linked datasets for hospital discharge and crash data for the years 2002, 2003, 2005, and 2009. There is no current unique identifier between crash and hospital discharge data; consequently,

linked datasets have been developed using probabilistic methods based on CODES2000 software.

Meet Federal Reporting Requirements

All federal reporting requirements for the Highway Performance Monitoring System, Federal Aid System, Fatality Analysis Reporting System (FARS), SAFETYNET, and others are being met. Illinois has combined its reporting of commercial motor vehicle involved crashes (SAFETYNET) with routine processing of their Crash Information System (CIS). This has eliminated redundant data entry and further improves the timeliness and accuracy of crash data. DTS is also looking at a similar practice for FARS reporting.

For the systems with data quality performance measurements in place Illinois is consistently meeting or exceeding the data quality standards for timeliness, accuracy and completeness.

Support Electronic Data Sharing

There are numerous examples of electronic data sharing. The CIS managed by DTS is currently accepting about 30 percent of crash reports electronically. The plan is to improve electronic reporting by implementing an Illinois version of the Traffic and Criminal Software (TraCS), working with third-party vendors and law enforcement records management systems to certify and accept their electronic reporting, and integrating electronic reporting from the City of Chicago's Regional Case Management Tool. The current Mobile Capture and Reporting (MCR) electronic reporting tool shares data with GIS roadway maps to improve the quality of the crash location, the Secretary of State (SOS) driver and vehicle files to reduce keying and support validation of driver and vehicle information, and SAFETYNET databases to support accurate reporting of CM-involved crashes. The EMS run reporting system at the IDPH is expanding the level of electronic reporting by statewide providers. Courts forward the records of convictions on traffic violations electronically to the SOS for uploading to the driver history. IDOT shares local roadway inventory data housed in their Illinois Roadway Information System (IRIS) with city, county and regional engineering agencies.

Adhere to State and Federal Privacy and Security Standards

Illinois has implemented data security procedures in line with state privacy laws as well as the Driver Privacy Protection Act (DPPA) and the Health Insurance Portability and Accountability Act (HIPAA). Privacy and security were reported as major concerns during the development of the public access files available through the Safety Data Mart and web site.

Recommendations

- Develop a statewide traffic records system inventory.
- Develop additional linked data sets including merged data for crashes, injury surveillance information, and driver information.
- Develop a public-use version of all linked data sets and provide a centralized access point for these resources.

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 Representative for Highway Safety and the Division of Traffic Safety (DTS), in their goal of reducing the number and severity of traffic crashes on the state's roadways, utilize a problem identification process with all the most recent and available traffic records data. Despite fiscal limitations, the DTS and their traffic records partners have made significant progress with increasing available crash, roadway, driver, vehicle, citation/adjudication, and EMS/injury surveillance system data. This provides the basis for identifying and prioritizing the problems with the best potential to provide measurable outcomes.

Develop Countermeasure Programs and Program Management Procedures

With the management support of the DTS, the various planning processes for the Strategic Highway Safety Plan, the traffic records strategic plan, and various other traffic safety planning, a process of selecting appropriate countermeasure activities that will maximize resources is implemented. The DTS employs the traffic safety management principles and guidelines as prescribed by the National Highway Traffic Safety Administration.

Perform Program Evaluation

All indications and reports generated provide evidence that safety programming evaluations are being undertaken as expected, and as required. Program performance was undertaken by all segments providing performance evaluation information during this assessment. This is a testament to the work of the DTS and its traffic safety partners.

Support Safety-Related Policies and Planning

The Illinois Department of Transportation (IDOT) Highway Safety Office (HSO) attempts to base all highway and safety policies and priorities on traffic records data. This includes all HSO activities and programs such as Safety Belt/Occupant Protection, Alcohol and Other Impaired Driving, Driver Behavior and Awareness, Information Systems and Decision Making, Motorcycle, Roadway Departure and Intersection.

Policy makers are made aware of the availability of traffic records data through meetings such as the Illinois Traffic Records Coordinating Committee (ITRCC), the Strategic Highway Safety Plan (SHSP), and the Illinois Safety Summit. State agencies maintain an impressive list of traffic safety-related websites where data dictionaries and statistics regarding the various traffic records components can be found.

The HSO and the DTS receive legislative inquiries on the impact of proposed changes and are able to respond in a timely fashion to assure that proposed legislation is based on data-driven decision-making.

Access Analytic Resources

Online resources for standard and ad hoc report generation have expanded dramatically since the 2006 traffic records assessment. What were once internal IDOT analytic capabilities are now available through the Safety Data Mart. The long-term vision promoted by the IDOT Bureau of Information Processing (BIP) includes even greater public access to data. For now, users have

the ability to generate maps and cross-tabulations of crash data with user-selectable parameters and data filters. The system can also provide data extracts so that users can download a file of filtered cases that they can analyze using their own tools, including spreadsheets. Use of the Safety Data Mart is not currently tracked because the web-site statistical reporting was turned off due to errors. The usage statistics were not specific enough to allow system managers to determine whether users were spending longer or shorter periods of time on particular pages of the site. No measures of user satisfaction are being gathered.

In addition to the Safety Data Mart, IDOT DTS analysts continue to produce analytic reports upon request and will also generate data extracts to meet a specific need.

The Illinois Department of Public Health (IDPH), under a grant through IDOT and in cooperation with the Emergency Medical Services for Children (EMSC) program at Loyola University Medical Center, has made available an online query system for safety analysis including mortality, hospital discharge, crash, and trauma registry data. The query capabilities are constrained and only limited data are available; however, these tools suffice to give easy access to summary data and reduce the burden on IDPH analytic staff and IDOT staff. The EMSC program staff includes statistical data analysts with expertise in data modeling and data quality control. In addition to supporting the online query tool, the staff create an annual crash facts report and several program/problem area facts reports using the crash data. The staff perform numerous quality control checks and report their findings to IDOT for correction. The most recent reports may be found on the EMSC website. The 2009 reports are scheduled for release mid 2011. Usage statistics for the online information and query facility are reported in the EMSC annual report. The reporting does not include user satisfaction ratings.

A majority of the courts are participating in the Judici program which gives users access to case-level information. Subscribers to the service get access to more advanced query tools which enable them to specify analyses and receive summary data.

The Crash Outcome Data Evaluation System (CODES) project includes the creation of linked datasets merging crash, emergency department, hospital discharge, and trauma registry data. These data are not publicly available; however, the CODES staff can perform analyses for users upon approval.

Provide Public Access to Data

There are several online resources available to the public to access Illinois crash and injury data. The primary resource for crash data is the Highway and Traffic Safety Information page (<http://www.dot.state.il.us/safety.html>) maintained by IDOT. This web page provides an extensive set of current data, reports, and other documents that would be useful for individual project activities and program development. The site also contains a link to the Safety Data Mart described above. Data may be queried at the crash, person and vehicle level. The data mart is password protected but users may obtain a login by sending an email to the administrators of the site.

Injury and crash data may be accessed through the EMS Data Reporting System at the IDPH website (<http://app.idph.state.il.us/emsrpt>). This interactive data system supports querying of

four individual statewide databases to provide injury, crash, and other health related information at the state, EMS regional and county level. The site provides a subset of data elements from the hospital discharge data, Trauma Registry data, mortality (vital statistics) data, and crash report data. This site was created and maintained through a grant to the Illinois Emergency Medical Services for Children program with the purpose of promoting the use of injury surveillance data through the development of “Quick Fact Reports” in a fact sheet format. In 2009, the number of visits to this site totaled nearly 25,000.

Promote Data Use and Improvement

The IDOT DTS has a history of promoting data use, although independent data use has become much more viable with the launch of the Safety Data Mart in 2009. Planning is underway to determine the most appropriate ways to promote the use of the Safety Data Mart with various traffic safety constituencies. An important part of that planning process is determining appropriate approaches to training, as use of the portal and interpretation of query results are important keys to successful data use.

Input is solicited from data users regarding ways in which the data can be improved. Feedback is frequently obtained from users regarding data timeliness and overall data quality issues; this feedback is utilized where applicable to provide data improvements.

Recommendations:

- Develop more detailed tracking of queries handled through the Safety Data Mart and by the IDOT DTS staff.
- Develop user feedback mechanisms for the Safety Data Mart.
- Expand the capabilities of the EMSC online query tools
- Improve usage tracking of the EMSC online query tools to include user satisfaction tools.
- Update the EMS Data Reporting System website to include Emergency Department and EMS (pre-hospital) data as they become available.

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	<ul style="list-style-type: none"> · Age · Gender · Experience · Alcohol/Drugs · Physiological Condition · Psychological Condition · Familiarity with Road & Vehicle · Distraction · Conviction & Crash History · License Status · Speed 	<ul style="list-style-type: none"> · Crash Avoidance · Vehicle Type · Size & Weight · Safety Condition, Defects · Brakes · Tires · Vehicle Age · Safety Features Installed · Registration 	<ul style="list-style-type: none"> · 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	<ul style="list-style-type: none"> · Belt Use · Human Tolerance · Size · Seating Position · Helmet Use 	<ul style="list-style-type: none"> · Crash-Worthiness · Passenger Restraints · Airbags and Airbag Shutoff 	<ul style="list-style-type: none"> · Guardrails · Median Barriers · Breakaway Posts · Rumble Strips and Other Safety Devices · Maintenance Status of Roadway and Devices
Post-Crash	<ul style="list-style-type: none"> · Age · Physical Condition · Insurance Status · Access to Health Care · Driver Control Actions · Court Actions · Probation 	<ul style="list-style-type: none"> · Post Crash Fires · Fuel Leakage · Power Cell Securement · Hazardous Materials · Title 	<ul style="list-style-type: none"> · 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	<ul style="list-style-type: none"> · Road Rage · Ped/Bike Behavior & Driver Behavior · Driver Age & Passenger Age & Number 	<ul style="list-style-type: none"> · Familiarity with Vehicle & Training · License Class & Vehicle Type · Rollover Propensity & Driver Actions · Vehicle Ergonomics & Person Size 	<ul style="list-style-type: none"> · Crash Avoidance · Vehicle Type · Familiarity with Roadway · Experience with Weather Conditions
Vehicle		<ul style="list-style-type: none"> · Vehicle Size Weight Mismatch · Under-Ride/Over-Ride · Shared Roads, No-Zone · Tire Inflation & Rollover Propensity 	<ul style="list-style-type: none"> · Rollover Propensity & Road Configuration · Roadway Debris & Vehicle Size Weight · Vehicle Type & Weather Conditions · Vehicle Condition & Weather Conditions
Environment			<ul style="list-style-type: none"> · 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	<ul style="list-style-type: none"> - Incident Number - Location (street address, description, coordinates, etc.) - Personal ID (name, address, DL number, etc.)
Crash Linkages to Roadway Information	<ul style="list-style-type: none"> - Location Coding (linear referencing system, reference post, coordinates, local street codes)
Crash Linkages to Driver and Vehicle Information	<ul style="list-style-type: none"> - Driver License Number - Vehicle Identification Number - Personal Identifiers (name, address, date of birth, etc.)
Crash Linkages to Statewide Injury Surveillance System Information	<ul style="list-style-type: none"> - 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

<i>Timeliness</i>	<ul style="list-style-type: none"> - # 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
<i>Accuracy</i>	<ul style="list-style-type: none"> - % 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
<i>Completeness</i>	<ul style="list-style-type: none"> - % 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
<i>Consistency</i>	<ul style="list-style-type: none"> - % 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

Status

In the time since the previous assessment, the crash data component has experienced several major improvements. Illinois is to be commended for the following notable achievements over the past five years:

- Expansion of electronic field data collection of crash reports. Currently, e-Crash reporting accounts for approximately 30% of all submissions, compared to a baseline of only a few percent in 2006 (actual value not available).
- Implementation of electronic data sharing between field data collection systems and the statewide central crash database—the Crash Information System (CIS) at the Illinois Department of Transportation (IDOT).
- Redesign of the crash data management processes in IDOT’s Division of Traffic Safety (DTS) contributing to improved timeliness such that crash report data entry averages fewer than 30 days from crash event to entry into CIS, and fewer than 60 days from event to final entry of location codes. In addition, the data for a calendar year are now finalized for official reporting by August of the following year (8 months) against a baseline of 18 months at the time of the last assessment.
- Increased availability of the crash data. In 2006, most user requests for data or summary reports were met through the efforts of DTS analysts. IDOT analytic tools were available to a limited number of users all within the agency. Now, all users may access the external online Safety Data Mart which provides capabilities to produce standard and user-specified ad hoc reports as well as map-based output from the IDOT GIS. Approved users have access to even more powerful tools and more complete data through the internal data mart.
- Management of data quality has continued to improve from the existing excellent baseline in 2006. At that time, DTS staff performed a series of year-end data cleansing steps designed to identify and correct errors prior to creating the official close-out file for annual reporting. While that capability still exists, the DTS staff have migrated many of their year-end edits to become part of the edit checks performed during field data collection as well as validation for data entry in CIS. By moving these checks earlier in the processing of crash data, errors are identified at a point when they can be used to provide timely feedback to law enforcement officers.

The State is to be commended for these and other efforts, many of which resulted from implementing recommendations presented in the 2006 traffic records assessment. It should be noted that the rest of this report section addresses current status and deficiencies but with an eye toward helping Illinois achieve the next level of crash data management and data quality. The State has demonstrated an ability and desire to improve the crash data component and is poised to achieve a vision of 100 percent electronic data collection and sharing; a complete, formal data quality management program; and broad accessibility of data and powerful analytic tools for all

users.

Description and Contents

The crash data component is created based on traffic crash reports submitted by law enforcement agencies using the SR 1050 form (rev. January 2010). This is a multi-page form with an overlay template and data fields recording the location, environment, persons, and vehicles involved in the crash. Effective January 1, 2009, the property damage threshold for reportable crashes was changed from \$500 to \$1,500 in crashes where all involved drivers are insured. If any involved driver is uninsured, the reporting threshold remains at the \$500 level.

The requirements for crash reporting and data management appear in Illinois Common Statutes Part 625, Sections 11-401 through 11-416. Law enforcement officers may complete a paper crash report or use one of several field data collection systems. IDOT provides the Mobile Capture and Reporting (MCR) system free of charge to law enforcement agencies. This system has undergone major revisions since 2006 to result in a state-of-the-art electronic field data collection system for crashes. IDOT is no longer actively promoting adoption of MCR by law enforcement agencies because of the high maintenance costs and the fact that staff resources are insufficient to support creation of an electronic citation component. IDOT recently decided to adopt the Traffic and Criminal Software (TraCS) solution as the replacement for MCR. While no precise timeline for the transition was available at the time of this assessment, it was clear that IDOT is committed to a TraCS implementation in the coming months—a contract has already been signed for creation of the Illinois-specific version of TraCS to include both crash and citation reporting.

IDOT processes approximately 400,000 crash reports per year. About 30 percent of crashes are received electronically from users of MCR. A small number of reports are received electronically from users of third-party vendor software—those packages that have gone through a validation and approval process with IDOT. The remaining crash reports are received on paper forms. Processes are in place to immediately forward reports of fatal crashes to the Fatality Analysis Reporting System (FARS) staff and those describing a reportable commercial vehicle crash to the SAFETYNET staff. Both processes appear to be working well in that timeliness of reporting to FARS and SAFETYNET meets the federal requirements.

The remainder of this section describes the system's performance in relation to specific components of the *Advisory*.

Applicable Guidelines

The SR 1050 form was designed originally with reference to the ANSI D-16.1 standard and more recently with reference to the MMUCC guideline. As noted in the 2006 assessment report, the form was judged to be 97 percent compliant with the then-current version of MMUCC. A more recent evaluation of the form is under dispute because it was based on an erroneously supplied data dictionary that reflected the publicly available dataset only (i.e., data elements describing information that is redacted from the public dataset were left out of the MMUCC review). In the past, Illinois has been notable for its ability to obtain many of the roadway data elements in the linked manner described in the MMUCC standard, as opposed to requiring that they be collected

on the crash report form. With improvements in location coding, and the application of GIS coordinates, the ability to link to roadway data in an automated manner has improved.

The next form revision is planned for 2013.

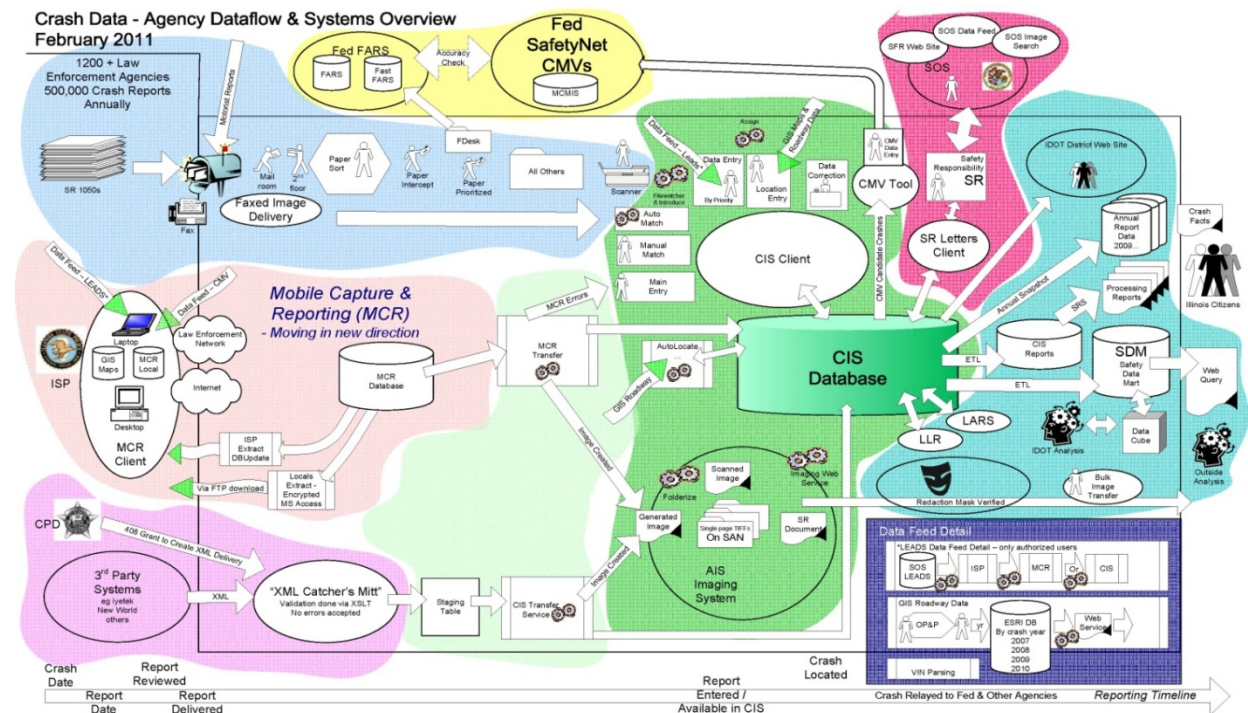
Data Dictionary

There is a complete data dictionary and complete system documentation for CIS. In addition, the MCR field data collection system has been thoroughly documented. Officers are provided with an instruction manual that explains the data requirements for each field on the SR 1050.

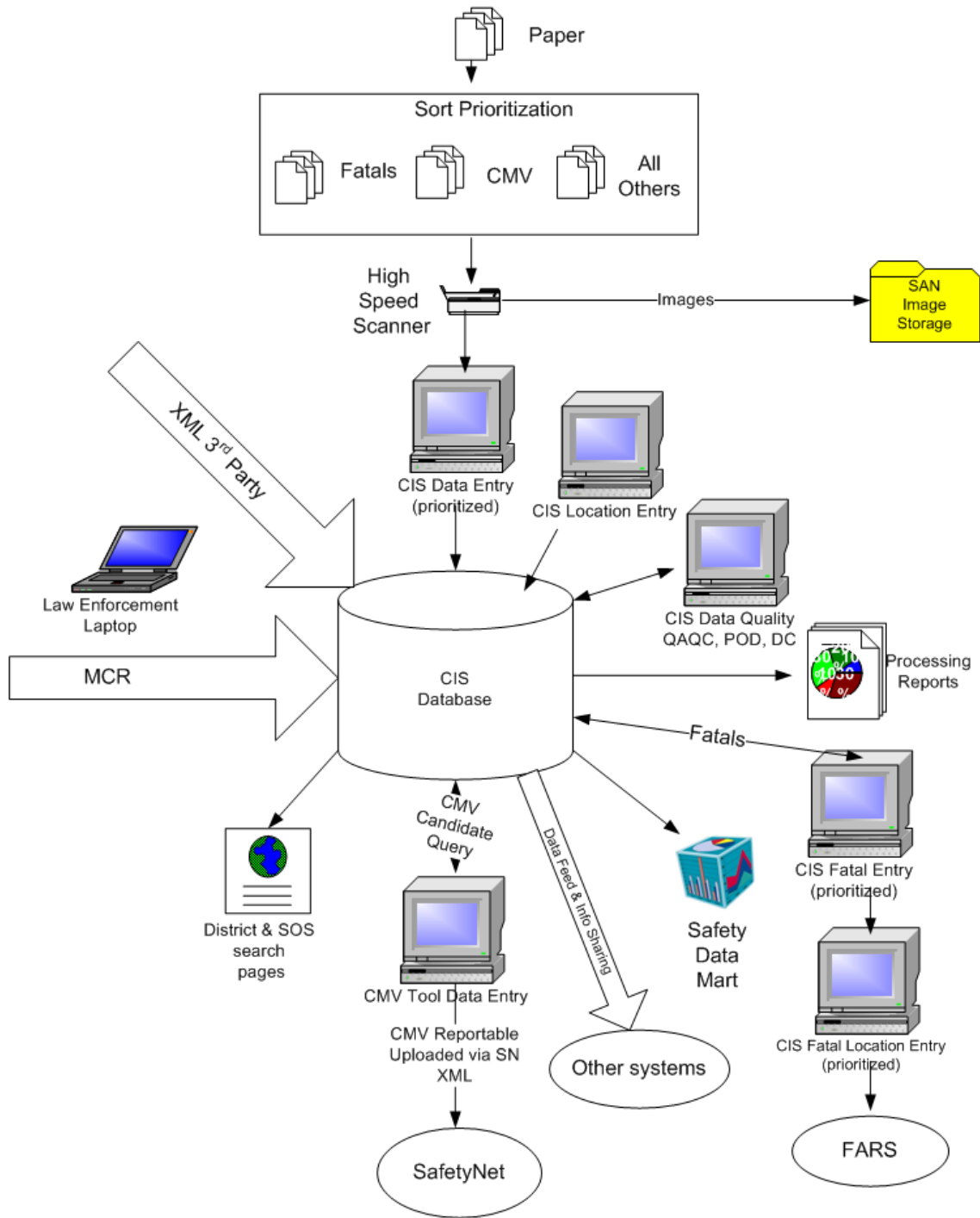
Users of the IDOT Safety Data Mart also have access to a user-oriented data dictionary that explains the contents of the crash data file available online.

Process Flow

The following process flow diagrams were supplied in the response to the pre-assessment questionnaire.



Illinois Crash Information System
Overview – Feb 2011



The diagrams show the processing of crash reports submitted on paper, via MCR, or through third-party vendor software products. The latter process will take on increasing importance for the future of the crash data component as the current plans for automated crash reporting by the

Chicago Police Department call for electronic submission through the third-party method. This is especially important as the Chicago PD accounts for approximately 25 percent of all crash reports.

IDOT's plan for the rollout of TraCS includes an 18-month timeline from contract initiation to implementation in the largest 207 law enforcement agencies. This plan aims to achieve 55 percent electronic reporting in that time frame. With the inclusion of Chicago PD, the state could conceivably achieve 80 percent electronic reporting or higher by 2013.

There is a degree of uncertainty in the TraCS timeline because, beyond the current MCR users, IDOT does not have detailed information on the technological capabilities of all law enforcement agencies. Some additional agencies have been on the waiting list for MCR and so it may be safe to assume that they have sufficient hardware to support a TraCS implementation. For other agencies, a survey is planned that should give IDOT enough information to determine if the TraCS timeline is realistic and what level of electronic reporting is likely to be achieved.

Interface with Other Components

Crash reporting integrates well with roadway, driver, and vehicle data components for the purposes of data validation and auto-population of data entry fields. Location codes are added to the crash reports either during field data collection (i.e., MCR users are required to supply latitude/longitude coordinates) or during IDOT's post data entry location coding process. MCR users with a bar code reader can obtain driver license information electronically to auto-populate personal identifying information on the crash report. Entering a driver license number during data entry from paper forms at IDOT initiates a driver file lookup to auto-populate and validate driver information. A similar process is used for vehicle information based on entry of a license plate number.

CIS has an automated process to create the SAFETYNET upload file. A similar upload file is being created to support the FARS process but this effort is on hold pending input from NHTSA. CIS also creates a file extract for use by the Secretary of State (SOS) to post crash involvement into the driver history file. A separate extract is created for use by the SOS to send notices of suspension for failure to provide proof of financial responsibility.

In addition, crash data are linked to several other traffic records system components for the purposes of enriching the datasets to support analysis. Crash and roadway inventory data are linked based on location code and/or latitude/longitude coordinates. Crash data are also linked to data files in the injury surveillance system, including EMS, emergency department, and hospital discharge data. A linkage to death certificate (vital records) data is being implemented beginning with 2010 data.

Quality Control Program

IDOT DTS has maintained an analysis-driven quality control program for crash data for many years; however, it lacks some components of a complete, formal quality program. Notable quality control steps that are in place include:

- Maintaining data entry timeliness so that feedback to law enforcement on individual crash reports is meaningful and can reasonably be expected to result in report corrections. Unfortunately, IDOT data entry staff does not generally reject reports containing errors. The task of error correction still falls mostly on the data entry staff because that has historically been part of the job and was the only reasonable approach back when data entry was delayed several months or longer.
- Publishing a comprehensive list of edit checks and data validation rules that all crash reports must meet. This list is incorporated into MCR and CIS data entry, and is provided to third-party vendors as part of the certification package required for them to meet IDOT's data submission requirements. The edits will be incorporated into the TraCS implementation as well.
- Noting errors during data cleansing steps for later use in feedback to law enforcement agencies, and consideration during updates to the form, edit checks, training, and instruction manuals. This process is not formalized to the point of being well-documented or targeted to problem agencies. The most significant change since 2006 in this area has been that many of the year-end data cleansing checks have been implemented as data entry edit checks so that the errors are caught earlier in the data management process.
- Auditing crash reports at an agency level by Chicago PD in cooperation with the Chicago Department of Transportation. This audit concentrated on a dozen critical data elements and resulted in a finding that as many as 90 percent of crash reports contained at least one error. This type of audit has not been conducted at the State level.
- Calculating standard measures of data quality for use in day-to-day management of the crash data component. These metrics are also supplied to stakeholders in a limited fashion. More could be done to make users and decision-makers aware of the data quality levels achieved in crash reporting.
- Obtaining error notations from users and applying appropriate corrections to the crash database. Analysts involved in grant-funded projects for IDOT DTS, as well as DTS analysts, make it a practice to provide error listings to the crash data managers who then make corrections to the data as appropriate.

The following data quality metrics were supplied in the response to the pre-assessment questionnaire.

<i>Performance Measure</i>	<i>Benchmark (CY2008)</i>	<i>CY2009 (actual)</i>	<i>CY2010 (projected)</i>	<i>CY2011 (projected)</i>
Average # days between the date the crash occurred and the date the official crash report was received by IDOT (all crash reports)	20.6 days	25.3 days	24.8 days	18.1 days
Median # days between the date the crash occurred and the date the official crash report was received by IDOT	15.5 days	17.7 days	17.3 days	11.6 days
Average # days to stat code the crash reports (all crash reports)	17.3 days	30.2 days	29.4 days	19.5 days
Median # days to stat code the crash	16.3 days	29.5 days	28.6 days	17.2 days
Average # days to location code the crash reports (all crash reports)	47.1 days	51.6 days	51.5 days	50.4 days
Median # days to location code the crash reports	40.5 days	76.8 days	76.6 days	74.2 days
LARS feedback to agencies	on demand	on	on	on demand
% of Crash Reports Electronically Filed	22.6%	27.8%	30%	60%
# of Crash Reports Electronically Filed	116,675	131,907	142,317	284,633
% of time “unknown” code is used in critical crash field* for a non-fatal crash at an agency level (data based on agencies submitting an average of 2 reports per month)	12.8%	10.7%	10.6%	9.1%
Integration with other databases+	8	9	11	11
<p>* Note: Critical crash fields for non-fatal crashes are defined as being: weather, light condition, traffic control device, traffic control device condition, road surface, vehicle type, vehicle usage, maneuver, driver apparent condition, driver date of birth, driver safety equipment used and driver airbag deployed.</p> <p>+ Note: MCR had integrations to CIS, GIS (roadway maps), SOS drivers, SOS vehicles, the commercial vehicle databases (SafetyNet/MCMIS) and Chicago PD</p>				

The above are the metrics reported by IDOT as part of the Section 408 grant process.

In addition, the CIS support staff calculated many of the metrics that were included in the pre-assessment questionnaire as examples. The results are presented in the following table based on 2009 data:

Timeliness	<ul style="list-style-type: none"> - # days from crash event to receipt for data entry on statewide database = <u>30.14</u> # days for manual data entry = <u>39.31</u> # days for upload of electronic data = <u>6.16</u> % reports entered into the system within 30 days of the crash = <u>39.82%</u> % reports aged more than 60 days = <u>2.27%</u>
Accuracy	<ul style="list-style-type: none"> % of crashes “locatable” using roadway location coding method = <u>100%</u> % VINs that are valid (i.e., match to vehicle record and decode) = <u>No current check for validity of VIN</u> % of interstate motor carriers “matched” in MCMIS = <u>100% - mismatches are researched and resolved</u> % crash reports with 1 or more uncorrected “fatal” errors = <u>These are corrected as part of the entry process.</u> % crash reports with 2 or more uncorrected “serious, non-fatal” errors = <u>These are corrected as part of the entry process.</u> % crash reports with 5 or more uncorrected “minor” errors = <u>These are corrected as part of the entry process.</u>
Completeness	<p><i>NOTE: in the assessment team’s judgment, the example metric is not relevant due to large drop in reporting due to the change in reporting threshold.</i></p>
Consistency	<ul style="list-style-type: none"> % of time “unknown” code is used in fields with that possible value = <u>10.72% (based on the critical crash field defined in example metrics above)</u> % logical error checks that fail = <u>No current check</u>
Completeness	<ul style="list-style-type: none"> % FARS/MCMIS match = <u>Estimated match is 98-99%.</u>

This response demonstrates the capabilities of CIS and the staff in DTS and the Bureau of Information Processing to evaluate the quality of the data. Many of the metrics supplied in the response are built into CIS and are calculated on a regular basis for use by the system managers. CIS also has a set of quality control screens that support regular reporting of quality metrics as well as review of the “problem of the day”—a special review aimed at identifying and correcting a selected error.

It should be noted that IDOT has an informal plan to transition the current data entry staff to quality assurance roles as the percentage of electronic data submissions rises. As the need for manual data entry wanes, the staff should be able to spend more time validating location information, and performing other data quality improvement tasks. These plans are somewhat vaguely defined at present, but it is clear that management is aware of the need for increased attention to data quality and hopes to transition the staff to fill this need as electronic reporting increases. A method for selecting crash reports and particular data elements (beyond location) for further attention will be required in order to make efficient use of this resource because the staff will not be able to perform quality control reviews of every crash report in the system.

Recommendations:

- ❑ Formalize the plan to transition current data entry staff to fulfill an expanded data quality improvement role in coordination with the increase in electronic data submissions. Particular tasks that the staff could perform include:
 - Review and correction of location information and location codes to achieve better accuracy and specificity.
 - Feedback to law enforcement agencies and officers regarding errors on individual reports.
 - Compiling error lists to formalize the link between data quality activities and training.
 - Review of reports targeted based on triggering events such as a short narrative, sparse diagram, logical inconsistencies, or past problems from that officer or agency.
 - Conducting periodic form-level audits based on a representative sample of reports.

- ❑ Formalize the quality control program. In particular, the following features of the current quality control program could be enhanced:
 - Feedback to law enforcement both on a case-by-case basis and reflecting aggregate analysis of error logs.
 - Tracking of reports returned for correction to ensure that they are resubmitted in a timely fashion.
 - Periodic audits of crash reports for logical consistency between the narrative, diagram, and the coded information on the form.
 - Development of additional data quality metrics to address various aspects of accuracy, completeness, and accessibility that are not fully measured now. Use of the Safety Data Mart should be included among the accessibility measures.
 - Data quality reporting to stakeholders including the Illinois Traffic Records Coordinating Committee, users of the Safety Data Mart, and safety decision makers who are using the crash data.

- ❑ Accomplish the implementation of electronic field data collection and reporting by the Chicago Police Department.

- ❑ Implement the TraCS replacement of MCR. Develop a more detailed implementation plan showing the month-by-month expected deployment by specific law enforcement agencies and the corresponding level of electronic data submission to be achieved.

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

<i>Timeliness</i>	<ul style="list-style-type: none"> - % of traffic counts conducted each year - # days from crash event to location coding of crashes - # days from construction completion to roadway file update
<i>Accuracy</i>	<ul style="list-style-type: none"> - % of crashes locatable using roadway location coding method - % errors found during data audits of critical data elements
<i>Completeness</i>	<ul style="list-style-type: none"> - % 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 State has demonstrated notable progress in the roadway component of the traffic records system since the 2006 traffic records assessment. Following are several improvements made to the roadway component since the 2006 report:

- The Illinois Roadway Information System (IRIS) was moved from a mainframe application to a SQL server database. The new database allows management of the system using the ArcGIS desktop editor improving data updates and accessibility to statewide roadway information.
- All State, county, and township roads are linked to GIS applications. Approximately 19,000 miles of municipal streets data from IRIS have been linked into GIS with 11,000 miles remaining to be linked to GIS. The project, when complete in 2012, will provide roadway information in a GIS format for all 140,000 miles of public roads in Illinois.
- Illinois Department of Transportation (IDOT) developed the External Safety Data Mart and Local Safety Analysis Tool to improve accessibility to roadway and crash information.
- IDOT created the Bureau of Safety Engineering to support local and state safety initiatives. The new unit directly supports the Highway Safety Improvement Program (HSIP), High Risk Rural Roads Program (HRRRP), implementation of the Highway Safety Manual (HSM), and the SafetyAnalyst software tool.

Description and Comments on Current Status

The highway transportation network in Illinois consists of 140,000 miles of public roads. State, county, township, and municipal governments own and operate the network according to the following jurisdictional mileage distribution:

16,057 mi. – State Roads
295 mi. – Toll Roads
16,482 mi. – County Roads
73,159 mi. – Township Roads
34,838 mi. – Municipal Streets

A core principle of managing these vast roadway infrastructure assets is to make resource allocation decisions based on quality information. The IDOT uses the Department's information systems to help make informed decisions regarding resource allocation to achieve its mission in providing mobility and safety to the motoring public. One of the primary data systems used by IDOT is IRIS.

The IDOT recently upgraded the system, moving all its data from the legacy main-frame platform into the new SQL server database. IRIS is comprised of a statewide, integrated database, applications, and automated tools. IRIS will provide the means of tracking and

managing Illinois' road inventory, associated assets, and attributes in a tabular, linear, and geospatial context.

The IRIS incorporates a database that provides universal enterprise data access, links geospatial data and business attributes to the roadway centerlines, and provides accessibility to users currently unable to retrieve critical roadway data. The core IRIS is intended to be the repository for several types of IDOT data. These data are stored in, and/or modified through, IRIS. They are: Roadway Inventory, Speed Zone, Highway Performance Monitoring System (HPMS) Reporting, Bridge Management System, and Pavement Management System.

IRIS currently maintains data for all public roads in Illinois and supports data-driven decision-making for all state and local safety programs.

With regard to its safety mission, IDOT conducts several major safety planning and programming functions. Some of these are the:

- Strategic Highway Safety Plan (SHSP)
- Highway Safety Improvement Program (HSIP)
- High Risk Rural Road Program (HRRRP)
- Rail Grade Crossing

The IDOT is the lead agency in the development and implementation of the SHSP. The SHSP is a comprehensive plan to improve safety in the State by identifying emphasis areas and listing safety strategies to reduce the number of fatal and serious injury crashes on the State's roadways. The SHSP serves as a planning guide to increase coordination and cooperation among state and local governments, law enforcement agencies, and planning organizations in developing safety programs and promoting highway safety on all public roads.

A multi-secretariat committee was formed to create, implement, and evaluate the SHSP. This committee's role is to ensure consistent communication and cooperation among all safety stakeholders into an integrated action plan. The purpose of the plan is to identify Illinois' key safety needs and guide investment decisions to achieve significant reductions in injuries and deaths on all public roads. The plan was developed in cooperation with federal, State, local, and private sector safety stakeholders. The following emphasis areas provide the substance of the SHSP:

- Alcohol and Other Impaired Driving
- Driver Behavior and Awareness
- Highway-Railroad Grade Crossings
- Information Systems for Decision Making
- Intersections
- Large Trucks

- Roadway Departure
- Safety Belts/Occupant Protection
- Vulnerable Users
- Work Zones

Issues for Consideration

The IDOT is further enhancing its safety planning and programming functions by including several analytic software tools suggested in the Highway Safety Manual. SafetyAnalyst has the capability not only to identify crash patterns at specific locations and determine whether those crash types are over-represented, but also to determine the frequency and percentage of particular crash types system-wide or for specified portions of the system (particular highway segment or intersection types). This capability can be used to investigate the need for system-wide engineering improvements (e.g., shoulder rumble strips on freeways) and for enforcement and public education efforts that may be effective in situations where engineering countermeasures are not. In order to use the full functionality of the SafetyAnalyst tool, additional roadway data elements such as curve information, lighting, roadside safety treatments, etc have been identified and should be included in IRIS. A research project has been proposed that will allow IDOT to capture this information. As this research project advances it should also consider data elements and attributes as described in the Model Inventory of Roadway Elements (MIRE) guideline.

As discussed previously, Illinois' SHSP identifies and implements safety strategies for ten emphasis areas as directed under the HSIP program. Illinois' HSIP program is used to implement infrastructure safety countermeasures on State and local roadways. As part of that program, IDOT analyzes crash and roadway data to identify the 5 percent list. This is made into a GIS layer and used with the other GIS information. In addition, IDOT has analyzed data and developed Safety Performance Functions (SPFs) and calculated Potential Safety Improvement (PSI) numbers for all of its state routes. This allows Illinois to identify those roadway segments that are poor safety performers and develop projects to address these locations.

IRIS currently collects and manages center line data for all public roads in Illinois. For most facilities this is sufficient; however, where highway rights-of-way include multiple roadways such as freeways and divided highways, directional data for each of the roadways are not available. IDOT should consider expanding the data collection and management processes to include data elements on these directional roadways.

Applicable Guidelines

The Highway Performance Monitoring System (HPMS) is a national guideline adopted by IDOT to report to FHWA certain road data on federal aid roads.

IDOT has been proactive in accepting and implementing the Highway Safety Manual. In conjunction with the implementation, IDOT should also consider the data elements suggested in the Model Inventory of Roadway Elements (MIRE) guideline.

Data Dictionary

The IRIS manual and data dictionary is available on the internet at <http://www.dot.il.gov/iris/aTable.html>.

Process Flow

Process flow diagrams are not available, but processes are described in the IRIS procedural manual.

Interface with other Traffic Records System Components

IRIS provides integration with the roadway and crash data systems. IDOT’s roadway information does not interface with any of the other Traffic Records System components.

Quality Control Program

The following table presents examples of quality control measurements for roadway data provided by the Office of Planning and Programming of IDOT.

<i>Timeliness</i>	- <i>Traffic cycle of every 2 years on State routes, every 5 years on non-State routes consistently performed</i>
<i>Consistency</i>	- <i>IRIS manual defines collection process and individual field definitions and responsibilities. Annual meetings are held with Road Inventory staff for training, discussion of roadway issues, and new uses of technology.</i>
<i>Completeness</i>	- <i>100% of State system counted within 2 cycles (except routes under construction during the traffic count period)</i> - <i>100 % of public roadways are in the inventory. New alignments or subdivision are added throughout the year.</i>
<i>Accuracy</i>	- <i>Edit reports run and corrections made when possible errors are identified and investigated. Information available to the general public and local agencies to comment content.</i>
<i>Accessibility</i>	- <i>Roadway data available in GIS files and publications found on IDOT’s website. Intranet applications open to all IDOT staff to view roadway, traffic, and photo log of roadways.</i>
<i>Data Integration</i>	- <i>All Roadway data which are tied to GIS are available to other GIS applications. Roadway data directly tied to PPS (Planning and Programming system), Structure system (ISIS). The new Roadway application being on a SQL server platform increases the ability of easier linkage as needed in the future.</i>

NHTSA recently published the *Model Performance Measures for State Traffic Records Systems* document. The document identified 61 model performance measures for the six core State traffic records data systems—crash, vehicle, driver, roadway, citation/adjudication, and EMS/injury surveillance. The State should review its roadway information quality control

program as a base to determine future progress and improve the timeliness, accuracy, consistency and completeness of the IRIS database.

Recommendations:

- Include directional road inventory information in IRIS for freeway and divided facilities.
- Continue the development and implementation of the SafetyAnalyst and HSM tools.
- Evaluate the additional data requirements of the SafetyAnalyst and HSM tools and consider adding the data to the IRIS database based on MIRE guidelines.
- Review the IRIS quality control measures to improve the timeliness, accuracy, consistency, and completeness of roadway features.

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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Driver Addresses (location code, coordinates)
Driver Linkages to Crash Information	<ul style="list-style-type: none"> - Driver License Number - Personal Identifiers (name, address, date of birth, etc.)
Driver Linkages to Statewide Injury Surveillance System Information	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - % of duplicate records for individuals - % “errors” found during data audits of critical data elements
Completeness	<ul style="list-style-type: none"> - % drivers records checked for drivers moving into the State - % of driver records transferred from prior State
Consistency	<ul style="list-style-type: none"> - % 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

Description and Contents

The Illinois Secretary of State's (SOS) Office of Driver Services Department (DSD) reports that there are over 8.8 million licensed drivers, including 460,728 commercial vehicle licensees. The DSD has 137 offices located throughout the state. In addition to the driver's license, they also issue permits and state identification cards.

Information contained for each person licensed includes the personal identification, driver's license number, license type, license status, and crash involvement history. The driver license number is an alphanumeric identifier that includes the driver's name, date of birth, and gender encoded in it.

Applicants from another state surrender their license from the previous jurisdiction but their prior convictions on record from that State are not retained on the new Illinois license record. While the previous state of the license is initially retained on the driver record, it is only retained through the first four-year period.

The driver's license is issued over-the-counter upon completion of appropriate requirements for an initial application or renewal.

Illinois has a successful graduated licensing law (GDL) and provides comprehensive information about the program on its website. A preliminary report has revealed a 50 percent drop in fatalities between 2007 and 2009 among the GDL age group.

The information in the driver record file supports the function of license issuance and driver control.

Data Input

Currently, 90 out of 102 counties report traffic convictions electronically to the DSD. The remaining counties still are submitting the convictions in paper form.

Courts do have the discretionary authority to divert convictions from being entered on a driver's record for attending a driver improvement school or performing community service. This action is described as court supervision and is not considered a conviction on the driving record with the exception of commercial driver's license holders in order to comply with federal regulations.

All crashes involving an injury, fatality, or property damage exceeding \$1,500 are posted to the driving record. If a conviction should result from crash involvement, the two items are not currently able to be linked on the driver record.

Crash involvement is used to determine compliance with the Illinois financial responsibility law. The Illinois Department of Transportation (IDOT) will certify uninsured crashes to the DSD for suspension under the financial responsibility provisions. Previously, it took the DSD two weeks to process these files. The DSD has reduced the time to mail the suspension notices to five days.

The DSD indicated that, upon request, they are able to generate specialized data reports from the driver record file.

Applicable Guidelines

The DSD maintains the driver information to interact with National Driver Register (NDR) via the Problem Driver Pointer System (PDPS) and the Commercial Driver License Information System (CDLIS). The DSD uses the American Association of Motor Vehicle Administrators (AAMVA) Code Dictionary to assure data exchanges within these systems. In addition, the DSD now employs facial recognition software on all new applicants as a measure to prevent individuals from obtaining multiple licenses and identity theft.

Data Dictionary

The DSD indicated that they did not have a current data dictionary document for the driver record file. They explained that the only one known to exist was too out-of-date and did not define each data field and there were no specified values for each file.

Process Flow

No process flow diagram was provided for this assessment. The DSD did indicate that they had some documentation on the process flow starting with the license application to when the license was actually issued. However, it does not carry through the process to show how it is updated to the driver license (DL) database, how errors are handled, etc. They reported that the Information Technology Department indicated that the existing process flow diagram was out-of-date and would not be helpful.

Interface With Other Traffic Records System Components

Vehicle Component:

The Vehicle Services Department (VSD) program validates the driver's license number (DLN) when performing an online name change or a DLN change; when performing an online Title or Registration transaction; and through the website (www.cyberdriveillinois.com) when a customer utilizes the "Pick-a-Plate" program to order a personalized or vanity style license plate. This validation check confirms that the entered DLN, in fact, exists in the driver's license database.

Citation Component:

Some law enforcement agencies use the Law Enforcement Agency Data System (LEADS) to populate fields in the existing electronic citation process. The LEADS obtains the name and address from the DSD database.

Adjudication Component:

Two times per year, adjudication agencies can request a data file from the DSD office for DL records that have a county code for their county and surrounding counties to obtain the name and address of those drivers to populate their own database.

Currently, 105 of the 107 adjudication agencies have online direct access to the driving records through the direct inquiry system. They are able to print the DL history records.

Crash Information:

The driver's license contains a bar code that can be used in e-crash and e-citation applications as they are implemented. With the appropriate bar code reader technology the appropriate fields on electronic forms can be populated.

Quality Control Program

There is a formal program of error/edit checking as data are entered into the driver file. The DSD programs have built-in edits to allow/disallow entry to the various fields. Errors are flagged immediately on terminals or in the form of error reports/cards the following day.

The lead operators monitor error cards/reports daily and if a pattern is detected, management is immediately notified. Management uses this information to conduct additional training, to update procedures, and to request additional programming or enhancements.

Quality Control Measurement for Driver Data

Timeliness

Average time from accepting application to create a new driver record	instantly
Average time to mail license to driver from time of application	over-the-counter
Average time to post convictions after receipt at DMV	10 days
Average time to forward dispositions from court to DMV	5 days

Accuracy

% of duplicate records for individuals requiring attention	2%
Frequency of audits to assure data quality	daily
% of errors found during audits of critical elements	3%

Completeness

% of records checked for drivers moving into the state	100%
% of requested from prior state	100% of CDL only
% of driver records received from prior state	N/A
% of immigration documents verified online	100%
% of non-CDL violations reported from other states added to driver history	98%

Recommendations

- Pursue authorization to allow previous traffic conviction history to be retained for new license applicants moving to Illinois from another State.
- Create a current data dictionary and flow process diagram for the existing driver record file data.

- Make driver history data available for use in safety analysis and linkage to other traffic records components.

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	<ul style="list-style-type: none"> - Location (street address, description, coordinates, etc.) - Personal ID (name, address, DL number, etc.)
Vehicle Linkages to Roadway Information	<ul style="list-style-type: none"> - Owner Addresses (location code, coordinates)
Vehicle Linkages to Crash Information	<ul style="list-style-type: none"> - Vehicle Identification Number - Personal Identifiers (name, address, date of birth, etc.)
Vehicle Linkages to Statewide Injury Surveillance System Information	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Average time for DMV to post title transactions - % title transactions posted within a day of receipt
Accuracy	<ul style="list-style-type: none"> - % of duplicate records for individuals - % errors found during data audits of critical data elements - % VINs successfully validated with VIN checking software
Completeness	<ul style="list-style-type: none"> - % 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

Description and Contents

The Illinois Secretary of State's (SOS) Vehicle Services Department (VSD) administers the title and registration of motor vehicles within the state. The vehicle record system contains 23 million title records. Intrastate commercial vehicles are included in the registration database, while interstate commercial vehicles are registered under the State's Interstate Registration Plan (IRP). The IRP is a separate stand-alone database. The information on all vehicles, private and commercial, is consistent with the American Association of Motor Vehicle Administrators (AAMVA) recommended guidelines.

Data included in the vehicle records include the identification and ownership of vehicles within the state. Data also includes vehicle make, model, year of manufacture, body type, and vehicle history (including odometer reading for vehicles ten years old or newer) in order to produce the information needed to support analysis of vehicle-related factors that may contribute to the State's crash experience.

Applicable Guidelines

The VSD records appropriate indicators such as stolen and salvage in the title and registration records. The National Motor Vehicle Title Information System (NMVTIS) facilitates such exchanges. In 2006, the Traffic Records Assessment included a recommendation that Illinois join that association. Illinois is the only state that is not a member of NMVTIS. The VSD is a member of AAMVA and the IRP.

Data Dictionary and Process Flow

Information regarding a data dictionary and a process flow diagram was not available for this assessment.

Interface with Other Traffic Records System Components

The information from the VSD's vehicle title and registration records system currently supports unique inquiries regarding individual records from law enforcement and inquiries required for the Fatality Analysis Reporting System (FARS). With the continuing development of electronic citations and crash reports, it is essential that vehicle records data be easily accessible to allow the electronic transmission of data to populate the information fields contained on these forms.

Officials from the VSD are members of the Traffic Records Coordinating Committee (ITRCC). The vehicle file cannot yet be linked with the driver file but some efforts have been undertaken since the previous assessment. The driver record file is accessible to the VSD.

Recommendations

- Become a full participating member of the National Motor Vehicle Title Information System to benefit by the automatic and instantaneous data transfer and authentication of vehicle titles coming into Illinois from all other states.

- Add a bar code on the vehicle registration document that contains owner information, make, model, year and vehicle identification number to facilitate the electronic transfer of vehicle information to other traffic record systems.
- Continue to develop guidelines for vehicle ownership name and address information that is identical to the driver record information requirements to facilitate future data file linkage of driver and vehicle ownership.
- Make up-to-date vehicle records data dictionary and process flow diagrams available for other traffic record users.

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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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

<i>Timeliness</i>	<ul style="list-style-type: none">- Average time for citations to be sent from LEAs to courts- Average time for convictions to be sent to DMV
<i>Accuracy</i>	<ul style="list-style-type: none">- % errors found during data audits of critical data elements- % violations narratives that match the proper State statute
<i>Completeness</i>	<ul style="list-style-type: none">- % of cases with both original charges and dispositions in citation tracking system
<i>Consistency</i>	<ul style="list-style-type: none">- % 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

Description and Contents

Traffic violations in Illinois are adjudicated by a Circuit Court in one of 23 judicial circuits. An elected Circuit Clerk for each of Illinois' 102 counties manages the Circuit Courts within that county. The Circuit Clerk is responsible for selecting an automated case management system for the courts in that county; there are 12 different systems that are utilized by the various counties within the state.

Because of the large number of case management systems in use throughout the state, there is limited information sharing among courts. Some courts share case information through the computer database known as Judici, and there are some other limited information sharing initiatives either in progress or under discussion. To the limited extent that court information is shared, it may be possible to view historical or pending case data from another jurisdiction. However, in many cases, historical and pending case data from other jurisdictions is not available.

Illinois has an approved Uniform Citation and Complaint Form used by all law enforcement agencies within the State, except for Chicago and the surrounding Cook County suburbs. Law enforcement agencies within the Chicago area use a different form. The uniform citation form contains violator information, charge, court of jurisdiction, court date, and final disposition. The Chicago form contains this information as well.

Citation forms are independently produced by each law enforcement agency. Each agency has the responsibility for tracking and ensuring accountability with respect to its own citations. Many agencies have their own citation tracking systems that fulfill this function. These tracking systems record each citation and some agencies reported policies that require that missing citations be accounted for by the officer to whom the citations were assigned. Note that there is no statewide citation file, and therefore no mechanism for tracking citations at the State level.

While there are a few electronic citation initiatives that are active around the State, generally most jurisdictions issue paper citations. There are also electronic citation initiatives that are currently being considered, including a larger effort involving the Illinois State Police in five counties. Additionally, with the State-level adoption of Traffic and Criminal Software (TraCS), it is anticipated that a TraCS electronic citation implementation will eventually be available. While some effort needs to be devoted to a common schema for transmitting electronic citations to the courts, the court case management systems are already technically capable of receiving electronic records as these electronic citation systems are deployed.

Paper citations are filed with the court by law enforcement by delivery of appropriate paper copies of the citation signed by the officer, along with the appropriate bond. In most cases, these citations are entered into the court case management system by court personnel. In some localities, the court case management systems are networked with law enforcement systems and the citations may be electronically transferred from the police agency and validated by court personnel who hold copies of the filed paper citation.

Court dispositions are filed with the Secretary of State's (SOS) office to be included as part of the driver history record. Dispositions that are filed include traffic and some convictions and all traffic dispositions for court supervisions, including major offenses (e.g., DUI). Acquittals, *nolle prosee* cases, dismissed cases, and other minor traffic violations are not required to be reported to the SOS Office as provided in Section 6-204(a) of the Illinois Vehicle Code.

Regarding convictions, approximately 90 of 102 counties file these dispositions electronically via the Administrative Office of Illinois Courts (AOIC), which acts as an electronic clearinghouse. The AOIC forwards the electronic conviction records to the SOS and to the issuing police agency daily. Counties with populations greater than 300,000 may electronically file their dispositions directly with the SOS office. Of the five counties with populations greater than 300,000, only Cook and DuPage report directly. Lake, Kane, and Will Counties report via the AOIC ADR program. In addition, in some localities, dispositions are also electronically transferred to the issuing police agency. The remaining seventeen counties do not file convictions and supervisions electronically, but forward a copy of the paper citation to the SOS that is marked with the disposition information.

There is no statewide file that contains information on all citations issued. The SOS driver history only contains information on traffic convictions (including some criminal violations) and all traffic supervisions, as noted above. The court case management systems are individual silos, containing information on all citations issued within the jurisdiction of a particular system. The police agency records management systems similarly only reflect the citations associated with a particular agency. A TraCS implementation at the state level may eventually provide a statewide citation tracking system, but attention will need to be given toward ensuring that other non-TraCS electronic citation systems are able to contribute to this central repository.

Applicable Guidelines

The National Information Exchange Model (NIEM) guidelines are potentially applicable to the electronic exchange of citation information if electronic citations become ubiquitous within the state.

Data Dictionary

A data dictionary, code tables and appropriate business edits have been developed for the citation within the various court case management systems.

Process Flow

Paper citations are physically delivered from the issuing agency to the court of jurisdiction. Once the citations are adjudicated, the dispositions for most jurisdictions are recorded in the court case management system and then electronically reported to the AOIC, which in turn electronically reports them to the SOS driver history file. For the remaining jurisdictions, paper copies of the citations with the dispositions noted are sent to the SOS office for entry into the driver history file.

Interface with other Components of the Traffic Records System

There is an interface between the court case management systems and the AOIC disposition reporting system, as well as an interface between the AOIC disposition reporting system and the

SOS driver history file. In addition, for some localities, there are interfaces between police agency records management systems and the court case management system.

Quality Control Program

No Quality Control measures were submitted.

Recommendations

- Encourage and assist all jurisdictions in electronic reporting of dispositions to the Administrative Office of Illinois Courts for further electronic transfer to the Secretary of State's office.
- Develop a statewide electronic citation application using TraCS that can be made available to police agencies not procuring independent commercial solutions.
- Establish a Statewide citation tracking system that would include all citations within the State and their dispositions—which would include convictions as well as non-convictions.
- Promote and assist all local police agencies in electronically generating citations and reporting them to the courts and to any future Statewide citation tracking system.
- Develop XML data standards to support data exchange with electronic citation systems, court case management systems, the Secretary of State's driver history file and police records management systems, as well as any future Statewide citation tracking 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

<i>Linkages Internal to the SWISS data on injury and healthcare treatments/outcomes</i>	<ul style="list-style-type: none"> - Patient name - Patient ID number - EMS run report number - Social Security Number
<i>Linkages between SWISS data and Crash Data</i>	<ul style="list-style-type: none"> - Personal Identifiers: Name, address, date of birth (direct linkage) - CODES linking variables (probabilistic linkage) - EMS run report number - Crash Report Number
<i>Linkages between SWISS data and other (non-Crash) components of the traffic records system</i>	<ul style="list-style-type: none"> - 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

<i>Timeliness</i>	<ul style="list-style-type: none"> - Average time for EMS run reports to be sent to governing agency - % EMS run reports 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
<i>Accuracy</i>	<ul style="list-style-type: none"> - % 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
<i>Completeness</i>	<ul style="list-style-type: none"> - % 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
<i>Consistency</i>	<ul style="list-style-type: none"> - % 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) 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.

Integration of injury surveillance data with other State traffic records system components benefits all organizations involved. Motor vehicle crash data supply much of the pre-event and event information used by the Haddon Matrix for injury prevention program planning activities. In a comprehensive traffic records system, data related to all EMS, outpatient care, and hospital admissions resulting from a motor vehicle crash may be used to quantify the severity and cost of the crash as well as the long-term outcomes associated with any resulting injuries. Providing traffic safety program coordinators and engineers with medical outcomes of motor vehicle crashes enables them to more accurately identify the level of crash severity beyond the typical five-point scale utilized on most crash reports.

Current Status

With the inclusion of data for emergency department visits in 2009, Illinois now has all of the primary components of a comprehensive injury surveillance system defined in the *Advisory* in place. These components include a pre-hospital data collection system, trauma registry, emergency department database and hospital discharge database. The trauma registry and EMS datasets are managed by the Division of Emergency Medical Services and Highway Safety in the Illinois Department of Public Health (IDPH). ED and hospital discharge data are managed within the IDPH Discharge Data Program, Division of Patient Safety and Quality, Office of Policy, Planning and Statistics. Vital statistics data are managed by the Division of Vital Records in the IDPH. In addition, the Department also manages a registry for all head and spinal cord injuries occurring in the State.

Beginning in April of 2011, all EMS agencies in the State will begin reporting pre-hospital data using a NEMSIS 2.2.1 Gold-compliant format. For the last several years, the Statewide EMS database has been limited by agencies using third-party software packages that were not compliant with the reporting standard that had been in place. As a result, only approximately 60 percent of the total EMS reports were available to the state. Most notably, data were not available for the City of Chicago and several of its 'collar' counties. The newly implemented system will begin to restore data from those missing areas and agencies and allow the IDPH to provide statewide data for pre-hospital care reports.

Illinois has participated in the Crash Outcome Data Evaluation System (CODES) since 2005. Limitations with Statewide availability of EMS data restricted initial efforts to successfully link crash and injury data for use in the project. With the inclusion of emergency department data in 2009 and the recent requirement of E-Codes in hospital discharge and emergency department

datasets, the CODES program has been able to improve the use of linked crash and injury data in generating reports for NHTSA and the State's traffic safety programs.

Emergency Medical Services (EMS)

The Division of Emergency Medical Services (DEMS) resides in the IDPH. Illinois is divided into 11 EMS regions which are comprised of 62 EMS administrative units (systems) for oversight and reporting purposes. There are currently 661 agencies and over 55,000 licensed First Responders and Emergency Medical Technicians who respond to an estimated one million service calls annually. In April of 2010, Illinois instituted a NEMSIS Gold-compliant EMS data collection system. Data specifications necessary to meet the new reporting requirements were provided to the State's EMS agencies. Electronic data submitters who are using third-party software must begin using the new reporting standards by April 29, 2011. A web-based reporting option through EMS Data Systems, Inc. was piloted in two of Illinois' EMS regions before going statewide in November of 2010. The development of this system was supported by the Illinois Traffic Records Coordinating Committee (ITRCC) through the use of Section 408 funds.

Applicable Guidelines

Under Illinois Administrative Code, 'a run report shall be completed by each vehicle service provider for every emergency pre-hospital or inter-hospital transport and for refusal of care'. Run report data for transports are submitted to their resource hospital. Data will then be compiled and submitted to the IDPH on a quarterly basis. Non-transport vehicle providers are not required to complete a run report but must document all medical care provided and submit that information to their EMS System within 24 hours.

Data Dictionary

The new reporting system is a NEMSIS 2.2.1 Gold-compliant dataset and contains the National Data Elements along with the ability for each agency to add additional elements as needed. The data dictionary is available from the NEMSIS website.

Process Flow

Ideally, EMS data are submitted by the provider to its local system and then to IDPH using one of three channels:

1. Paper forms are sent by mail or hand delivered to the IDPH and scanned into the database,
2. Multiple-record electronic files generated by several different third-party software packages are uploaded to the State database through a secure website accessible to the submitting organization, or

3. Electronic records generated by State-provided or third-party software are automatically uploaded to the State database by the individual agency.

The typical processing delay for paper forms is currently four to five months from incident to availability on the State system. Electronic files provided by third-party vendors range from 45 days to 105 days depending on whether the agency is on a monthly or quarterly reporting schedule. The new NEMSIS-compliant software package available from the State has the capability of uploading files upon completion provided a wireless internet connection is available.

EMS agencies using third-party software can access their data through applications provided by their software vendor. Requests for data analysis may also be made directly to the IDPH. Historically, requests have been received from EMS providers, EMS systems, and other entities for a variety of purposes, including the evaluation of protocols at the local and system levels. Examples of data requests include such topics as response time, AED coverage for cardiac calls, and responses that are associated with underage alcohol use. The release of record-level data containing protected health information requires a data sharing agreement that can be obtained through the IDPH Data Release and Research Committee.

The DEMS is in the process of finalizing a data sharing agreement that will allow transfer of Illinois EMS data to the NEMSIS database.

Interface with other Traffic Records System Components

IDPH has provided information to the Illinois Department of Transportation (IDOT) for integration purposes under a data sharing agreement. Due to completeness issues, EMS data has not been integrated with other traffic system components since 2005. However, it is anticipated that EMS data may once again be linked to other traffic record components as the new data collection system matures. The IDPH EMS data program administrator actively participates in the ITRCC and has offered his assistance in the use of EMS data for linkage activities.

Quality Control

The data system uses point-of-entry error checking for electronically submitted data. Error checks for paper forms are performed as they go through the scanning process. Rejected records are returned to the local agency for correction. The new web-based system contains an online validation tool with many consistency checks. Before submitting data to the State, agencies must complete a validation process established by DEMS. Data are not accepted from agencies that have not successfully completed this process.

The following table was provided in the responses to the pre-assessment questionnaire.

Selected Quality Control Measurements for the EMS System

Timeliness Note: State Administrative Rules allow 90 days for data submission	- % EMS reports sent to governing agency within 10 days of incident	Approximately 5% (this will increase as more submitters adopt the software supplied by the state, which only recently became available)
	- % EMS run reports sent to governing agency within 30 days	Approximately 10-15%
Accuracy	- % "missing" found during data audits of critical data elements	Elements such as unit utilization times, incident date and county, call disposition and responding agency are close to 100% complete.

Emergency Department Data and Hospital Discharge Data System

The Illinois Hospital Association (comprised of 226 hospitals within the State) collects uniform information on approximately 1.6 million hospital discharges per year. It contains some demographic characteristics of hospitalized patients as well as principal conditions associated with their hospitalization, major medical procedures, hospitalization outcomes and charges. In 2008 the reporting of E-Code data was made a requirement of the data collection system. Data collected by the Hospital Association are provided to IDPH for management and analysis. Beginning in 2009, data collected from approximately five million annual emergency department visits was added to the dataset provided to IDPH. The inclusion of hospital ambulatory care data will allow safety analysts to provide a more complete picture of the extent of motor vehicle injury in Illinois.

Applicable Guidelines

Data on inpatient hospital discharges and emergency department visits are collected by all State-certified hospitals and submitted to the Illinois Hospital Association and IDPH in accordance with Illinois Administrative Code.

All hospital data are collected using the UB04 standard as established by the National Uniform Billing Committee and the American Hospital Association. Inclusion of E-Codes became a requirement in 2008 (hospital discharge) and 2009 (emergency department). It is estimated that up to 80 percent of applicable records include an E-Code in one of the available fields.

Data Dictionary

Complete data dictionaries for hospital discharge and emergency department data are maintained by the IDPH and the Hospital Association. A user manual and data dictionary for a subset of hospital discharge data are maintained online by the Illinois Emergency Medical Services for

Children (EMSC) program and are available on the EMS Data Reporting System website. Data collected include patient demographics, ICD-9 codes, E-codes, hospital charges and payer information. E-codes are encouraged, but are not mandatory in the hospital data system for hospitalizations with a primary diagnosis ICD-9 code between 800 and 959.9 which denote an injury case.

Process Flow

Since 2009, data are collected on all inpatient and emergency department visits to those hospitals which provide data to the Hospital Association. Data is then provided to IDPH on a quarterly basis.

Interface with other Traffic Records System Components

Data are provided to the Illinois CODES project on an annual basis for linkage with crash and trauma registry data.

Quality Control

The data collection software at each participating hospital has business rules integrated into the system to prevent incomplete or invalid records. IDPH staff periodically check the dataset for completeness, particularly for the presence of valid E-Codes. No other quality control metrics were provided for this assessment.

Trauma Registry

The IDPH collects and maintains trauma registry data for the State. There are 62 hospitals designated as trauma centers (58 in Illinois and four in bordering states) that provide data on approximately 43,000 patients annually to the registry system. These trauma centers are designated by the State as Level I (19 hospitals) and Level II (43 hospitals). Three of these hospitals also serve as pediatric trauma centers.

Applicable Guidelines

The Illinois Administrative Code sets uniform reporting requirements for designated hospitals. Trauma centers must submit data to IDPH on patients who (a) sustain traumatic injuries that require treatment at a trauma center who are subsequently admitted to that center; (b) are transferred to a trauma center by another facility for more definitive care of their injuries; or (c) are dead-on-arrival or die in the emergency department. Collection of E-Codes is required in the trauma registry data.

Data Dictionary

A complete data dictionary for the trauma registry is maintained by the IDPH. A subset of variables and their definitions are available for querying online at the EMSC website. Trauma registry data from 42 of the trauma centers are voluntarily reported to the National Trauma Data Bank.

Process Flow

Data for patients meeting trauma registry criteria are entered into a web-based data collection system and submitted quarterly to the IDPH. Annual datasets are generally available six months after the close of the calendar year.

Interface with other Traffic Records System Components

Trauma registry data have been used by the CODES program for linkage with hospital discharge and crash reports. In particular the presence of a valid E-Code (estimated at 95 percent) has been beneficial in accurately identifying persons injured as the result of a motor vehicle crash.

Quality Control

The web-based data collection system contains a completeness check with a nine-field approval process, including E-Code, before the data can be submitted.

The following table was prepared based on information provided during the assessment:

Selected Quality Control Measurements for the Trauma Registry Data

Timeliness	- Number of days from trauma center discharge until data is entered into state database	Data are provided quarterly to IDPH
	- Number of days from end of quarter/year until data is available for analysis on a state level.	Data are typically available by June of the following year
Accuracy	- % “missing” found during data audits of critical data elements	Typically no elements are missing. Nine fields are checked for completeness before submission. The IDPH also validates the data before accepting the data file.
Completeness	- % of trauma registry records containing a valid E-Code	95-100%

Division of Vital Records (DVR)

Applicable Guidelines

Illinois State law mandates that all death certificates be filed with the IDPH. These records are typically filed by funeral home directors with pertinent medical information completed by an attending physician. Death certificates are sent to the local registrar who then forwards them to the IDPH, Division of Vital Records (DVR).

Data Dictionary

The data dictionary is maintained by the DVR. As with the other injury surveillance systems, a limited querying system is available at the EMSC website along with a brief description of the data elements used. Similar to other States, all cause of death information is classified in

accordance with the ICD-10 standard and E-Codes are included for mechanism of injury information.

Process Flow

Death certificates for all persons who die in Illinois, and for those residents who die in other States are submitted to the DVR for entry into the data system.

Interface with other Traffic Records System Components

Vital statistics data are available for integration with other traffic records components through the CODES program. The dataset contains several personal identifiers that are useful in providing accurate linkages with other systems.

Quality Control

Quality and validation checks occur at the data entry level. Records with missing or incorrect data are returned for correction. No performance measures were submitted.

Crash Outcome Data Evaluation System (CODES)

Illinois has been a part of the CODES program since 2005, with IDOT managing and conducting the data linkage and analysis for NHTSA and the State.

Analysts within the Illinois Department of Transportation (IDOT) have successfully integrated crash, EMS, and hospital data for calendar years 2002, 2003, and 2005. Incomplete statewide EMS data for the subsequent years affected the ability of the analysts to obtain a Statewide dataset. During those early years, the trauma registry dataset was used to augment missing E-Codes in the hospital discharge data.

Several recent improvements in data collection and quality have revitalized the CODES program. First, the addition of emergency department data was able to fill in the missing piece of information regarding those persons involved in a motor vehicle crash but not admitted to a hospital. Second, the requirement of adding a valid E-Code to all hospital records provided a more accurate method to subset the population of injured persons prior to linkage. Third, the revision of the EMS data collection system will, over the coming months, provide more complete Statewide data on pre-hospital care reports. Linkage between crash, trauma registry, emergency department, and hospital data is now underway for 2009 data. Recent test linkages have reportedly been very successful.

Analysts at IDOT, along with other partners, have produced a multitude of reports that focus on traffic safety program areas. CODES data have been used to support legislative activities, especially in the area of occupant restraint. It is very encouraging to see CODES partners and other state agencies promoting the use of those data because such support is crucial for future sustainability of the program.

Recommendations:

- Develop incentives for EMS agencies to improve compliance with current reporting requirements.
- Continue and expand CODES data linkage and analysis activities through the inclusion of the new EMS database and other traffic records components, notably driver history, licensing, and registration.

APPENDIX A

SELECTED REFERENCES

- AASHTO Strategic Highway Safety Plan. Dec. 2004. American Association of State Highway and Transportation Officials. 20 Mar. 2006 <<http://safety.transportation.org/doc/Safety-StrategicHighwaySafetyPlan.pdf>>
- Administrative Ruling #119. n.d. Federal Motor Carrier Safety Administration. 20 Mar. 2006 <<http://www.fmcsa.dot.gov/documents/adminrule.pdf>>
- Anti Car Theft Improvements Act of 1996. 3 Jan. 1996. American Association of Motor Vehicle Administrators. 20 Mar. 2006 <<http://www.aamva.org/Documents/vehAntiCarTheftImprovAct1996.pdf>>
- Bahar, G., M. Masliah, C. Mollett, and B. Persaud. Integrated Safety Management Process (NCHRP Synthesis 501). 2003. Transportation Research Board. 17 Mar. 2006 <http://trb.org/publications/nchrp/nchrp_rpt_501.pdf>
- Branding Best Practices. Sep. 2002. American Association of Motor Vehicle Administrators. 17 Mar. 2006 <<http://www.aamva.org/Documents/vehBrandingBestPractices.pdf>>
- Business Partner Electronic Vehicle Registration. n.d. American Association of Motor Vehicle Administrators. 17 Mar. 2006 <http://www.aamva.org/vehicles/veh_AutoSystBPEVROverview.asp>
- Conference Proceedings on Intersection Safety: Achieving Solutions through Partnerships. *The Toolbox on Intersection Safety and Design: Data Collection and Analysis for Improved Operations*. March 2004. Irvine, California
- Council, F. Report to the Committee for Review of the Federal Motor Carrier Safety Administration Truck Crash Causation Study. 4 Sep. 2003. Transportation Research Board. 17 Mar. 2006 <http://trb.org/publications/reports/tccs_sept_2003.pdf>
- Data Element Dictionary for Traffic Records Systems (ANSI D20-2003). Apr. 2003. American Association of Motor Vehicle Administrators. 17 Mar. 2006 <http://www.aamva.org/Documents/std2003_ANSI_DICTIONARY_FINAL.pdf>
- Defining Compacts: Jurisdictional Agreements. 28 Oct. 2004. American Association of Motor Vehicle Administrators. 17 Mar. 2006 <http://www.aamva.org/drivers/mnu_drvCompacts.asp>
- DeLucia, B.H., and R.A. Scopatz. NCHRP Synthesis 350: Crash Records Systems: A Synthesis of Highway Practice. Jan. 2006. Transportation Research Board. 17 Mar. 2006 <http://trb.org/publications/nchrp/nchrp_syn_350.pdf>
- Depue, L. Safety Management Systems (NCHRP Synthesis 322). 2003. Transportation Research Board. 17 Mar. 2006 <http://trb.org/publications/nchrp/nchrp_syn_322.pdf>
- DL/ID Card Design Specifications. 26 Sep. 2003. American Association of Motor Vehicle Administrators. 20 Mar. 2006 <http://www.aamva.org/IDSecurity/idsCardDesignSpecifications_UID7.asp>

- DL/ID Security Framework. Feb. 2004. American Association of Motor Vehicle Administrators. 20 Mar. 2006
<http://www.aamva.org/Documents/idsAAMVASEcurityFramework_Feb2004.pdf>
- DL/ID Standard. 6 Jun. 2005. American Association of Motor Vehicle Administrators. 20 Mar. 2006 <<http://www.aamva.org/standards/stdAAMVADLIdStandard2000.asp>>
- Driver Record Information Verification System (DRIVERs). 24 Jan. 2006. American Association of Motor Vehicle Administrators. 17 Mar. 2006
<http://www.aamva.org/drivers/drv_AutomatedSystemsDRIVERs.asp>
- DUI Tracking System Pilot Program, Federal Register (Volume 69, Number 116). June 17, 2004. National Highway Traffic Safety Administration. 20 Mar. 2006
<<http://a257.g.akamaitech.net/7/257/2422/06jun20041800/edocket.access.gpo.gov/2004/pdf/04-13611.pdf>>
- Fekpe, E.S., T. Windholz, K. Beard, and K. Novak. Quality and Accuracy of Positional Data in Transportation (NCHRP Report 506). 2003. Transportation Research Board. 20 Mar. 2006 <http://trb.org/publications/nchrp/nchrp_rpt_506.pdf>
- Finison, K.S. Standardized Reporting Using CODES (Crash Outcome Data Evaluation System). Apr. 2000. National Highway Transportation Safety Administration. 17 Mar. 2006
<<http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/CODES/809-048.pdf>>
- Gabler, H.C., D.J. Gabauer, H.L. Newell, and M.E. O'Neill. Use of Event Data Recorder (EDR) Technology for Highway Crash Data Analysis (NCHRP 17-24). Dec. 2004. Transportation Research Board. 20 Mar. 2006
<http://trb.org/publications/nchrp/nchrp_w75.pdf>
- GIS in Transportation. n.d. Federal Highway Administration. 17 Mar. 2006
<<http://www.gis.fhwa.dot.gov/fhwaEfforts.asp>>
- Global Justice XML Data Model (Global JXDM). n.d. U.S. Department of Justice. 20 Mar. 2006 <<http://it.ojp.gov/jxdm>>
- Guidance for Implementation of the AASHTO Strategic Highway Safety Plan (NCHRP 17-18(3)). 21 Feb. 2006. Transportation Research Board. 17 Mar. 2006
<[http://www4.nationalacademies.org/trb/crp.nsf/All+Projects/NCHRP+17-18\(3\)](http://www4.nationalacademies.org/trb/crp.nsf/All+Projects/NCHRP+17-18(3))>
- Highway Safety: Improved Monitoring and Oversight of Traffic Safety Data Program Are Needed. Nov. 2004. Government Accountability Office. 17 Mar. 2006
<<http://www.gao.gov/new.items/d0524.pdf>>
- Highway Safety Improvement Program. 13 Dec. 2005. Federal Highway Administration. 17 Mar. 2006 <http://safety.fhwa.dot.gov/state_program/hsip/index.htm>
- Highway Safety Manual. n.d. Transportation Resource Board. 17 Mar. 2006
<<http://www.highwaysafetymanual.org/>>
- Index to HSIS Summary Reports. 8 Aug. 2001. Federal Highway Administration. 17 Mar. 2006 <<http://www.hsisinfo.org/pdf/sum.htm>>
- Initiatives to Address Improvement of Traffic Safety Data. Jul. 2004. National Highway Traffic Safety Administration. 17 Mar. 2006

- <http://www.nhtsa.dot.gov/people/crash/crashstatistics/trafficsafetydata_IPT_Report.htm>.
- Intelligent Transportation Systems of America. 17 Mar. 2006
<http://www.itsa.org/what_is_its/c8/What_is_ITS.html>
- Interactive Highway Safety Design Model. n.d. Federal Highway Administration. 17 Mar. 2006 <<http://www.tfhrc.gov/safety/ihsdm/ihsdm.htm>>
- International Registration Plan (IRP). Sep. 1973. American Association of Motor Vehicle Administrators. 17 Mar. 2006
<http://www.aamva.org/IRP/documents/pub_ThePlan.pdf>
- International Registration Plan (IRP). n.d. American Association of Motor Vehicle Administrators. 20 Mar. 2006 <<http://www.aamva.org/irp>>
- Johnson, S.W., and J. Walker. n.d. The Crash Outcome Data Evaluation System (CODES), Report DOT HS 808 338. Jan. 1996. National Highway Traffic Safety Administration. 20 Mar. 2006
<<http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/CODES/codestch.pdf>>
- Justice Standards Clearinghouse for Information Sharing. n.d. U.S. Department of Justice. 17 Mar. 2006 <<http://it.ojp.gov/jsr/public/index.jsp>>
- Large Truck Crash Causation Study Interim Report. Sep. 2002. National Highway Traffic Safety Administration. 17 Mar. 2006 <<http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/Rpts/2002/809-527.pdf>>
- Lerner, N., R. Llaneras, A. Smiley, and F. Hanscom. Comprehensive Human Factors Guidelines for Road Systems (NCHRP Web-Only Document 70 (Project 17-18(08))). Mar. 2005. Transportation Research Board. 17 Mar. 2006
<http://trb.org/publications/nchrp/nchrp_w70.pdf>
- Manual on Classification of Motor Vehicle Traffic Accidents, Sixth Edition (ANSI D16.1-1996). 28 Oct. 1996. National Safety Council. 17 Mar. 2006
<http://www.nsc.org/public/mem/ansid16_1.pdf>
- MMUCC Guideline: 2nd Edition. 2003. National Highway Traffic Safety Administration. 17 Mar. 2006 <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/MMUCC/2003/MMUCC_02.pdf>
- Model Kit Car and Street Rod Definitions and Procedures. 2005. American Association of Motor Vehicle Administrators. 20 Mar. 2006
<<http://www.aamva.org/documents/nwspolicybookandappendices.pdf?ct=all&qu=model%20kit%20car%20and%20street%20rod%20&st=r&action=search>>
- Model Minimum Uniform Crash Criteria (MMUCC): Second Edition. 2003. National Highway Traffic Safety Administration. 20 Mar. 2006 <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/MMUCC/2003/MMUCC_02.pdf>
- Motor Carrier Management Information System Crash Report Data Elements and Their Definitions. n.d. Federal Motor Carrier Safety Administration. 20 Mar. 2006
<<http://mcmiscatalog.fmcsa.dot.gov/beta/Catalogs&Documentation/documentation/Crashes/crash3.asp>>

National Agenda for the Improvement of Highway Safety Information Systems. n.d. Association of Transportation Safety Information Professionals. 23 Mar 2006 <http://www.atsip.org/images/uploads/National_Agenda.pdf>

National Association of Trailer Manufacturers (NATM). 20 Mar. 2006 <<http://www.natm.com>>

National Electronic Injury Surveillance System (NEISS) On-line. n.d. U.S. Consumer Product Safety Commission. 17 Mar. 2006 <<http://www.cpsc.gov/library/neiss.html>>

National EMS Information System Fact Sheet. 2004. National EMS Information System. 17 Mar. 2006 <<http://www.nemsis.org/media/pdf/NEMISIS%20Fact%20Sheet%206-2005.pdf>>

National Highway Traffic Safety Administration. Traffic Safety Information Systems Strategic Planning Process – A Guide for States. March 2006. <<http://www.nhtsa-tsits.net/planning/>>

National Incident-Based Reporting System (NIBRS) Implementation Program. 15 July 2005. Bureau of Justice Statistics. 17 Mar. 2006 <<http://www.ojp.usdoj.gov/bjs/nibrs.htm>>

National Law Enforcement Telecommunication System (NLETS). 17 Mar. 2006 <<http://www.nlets.org/general.html>>

National Model: Statewide Application of Data Collection and Management Technology to Improve Highway Safety (Report FHWA-RD-99-140). 1999. Federal Highway Administration. 20 Mar. 2006 <<http://www.tfhr.gov/safety/national>>

National Motor Vehicle Title Information System, State Batch Procedures Manual 2004. Aug. 2004. American Association of Motor Vehicle Administrators. 20 Mar. 2006 <http://aamva.net/Documents/vehNMVTISBatchStateProceduresManual_2004.pdf>

NCSC - Helping Courts Anticipate Change and Better Serve the Public. 14 Mar 2006. National Center for State Courts. 23 Mar 2006 <<http://www.ncsconline.org/>>

NEMISIS NHTSA Version 2.2 Data Dictionary. 2005. National EMS Information System. 17 Mar. 2006 <<http://www.nemsis.org/media/pdf/NEMISIS%20Version%202.2%20Data%20Dictionary%20Final.pdf>>

NMVTIS Pilot. 25 Apr. 2002. American Association of Motor Vehicle Administrators. 17 Mar. 2006 <http://www.aamva.org/vehicles/veh_AutoSystNMVTISPilot.asp>

NMVTIS Titling of Stolen Cars. n.d. American Association of Motor Vehicle Administrators. 20 Mar. 2006 <http://www.aamva.org/vehicles/veh_AutoSystNMVTISStolenCarTitles.asp>

NMVTIS Vehicle Fraud. n.d. American Association of Motor Vehicle Administrators. 20 Mar. 2006 <http://www.aamva.org/vehicles/veh_AutoSystNMVTISVehFraud.asp>

Operating Authority Classifications. 19 Mar. 2002. Federal Motor Carrier Safety Administration. 20 Mar. 2006 <http://www.fmcsa.dot.gov/espa%20B1ol/english/pdfs/part_365.htm>

- Performance and Registration Information Systems Management (PRISM). n.d. Federal Motor Carrier Safety Administration. 20 Mar. 2006 <<http://www.fmcsa.dot.gov/facts-research/facts-figures/analysis-statistics/prism.htm>>
- Personal Identification - AAMVA International Specification - DL/ID Card Design. Mar. 2005. American Association of Motor Vehicle Administrators. 17 Mar. 2006 <<http://www.aamva.org/Documents/std2005DL-IDCardSpecV2FINAL.pdf>>
- Pfefer, R.C., T.R. Neuman, and R.A. Raub. Improved Safety Information to Support Highway Design (NCHRP Report 430). 1999. Transportation Research Board. 20 Mar. 2006 <<http://www4.trb.org/trb/crp.nsf/All+Projects/NCHRP+17-12>>
- Pfefer, R.C., R.A. Raub, and R.E. Lucke. Highway Safety Data: Costs, Quality, and Strategies for Improvement, Final Report (FHWA-RD-96-192). Jan. 1988. Federal Highway Administration. 20 Mar. 2006 <<http://ntl.bts.gov/lib/6000/6700/6773/673.pdf>>
- Policy on Manufacturers Certificate of Origin (MCO). 2002. American Association of Motor Vehicle Administrators. 20 Mar. 2006 <<http://www.aamva.org/Documents/nws2002PolicyBookAppendices.pdf#page=11>>
- Policy on Vehicle Titling/Certificate of Origin. 2002. American Association of Motor Vehicle Administrators. 20 Mar. 2006 <<http://www.aamva.org/Documents/nws2002PolicyBookAppendices.pdf>>
- Redding, R.L. Federal Government Reviews Anti-Car Theft Act. Nov. 1999. Automotive Service Association. 20 Mar. 2006 <<http://www.asashop.org/autoinc/nov99/legis.htm>>
- Registration Reciprocity Agreement between the Signatory Jurisdictions. n.d. American Association of Motor Vehicle Administrators. 17 Mar. 2006 <http://www.aamva.org/Documents/mcs_AAMVARegistrationReciprocityAgreement.pdf>
- Research Project #9: Explore Options for Using Technology in Data Collection. Safety Data Action Plan. n.d. Bureau of Transportation Statistics. 17 Mar. 2006 <http://www.bts.gov/publications/safety_data_action_plan/project_09.htm>
- SafetyAnalyst. n.d. Federal Highway Administration. 20 Mar. 2006 <<http://www.safetyanalyst.org/>>
- Safety and Fitness Electronic Records System. n.d. Federal Motor Carrier Safety Administration. 20 Mar. 2006 <<http://safer.fmcsa.dot.gov>>
- “Safety in Numbers: Using Statistics to Make the Transportation System Safer.” Safety Data Action Plan. 13 Sep. 2000. Bureau of Transportation Statistics. 17 Mar. 2006 <http://www.bts.gov/publications/safety_data_action_plan/entire.pdf>
- “Safety Management Systems: Good Practices for Development and Implementation.” Safety by Design. 20 May 1996. Federal Highway Administration. 17 March 2006 <http://safety.fhwa.dot.gov/state_program/safety_manage/docs/sm_best.pdf>
- Scopatz, R.A., C.E. Hatch, B.H. DeLucia, K.A. Tays. Unlicensed to Kill: The Sequel. Jan. 2003. AAA Foundation for Traffic Safety. 20 Mar. 2006 <<http://www.aaafoundation.org/pdf/UnlicensedToKill2.pdf>>

- Social Security Online Verification (SSOLV). 25 Jun. 2002. American Association of Motor Vehicle Administrators. 17 Mar. 2006
<http://www.aamva.org/drivers/driv_AutomatedSystemsSSOLV.asp>
- State CMV "Cab Card" Samples. 19 Feb. 2004. American Association of Motor Vehicle Administrators. 20 Mar. 2006 <http://www.aamva.org/irp/jurisinfo/jur_CabCards.asp>
- State Data System Crash Data Report: 1990 – 1999. Jul. 2002. National Highway Traffic Safety Administration. 17 Mar. 2006 <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/Rpts/2002/809_301/809_301.pdf>
- State Laws Regarding Proof of Financial Responsibility. n.d. Insurance Information Institute. 20 Mar. 2006 <<http://www.iii.org/individuals/auto/a/stateautolaws>>
- State Legislative Fact Sheet. n.d. National Highway Traffic Safety Administration. 20 Mar. 2006 <<http://www.nhtsa.dot.gov/people/outreach/safesobr/13qp/facts/factzero.html>>
- Strategic Highway Safety Plans: A Champion's Guide to Saving Lives. 14 Oct. 2005. Federal Highway Administration. 13 Dec. 2005
<<http://safety.fhwa.dot.gov/safetealu/shsppreview.htm>>
- Taking a Bite Out of Crime. Station Reporter Online. 20 Mar. 2006
<<http://home.istar.ca/~rdalfers/STORY1H.html>>
- TIRF DWI System Improvements. n.d. Traffic Injury Research Foundation. 20 Mar. 2006
<http://www.trafficinjuryresearch.com/dwi_systemimprovements/workgroup_systemimprovements.cfm>
- Traffic Records: A Highway Safety Program Advisory. Dec. 2004. National Highway Traffic Safety Administration. 20 Mar. 2006 <<http://www.nhtsa-tsis.net/trd/pdfs/AdvisoryJune12003Version.pdf>>
- Traffic Safety Information Systems in Europe and Australia. Oct. 2004. Federal Highway Administration. 17 Mar. 2006
<http://international.fhwa.dot.gov/tsis_04010/2004TSISReportWeb.pdf>
- Trauma System Agenda for the Future. Oct. 2002. National Highway Traffic Safety Administration. 17 Mar. 2006
<http://www.nhtsa.dot.gov/people/injury/ems/TRAUMA_SYSTEM/index.htm>
- Vehicle Manufacturer Information. n.d. National Highway Traffic Safety Administration. 20 Mar. 2006
<<http://www.nhtsa.gov/portal/site/nhtsa/menuitem.2c1aef50b138a23d76c1f41046108a0c>>
- Vehicle Registration Reciprocity Agreement. n.d. American Association of Motor Vehicle Administrators. 20 Mar. 2006
<http://www.aamva.org/Documents/mcs_AAMVARegistrationReciprocityAgreement.pdf>
- Vehicle (Title) Brands Best Practices. Sep. 2002. American Association of Motor Vehicle Administrators. 20 Mar. 2006
<<http://www.aamva.org/Documents/vehBrandingBestPractices.pdf>>

Vehicle Types. 14 Oct. 2003. Federal Highway Administration. 20 Mar. 2006
<<http://www.fhwa.dot.gov/policy/ohpi/vehclass.htm>>

Walton, C.M. and B.L. Mallory, et al. Strategic Highway Research Program (Special Report 260). 2001. Transportation Research Board. 17 Mar. 2006
<<http://trb.org/trb/publications/sr/sr260.pdf>>

Wilson, E., and M.E. Lipinski. Road Safety Audits (NCHRP Synthesis 336). 2004. Transportation Research Board. 17 Mar. 2006
<http://trb.org/publications/nchrp/nchrp_syn_336.pdf>

Working Group on DWI System Improvements. n.d. Traffic Injury Research Foundation. 17 Mar. 2006 <<http://www.tirf.org>>

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
MIRE	Model Inventory of Roadway Elements

MMUCC	Model Minimum Uniform Crash Criteria
NCIC	National Crime Information Center
NCSC	National Center for State Courts
NDR	National Driver Registry
NEMESIS	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

JACK D. BENAC, PROJECT MANAGER

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SUMMARY OF EXPERIENCE

Mr. Benac has over 34 years experience in transportation safety. Mr. Benac's transportation safety career began in the Traffic and Safety Division with the Michigan Department of Transportation where he conducted transportation safety research and was responsible for the development of safety systems. He was team leader in the development of the Michigan Dimensional Accident Surveillance System (MIDAS), Michigan Traffic Sign Inventory System (MTSIS), and Michigan Guardrail Information System. He was the Project Manager in developing MDOT's Safety Status System (SAFESTAT). Mr. Benac worked in the private sector where he was a member of a consultant team developing safety systems for the Ohio Department of Transportation and the Illinois Department of Transportation.

Mr. Benac worked as an instructor at Lansing Community College where he developed course material in traffic technology and taught traffic safety classes.

Mr. Benac was employed with the Michigan Department of Information Technology until 2010 where he was a Project Manager and completed a project to reengineer Michigan's Traffic Crash Reporting System. The project received a ComputerWorld Honors award in 2004 and was recognized as one of five finalists in the Government and Nonprofit category.

Mr. Benac retired from Michigan State Government on December 31, 2010.

EDUCATION

- Graduate of Ferris State University in Civil Technology 1970.
- Certificates from Michigan State University in Traffic Simulation Modeling 1985.
- Certificates from George Washington University in the Management of Information Technology Projects 1999-2001.

COMMUNITY

- President, Lake Victoria Property Owners Association 1981-1989.
- Community Board of Education from 1989 to 2005.
- Member of Volunteer Services, Great Lakes Region, International Red Cross 1991-Present

TIMOTHY J. KERNS

University of Maryland
National Study Center for Trauma and EMS
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Baltimore, MD 21201
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Professional Experience

Mr. Kerns has been a database engineer at the University of Maryland's National Study Center for Trauma and EMS since 1990. During this time he has gained considerable experience in the manipulation and use of large datasets relating to motor vehicle crashes and injury. He 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. He is currently the project director for 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).

Organizations

American Trauma Society – Maryland Division
Association of Traffic Safety Information Professionals

ALLEN S. PARRISH, PH.D.

Department of Computer Science
The University of Alabama
Tuscaloosa, AL 35487
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INTERESTS

Transportation information systems; crash and citation records; electronic citations; traffic crash data analysis and visualization; data mining; applications of information technology to homeland security and law enforcement.

EDUCATION

Ph.D. Computer and Information Science, The Ohio State University, Columbus, Ohio, 1990.
M.S. Computer and Information Science, The Ohio State University, Columbus, Ohio, 1987.
B.S. Computer Science, The University of Tennessee, Martin, TN, 1983.

EMPLOYMENT

(August 2005 to Present) Professor, The University of Alabama, Tuscaloosa, AL
(August 1996 to August 2005) Associate Professor, The University of Alabama, Tuscaloosa, AL.
(August 1990 to August 1996) Assistant Professor, The University of Alabama, Tuscaloosa, AL.
(September 1986 to August 1990) Graduate Teaching Associate, Ohio State University, Columbus, Ohio.
(September 1985 to September 1986) Graduate Fellow, Ohio State University, Columbus, Ohio.
(August 1983 to September 1985) Senior Computer Program Specialist, The University of Tennessee, Martin, TN.

ADMINISTRATIVE EXPERIENCE

January 2000 to Present: Director, CARE Research and Development Laboratory (CRDL). Responsible for the management and supervision of a major College of Engineering research operation with \$2M in annual research expenditures. Supervise 8 full-time professional staff, as well as around 10 students, in collaboration with 2 other Computer Science faculty members. Responsible for management of budgets, personnel and purchasing funded by a large number of concurrent contracts, as well as technical direction and coordination for the entire operation. The CRDL conducts research and advanced development projects involving data mining, mobile and wireless computing, and traffic safety/law enforcement information systems.

GRANTS AND CONTRACTS

Over 50 separate funded projects totally over \$15M during 1990-2005. Recent sponsors have included:

- National Highway Traffic Safety Administration
- Federal Motor Carrier Safety Administration
- Department of Homeland Security

- Department of Justice – Office of Justice Programs
- Alabama Criminal Justice Information Center
- Alabama Administrative Office of Courts
- Alabama Department of Public Safety
- Alabama Department of Transportation
- Alabama Department of Public Safety
- Georgia Department of Transportation
- Delaware Highway Safety Office

RECENT PUBLICATIONS

Over 75 publications in a large number of areas of computer science. Some recent relevant publication titles include:

- Wang, H., R. Smith, S. Vrbsky and A. Parrish, Improved Variable and Value Ranking Techniques for Mining Categorical Traffic Accident Data, *Expert Systems With Applications*, to appear, 2006.
- Improved Variable and Value Ranking Techniques for Mining Categorical Traffic Accident Data Wang, H., H. C. Chen and A. Parrish. Automated Selection of Auto Crash Causes,” *Proceedings of 42nd ACM Southeast Regional Conference*, pp. 375-378, 2004.
- Wang, H., A. Parrish and H. C. Chen. “Automated Selection of Automobile Crash Countermeasures,” *Proceedings of 41st ACM Southeast Regional Conference*, pp. 268-273, 2003.
- Turner, D., D. Brown, A. Parrish and R. Stricklin, “Critical Analysis Reporting Environment (CARE),” *Data Mining IV*, WIT Press, December 2003, pp. 119-128. (A publication of the *Proceedings of the 4th International Conference on Data Mining 2003*).
- Parrish, A., S. Vrbsky, B. Dixon and W. Ni, “Optimizing Disk Storage to Support Statistical Analysis Operations,” *Decision Support Systems*, to appear, 2004.
- Parrish, A., B. Dixon, D. Cordes, S. Vrbsky and D. Brown, “CARE: An Automobile Crash Data Analysis Tool,” *IEEE Computer*, vol. 36, no. 6, June 2003, pp. 22-30.

RECENT CONFERENCE PRESENTATIONS

- Parrish, A., “Electronic Citations in Alabama,” Presentation at the 31st Annual International Forum on Traffic Records and Highway Information Systems, Buffalo, NY, July 2005.
- Parrish, A., “Data Integration to Improve Traffic Safety Enforcement,” Presentation at the 30th Annual International Forum on Traffic Records and Highway Information Systems, Nashville, TN, July 2004.
- Parrish, A., “Wireless Data Communications: Alternatives, Challenges and Applications,” Presentation at the 5th Annual Alabama Law Enforcement Technology Conference, Point Clear, AL, December 2003.
- Parrish, A., “Handheld Computing Devices for Mobile Traffic Records Management,” Presentation at the 29th International Forum on Traffic Records and Highway Information Systems, Denver, CO, July 2003.
- Parrish, A., “CARE After 20 Years: Impact on Highway Safety,” Presentation at the 28th International Forum on Traffic Records and Highway Information Systems, Orlando, FL, August 2002.

Robert A. Scopatz, Ph.D.

Years of Experience: 25, with Current Employer: 14

Dr. Bob Scopatz, Director 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. Obonor, 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).
- Analysis 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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Title: Highway Safety Administrator

The Nebraska Office of Highway Safety is responsible for the development, administration, implementation, and evaluation of the state's annual Strategic Traffic Safety Plan involving the National Highway Traffic Safety Administration's funding.

Oversight includes: U.S. Office of Juvenile Justice and Delinquency Prevention's Enforcing Underage Drinking Law Nebraska federal funding; State Motorcycle Rider Training Course Administration; state Traffic Records Coordinating Committee; state Underage Drinking Advisory Task Force; state Drug Recognition Expert Training; state Child Passenger Safety Committee; and the Nebraska Highway Safety Advocates Coalition.

Experience:

Fred has over 35 years of experience in the state Highway Safety Office, including 28 as the Administrator. In addition, he also has served as the Interim Director of the Department of Motor Vehicles (DMV), the DMV Vehicle Services Administrator, the backup DMV Budget and Fiscal Manager, and the DMV Public Information Officer.

Prior to this work he served as a Budget Analyst in the Governor's Budget Office. He has also been appointed by several Governor's to serve on multiple traffic safety related Task Forces and Blue Ribbon Committees, including leading several of them.

Education:

B.A. in Sociology, University of Nebraska Lincoln

Organizations:

Governor's Highway Safety Association—Executive Board
Nebraska Preventive Health Advisory Committee—Vice Chair
Nebraska MADD State Executive Operations Council
Independence Treatment Center Advisory Committee
Traffic Records Committee—Chair
Nebraska Safety Center Advisory Committee—Traffic Chair
National Safety Council-Greater Omaha Chapter Board
Nebraska Safety Council-Traffic Safety Committee
Nebraska Medical Association-Underage Drinking Working Group

Previous Assessments:

Traffic Records—Iowa and Kentucky
Alcohol—Hawaii and North Dakota