Traffic Records Program Assessment Advisory, 2018 Edition

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13. ABSTRACT

High-quality State traffic record data is critical to effective safety programming, operational management, and strategic planning. Every State should maintain a traffic records system that supports the data-driven, science-based decision-making necessary to identify problems; develop, deploy, and evaluate countermeasures; and efficiently allocate resources.

Federal statute requires States to certify that "an assessment of the State's highway safety data and traffic records system was conducted or updated during the preceding 5 years" to qualify for a State traffic safety information system improvements grant, per. 23 U.S.C. §405(c). NHTSA regulations in 23 C.F.R. §1300.22(b)(4) require that the assessment comply with "procedures and methodologies" outlined in this advisory. 23 C.F.R. §1300.22(b)(4). This document provides guidance on three different assessment processes so that States may choose the process that best fits their needs.

This Traffic Records Program Assessment Advisory provides voluntary guidance and describes the ideal traffic records systems from which States can assess their capabilities. Like the 2012 version, this updated advisory provides contents, capabilities, and data quality of an effective traffic records system by describing an ideal system that supports high-quality decisions and leads to cost-effective improvements in highway and traffic safety. The benefit for States to align to the description of the ideal traffic records system would be to ensure that complete, accurate, and timely traffic safety data is collected, analyzed, and made available for decision making, which is central to identifying traffic safety problems, and designing countermeasures to reduce injuries and deaths caused by crashes. The ideal described is aspirational, and there is no expectation that States align perfectly with the ideal as described. A national group of subject matter experts developed this Advisory as a heuristic for States to identify their traffic records system's strengths as well as opportunities for improvement.

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THE TRAFFIC RECORDS ASSESSMENT PROCESS

Federal statute requires States to certify that "an assessment of the State's highway safety data and traffic records system was conducted or updated during the preceding 5 years" to qualify for a State traffic safety information system improvements grant, per 23 U.S.C. §405(c). NHTSA regulations in 23 C.F.R. §1300.22(b)(4) require that the assessment comply with "procedures and methodologies" outlined in this advisory. NHTSA seeks to provide States with flexibility in meeting these requirements. Therefore, this document provides guidance on three different assessment processes so that States may choose the process that best fits their needs.

First, States may design their own assessments of their traffic safety information systems. NHTSA regulations require States to list all recommendations from the most recent highway safety data and traffic records system assessment and identify whether and how they intend to address those recommendations, per 23 C.F.R. §1300.22(b)(2)(ii-iv). A State's assessment should therefore result in a comprehensive set of recommendations that will improve the State traffic safety information systems and inform the State's traffic records strategic plan. When designing an assessment, States may consider the following noteworthy practices when assessing their data systems.

- Using third-party assessors with knowledge in each of the core safety databases—crash, driver, vehicle, roadway, citation and adjudication, and injury surveillance systems, who can provide helpful expertise and an outside perspective.
- Comparing States capabilities with the ideal described in the advisory to benchmark systems and identify the strengths and opportunities for improvement within each core safety system.
- Examining the role of the Traffic Records Coordinating Committee—including data integration efforts and the strategic planning process—as well as evaluating the crash, driver, vehicle, roadway, citation and adjudication, and injury surveillance systems.
- Identifying critical data quality control practices (including the use of performance measures and metrics), conformance to applicable guidelines, adequacy of State or system procedures and processes, data integration, and capacity to interface with other systems.

Second, NHTSA has developed a self-assessment tool that States may use. The assessment tool consists of a series of questions developed by NHTSA with the input of subject matter experts that will result in recommendations. The questions can be found in Appendix E. This assessment tool is available at www.nhtsa.gov/research-data/traffic-records or upon request.

Third, States may opt to participate in NHTSA's State Traffic Records Assessment Program at no cost to the State. STRAP is a peer assessment process using the questions from NHTSA's assessment tool, found in Appendix E. Qualified independent assessors will evaluate the State's responses to the questions and then provide recommendations; more specific, actionable considerations; and a personalized report. This process is supported by a highly qualified facilitator and is punctuated by two on-site meetings and a webinar report.

Regardless of which process a State chooses to conduct its assessment, NHTSA GO Teams remain available to States that wish to apply for additional technical assistance. GO Teams provide technical expertise and guidance on specific small to mid-scale projects that the States wish to undertake but may require additional, specialized knowledge. Application forms are available on the NHTSA website at www.nhtsa.gov/sites/nhtsa.dot.gov/files/go_team_fact_sheet.pdf.

SECTION 1: INTRODUCTION

High-quality State traffic records data is critical to effective safety programming, operational management, and strategic planning. Every State—in cooperation with its local, regional, and Federal partners—should maintain a traffic records system that supports the data-driven, science-based decision-making necessary to identify problems; develop, deploy, and evaluate countermeasures; and efficiently allocate resources. Functionally, a traffic records system includes the collection, management, and analysis of traffic safety data. It is comprised of six core data systems—crash, driver, vehicle, roadway, citation and adjudication, and injury surveillance—as well as the organizations and people responsible for them.

This *Traffic Records Program Assessment Advisory* provides voluntary guidance and describes the ideal traffic records systems from which States can assess their capabilities. Like the 2012 version, this updated *advisory* provides information on the contents, capabilities, and data quality of an effective traffic records system by describing an ideal system that supports high-quality decisions and leads to cost-effective improvements in highway and traffic safety. The benefit for States to align to the description of the ideal traffic records system would be to ensure that complete, accurate, and timely traffic safety data is collected, analyzed, and made available for decision making, which is central to identifying traffic safety problems, and designing countermeasures to reduce injuries and deaths caused by crashes. The ideal described is aspirational, and there is no expectation that States align perfectly with the ideal as described. A national group of subject matter experts developed this advisory as a heuristic for States to identify their traffic records systems' strengths as well as opportunities for improvement.

Scope

The *advisory* provides voluntary guidance on the collection, management, and analysis of data used to inform highway and traffic safety decision-making. This includes data from the six core data systems and the State's Traffic Records Coordinating Committee, its data use and management protocols, and the State's integration of traffic safety data for analysis purposes. Traffic records data is critical to States' strategic planning processes. Indeed, quality traffic records data provides the foundation for the four major planning documents required by law: The State Traffic Records Coordination Committee's own "multiyear highway safety data and traffic records system strategic plan" (State Traffic Records Strategic Plan), the Commercial Vehicle Safety Plan, the Highway Safety Plan, and the Strategic Highway Safety Plan. States need timely, accurate, complete, and uniform traffic records to identify and prioritize traffic safety issues and to choose appropriate countermeasures and evaluate their effectiveness. The *advisory* is updated regularly to keep pace with State traffic records systems as new technologies and innovations enter common use.

Note on Critical Concepts

This document's utility and clarity are contingent in large part on several foundational parameters and definitions outlined below:

Interface and Integration Linkages

This document makes a distinction between interface and integration linkages. Both rely on connections among traffic records data systems, but their desired outcomes and connection protocols differ. System interface reflects a standing or real-time relationship between datasets and a high degree of system interoperability. In practice, system interface linkage is useful when circumstances demand real-time relationships between databases that need to be connected and accessible always. Interface linkages

exist primarily to support key business processes, for example allowing law enforcement officers to validate and verify drivers' license information in the crash report or citation. Interface linkages are addressed in each module.

In contrast, system integration generally describes a linking of administrative databases to support in-depth analysis. Integration linkages are often executed at set points in time, such as at the end of a calendar year or when all records for the period are considered final. System integration and related data exchange programs are discussed in Section 4.

Measures and Metrics

The *advisory*—as well as NHTSA's 2011 *Model Performance Measures for State Traffic Records Systems*[1]—makes a clear distinction between traffic safety data performance measures and performance metrics. While both address the six core traffic records performance attributes (timeliness, accuracy, completeness, uniformity, integration, and accessibility), performance measures are tools used to gauge the performance of a specific system in one of the six core areas. In contrast, performance metrics are explicit—usually numeric—goals established by each State for individual systems or subsystems.

For example, a State may choose to track the timeliness of its crash database by using a performance measure such as *the median or mean number of days between (a) the crash date to (b) the date the crash report is entered into the database*. A performance metric related to the above example would be *within 3 years, ensure that all crash records are entered into the database within 10 business days*. It is incumbent upon the State to determine whether to establish performance metrics and to set any metrics' parameters based on their own goals.

[1] National Highway Traffic Safety Administration. (2011, February). *Model performance measures for State traffic records systems* (Report No. DOT HS 811 441). Washington, DC: Author. Available at www-nrd.nhtsa.dot.gov/Pubs/811441.pdf

SECTION 2: TRAFFIC RECORDS SYSTEM MANAGEMENT

A State traffic records system assists the traffic safety community in implementing programs and countermeasures that reduce motor vehicle crashes, deaths, and injuries. Data-driven improvements rely on a State's traffic records system to identify opportunities to improve highway safety, measure progress, and systematically evaluate countermeasure effectiveness. Because the data comes from many sources, the process requires coordination and cooperation, best achieved with the establishment of a traffic records coordinating committee and a statewide "multiyear highway safety data and traffic records system strategic plan" (State Traffic Records Strategic Plan). The development and management of a State's traffic records system, a fully functioning traffic records coordinating committee (TRCC), and State Traffic Records Strategic Plan all require close coordination and cooperation among the data collectors, managers, and users of the six core data systems—crash, vehicle, driver, roadway, citation and adjudication, and injury surveillance.

SECTION 2-A: TRAFFIC RECORDS COORDINATING COMMITTEE

The following are the critical features of an ideal TRCC.

Establish a TRCC
The ideal TRCC is sufficiently representative to possess both the staff-level technical expertise and executive-level decision-making capabilities required to ensure the TRCC can adequately coordinate and influence the State's traffic records system. In practice, the ideal TRCC includes executives—or their designees—who are empowered to establish policy, direct resources within their areas of responsibility, and set the vision and mission for the TRCC. The TRCC also includes technical staff representatives from all stakeholder groups and organizations and is responsible—as defined by the TRCC Chair—for the oversight and coordination of the State's traffic records system. The specifics of how the ideal TRCC is organized will vary—some will have separate executive committees, others will have single sitting bodies including both executive and technical representatives.

Ensure TRCC Membership is Representative
The ideal TRCC is composed of members representing the interests of traffic safety data collectors, managers, and users. At a minimum, membership includes the State agencies or entities responsible for the core data systems—crash, driver, vehicle, roadway, citation and adjudication, and injury surveillance. The TRCC includes executive-level individuals that have resource allocation responsibilities within each of the custodial agencies. Specifically, these entities include at least: crash (State law enforcement, DMV, DOT, SHSO), driver (licensing agency), roadway (DOT), citation and adjudication (State and local law enforcement, Administrative Office of the Courts), and injury surveillance (EMS, State DOH, public health).

The TRCC ideally also includes technical staff tasked with the oversight and coordination of the traffic records system's components. Specifically, these individuals represent all appropriate stakeholder entities, including those on the TRCC and some or all the following: State IT agency and offices, State Fatality Analysis Reporting System analyst, metropolitan and regional planning agencies, Federally recognized Indian Tribes, county/city engineers, judges, prosecutors, university researchers, and non-governmental safety advocates such as Mothers Against Drunk Driving. Appropriate Federal liaisons—including FHWA, FMCSA, and NHTSA at a minimum—are included as non-voting members. States containing National Parks, U.S. Park Police jurisdictions, or Federally recognized Indian Tribes should coordinate with Department of Interior agencies that have a role in managing traffic records (National

Park Service Rangers, Bureau of Land Management enforcement, and Bureau of Indian Affairs Law Enforcement Services). The ideal composition of a TRCC will vary depending on a State's unique circumstances. These circumstances should be considered in seeking additional TRCC representatives.

Obtain Formal TRCC Authorization

The ideal TRCC is formally chartered by a memorandum of understanding, charter, or another foundational document that describes the powers and duties of the committee as specified in enabling State legislation. This authorization empowers each member to officially participate in the State's TRCC and leverage resources, streamline processes, integrate systems, and focus on strategic investments.

Institutionalize TRCC Responsibilities

The TRCC (1) provides the leadership and coordination necessary to develop, implement, and monitor the State Traffic Records Strategic Plan; (2) influences agency policy decisions that impact the State's traffic records system; (3) advises the SHSO regarding the allocation of Federal funding as appropriate; (4) identifies performance measures and monitors progress; (5) serves as a forum for the discussion of the State's traffic records investments and challenges; and (6) provides meaningful coordination among stakeholders.

The TRCC oversees traffic records improvement projects under its direct responsibility. The TRCC also monitors other projects to ensure coordination among the traffic records system's component organizations and assess system-wide impacts. For example, when a custodial agency considers making changes to its traffic records-related systems, the TRCC should be briefed so the TRCC can assess potential impacts on other systems and identify potential opportunities to leverage investments.

The TRCC also coordinates the development of a traffic records inventory. By consolidating the discrete systems documentation maintained by custodial agencies into a coherent whole, the TRCC-maintained traffic records inventory can improve accessibility and analysis for all stakeholders.

Designate TRCC Leadership

There are two primary leadership roles within the TRCC: the TRCC chair and the TRCC coordinator. These roles may, in some cases, be assumed by the same individual.

The TRCC chair provides leadership for committee activities as specified in the State Traffic Records Strategic Plan. The ideal individual is employed by the SHSO or one of the other key custodial agencies and has rank and authority sufficient to advise the executive TRCC on matters pertaining to technical TRCC efforts. Like all TRCC leadership positions, the chair's term should be specified in the charter, a memorandum of understanding (MOU), or appropriate foundational document.

The TRCC coordinator is designated by the committee to aid the TRCC chair. The coordinator may be an employee of a key custodial agency or a contractor. Specific duties include coordination of the TRCC at the direction of the chair; coordination of the development, implementation, and maintenance of the State Traffic Records Strategic Plan; and providing secretariat support for the executive TRCC.

Conduct Regular Meetings

The TRCC meets regularly—at least quarterly to maintain optimal organizational performance. The TRCC creates working sub-committees to address specific issues or projects as they arise. These sub-committees may need to meet independently and/or separately from the primary TRCC.

Oversee Quality Control and Data Improvements
The TRCC prioritizes, promotes, and coordinates quality control and data improvement programs that impact the core traffic records systems. The presentation of quality control metrics should be part of the TRCC's regular meetings.

The TRCC encourages the implementation of information quality best practices and use of NHTSA's *Model Performance Measures for State Traffic Records Systems*.[2]

Oversee Training and Technical Assistance for Traffic Records Data Improvement
The TRCC promotes the deployment of training needs assessments and works to address identified training and technical assistance needs. Presentations detailing these needs and participation in relevant training are a part of the technical TRCC's regular meetings. The TRCC monitors and encourages the deployment and promotion of training programs and training sessions held at the annual International Forum on Traffic Records and Highway Safety Information Systems.

Coordinate Grant Funds
The TRCC advises the SHSO on the allocation of NHTSA grant funds dedicated to traffic records data improvement and monitors traffic records programs supported by other Federal funds. The TRCC serves as a critical forum for the coordination, and efficient leveraging of funds used to improve the collection, processing, management, and analysis of State traffic records data. Specifically, the TRCC is responsible for creating and approving the States' Traffic Records Strategic Plan. The TRCC discusses how to optimally invest available traffic records improvement funds and coordinate the use of these resources—in particular, DOT grant funds that can be used for State traffic records systems data improvement projects.

For additional information and recommendations regarding effective TRCC conduct, refer to *State Traffic Records Coordinating Committee Noteworthy Practices*.[3]

[2] Ibid.

[3] Scopatz, R. A., Lefler, N., & Peach, K. (2015, June). *State Traffic Records Coordinating Committee noteworthy practices* (Report No. FHWA-SA-15-083). Washington, DC: Federal Highway Administration. Available at https://safety.fhwa.dot.gov/rsdp/downloads/trcc_noteworthy.pdf

SECTION 2-B: STRATEGIC PLANNING FOR TRAFFIC RECORDS SYSTEMS

The Traffic Records Coordinating Committee is responsible for developing the State Traffic Records Strategic Plan that guides the State's traffic records improvement efforts. This document is a multi-year plan, updated annually, that addresses all the recommendations from the State's most recent Traffic Records assessment, sets the framework for improving all aspects of the State's traffic records system, and provides goals and objectives for activities over the short and long term.

The State Traffic Records Strategic Plan is distinct from other congressionally-mandated strategic planning documents, including the Highway Safety Plan, the Strategic Highway Safety Plan, and the Commercial Vehicle Safety Plan. One way to reduce duplication of efforts within a State's traffic records system is to incorporate the TRCC's strategic planning into these three State safety plans.

The State Traffic Records Strategic Plan is data-driven, addresses measurable areas of opportunity, and works towards State-defined performance metrics to enhance system performance. The State Traffic Records Strategic Plan includes activities that improve the timeliness, accuracy, completeness, uniformity, integration, and accessibility of State highway safety data. By identifying and addressing these traffic records data quality issues, the strategic plan enhances the State's ability to conduct traffic safety problem identification, select and develop countermeasures, and measure the effectiveness of said countermeasures. Developed and approved by the State's TRCC, the ideal State Traffic Records Strategic Plan:

- Identifies performance-based measures and corresponding metrics for each of the six core data systems;
- Demonstrates quantitative improvement in a data attribute (accuracy, completeness, timeliness, uniformity, accessibility or integration) of a core database on an annual basis;
- Addresses areas of opportunity to improve existing data and data systems, and documents how these will be addressed;
- Identifies strategies that address the timeliness, accuracy, completeness, uniformity, integration, and accessibility of the six core data systems;
- Indicates what funds will be used to undertake efforts detailed in the strategic plan and describes how these allocations address the plan's stated goals;
- Prioritizes traffic records improvement projects;
- Identifies and addresses technical assistance and training needs;
- Leverages Federal funds and assistance programs;
- Establishes timelines and responsibilities for the projects in the plan; and,
- Integrates State and local data needs and goals into the highway safety data and traffic records system strategic plan.

Ideally, the creation and management of the State Traffic Records Strategic Plan include the following considerations.

Monitor Opportunities to Use New Technology

The State Traffic Records Strategic Plan addresses the adoption and integration of new technology at the project level to ensure timely, accurate, and complete traffic safety data required for more complex analyses. The application of new technology in all operational phases (data collection, interface, processing, retrieval, integration, and analysis) should be continuously reviewed and assessed.

Consider Lifecycle Costs
The State Traffic Records Strategic Plan considers the costs of data improvement projects' lifecycle maintenance to ensure the traffic records system continues to function even in the absence of Federal grant funds.

Engage with Localities
The State Traffic Records Strategic Plan is responsive to the needs of all stakeholders, including local users and tribal nations.

Coordinate with Federal Data Systems
The State Traffic Records Strategic Plan's data collection, management, and analysis portfolio include coordination of the State's systems with key Federal traffic records data systems. These include the Fatality Analysis Reporting System, the National Driver Register's Problem Driver Pointer System, the Motor Carrier Management Information System, and the Commercial Driver License Information System.

SECTION 3: TRAFFIC RECORDS SYSTEM COMPONENTS

SECTION 3-A: CRASH DATA SYSTEM

Description and Contents of the Crash Data System

The crash data system is the keystone of a State's traffic records system. The crash system not only holds the basic data critical to developing and deploying effective traffic safety countermeasures, it frequently also serves as the hub through which other systems are connected.

The benefits and overall utility derived from the other traffic records systems are significantly enhanced by reliable, valid statewide crash data. Linking other systems' data with crash data enables invaluable opportunities for analysis. The resulting information drives State highway safety and injury prevention programs and has widespread applicability for all levels of government, industry, research groups, lawmakers, healthcare providers, and the public.

The State crash system ideally contains—at a minimum—basic information about every reportable motor vehicle crash in the State. (Reportable is defined by the applicable State statute.) The available data should be sufficient to permit decision-makers to draw valid conclusions about the crash experience in their State. Ideally, all State crash data is consolidated into one generally accessible database with a clearly defined organizational custodian. The crash system provides both an official record of the crash and data for analytic purposes. The crash system documents the characteristics of a crash and provides the following details about each incident.

- **Who:** Information about the drivers, occupants, and non-motorists involved in a crash (e.g., license status, age, sex);
- **What:** Information about the type of vehicles involved in crashes (e.g., make, model, body type, vehicle registration);
- **When:** Information detailing the time and date a crash occurred (e.g., date, time of day, the day of the week)
- **Where:** Information about the crash location (e.g., location name, Lat/Long coordinates, type, attributes);
- **How:** Information describing the sequence of events and circumstances related to a crash—up to and including the first harmful event through the end of a crash and its consequences (e.g., damage, injury);
- **Why:** Information about the interaction of various systems that may have contributed to the crash occurrence (e.g., weather, light conditions, driver actions, non-motorist actions) and/or the crash severity.

Ideally, crash data reflecting all levels of severity—including fatal, injury, and property damage only—is collected and used to support safety analysis.

Through linkages to other traffic records data systems, the crash data system identifies detailed specifics of the roadways (number of lanes, AADT, etc.), vehicles (registration, etc.), and persons (license status, citation history, etc.) involved in a crash. Data and analytic tools are broadly available so safety stakeholders can identify locations, roadway features, behaviors, driver characteristics, and vehicle characteristics that relate to crash risk.

Crash data is used to guide engineering and construction projects, prioritize law enforcement activity, and select and evaluate safety countermeasure programs. Crash data is also used in analysis related to emergency response and to maximize the level of care and the survivability associated with injuries sustained in a crash.

Applicable Guidelines for Crash Systems

There are several voluntary guidelines available to States wishing to build and maintain an ideal crash data system. The *Model Minimum Uniform Crash Criteria* (MMUCC) Guideline[4] provides a suggested minimum set of crash data elements, attributes and edit checks that enable valid statistical analysis. As a minimum standard set for any reportable crash, States are encouraged, but not required, to adopt additional data elements and attributes as required by their specific data needs.

When creating or updating crash system data dictionaries, States can also consider ANSI D16.1, the *Manual on Classification of Motor Vehicle Traffic Crashes*,[5] a standard for statistical motor vehicle traffic crash classifications for nationwide use. ANSI D16 provides a common language for crash data reporters, classifiers, analysts, and users.

States are responsible for protecting against unlawful disclosure of personal information as defined in 18 U.S.C. §2725 and relevant State statutes. Per the Driver's Privacy Protection Act (DPPA), States may not release personally identifying information without the express consent of the individual in question, except for certain circumstances set forth in 18 U.S.C. §2721.[6]

Finally, the FARS coding and validation manuals provide critical guidance for the collection of data specifically for the Fatalities Analysis Reporting System, the nationwide annual census of fatalities occurring because of motor vehicle crashes. The FARS manuals are updated annually. State FARS analysts must use the manual appropriate to the current program year.

Data Dictionary for the Crash Data System

Ideally, the State maintains a crash system data dictionary documenting the following.

- All data elements, definitions, and attributes in the crash data collection form/software;
- All data elements, definitions and attributes in the crash database, to include linked and derived variables; and
- All system edit-checks and validation rules (e.g., rules that are applied to prevent improper or inconsistent data from being entered).

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[4] National Highway Traffic Safety Administration. (2017, July). *MMUCC guideline: Model minimum uniform crash criteria, fifth edition, 2017* (Report No. DOT HS 812 433). Washington, DC: Author. Available at https://crashstats.nhtsa.dot.gov/Api/Public/Publication/812433

[5] D.16 Committee on Classification of Motor Vehicle Traffic Crashes (2017). *ANSI D16.1 – 2017 American national standard manual on classification of motor vehicle traffic crashes*, Eighth Edition. Mechanicsville, VA: Association of Transportation Safety Information Professionals. Available at http://www.atsip.org/ANSI_Ver_2017_D16.pdf

[6] Available at www.gpo.gov/fdsys/granule/USCODE-2011-title18/USCODE-2011-title18-partI-chap123-sec2721/content-detail.html

The data dictionary is kept up-to-date and consistent with the field data collection manual, coding manual, crash report, database schema and any training materials. Access should be granted to all appropriate data collectors, managers, and users.

The data dictionary explains each data element. Specifically, it outlines what is included and not included, rules of use, and any exceptions to the rules. The data dictionary also indicates the data elements that are (a) populated through linkages to other traffic records system components and (b) link crash data to data in other traffic records systems.

Procedures and Process Flows for Crash Data Systems

Ideally, crash data should be collected electronically in the field by all jurisdictions using a uniform, efficient approach (e.g., question or scenario-based software) that is consistent with the MMUCC Guideline and the statewide database's validation rules. Data is subject to validation checks at the point it is added to the record.

The State maintains accurate and up-to-date documentation—including process flow diagrams—that details the policies and procedures for key processes governing the collection, submission, processing (e.g., location coding), posting, and maintenance of crash data. This should include provisions for submitting fatal crash data to the State FARS data collection unit and commercial vehicle crash data to SafetyNet.

Process flow diagrams document key processes including interactions with other data systems. Ideally, each diagram should be annotated to show the time required to complete each critical step. The process flow diagram also includes the processes for managing errors and incomplete data (e.g., returning crash reports to the originating officer or department for correction and resubmission). The documentation accounts for both paper and electronic process flows.

In addition, crash system documentation indicates if edits and other steps are accomplished manually or electronically. The State ideally has documented retention and archival storage policies that serve the needs of safety engineers and other users with a legitimate need for long-term access to the reports.

Ideally, the State also maintains standards for all traffic records applications and databases, and the data dictionary should include consistent definitions for all elements—particularly those common across applications and databases.

Crash Data Systems Interface with Other Traffic Records Components

The crash system is linked with other traffic records systems to enhance data quality and support the crash system's critical business processes. Given the relative maturity of State crash systems and the higher standards of their formal data quality control programs, the ideal is consequently more developed for the crash module. System *interface* describes a timely, seamless relationship and a high degree of interoperability between systems. In contrast, system *integration* refers to the discrete linking of datasets for analytic purposes. Data integration is addressed in Section 4.

In practice, the system interface is useful when circumstances require relationships between traffic records data systems that always need to be connected and accessible. These interfaces occur throughout a crash record's lifecycle: data collection, submission, processing, posting, and maintenance. Ideally, such interfaces improve the efficiency and cost-effectiveness of the crash system.

The State's crash data ideally exists in one consolidated, generally accessible database. If data is first aggregated in separate law enforcement databases or records management systems, upload to the statewide database is electronic and automatic. The statewide crash database is also capable of supplying data to law enforcement agencies' RMS.

Routine protocols for uploading data to FARS and SafetyNet are created to ensure congruence with the State's crash data and to generate management and analysis efficiencies. Examples of useful interfaces between the crash data system and other traffic records system components are outlined below.

Crash system and driver system interfaces can:

- Verify and validate the driver's personal information in the crash record;
- Access driver records in the field;
- Identify inconsistencies between the crash and driver records for review and possible correction; and
- Indicate crash involvement on the driver file.

Crash system and vehicle system interfaces can:

- Verify and validate the vehicle information in the crash record;
- Access vehicle records in the field; and
- Identify inconsistencies between crash and vehicle records for review and possible correction.

Crash system and roadway system interfaces can:

- Verify and validate the roadway information in the crash record; and
- Identify inconsistencies between the crash and roadway records for review and possible correction.

Crash system and citation or adjudication system interfaces can:

- Verify and validate the citation and alcohol or drug test information in the crash record;
- Identify inconsistencies between the crash and citation records for review and possible correction; and
- Provide access to crash history in addition to criminal history, contact history, and location history in the field.

Crash system and injury surveillance data system interfaces can:

- Verify and validate the EMS information in the crash record; and
- Identify inconsistencies between the crash and EMS records for review and possible correction.

Table 1: Common Interface Links Between Crash and Other Data Systems

Crash System Interfaces With the Driver System	• Full name • Date of birth • Address • Driver's license number • Photo match
Crash System Interfaces With the Vehicle System	• Vehicle make • Vehicle model • Vehicle year • License plate number • VIN
Crash System Interfaces With the Roadway System	• Precise location (lat/long coordinates, route and milepost, street address, etc.)
Crash System Interfaces With the Citation and Adjudication Systems	• Full name • Date of birth • Address • Driver's license number • Photo match
Crash System Interfaces With the Injury Surveillance System	• Full name • Date of birth • Address • EMS run report number • Unique patient ID number • Precise location (lat/long coordinates, route and milepost, street address, etc.)

Data Quality Control Programs for the Crash Data System

A formal, comprehensive crash data quality management program's review protocols cover the entire process—the collection, submission, processing, posting, and maintenance of crash data. Ideally, such a system includes the aspects enumerated below.

Automated edit checks and validation rules that ensure entered data falls within the range of acceptable values and is logically consistent between other fields. Edit checks are applied when data is added to the record. Many systems have a two-tiered error classification system, distinguishing critical errors that must be corrected before submission and non-critical error warnings that may be overridden.

Limited State-level correction authority is granted to quality control staff working with the statewide crash database to amend obvious errors and omissions without returning the report to the originating officer. Obvious errors include minor misspellings, location corrections, and directional values. Obvious omissions include missing values that can easily be obtained from the narrative or diagram.

Processes for returning rejected crash reports are in place to ensure the efficient transmission of rejected reports between the statewide data system and the originating officer as well as tracking the corrected report's submission.

Performance measures are tailored to the needs of data managers and address the concerns of data users. Measures can be aggregated from collectors, users, and the State TRCC. The crash data should be timely, accurate, complete, uniform, integrated, and accessible. These attributes are tracked using State-established quality control measures. The measures in Table 2 are examples of high-level quality management indicators. The State is encouraged to develop additional measures that address their specific needs.

Table 2: Example Quality Control Measurements For Crash Data Systems	
Timeliness	• The median or mean number of days from (a) the crash date to (b) the date the crash report is entered into the database. • The percentage of crash reports entered into the database within XX* days after the crash. *e.g., 30, 60, or 90 days.
Accuracy	• The percentage of crash records with no errors in critical data elements (for example, crash severity). • The percentage of in-State registered vehicles on the State crash file with VIN matched to the State vehicle registration file.
Completeness	• The percentage of crash records with no missing critical data elements. • The percentage of crash records with no missing data elements. • The percentage of unknowns or blanks in critical data elements for which unknown is not an acceptable value.
Uniformity	• The number of MMUCC-compliant data elements entered into the crash database or obtained via linkage to other databases.
Integration	• The percentage of appropriate records in the crash database that are linked to another system or file. Examples: crash with in-State driver linked to driver file, crash with EMS response linked to EMS file.
Accessibility	• Identify the principal users of the crash database. Query the principal users to assess (a) their ability to obtain the data or other services requested and (b) their satisfaction with the timeliness of the response to their request. Document the method of data collection and the principal users' responses.
Source: Model Performance Measures for State Traffic Records Systems, DOT HS 811 411.	

Numeric goals —or performance metrics—for each performance measure are established and regularly updated by the State in consultation with users via the TRCC.

Performance reporting provides specific feedback to each law enforcement agency on the timeliness, accuracy, and completeness of their submissions to the statewide crash database relative to applicable State standards.

High-frequency errors are tracked and used to generate new training content and data collection manuals, update the validation rules, and prompt form revisions.

Quality control reviews comparing the narrative, diagram, and coded report contents are considered part of the statewide crash database's data acceptance process.

Independent sample-based audits are conducted periodically for crash reports and related database contents. A random sample of reports is selected for review. The resulting reviews are also used to generate new training content and data collection manuals, update the validation rules, and prompt form revisions. At a minimum, these audits occur on an annual basis.

Periodic comparative and trend analyses are used to identify unexplained differences in the data across years and jurisdictions. At a minimum, these analyses occur on an annual basis.

Data quality feedback from key users is regularly communicated to data collectors and data managers. This feedback will include corrections to existing records as well and comments relating to frequently occurring errors. Data managers disseminate this information to law enforcement officers as appropriate.

Data quality management reports are provided to the TRCC for regular review. The TRCC uses the reports to identify problems and develop countermeasures.

SECTION 3-B: DRIVER DATA SYSTEM

Description and Contents of the Driver Data System

The driver data system ensures that each person licensed to drive has one identity, one license to drive, and one record. Custodial responsibility for the driver system resides in a single location, generally the State Department or Division of Motor Vehicles. For this advisory, that State means the custodial agency.

Ideally, the driver system maintains information on all out-of-State or unlicensed drivers convicted of traffic violations within the State's boundaries. At a minimum, the driver system maintains driver identities, histories, and licensing information for all records in the system. The driver history record (DHR) contains all sanctions and convictions received by a driver as well as driver's license issuance and expiration dates and restrictions. While the structure of the driver system is typically oriented towards individual drivers, the system is also designed to support (in concert with other data systems) both aggregate and detailed analyses of driver behaviors as they relate to safety.

Critical information the driver system maintains about all persons licensed by the State includes—but is not limited to—the items found in Table 3 below.

Table 3: Critical Information Maintained by the Driver Data System

• Personally, identifiable information • Driver's license number • License type • License status • Conviction history for violations in current and other States • Commercial driver's license endorsements • Non-commercial driver's license endorsements • All commercial driver convictions, in and out of State • Driver restrictions, including interlocks • Crash involvement regardless of violation	• Driver improvement or control actions • Novice driver education or training, including the type of license, the name of the provider, and type of education (e.g., classroom or behind-the-wheel) • Driver improvement or traffic violation courses (may be provided via linkage with another system) • Dates of original issuance for all permits, licenses, and endorsements (e.g., learner's permit, provisional license, commercial driver's license [CDL], motorcycle license)

At a minimum, the driver system should be linked to the crash data system, the DUI tracking system, and the citation and adjudication systems (for both original charges and the final dispositions of all traffic citations).

Applicable Guidelines for the Driver Data System

Ideally, ANSI D.20 standards are used to develop data definitions for traffic records-related information in the driver system. Driver information is maintained in a manner that accommodates interaction with the National Driver Register Problem Driver Pointer System and FMCSA's Commercial Driver's License Information System. These systems enable States to assess complete driving histories and prevent problem drivers from circumventing driver control actions and falsely obtaining multiple licenses. Data exchange for PDPS and CDLIS relies upon the AAMVA Code Dictionary.

Data Dictionary for the Driver Data System

Ideally, the contents of the driver data system are well documented; each field has an established definition and validated values—including appropriate null codes. Applicable edit checks and data collection guidelines match the data definitions. The data dictionary is maintained and updated to keep pace with system, legislative, and other changes.

Procedures and Process Flows for the Driver Data System

Ideally, the driver data system's custodial agency maintains accurate and up-to-date documentation detailing the policies and procedures that govern the collection, reporting, and posting of license, conviction, and sanction information. Key processes include license, permit, and endorsement issuance; reporting and recording relevant convictions; reporting and recording driver education and improvement courses; reporting and recording other information that may result in a change of license status; and, maintaining the appropriate system and information security.

The custodial agency also maintains detailed process flow diagrams outlining the driver system's key data process flows, including inputs from other components and the processes for error correction and error handling (returning reports to the original source for correction and resubmission). Quality assurance, error correction, and error handling processes should also be explicitly shown in the diagrams.

Process flow diagrams include information on how each step is accomplished—whether manually or electronically—and clearly distinguish between the two. In States that have administrative authority to suspend licenses based on a DUI arrest independent of adjudication, the steps in this process are included in the diagram as well. The process flow diagram also documents the frequency, conditions, and procedures for purging data from the Driver system to ensure that outdated information is removed while necessary information is retained appropriately.

States should have established processes to detect fraud in the driver data. For example, participation in the Systematic Alien Verification for Entitlements (SAVE) program, deployment of facial recognition software, fingerprint checking, and other biometric technologies can detect individuals attempting illegal re-licensure. States can check internal fraud by examining individual issuer and examiner outputs for unusual patterns. Examples of potential internal fraud include an examiner whose license issuances are twice or three times as likely to involve applicants presenting immigration documents, and a small office whose clientele is coming from an unreasonable distance. States should also have formalized methods to identify and prevent fraud when issuing commercial driver's licenses and provide background checks before issuing hazardous materials endorsements. To improve intrastate fraud detection, States should be able to share DHRs electronically—the transfer of data through an authorized electronic data interchange system such as a secure computer network—with other States.

It is vital that States have robust security protocols governing access to and release of driver system data in compliances with all applicable State and Federal laws, including the Driver's Privacy Protection Act.

Driver System Interface with Other Components

The driver system interfaces with other traffic records systems to enhance data quality and support the driver system's critical business processes. System *interface* describes a timely, seamless relationship and a high degree of interoperability between systems. In contrast, system *integration* refers to the discrete linking of databases for analytic purposes. Data integration is addressed in Section 4.
In practice, the system interface is useful when circumstances require relationships between traffic records data systems that always need to be connected and accessible. Linkages that support the driver system include those with the crash system, citation and adjudication systems, Social Security Online Verification, SAVE, CDLIS, and the PDPS. Custodians of the driver system maintain the capability to grant authorized law enforcement, court, and other State users access to information within the driver system.

Productive linkages between the driver system and other traffic records components are dependent upon an explicitly defined linking variable that ensure more accurate and up-to-date information. Some common linking variables can be found in Table 4.

Table 4: Common Interface Links Between Driver and Other Data Systems

Driver System Interfaces with the Crash System	• Personal identifiers (e.g., name, address, date of birth)	• Crash report number
Driver System Interfaces with the Citation System	• Personal identifiers (e.g., name, address, date of birth)	• Citation or case number
Driver System Interfaces with the Adjudication System	• Personal identifiers (e.g., name, address, date of birth)	• Citation or case number

Data Quality Control Programs for the Driver System

A formal, comprehensive driver data quality management program's review protocols cover the entire process—the collection, submission, processing, posting, and maintenance of driver data. Ideally, such a system includes the aspects enumerated below.

Automated edit checks and validation rules that ensure entered data falls within the range of acceptable values and is logically consistent between other fields. Edit checks are applied when data is added to the record. Many systems have a two-tiered error classification system, distinguishing critical errors that must be corrected before submission and non-critical error warnings that may be overridden.

Performance measures are tailored to the needs of data managers and address the concerns of data users. Performance measures also ensure the integrity of the data. Measures can be aggregated from collectors, users, and the State TRCC. The driver data should be timely, accurate, complete, uniform, integrated, and accessible. These attributes are tracked using State-established quality control measures. The measures in Table 5 are examples of high-level quality management indicators. The State is encouraged to develop additional measures that address their specific needs.

Table 5: Example Quality Control Measurements For Driver Data Systems	
Timeliness	• The median or mean number of days from (a) the date of a driver's adverse action to (b) the date the adverse action is entered into the database. • The median or mean number of days from (a) the date of receipt of citation disposition notification by the driver repository to (b) the date the disposition report is entered into the driver's record in the system within a period determined by the State.
Accuracy	• The percentage of driver records with no errors in critical data elements. Even with edit checks, a driver record might have programming errors.
Completeness	• The percentage of driver records with no missing critical data elements. • The percentage of records on the State driver system that contain no missing data elements. • The percentage of unknowns or blanks in critical data elements for which unknown is not an acceptable value.
Uniformity	• The number of standards-compliant data elements entered into the driver database or obtained via linkage to other databases. Relevant standards include ANSI D.20.
Integration	• The percentage of appropriate records in the driver database that is linked to another system or file.
Accessibility	• Identify the principal users of the driver database. Query the principal users to assess (a) their ability to obtain the data or other services requested and (b) their satisfaction with the timeliness of the response to their request. Document the method of data collection and the principal users' responses. Satisfaction with responses to legitimate data queries should be tracked. Either access to the database or access to the data can be tracked.
Source: *Model Performance Measures for State Traffic Records Systems*, DOT HS 811 411	

Numeric goals—or performance metrics—for each performance measure are established and regularly updated by the State in consultation with users via the TRCC.

Performance reporting provides specific feedback to law enforcement agencies, courts, and other agencies on the timeliness, accuracy, and completeness of their submissions to the statewide driver database relative to applicable State standards.

High-frequency errors are tracked and used to generate new training content and data collection manuals, update the validation rules, and prompt form revisions.

Quality control reviews are conducted to ensure all data associated with a record does, in fact, belong to that record, and to ensure that documents maintained in the system are linked to the correct record.

Independent sample-based audits are conducted periodically for the driver reports and related database contents. A random sample of reports is selected for review. The resulting reviews are also used to generate new training content and data collection manuals, update the validation rules, and prompt form revisions. At a minimum, these audits occur on an annual basis.

Periodic comparative and trend analyses are used to identify unexplained differences in the data across years. At a minimum, these analyses occur on an annual basis.

Data quality feedback from key users is regularly communicated to data collectors and data managers. This feedback will include corrections to existing records as well and comments relating to frequently occurring errors. Data managers disseminate this information to law enforcement officers, courts, and other agencies as appropriate.

Data quality management reports are provided to the TRCC for regular review. The TRCC uses the reports to identify problems and develop countermeasures.

SECTION 3-C: VEHICLE DATA SYSTEM

Description and Contents of the Vehicle Data System

The vehicle system is an inventory of data that enables the titling and registration of each vehicle under the State's jurisdiction to ensure that a descriptive record is maintained and made accessible for each vehicle and vehicle owner operating on public roadways.

Vehicle information includes identification and ownership data for vehicles registered in the State as well as out-of-State vehicles involved in crashes within the State's boundaries. Information on vehicle make, model, year of manufacture, body type (usually extracted from the VIN), and adverse vehicle history (title brands) is maintained to produce the data needed to support safety programs. Ideally, the vehicle system is capable of recording and reporting title data, registration information, and verification of required insurance and should clearly define both the vehicle itself and the owner or leaseholder.

Custodial responsibility for vehicle data usually resides in a State's Department or Division of Motor Vehicles or Department of Revenue. The structure of vehicle databases is typically oriented to individual "customers." While some commercial vehicle-related functions are handled separately, such information should still be accessible via the primary vehicle data system.

In addition to serving its primary users within the custodial agency, the vehicle system also permits law enforcement officers to obtain vehicle information from the registration and title files at the time of field contact. Vehicle registration documents are barcoded—using at a minimum the 2D standard—so law enforcement officers in the field can collect vehicle registration information rapidly and accuracy using barcode readers or scanners. Authorized investigators and research analysts should also have access to the vehicle data system.

Applicable Guidelines for the Vehicle Data System

Ideally, title brand information and stolen vehicle indicators are available to other States. Sharing such information between State vehicle systems is accomplished via the National Motor Vehicle Title Information System (NMVTIS). The system is queried, and data provided before the issuance of a new title. NMVTIS enables titling jurisdictions to exchange title information instantaneously and determine the status and validity of vehicle titles. States provide data to NMVTIS on a real-time basis or, at a minimum, once a day.

The assignment of title brands is pursuant to the definitions and guidelines published by the American Association of Motor Vehicle Administrators (AAMVA). Ideally, States are also active participants in the Performance and Registration Information Systems Management program, a Federal-State partnership that identifies motor carriers with deficient safety records and ties carrier safety to vehicle registration.

The International Registration Plan, a reciprocity agreement between U.S. States and Canadian provinces, administers the registration fees and taxation processes for interstate commercial vehicles. States that empower auto dealers to transact vehicle registrations and title applications follow AAMVA's Business Partner Electronic Vehicle Registration guidelines. The National Information Exchange Model is the standard for data exchange interoperability.

Vehicle System Data Dictionary

The vehicle system data dictionary specifies definitions for each data element and, where applicable, provides matching edit checks and data collection guidelines. Ideally, procedures for collection, reporting, and posting of registration, title, and title brand information are formally documented. The data dictionary is accessible to all users and updated regularly to reflect changes to the system. Procedures for updating the data dictionary are also documented.

Procedures and Process Flows for the Vehicle Data System

The vehicle data system's custodial agencies ideally maintain accurate and up-to-date documentation—including process flow diagrams—that details the policies and procedures governing the collection, reporting, and posting of titling, registrations, and associated transactions. In addition to primary business practices, custodial agencies also maintain safeguards protecting against fraud. Ideally, States have robust security protocols governing access to and release of vehicle data that comply with all applicable State and Federal laws, including the Driver's Privacy Protection Act.

Custodial agencies also maintain overall process documents that outline the vehicle system's key data processes, including inputs from other data systems. The steps from initial title issuance based on a manufacturer's statement (or certificate) of origin, title transfer from in-State, title transfer from a prior State, and registration are best documented in process flow diagrams or descriptive narratives for each subsystem. When receiving a title that includes a title brand from a prior State, that information should be carried forward onto the new title document. Another step, when applicable, is the posting of a title brand to the title record. When the vehicle is reported no longer serviceable the system records the vehicle as junked and the VIN cannot be reused.

The process flow diagram is annotated to show the time required to complete each step and to show alternate flows and timelines depending on whether the data is submitted electronically to the statewide system. The diagram or narrative includes processes for error correction and error handling (e.g., returning reports to the original source for correction and resubmission). The State also documents the timing, conditions, and procedures for purging records from the vehicle files. Ideally, diagrams and narratives show all major steps whether accomplished by staff or by automated systems and should clearly distinguish between the two.

Vehicle Data System Interface with Other Traffic Records System Components

The vehicle data system interfaces with other traffic record components to enhance data quality and support the vehicle system's critical business processes. System *interface* describes a timely, seamless relationship and a high degree of interoperability between systems. In contrast, system *integration* refers to the discrete linking of databases for analytic purposes. Data integration is addressed in Section 4.

In practice, the system interface is useful when circumstances require relationships between traffic records data systems that always need to be connected and accessible. These interfaces occur throughout a vehicle record's lifecycle: data collection, submission, processing, posting, and maintenance. Ideally, such interfaces improve the efficiency and cost-effectiveness of the vehicle system.

Interface linkages between the driver and vehicle systems are very important as they can result in significant cost and operational efficiencies. Such linkages between the driver and discrete vehicle systems are much easier to accomplish when personal information in the vehicle systems is entered using the same conventions as the driver system. In cases where the driver and vehicle systems are unified, the personal information serves both the driver and vehicle components.

Additionally, the vehicle system supports key processes in other systems, particularly the citation and crash components. Vehicle data is useful in verifying and validating information during crash report data collection and entry, and for flagging records in the vehicle system for a possible update when a discrepancy is identified in the field. Ideally, key variables such as VIN, license plate number, and vehicle owner name and address are made available to support matching records among these system components.

Common linking elements are required for retrieving associated records from the various traffic records components. Such linkages as given in Table 6 are essential to the efficient access of vehicle file information when populating a citation or crash record.

Table 6: Common Interface Links Between Vehicle and Other Data Systems

Vehicle System Interfaces With the Crash System	• Driver and owner personal identifiers (e.g., name, address, date of birth)	• VIN
Vehicle System Interfaces With the Driver System	• Driver and owner personal identifiers (e.g., name, address, date of birth)	
Vehicle System Interfaces With the Citation System	• Driver and owner personal identifiers (e.g., name, address, date of birth)	• VIN

Data Quality Control Programs for the Vehicle Data System

A formal, comprehensive vehicle data quality management program's review protocols cover the entire process—the collection, submission, processing, posting, and maintenance of vehicle data. Ideally, such a system includes the aspects enumerated below.

Automated edit checks and validation rules that ensure entered data falls within the range of acceptable values and is logically consistent with other elements. Edit checks are applied when data is added to the record. Many systems have a two-tiered error classification system, distinguishing critical errors that must be corrected before submission and non-critical error warnings that may be overridden.

Limited State-level correction authority is granted to quality control staff working with the statewide vehicle database to amend obvious errors and omissions. Obvious errors include minor misspellings, etc.

Performance measures are tailored to the needs of data managers and address the concerns of data users. Performance measures also ensure the integrity of the data. Measures can be aggregated from collectors, users, and the TRCC. The vehicle data should be timely, accurate, complete, uniform, integrated, and accessible. These attributes are tracked using State-established quality control measures. The measures in Table 7 are examples of high-level quality management indicators. The State is encouraged to develop additional measures that address their specific needs.

Table 7: Example Quality Control Measurements for Vehicle Data Systems	
Timeliness	• The median or mean number of days from (a) the date of a critical status change in the vehicle record (e.g., suspension due to failure to maintain financial responsibility) to (b) the date the status change is entered into the database. • The percentage of vehicle record updates entered into the database within X days (e.g., 30, 60, or 90 days) of the critical status change.
Accuracy	• The percentage of vehicle records with no errors in critical vehicle data elements.
Completeness	• The percentage of vehicle records with no missing critical data elements. • The percentage of records on the system that contain no missing data elements. • The percentage of unknowns or blanks in critical data elements for which unknown is not an acceptable value. • The percentage of vehicle records from larger trucks and buses that have all the following data elements: motor carrier ID, gross vehicle weight rating/gross combination weight rating, vehicle configuration, cargo body type, and hazardous materials (cargo only).
Uniformity	• The number of standards-compliant data elements entered into the vehicle database or obtained via linkage to other databases.
Integration	• The percentage of appropriate records in the vehicle database that is linked to another system or file.
Accessibility	• Identify the principal users of the vehicle database. Query the principal users to assess (a) their ability to obtain the data or other services requested and (b) their satisfaction with the timeliness of the response to their request. Document the method of data collection and the principal users' responses.
Source: 2011 DOT HS 811 411, Model Performance Measures for State Traffic Records Systems	

Numeric goals —or performance metrics—for each performance measure are established and regularly updated by the State in consultation with users via the TRCC.

Performance reporting provides specific feedback to law enforcement agencies and other agencies on the timeliness, accuracy, and completeness of their submissions to the statewide vehicle database relative to applicable State standards.

High-frequency errors are used to generate new training content and data collection manuals, update the validation rules, and prompt form revisions.

Quality control reviews for the vehicle system are used to ensure all data associated with a record does, in fact, belong to that record and is accurate, as well as if documents are maintained in a system and associated with the correct record.

Independent sample-based audits are conducted periodically to examine vehicle reports and related database contents. A random sample of reports is selected for review. The resulting reviews are also used to generate new training content and data collection manuals, update the validation rules, and prompt form revisions. At a minimum, these audits occur on an annual basis.

Periodic comparative and trend analyses are used to identify unexplained differences in the data across years. At a minimum, these analyses occur on an annual basis.

Data quality feedback from key users is regularly communicated to data collectors and data managers. This feedback will include corrections to existing records as well and comments relating to frequently occurring errors. Data managers disseminate this information to law enforcement officers and other governmental agencies as appropriate.

Data quality management reports are provided to the TRCC for regular review. The TRCC used the reports to identify problems and develop countermeasures.

SECTION 3-D: ROADWAY DATA SYSTEM

Description and Contents of the Roadway Data System

The State's roadway data system comprises data collected by the State including non-State-owned public roads and roads on tribal land in the State. Per the *Highway Performance Monitoring System Field Manual*,[7] a public road is defined as "any road or street owned and maintained by a public authority and open to public travel" (23 U.S.C. 101[a]). The ideal statewide system incorporates sufficient information on all public roads to support valid, system-wide network screening and countermeasure development, deployment, and evaluation.

To collect roadway inventory information for safety purposes, the FHWA developed the *Model Inventory of Roadway Elements*[8] to provide an extensive listing of data elements dealing with road segments, intersections, interchanges, and traffic. The minimum data elements required for safety analysis are a subset of the MIRE referred to as the MIRE fundamental data elements (FDEs), which vary depending on the function class and surface type of a public roadway. State roadway data collection is dictated by available resources and the FHWA document *Guidance on State Safety Data Systems.*[9]

As a prerequisite for collecting and using MIRE and the FDEs, States must be able to uniformly locate the collected roadway and traffic data elements to a compatible location referencing system (e.g., linear referencing system, GIS). Ideally, the State's referencing system is inclusive of all public roadways within the State and can identify crash locations. Common analysis tools such as AASHTOWare Safety Analyst and the Highway Safety Manual use MIRE-derived data.

The State Department of Transportation typically is the custodial agency for the roadway data system. This component, at a minimum, includes the enterprise-related files listed below. While this assessment focuses on the FDEs as shown in the following three tables separated by functional classification and type of pavement, States are encouraged to review the MIRE and identify which additional elements would best serve the State's data needs and be included in the roadway inventory.

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[7] Federal Highway Administration. (2016, December). *Highway Performance Monitoring System field manual*. (Office of Management & Budget Control No. 2125-0028). Washington, DC: Author. Available at www.fhwa.dot.gov/policyinformation/hpms/fieldmanual/hpms_field_manual_dec2016.pdf

[8] Lefler, N., Council, F., Harkey, D., Carter, D., McGee, H., & Daul, M. (2010, October). *Model inventory of roadway elements—MIRE, Version 1.0* (Report No. FHWA-SA-10-018). Washington, DC: Federal Highway Administration. Available at http://safety.fhwa.dot.gov/tools/data_tools/mirereport/mirereport.pdf.

The 2.0 version of this publication is:

Lefler, N., Zhou, Y., Carter, D., McGee, H., Harkey, D., & Council, F. (2017, July). *Model inventory of roadway elements – MIRE 2.0* (Report No. FHWA-SA-17-048). Washington, DC: Federal Highway Administration. Available at https://safety.fhwa.dot.gov/rsdp/downloads/fhwasa17048.pdf

[9] Federal Highway Administration. (2016, April 14). *Guidance on State safety data systems*. Washington, DC: Author. Available at https://safety.fhwa.dot.gov/legislationandpolicy/fast/docs/ssds_guidance.pdf

Table 8. MIRE Fundamental Data Elements for Non-Local Paved Roads Based on Functional Classification

MIRE Name (MIRE 1.0 Element Number)

Roadway Segment	Intersection	Interchange/Ramp
Segment Identifier (12) Route Number (8) Route/Street Name (9) Federal Aid/ Route Type (21) Rural/Urban Designation (20) Surface Type (23) Begin Point Segment Descriptor (10) End Point Segment Descriptor (11) Segment Length (13) Direction of Inventory (18) Functional Class (19) Median Type (54) Access Control (22) One/Two-Way Operations (91) Number of Through Lanes (31) AADT (79) AADT Year (80) Type of Governmental Ownership (4) Unique Junction Identifier (120) Location Identifier for Road 1 Crossing Point (122) Location Identifier for Road 2 Crossing Point (123) Intersection/Junction Geometry (126) Intersection/Junction Traffic Control (131) AADT (79) [for Each Intersecting Road] AADT Year (80) [for Each Intersecting Road] Unique Approach Identifier (139)	Unique Junction Identifier (120) Location Identifier for Road 1 Crossing Point (122) Location Identifier for Road 2 Crossing Point (123) Intersection/Junction Geometry (126) Intersection/Junction Traffic Control (131) AADT (79) [for Each Intersecting Road] AADT Year (80) [for Each Intersecting Road] Unique Approach Identifier (139)	Unique Interchange Identifier (178) Location Identifier for Roadway at Beginning Ramp Terminal (197) Location Identifier for Roadway at Ending Ramp Terminal (201) Ramp Length (187) Roadway Type at Beginning Ramp Terminal (195) Roadway Type at Ending Ramp Terminal (199) Interchange Type (182) Ramp AADT (191) Year of Ramp AADT (192) Functional Class (19) Type of Governmental Ownership (4)

Model Inventory of Roadway Elements–MIRE, Version 2.0, Report No. FHWA-SA-17-048, July 2017, https://safety.fhwa.dot.gov/rsdp/downloads/fhwasa17048.pdf.

Table 9. MIRE Fundamental Data Elements for Local Paved Roads Based on Functional Classification MIRE Name (MIRE 1.0 Element Number)
Roadway Segment
Segment Identifier (12) Functional Class (19) Surface Type (23) Type of Governmental Ownership (4) Number of Through Lanes (31) Average Annual Daily Traffic (79) Begin Point Segment Descriptor (10) End Point Segment Descriptor (11) Rural/Urban Designation (20)
Model Inventory of Roadway Elements–MIRE, Version 2.0, Report No. FHWA-SA-17-048, July 2017, https://safety.fhwa.dot.gov/rsdp/downloads/fhwasa17048.pdf.

Table 10. MIRE Fundamental Data Elements for Unpaved Roads MIRE Name (MIRE 1.0 Element Number)
Roadway Segment
Segment Identifier (12) Functional Class (19) Type of Governmental Ownership (4) Begin Point Segment Descriptor (10) End Point Segment Descriptor (11)
Model Inventory of Roadway Elements–MIRE, Version 2.0, Report No. FHWA-SA-17-048, July 2017, https://safety.fhwa.dot.gov/rsdp/downloads/fhwasa17048.pdf.

Applicable Guidelines for the Roadway Data System

MIRE is the major guideline pertaining to the roadway system. There are a total of 205 elements that comprise MIRE Version 2.0[10] and a smaller subset of those elements have been identified as Fundamental Data Elements (FDEs) depending on roadway classification type (see Tables 8, 9, and 10). The MIRE elements are divided among three broad categories: roadway segments, roadway alignment, and roadway junctions. Each MIRE element has a name, a definition, a list of attributes (coding scheme), a reference indicating how the element relates to elements in the Highway Performance Monitoring System and new safety tools, and—when necessary—an illustration that provides supplemental information on the element. It is important to have MIRE-level data for at least the roadway segments that have high crash rates so that possible roadway causality can be investigated.

Data Dictionary for the Roadway Data System

Ideally, information for all roadway information systems is thoroughly documented in a data dictionary. This documentation includes a definition for each element for all pertinent roadway components and data collection guidelines that match the data definitions. The dictionary is consistent and matches the roadway components in all applicable forms (e.g., crash report form, EMS run reports, citations). Roadway owners ideally will coordinate their definitions with MIRE definitions. This ensures that the roadway data elements are sufficient to conduct high quality safety analysis.

The data dictionary is maintained and updated to keep pace with changes. Procedures for updating the dictionary are also to be documented.

[10] Lefler, Zhou, Carter, McGee, Harkey, & Council, 2017.

Procedures and Process Flows for the Roadway Data System

The roadway system's custodial agency maintains accurate and up-to-date documentation—ideally including process flow diagrams—that details the policies and procedures governing the identification of new roadways, including the location referencing system. Updating the roadway inventory, archiving and accessing historical roadway inventory data, error checking, and matching of traffic and crash data with relevant roadway data are also included in the documented procedures. Distinctions between manual and electronic processes are also to be documented explicitly. In addition to primary business rules, the custodial agency also maintains security protocols governing access to, modification of, and release of roadway system data. The documentation also defines specific roles and responsibilities.

Creating, updating, and using roadway information for safety analysis are all complex processes that must be well documented to be understood, managed, and improved. A process flow diagram can help data collectors, managers, and users visualize and document these processes and promote a common understanding of how the system works. In addition, these process flow diagrams and documented procedures can help identify flaws, bottlenecks, and other less-obvious critical features of the roadway data flow for further system updates. The process flow diagrams are ideally annotated to reflect the overall timeliness, accuracy, and completeness of data flows.

The procedures for collecting traffic data are documented as well, including the procedures for traffic estimation. Where applicable, the process flow includes how local and tribal agencies manage and collect the roadway data they contribute to the State roadway data inventory.

Intrastate Roadway System Interface

State roadway information systems are generally held by multiple custodial agencies. These systems need to interface with each other and the State's enterprise roadway information system to support the roadway system's critical business processes and enhance data quality. Therefore, this portion of the *Advisory* addresses the interface linkages that can be established between discrete systems within the State's roadway data component.

System *interface* describes a timely, seamless relationship and a high degree of interoperability between systems. In contrast, system *integration* refers to the discrete linking of databases for analytic purposes. Data integration is addressed in Section 4.

Ideally, compatible location coding methodologies apply to all roadways, whether State- or locally maintained. When using a Geographic Information System (GIS), translations should be automatic between legacy location codes and geographic coordinates. This process should be established and well documented. Where multiple location coding schemes are used (e.g., linear reference, route/milepost, street names, and physical addresses), systems ensuring accurate and efficient translation among the various location code types are necessary. A combination of automated and manual processes may be used to assign location codes and translate among the various types of location codes. It is important, however, to document the steps in these processes and separately track the degree of success achieved by the linkage efforts so manual and automated processes may be compared.

States can create a segmental file based on a data element point of change for a variety of physical and safety roadway assets. This is of greater importance now that there is an emphasis on the inclusion of all public roads, as this may involve MPOs and local transportation agencies collecting data and conducting analyses.

Data Quality Control Programs for the Roadway Data System

Custodians of the roadway system should maintain a comprehensive, systematic quality control management process that ensures the efficient functioning of the system. The quality control process should include data quality measures as well. The timeliness, accuracy, completeness, uniformity, integration, and accessibility of the roadway data should be monitored based on a set of metrics established by the State. 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 detected errors. In addition, the custodial agency and the TRCC should work together to establish and review the sufficiency of the quality control program and to review the results of the quality control measures.

Roadway data managers should produce and analyze periodic data quality reports. When these reports identify shortcomings, appropriate measures should be taken and corrections applied. If common errors are identified, training and changes to the applicable instruction manuals, edit checks, and the data dictionaries should be made. Audits and validation checks should be conducted as part of the quality control program to assure the accuracy of specific critical data elements. The measures shown below in Table 11 are examples of high-level management indicators of quality taken from NHTSA's *Model Performance Measures for State Traffic Records Systems*.[11] 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.

[11] NHTSA, 2011.

Table 11: Example Quality Control Measurements For Roadway Data Systems	
Timeliness	• The median or mean number of days from (a) the date a periodic collection of critical roadway data elements is complete to (b) the data the updated critical roadway data element is entered into the database. • The median or mean number of days from (a) roadway project completion to (b) the date the data the updated critical roadway data elements are entered into the database.
Accuracy	• The percentage of road segment records with no errors in critical data elements.
Completeness	• The percentage of road segment records with no missing critical data elements. • The percentage of public road miles or jurisdictions identified on the State's basemap or roadway inventory file. • The percentage of unknowns or blanks in critical data elements for which unknown is not an acceptable value. • The percentage of total roadway segments that include location coordinates, using measurement frames such as a GIS basemap.
Uniformity	• The number of MIRE-compliant data elements entered into the roadway database or obtained via linkage to other databases.
Integration	• The percentage of appropriate records in a specific system in the roadway database that is linked to another system or file.
Accessibility	• Identify the principal users of the roadway database. Query the principal users to assess (a) their ability to obtain the data or other services requested and (b) their satisfaction with the timeliness of the response to their request. Document the method of data collection and the principal users' responses.
Source: 2011 DOT HS 811 411, Model Performance Measures for State Traffic Records Systems	

SECTION 3-E: CITATION AND ADJUDICATION SYSTEMS

Description and Contents of the Citation and Adjudication Data Systems

The State's citation and adjudication data systems, while interdependent, are vastly different and represent separate State agencies (extending through separate branches of government) and all levels of governance. Responsibility for the systems is shared among various data-owning agencies—from local to State—and a willingness to share appropriate data is necessary to support core business practices although each of the agencies remains independent. When regarded together, State citation and adjudication systems provide information about citations, arrests, and dispositions.

For traffic records purposes, the goal of the citation and adjudication systems is to collect all the information relevant to traffic records-related citations in a central, statewide repository (and linked to appropriate Federal data systems) so the information can be analyzed by authorized users to improve and promote traffic safety. Ideally, information from these systems also supports traffic safety analysis that identifies trends in citation issuance, prosecution, and case disposition.

The ideal citation system contains a process grounded in a unique citation number assigned by a statewide authority and used by all law enforcement agencies. The law enforcement officer issues the citation and copies are provided to the statewide licensing agency, the appropriate (State or local) prosecutor and/or courts, and the individual. Citations are often disposed of outside of the courts or judicial branch. Citations that are adjudicated are subject to a variety of processes. Ideally, the record should reflect the processes that resulted in the disposition of the case.

If it is a civil or criminal citation, the individual is entitled to have their case heard before a magistrate or judge. If it is a licensure action (e.g., suspension, revocation, points assigned) the case will be heard before a hearing officer or administrative law judge. The disposition of the citation (e.g., dismissed, tried) is then transmitted and posted to the driver and/or vehicle file and sent on to the appropriate State and Federal repositories (e.g., PDPS, CDLIS). If it is a criminal offense, the citation is also transmitted to a statewide criminal records system.

Interface linkages among the criminal justice system, the civil justice system, and the citation system are necessary to manage administrative cases, criminal traffic cases, and final case disposition. Specifically, case management systems throughout the State should be interoperable—capable of sharing data between courts and supplying disposition data to the statewide repository. Final disposition is forwarded to the driver and vehicle systems.

Law enforcement officers, prosecutors, probation officers, parole officers, and judges benefit from having real-time access to individuals' driving and criminal histories to appropriately cite, charge, adjudicate and impose penalties and sanctions. Ideally, all State and local courts participate in and have access to an interfaced network of data systems that provide this degree of information access.

Custodial responsibility for the multiple components that comprise the State's citation and adjudication systems is divided among local and State agencies and may be shared between organizational custodians. The citation tracking systems, for example, are often maintained by law enforcement agencies, courts, and the licensing agency. A citation tracking system is a statewide repository for data about the State's traffic enforcement activities, and tracks each citation issued from its inception

(printing or issuance of a citation number if electronic) through the courts, including deferrals, dismissals, and plea-bargains, to posting of the disposition on the driver history record. Responsibility for coordinating, managing, and promoting such systems (e.g., for citation tracking, criminal justice information, case management, driver licensing and vehicle registration) resides at the State level. State agencies are best suited to the management of law enforcement information (e.g., criminal justice information agency), for coordinating and promoting court case management technology (e.g., administrative arm of the State's court system), and for assuring that convictions are forwarded on to the licensing agency and posted to the driver history (e.g., court records custodian and the licensing agency).

Applicable Guidelines and Participation in National Data Exchange Systems for the Citation and Adjudication Systems

Ideally, State citation and adjudication agencies participate in the appropriate national data systems including:

- National Crime Information Center;
- Uniform Crime Reporting;
- National Incident-Based Reporting System; and,
- National Law Enforcement Telecommunication System.

Citation and adjudication data systems ideally meet current national law enforcement and court standards. Most of these systems are based on currently applicable guidelines and standards including:

- The Functional Requirement Standards for Traffic Court Case Management Systems managed by the National Center for State Courts;
- The National Information Exchange Model Justice domain managed by the Department of Justice and Department of Homeland Security; and
- The Model Impaired Driver Records Information System managed by NHTSA.

States should also be looking to the future. As information technologies continue to change, States should consider advanced technologies that may better serve their data management and exchange needs.

Data Dictionaries for the Citation and Adjudication Data Systems

Ideally, the State maintains system-specific data dictionaries for the citation systems (electronic and manual) as well as the courts' case management systems used in the State. These system data dictionaries document all variables in the data collection form and/or software and all variables in the database (including derived variables). The data dictionary lists the name of the element in the database as well as the commonly understood description. Furthermore, the dictionary provides an established data definition and validated values—including appropriate null codes—for each field in the data system.

The data dictionary is kept up-to-date and consistent with the field data collection manual, training materials, coding manual, and corresponding report. Access is granted to all appropriate collectors, managers, and users.

All system edits are also documented in the data dictionary. The dictionary explains each element—specifically, what is and is not included, the rules of use, and any exceptions to these rules.

The data dictionary indicates which data fields are populated through linkages to other traffic records components and which data fields are used to link citation and adjudication data to other traffic records components.

Procedures and Process Flows for the Citation and Adjudication Data Systems

Citation and adjudication systems for traffic safety related purposes comprise complex processes that must be well documented to be understood, managed, and improved. Stakeholders and data custodians should comply with all applicable procedures.

The ideal citation and adjudication systems track the citation from the State provider's issuance of a unique citation to a law enforcement agency that then issues the unique citation to the offender, appending the appropriate charge. That unique citation is then adjudicated and the disposition of the associated charge is entered into the driver and/or vehicle systems. Responsibility for each part of this process is assigned to the appropriate custodial agency. Given the importance of impaired driving data to traffic safety, a DUI tracking system is essential.

The ideal citation and adjudication systems include DUI offender records and are comprehensive enough to include communication and exchange of data with other non-traditional statewide and local agencies that participate in the management of these cases. The DUI tracking system should be interactive and accessible to all who are in contact with a DUI offender, from arrest through compliance with sanctions. A DUI tracking system includes the citation, the administrative per se paperwork and information about the administrative hearing, the alcohol evaluation (if any), education/therapy recommendations, assignments and completion, the court disposition, sanctions imposed (interlock, etc.), and compliance and re-licensure.

The Model Impaired Driver Record Information System (MIDRIS) is a set of procedures and data elements that make it possible to manage DUI information from arrest through sanction completion and reinstatement of driver’s license or privilege. MIDRIS provides a centralized point of access for DUI driver information through the entire lifecycle of the violation, to include posting on the driver history record. Access to this system should be available to all agencies that provide services to or interact with impaired drivers.

These complex processes and responsibilities are best assigned to the appropriate stakeholder agencies and their performance of these processes and responsibilities accurately described in the supporting documentation. Ideally, the State maintains accurate and up-to-date process documentation—including process flow diagrams—that explains these critical functional elements and identifies the roles of key stakeholders.

Critical Functional Elements

- Tracking the citation from point of issuance to the driver file
- Tracking DUI cases in a DUI tracking system, which includes any drug testing or blood alcohol concentration testing data
- Tracking administrative driver sanctions
- Tracking citations for juvenile offenders
- Distinguish between the administrative handling of payments in lieu of court appearances (mail-ins) and court appearances
- Tracking deferral and dismissal of citations

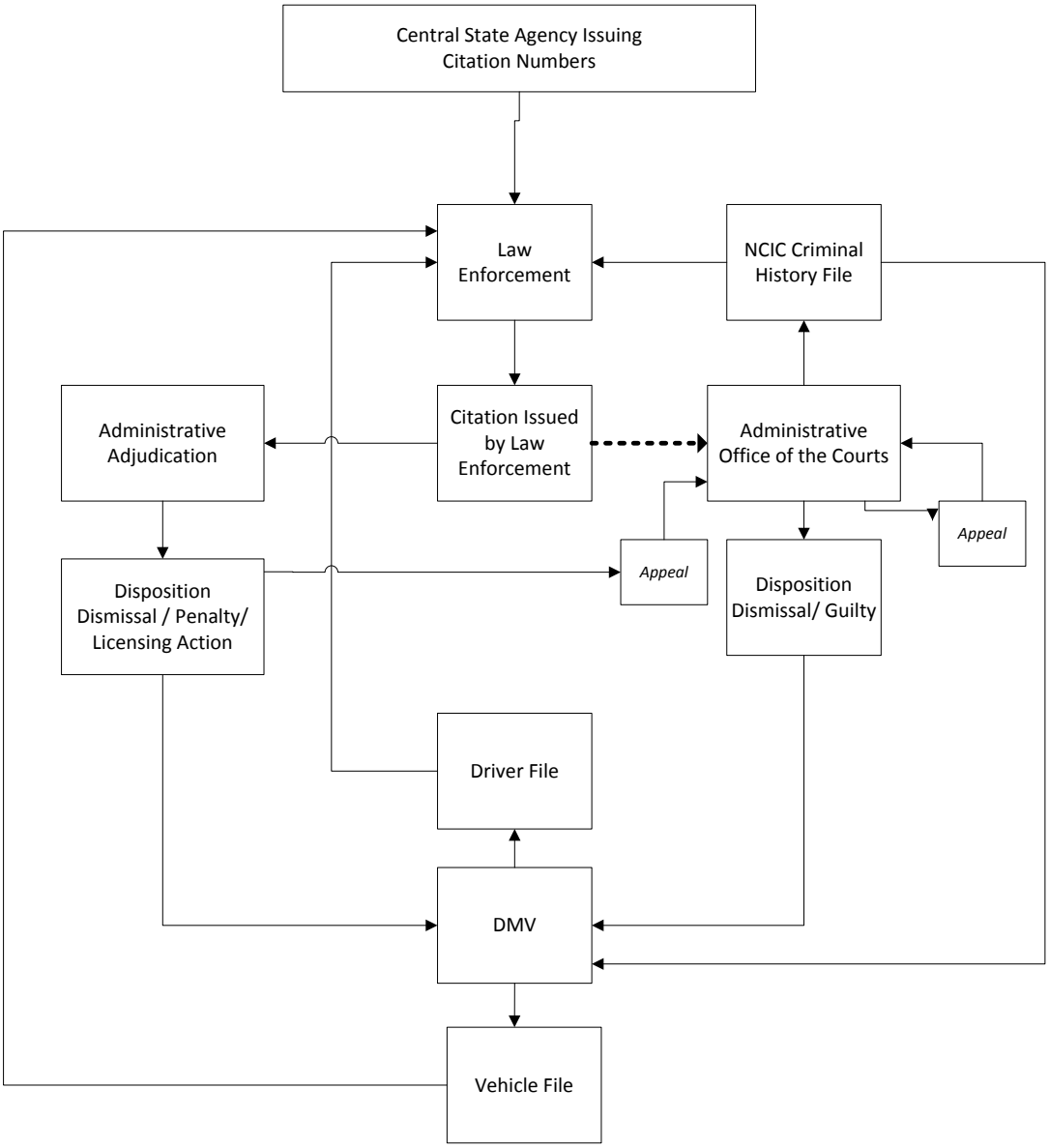
Key Stakeholders

- Traffic summons (citation) committee
- Law enforcement agencies
- Administrative law judges and hearing officers
- Prosecutors
- Judges and magistrates
- County and municipal attorneys
- State court administrators
- State licensing agency
- State DUI/DUID toxicology labs

The narratives or process flow diagrams order and identify critical functional elements and key stakeholder roles. They also include alternative data flows reflecting both manual and electronic submissions. In addition, the narrative or diagrams include the processes for amending citations or charges. If the State purges records, the timing, conditions, and procedures for doing so are also important parts of this documentation.

In addition to these primary business practices, stakeholders and custodial agencies ideally also follow established, documented security protocols that govern access, modification, and release of data. Roles and responsibilities should be clearly identified.

Figure 1. Illustration of a Citation and Adjudication Critical Path



Citation and Adjudication Systems Interface with other Components

The citation and adjudication systems interface with other traffic records system components to support critical business processes and enhance data quality. System *interface* describes a timely, seamless relationship and a high degree of interoperability between systems. In contrast, system *integration* refers to the discrete linking of databases for analytic purposes. Data integration is addressed in Section 4.

In practice, the system interface is useful when circumstances require relationships between traffic records data systems that always need to be connected and accessible. These interfaces occur throughout a record's lifecycle: data collection, submission, processing, posting, and maintenance. Ideally, such interfaces improve the efficiency and cost-effectiveness of the citation and adjudication systems.

Citation data—used in the process of issuing a citation—is linked with the driver system to collect driver information, to carry out administrative actions (e.g., suspension, revocation, cancellation, interlock), and to determine applicable charges. Citation data is linked to the vehicle file to collect vehicle information and to carry out administrative actions (e.g., vehicle seizure, forfeiture, interlock). Citation data is also linked to the crash system to document incident location, and associated violations and charges resulting from the crash.

Adjudication data—initial charge, dispositional charge, and dispositional order—is linked with the driver system to obtain certified driver records, to carry out administrative actions (e.g., suspension, revocation, cancellation, interlock), to determine the applicable charges, and to post the dispositions to the driver file. Adjudication data is linked to the vehicle file to carry out administrative actions (e.g., vehicle seizure, forfeiture, interlock). Adjudication is also linked to the crash system to document violations and charges resulting from the crash. Key citation and adjudication system linkages are listed in Table 12.

Table 12: Common Interface Links Among Citation, Adjudication and Other Data Systems

Citation and Adjudication System Interfaces With the Crash System	• Personal identifiers (e.g., name, address, date of birth)	• Precise location (coordinates, street address, etc.)
Citation and Adjudication System Interfaces With the Vehicle System	• Personal identifiers (e.g., name, address, date of birth) • License plate number	• VIN • Precise location (coordinates, street address, etc.)
Citation and Adjudication System Interfaces With the Driver System	• Personal identifiers (e.g., name, address, date of birth) • License plate number	• VIN

Quality Control Programs for the Citation and Adjudication Systems

To increase public confidence and trust in the traffic records system, it is essential that each part of the citation and adjudication systems have a formal data quality assurance program. While data quality management practices for citation and adjudication depend a great deal on the specific data system or file, each should have a formal, comprehensive data quality management program with quality control protocols that cover each component's critical data flows and business practices.

Ideally, citation and adjudication data is timely, accurate, complete, uniform, integrated and accessible. These attributes are tracked based on a set of established quality control measure. The quality of the citation and adjudication systems data is assured by formal programs of error and edit checking as the data is entered into the various systems. Procedures for addressing detected errors are also maintained and followed.

In addition, custodial agencies should work together to establish and review the sufficiency of their data quality control programs and review the results of the performance measures used to track system performance. Data managers and key users should regularly review data quality reports. The procedures

that should be documented include information sharing with data collectors via individual and agency feedback, training, and changes to applicable manuals, data dictionaries, and edit checks. Routine audits and validation checks assure the quality of specific critical data attributes. Sample performance measures are presented in Table 13.

Table 13: Example Quality Control Measurements for Citation and Adjudication Data Systems

Timeliness	• The median or mean number of days from (a) the data a citation is issued to (b) the date the citation is entered into the statewide citation database (or first-available repository). • The median or mean number of days from (a) the date of charge disposition to (b) the charge disposition is entered into the statewide adjudication database (or first-available repository). Note: Many States do not have statewide databases for citation or adjudication records. For those States citation and adjudication system, timelines and other data quality attributes should be measured at the individual first-available repositories.
Accuracy	• The percentage of citation records with no errors in critical data elements. • The percentage of charge disposition records with no errors in critical data elements.
Completeness	• The percentage of citation records with no missing critical data elements. • The percentage of citation records with no missing data elements. • The percentage of unknowns or blanks in critical data elements for which unknown is not an acceptable value.
Uniformity	• The number of Model Impaired Driving Record Information System (MIDRIS)-compliant data elements entered into the citation database or obtained via linkage with other systems' databases. • The percentage of citation records entered into the database with common uniform statewide violation codes.
Integration	• The percentage of appropriate records in the citation file that is linked to another system or file.
Accessibility	• Identify the principal users of the citation or adjudication database. Query the principal users to assess (a) their ability to obtain the data or other services requested and (b) their satisfaction with the timeliness of the response to their request. Document the method of data collection and the principal users' responses.

Source: Model Performance Measures for State Traffic Records Systems, DOT HS 811 411.

In States that have a single agency that issues the citation numbers, a quality control system can track citations from the issuance of the number through final disposition. Specifically, this should capture information on intermediate dispositions (e.g., deferrals, dismissals).

Ideally, DUI tracking systems have additional quality control procedures to ensure that the data is accurate and timely given the impactful nature of DUI dispositions.

SECTION 3-F: INJURY SURVEILLANCE SYSTEM

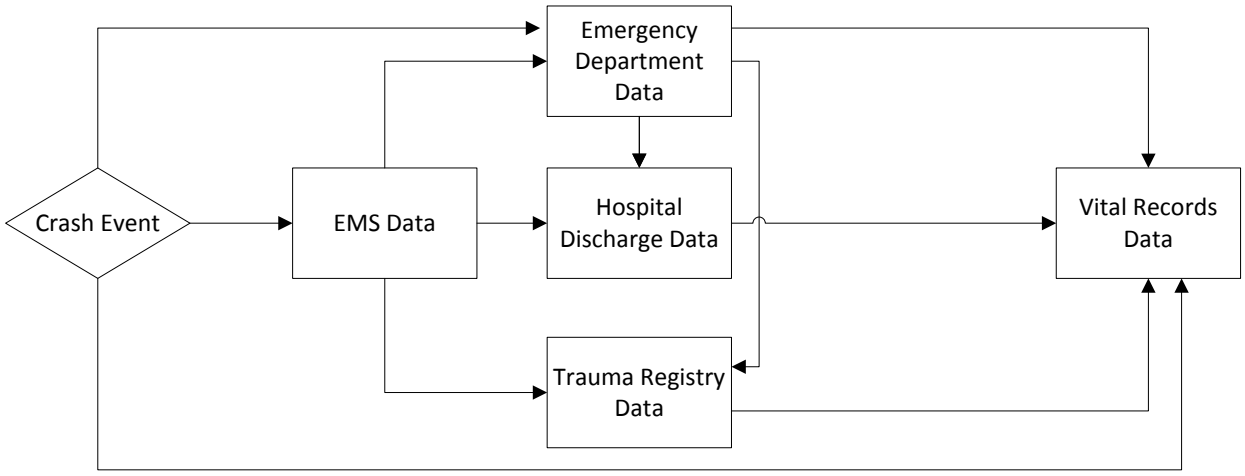
Description and Contents of the Injury Surveillance System

There is a concrete interest in injury control programs within the traffic safety, public health, and enforcement communities. The development of a statewide injury surveillance system is driven by local, State, and Federal programs within the traffic safety, public health, and law enforcement communities. These surveillance systems typically incorporate pre-hospital emergency medical services, trauma registry, emergency department, hospital discharge, rehabilitation databases, payer-related databases, and mortality data (e.g., death certificates, autopsies, and coroner and medical examiner reports). The data from these different systems are used to track injury type, causation, severity, cost, and outcome.

Other traffic records system components provide the injury surveillance system with supplementary information regarding the crash, vehicle, occupant, and environmental characteristics. The custodial responsibility for the various files and databases within the injury surveillance system is typically distributed among several State agencies and other entities.

Ideally, the injury surveillance system tracks the frequency, severity, and nature of injuries sustained in motor vehicle crashes; enables the integration of injury data with the crash data; and makes this information available for analysis that supports research, prevention, problem identification, policy-level decision-making, and efficient resource allocation. Technical resources to assist with the analysis and interpretation of this data should be made available to interested stakeholders. Common sectors within the stakeholder community include traffic safety, health care, injury prevention, research, and the interested public. In turn, the use of system data is best integrated into injury control programs within traffic safety and other safety-related programs at the local and State levels.

Figure 2. Injury Surveillance System Critical Pathways



Data Dictionaries and Coding Manuals for the Injury Surveillance System

Ideally, the contents of the injury surveillance system's component databases are well documented and use injury and trauma severity scoring systems such as the Injury Severity Score and Abbreviated Injury Scale. A data dictionary for the injury surveillance system's component databases should include the variable names and definitions. If not included in the dictionary, coding manuals or other supporting

documents should provide a summary of the data—characteristics, values, limitations, and exceptions, whether submitted or user-created—and how this data is collected, managed and maintained.

Injury Scoring Systems

State injury surveillance systems should incorporate information on motor vehicle crash patients' functional outcomes that include measures of survival, recovery, and disability upon hospital discharge. The AIS and the ISS are valuable measures of injury severity. The AIS, developed by the Association for the Advancement of Automotive Medicine, categorizes injury severity by body region and—when combined with crashed data—can be used to describe injury patterns by crash configuration. The ISS provides a more comprehensive measure of injury severity when a patient has injuries to multiple body regions. Additionally, the Glasgow Coma Scale is used to assess the neurologic state of a patient.

Procedures and Process Flows for the Injury Surveillance System

Ideally, States should be able to describe how injury surveillance data is collected, managed, analyzed, and linked—as well as how long each part of the process takes. This applies to all injury surveillance system components: EMS, emergency department, hospital discharge, trauma registry, and vital records.

The procedures and flows of information from the crash through subsequent medical care should be documented—ideally with a process flow diagram. Process flow diagrams should show all major steps—both manual and electronic—and distinguish between the two methods. Processes for paper and electronic filing and reporting should be shown separately.

Injury surveillance data custodians should comply with applicable procedures. Specifically, these procedural guidelines should cover data collection, processing, and error-checking, in addition to training and access protocols. Training in data collection and submission should occur regularly. Special focus should be given to areas of concern identified during routine data queries and quality control checks.

Data should be made available for local and State agency use. Standardized reports can be prepared periodically and used in problem identification and program evaluation activities. Ideally, an aggregate database is made available for research efforts and linkage to other data systems.

Quality Control Programs for the Injury Surveillance System

Each component of the injury surveillance system should have a formal, comprehensive quality management process that includes quality control metrics and quality control reports tailored to their various users (data system managers, collectors, TRCC members, general users, etc.). This quality control program should ensure that data in the injury surveillance system is timely, accurate, uniform, complete, integrated, and accessible. Quality control should be addressed separately for EMS, emergency department, hospital discharge, trauma, vital records, and other sources of information (rehabilitation database, spinal cord injury registry, traumatic brain injury registry, etc.).

A formal, comprehensive injury surveillance data quality management program should include quality control review protocols for each component that cover the entire process—collection, management, and reporting. Ideally, such a program should include the following aspects.

Automated edit checks/validation rules that ensure entered data falls within the range of acceptable values and is logically consistent between fields. Edit checks are applied when the data is added to the record. Many systems have a two-tiered error classification: critical errors must be corrected before submission and warnings that may be overridden.

Limited State-level correction authority is granted to quality control staff working with the statewide injury surveillance databases to amend obvious errors and omissions without returning the report to the originating entity. Obvious errors include minor misspellings and location corrections. Obvious omissions include missing values that can be easily obtained from the narrative.

Processes for returning rejected records are in place to ensure the efficient transmission of rejected records between the State-level databases and the collecting entities as well as the tracking and resubmission of the corrected records.

Performance measures are tailored to the needs of data managers and address the concerns of data users. Measures can be aggregated for collectors, users, and the State TRCC. Data should be timely, accurate, complete, uniform, integrated, and accessible. These attributes should be tracked based on a set of State-established quality control metrics. The measures in Table 14 are examples of high-level management indicators of quality. The State may develop additional measures that address their specific business needs.

Table 14: Example Quality Control Measurements For the Injury Surveillance Data System

Timeliness	• The *median* or *mean* number of days from (a) the date of an EMS run to (b) the date when the EMS patient care report is entered into the database. • The *percentage* of EMS patient care reports entered into the State EMS file within X days (*e.g., 5, 30, or 90 days)* after the EMS run.
Accuracy	• The percentage of EMS patient care reports with no errors in critical data elements (for example, dispatch notified date/time).
Completeness	• The percentage of EMS patient care reports with no missing critical data elements. • The percentage of EMS patient care reports with no missing data elements. • The percentage of unknowns or blanks in critical data elements for which unknown is not an acceptable value.
Uniformity	• The percentage of records on the State EMS data file that are National Emergency Medical Service Information System (NEMSIS)-compliant. • The number of records on the State EMS data file that are NEMSIS-compliant. *Where applicable, analogous national standards for uniformity may be used as follows: State Emergency Dept. File & Universal Billing 04 (UB04) State Hospital Discharge File & Universal Billing 04 (UB04) State Trauma Registry File & National Trauma Data Standards State Vital Records & National Association for Public Health Statistics and Information Systems
Integration	• The percentage of appropriate records in the EMS file that is linked to another system or file.
Accessibility	• Identify the principal users of the injury surveillance database. Query the principal users to assess (a) their ability to obtain the data or other services requested and (b) their satisfaction with the timeliness of the response to their request. Document the method of data collection and the principal users' responses.

Source: Model Performance Measures for State Traffic Records Systems, DOT HS 811 411.

Numeric goals for each performance measure are established and regularly updated by the State.

Performance reporting that provides specific feedback to each submitting entity on the timeliness, accuracy, and completeness of their submissions to the statewide databases relative to applicable standards.

High-frequency errors are tracked and used to update training content, data collection manuals, and validation rules.

Quality control reviews are conducted to ensure completeness and accuracy of injury information and to identify and track duplicate records within and across injury surveillance systems.

Periodic comparative and trend analyses are used to identify unexplained differences in the data across years and agencies. At a minimum, these analyses should occur on an annual basis.

Data quality feedback from key users is regularly communicated to data collectors and data managers. This feedback will include identification of errors in existing records as well as comments relating to frequently occurring errors. Data managers disseminate this information to collecting entities.

Data quality management reports are provided to the managing agency for regular review and should be available to the State TRCC upon request. The reports are used to identify problems and develop countermeasures.

Privacy Laws and Regulations

In addition to any applicable State statutes, State healthcare data custodians must comply with the pertinent aspects of the Health Insurance Portability and Accountability Act of 1996 as amended by the Heath Information Technology for Economic and Clinical Heath Act. HIPAA sets forth protections for patient privacy and confidentiality. For data sharing purposes, it is helpful to note that NHTSA is a public health authority as defined by HIPAA.

Data Interfaces within the Injury Surveillance System

This section on the injury surveillance system's interface linkages focuses on the relationships within the system that enhance the continuity of patient care, support system enhancements, and strengthen the system's critical business processes.

System *interface* describes a timely, seamless relationship and a high degree of interoperability between systems. In contrast, system *integration* refers to the discrete linking of databases for analytic purposes. Data integration is addressed in Section 4. In practice, the system interface is useful when circumstances require relationships between traffic records data systems that always need to be connected and accessible.

Critical injury surveillance interfaces include links between EMS data and emergency department and hospital discharge data, EMS data and the trauma registry, and vital statistics and hospital discharge data. The interface between injury surveillance components may significantly improve subsequent integration with other traffic records systems.

HIPAA and State confidentiality laws provide guidelines for sharing certain data elements that may be critical to data interfaces. Each State should have data use agreements or similar documents and an institutional review board approval for sharing identifiable healthcare data.

Emergency Medical Systems

NHTSA manages the National Emergency Medical Services Information System (NEMSIS), which standardizes EMS patient care reporting across the United States and maintains a national EMS database. NEMSIS is a system of local, State, and national databases. Identifying pre-hospital information for persons involved in a motor vehicle crash helps quantify the magnitude of the problem and allocate appropriate resources.

Emergency Department and Hospital Discharge

Administrative data files for emergency department visits and inpatient hospitalizations are based on the uniform billing code issued by the U.S. Department of Health and Human Services. The most recent uniform billing code can provide charge data on emergency department and inpatient hospital stays. Having this data in the injury surveillance system can be useful in assessing the severity and medical outcomes of crash-related injuries.

Trauma Registry

The National Trauma Data Standard, developed by the American College of Surgeons Committee on Trauma, provides data standards for trauma registry databases. Built on an XML schema shared with NEMSIS, the NTDS enables improved integration of EMS and trauma data.

Vital Records

The U.S. Standard Certificate of Birth, Standard Certificate of Death, and the Report of Fetal Death are the principal means of promoting uniformity in the vital records data collected by the States. These documents are reviewed and revised approximately every 10 years through a process that includes broad input from data providers and users. The Centers for Disease Control and Preventions' National Center for Health Statistics provides guidance for the cause of death coding based on ICD-10 standards.

SECTION 4: DATA USE AND INTEGRATION

Highway traffic safety decision-makers use data to develop and evaluate engineering, enforcement, education, and emergency medical services safety countermeasures. A State's highway safety office manages programs related to road users' behavior. These programs may address topics including occupant protection, impaired driving, older drivers, and pedestrian safety. Program managers use data and analyses to identify problems, determine priorities, allocate resources, and evaluate program effectiveness. More comprehensive behavioral safety analyses often require integrated datasets.

This *Advisory* makes a distinction between the terms *integration* and *interface*. Both rely on connections among datasets, but the methods and purposes differ. Integration—discussed in this section—addresses the linking of datasets to support in-depth analysis. Integration of traffic records data often takes place at regularly scheduled points in time, such as the end of the calendar year or when all records for a set period are considered final. In contrast, interface linkages—discussed separately in each of the major system component sections of the *Advisory*—addresses linkages performed more nearly in real-time. Interface linkages exist primarily to support key business processes. For example, an interface linkage between the crash system and the driver system enables law enforcement officers to validate and verify a driver's license information in the field when filling out a crash report or a citation.

Data integration refers to the establishment of connections between the six major traffic records system components (crash, vehicle, driver, roadway, citation and adjudication, and injury surveillance). Each component may potentially have multiple sub-systems that can also be integrated for analytical purposes. A State's traffic records community stands to benefit from the creation of these integrative linkages. The resulting integrated datasets enable users to conduct analyses and generate insights impossible to achieve if based solely on the contents of any singular data system. The linked data adds detail to the understanding of each crash event, the roadway environment, and the people and vehicles involved. In addition, these integrative connections efficiently expand the information available to decision-makers while avoiding the expense, delay, and redundancy associated with collecting the same information separately.

Integration may include coordinated data definitions across files both within and between agencies. Development of such data definitions is generally the first step in producing meaningfully linked datasets, though emergent XML schemas like the National Information Exchange Model can enable the integration of datasets without altering system data definitions.

Integrative linkages may be probabilistic or deterministic. Probabilistic linkage methods rely on the application of sophisticated statistical analyses to multiple data elements to determine the probability that a match exists between records in two or more datasets. Deterministic linkages are achieved by directly matching data elements such as event or record identification numbers, personal identifiers, etc. Both approaches are useful, valid, and commonly used.

Data quality plays an important role in any successful data integration effort. If the data to be linked is not accurate and complete, the resulting integrated dataset will have less value to decision-makers. Indeed, the quality of data in an integrated dataset is always limited by the quality of the data in each of the source datasets. If records are missing in one dataset, they cannot be matched with the records in any of the other datasets. If the data needed to establish integrative linkages is not accurate, incorrect linkages and/or unmatched data will result.

Data governance is the formal management of a State's data assets. Governance includes a set of documented processes, policies, and procedures that are critically important to integrate traffic records data. These policies and procedures address and document data definitions, content, and management of key traffic records data sources within the State. Such data standards applied across platforms and systems provide the foundation for data integration and comprehensive data quality management.

Cost and effort can be saved by considering data integration during the design or update of traffic records data systems. The formal system documentation required in a traffic records system inventory permits the identification of common variables and provides an understanding of data quality that may affect linkage processes. A formal traffic records system inventory includes all traffic records data sources, system custodians, data elements and attributes, linkage variables, linkages useful to the States, and data access policies.

Data integration can be challenging for many reasons—high costs, legislative restrictions, potential liabilities, custodial resistance, lack of skilled analysts. This is true particularly as the advantages of integration are not always clear in advance and the methods may be unfamiliar to data managers and decision-makers. However, the effectiveness of that decision-making depends on the accessible, high-quality data an analysis that is clearly enhanced when enriched through integrating multiple traffic records data sources. The general benefits of integrated data include:

- Lower costs to achieve the desired level of data content and availability;
- Support for multiple perspectives in data analysis and decision-making;
- Expanded opportunities for data quality validation and error correction;
- Additional options for exposure data to form rates and ratio-based comparisons;
- Enhanced accuracy and completeness of data describing crash events, the roadway environment, and the involved people and vehicles;
- Increasing the relevance of information available for legislative and policy analysis; and,
- Increased support for advanced methods of problem identification, countermeasure selection, and evaluation of program effectiveness.

Some examples of the broader utility of information extracted from integrated traffic records datasets include:

- Analyses showing the costs of injuries associated with crashes in general and crashes with contributing factors or behaviors (e.g., Crash Outcome Data Evaluation System);
- Analyses illuminating more effective allocation of law enforcement resources (e.g., Data Driven Approaches to Crime and Traffic Safety); and,
- Analyses that associate crash risk with specific roadway features such as those described in the Highway Safety Manual.

The State TRCC, with its multi-disciplinary membership, is the best place to take the lead in promoting the creation and use of integrated datasets. The TRCC is also ideally positioned to aid in developing the necessary data governance, access, and security policies for datasets that include multiple sources from multiple agencies. The TRCC includes representative data collectors, managers, and users drawn from each of the core traffic records system components. Membership also includes users of integrated datasets formed when data from different component systems are linked.

While each individual data system may be enhanced through integrative linkage with other sources of traffic safety data, this document focuses primarily on the important linked datasets resulting from the

integration of crash data with data from the other five components. The resulting information can be useful at the local, State, and national levels.

Crash Data Integration with Vehicle Data
Linkages based on fields such as license plate number or registration number result in integrated datasets that provide enhancements such as VIN-derived vehicle characteristics and registration and title information describing the age and history of vehicles. Analysis of these integrated datasets can help identify vehicle characteristics associated with crashes and at-risk drivers.

Crash Data Integration with Driver Data
Linkages based on drivers' personal identifiers result in integrated datasets incorporating crash contributing factors (e.g., behaviors, vehicle choice, driver maneuvers) and drivers' past histories. Analyses of these integrated datasets can help identify high-risk driver populations and predict future safety problems based on past experiences.

Crash Data Integration with Roadway Data
Linkages based on location information (roadway names, location codes, geographic coordinates, etc.) result in integrated datasets incorporating crash descriptions, roadway characteristics, and traffic data (e.g., traffic counts, speed data). Analyses of these integrated datasets can help identify roadway features associated with increased crash frequency and severity, as well as countermeasures designed to address the increased risk of crashes, injuries, and fatalities.

Crash Data Integration with Citation and Adjudication Data
Linkages based on person and event identifiers from citation and adjudication data systems result in integrated datasets incorporating crash characteristics and traffic violations. Analyses of these integrated datasets can help identify relationships between crashes and illegal actions made by roadway users and aid in law enforcement and the evaluation of adjudication safety programs.

Crash Data Integration with Injury Surveillance Data
Linkages based on matching crash-involved people with their crash-related medical records results in integrated datasets incorporating person-related contributing factors (e.g., age, sex, behavior), crash dynamics (e.g., type of crash, ejection, vehicle compatibility), and information describing the resulting injury severity, medical treatments, outcomes, and charges. Analyses of these datasets can help describe the consequences of specific behaviors and choices and give decision-makers a more accurate picture of crash outcomes.

Other Considerations
Data linkage opportunities are not, however, limited to connections between the crash system and one other component system. Productive linkages can be established among crash and multiple components or between other non-crash components. The development of new integrative linkages is driven by questions that cannot be answered with the discrete, unlinked component datasets.
Creation of linked datasets is not an end in and of itself. Data users and decision-makers should have access to the resources that support their needs—including skilled analytic personnel and user-friendly access tools. Ideally, these resources are specifically designed to meet a variety of needs, including legislative queries, problem identification, program and countermeasure development, management, and evaluation, as well as meeting all reporting requirements. Traffic records system components are best when designed to give the public appropriate access to these resources as well.

APPENDICES

APPENDIX A: FUNDING SOURCES

FHWA Funding Sources

- Highway Safety Improvement Program, National Highway System, and Surface Transportation Program - HSIP funds (23 U.S.C. § 148)
- Metropolitan Planning Funds (23 U.S.C. § 104(f)
- State Planning and Research Funds (23 U.S.C. § 505)

FMCSA Funding Sources

- High Priority
- Motor Carrier Safety Assessment Program Basic and Incentive Grant

NHTSA Funding Sources

- Highway Safety Programs (23 U.S.C. § 402)
- Occupant Protection Incentive Grants (23 U.S.C. § 405b)
- State Traffic Safety Information System Improvement Grants (23 U.S.C. § 405c)
- Impaired Driving Countermeasures Grants (23 U.S.C. § 405d)
  - Alcohol Ignition Interlock Law Grants
  - 24-7 Sobriety Programs Grants
- Distracted Driving Grants (23 U.S.C. § 405e)
- Motorcyclist Safety Grants (23 U.S.C. § 405f)
- State Graduated Driver Licensing (23 U.S.C. § 405g)
- Nonmotorized Safety Grants (23 U.S.C. § 405h)

APPENDIX B: CONTRIBUTORS

The 2017 rewrite of this *advisory* was accomplished in close consultation with a variety of subject matter experts from all areas of traffic safety. In addition to the numerous individuals who provided insightful commentary and suggestions online, the experts listed below were of help in making this effort a successful one.

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APPENDIX C: KEY TERMS

These terms are understood to mean the following in this document.

- Data system: One of the six component State traffic records systems—crash, driver, vehicle, roadway, citation and adjudication, and injury surveillance—which may comprise several independent databases with one primary data file.
- Data file: A dataset or group of records within a data system or database. A data system may contain a single data file—such as a State's driver file—or more than one. For example, the injury surveillance system consists of separate files for the emergency medical service, emergency department, hospital discharge, trauma registry, and vital records.
- Record: All the data entered in a file for a specific event (a crash, a patient hospital discharge, etc.).
- Data element: Individual fields coded within each record (e.g., first name, last name, address).
- Data attribute: Different values entered for each element, which may be limited to a preexisting set of values and/or is divided into subfields.
- Data governance: A set of processes that ensures that important data assets are formally managed throughout the enterprise.
- Data linkages: The connections established by matching at least one data element from a record in one file with the corresponding element or elements in one or more records in another file or files. Linkages may be further described as interface linkages or integration linkages depending on the nature and desired outcome of the connection.
- Data interface: A seamless, on-demand connectivity and a high degree of interoperability between systems that support critical business processes and enhances data quality. An interface refers to the 'real-time' transfer of data between data systems (i.e., auto-populating a crash report using a bar code reader for a driver license).
- Data integration: The discrete linking of databases for analytic purposes.
- State: The 50 States, the District of Columbia, Puerto Rico, and the Territories. These are the jurisdictions eligible to receive State data improvement grants. In this context, "State" should be understood to include these additional jurisdictions.
- System Interface: Describes a timely, seamless relationship and a high degree of interoperability between systems. In contrast, system integration refers to the discrete linking of databases for analytic purposes.
- Traffic Records Inventory: A compilation of contact information, data dictionaries, data flows, user and instructional manuals, and other system documentation for all components of the traffic records system. It is crucial for data integration efforts because, ideally, it identifies potential linking variables among the various systems. One goal of establishing a traffic records inventory is to create a "one-stop-shop" where interested parties can go to find up-to-date information about the systems. The inventory should thus be kept current through a reasonable update process.

APPENDIX D: LIST OF ACRONYMS

Acronym	Definition
§405(c)	FAST Act State Traffic Safety Information System Improvement Grant
AADT	Average Annual Daily Traffic
AIS	Abbreviated Injury Scale
AAMVA	American Association of Motor Vehicle Administrators
ANSI	American National Standards Institute
DDACTS	Data Driven Approaches to Crime and Traffic Safety
DHR	driver history record
DMV	Department of Motor Vehicles
DOH	Department of Health
DPPA	Driver's Privacy Protection Act
DUA	Data Use Agreement
DUI	driving under the influence
DUID	driving under the influence of drugs
EMS	Emergency Medical Service
FARS	Fatality Analysis Reporting System
FDEs	fundamental data elements
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
GDL	Graduated Driver Licensing
GHSA	Governors Highway Safety Association
GIS	Geographic Information System
GJXDM	Global Justice XML Data Model
HIPAA	Health Insurance Portability and Accountability Act
HSIP	Highway Safety Improvement Plan
HSP	Highway Safety Plan
ICD-10	International Classification of Diseases and Related Health Problems
ISS	Injury Severity Score
IT	Information Technology
MADD	Mothers Against Drunk Driving
MCMIS	Motor Carrier Management Information System
MIDRIS	Model Impaired Driving Records Information System
MIRE	Model Inventory of Roadway Elements
MMUCC	Model Minimum Uniform Crash Criteria
MPO	Metropolitan Planning Organization
NAPHSIS	National Association for Public Health Statistics and Information Systems
NCSC	National Center for State Courts
NDR	National Driver Register
NEMSIS	National Emergency Medical Services Information System
NIEM	National Information Exchange Model
NMVTIS	National Motor Vehicle Title Information System

NTDS	National Trauma Data Standard
PCR	police crash report
PDO	property damage only
PDPS	Problem Driver Pointer System
RMS	Records Management System
SAVE	Systematic Alien Verification for Entitlements
SHSO	State Highway Safety Office
SHSP	Strategic Highway Safety Plan
SSOLV	Social Security Online Verification
TRCC	Traffic Records Coordinating Committee
VIN	Vehicle Identification Number
XML	Extensible Markup Language

APPENDIX E: ASSESSMENT QUESTIONS

NHTSA developed the following set of questions with the input of subject matter experts, to assess the capabilities of States' traffic records systems. States can answer these questions to fulfill the assessment requirements for the State traffic safety information system improvements grant, 23 U.S.C. §405(c) by either opting to complete NHTSA's traffic records self-assessment tool or participating in a peer review assessment using the State Traffic Records Assessment Program. Alternatively, States can choose to design their own assessment and develop their own questions.

Traffic Records Coordinating Committee

1. Does the TRCC membership include executive and technical staff representation from all six data systems?
2. Do the executive members of the TRCC regularly participate in TRCC meetings and have the power to direct the agencies' resources for their respective areas of responsibility?
3. Do the custodial agencies seek feedback from the TRCC members when major projects or system redesigns are being planned?
4. Does the TRCC involve the appropriate State IT agency or offices when member agencies are planning and implementing technology projects?
5. Is there a formal document authorizing the TRCC?
6. Does the TRCC provide the leadership and coordination necessary to develop, implement, and monitor the State Traffic Records Strategic Plan?
7. Does the TRCC advise the State Highway Safety Office on allocation of Federal traffic records improvement grant funds?
8. Does the TRCC identify core system performance measures and monitor progress?
9. Does the TRCC enable meaningful coordination among stakeholders and serve as a forum for the discussion of the State's traffic records programs, challenges, and investments?
10. Does the TRCC have a traffic records inventory?
11. Does the TRCC have a designated chair?
12. Is there a designated Traffic Records Coordinator?
13. Does the TRCC meet at least quarterly?
14. Does the TRCC review quality control and quality improvement programs impacting the core data systems?
15. Does the TRCC assess and coordinate the technical assistance and training needs of stakeholders?
16. Do the TRCC's program planning and coordination efforts reflect traffic records improvement funding sources beyond §405(c) funds?

Strategic Planning for Traffic Records Systems

17. Does the State Traffic Records Strategic Plan address existing data and data systems areas of opportunity and document how these are identified?
18. Does the State Traffic Records Strategic Plan identify countermeasures that address at least one of the performance attributes (timeliness, accuracy, completeness, uniformity, integration, and accessibility) for each of the six core data systems?
19. Does the TRCC have a process for identifying at least one performance measure and the corresponding metrics for the six core data systems in the State Traffic Records Strategic Plan?
20. Does the TRCC have a process for prioritizing traffic records improvement projects in the State Traffic Records Strategic Plan?

21. Does the TRCC identify and address technical assistance and training needs in the State Traffic Records Strategic Plan?
22. Does the TRCC have a process for establishing timelines and responsibilities for projects in the State Traffic Records Strategic Plan?
23. Does the TRCC have a process for integrating and addressing State and local (to include Federally recognized Indian Tribes, where applicable) data needs and goals into the State Traffic Records Strategic Plan?
24. Does the TRCC consider the use of new technology when developing and managing traffic records projects in the State Traffic Records Strategic Plan?
25. Does the State Traffic Records Strategic Plan consider lifecycle costs in implementing improvement projects?
26. Does the State Traffic Records Strategic Plan make provisions for coordination with key Federal traffic records data systems?
27. Is the TRCC's State Traffic Records Strategic Plan reviewed, updated and approved annually?

Description and Contents of the Crash Data System

28. Is statewide crash data consolidated into one database?
29. Is the statewide crash system's organizational custodian clearly defined?
30. Does the State have criteria requiring the submission of fatal crashes to the statewide crash system?
31. Does the State have criteria requiring the submission of injury crashes to the statewide crash system?
32. Does the State have criteria requiring the submission of property damage only (PDO) crashes to the statewide crash system?
33. Does the State have statutes or other criteria specifying timeframes for crash report submission to the statewide crash database?
34. Does the statewide crash system record crashes occurring in non-trafficway areas (e.g., parking lots, driveways)?
35. Is data from the crash system used to identify crash risk factors?
36. Is data from the crash system used to guide engineering and construction projects?
37. Is data from the crash system regularly used to prioritize law enforcement activity?
38. Is data from the crash system used to evaluate safety countermeasure programs?

Applicable Guidelines for the Crash Data System

39. Is there a process by which MMUCC is used to help identify what crash data elements and attributes the State collects?
40. Is there a process by which ANSI D.16 is used to help identify the definitions in the crash system data dictionary?

Data Dictionary for the Crash Data System

41. Does the data dictionary provide a definition for each data element and define that data element's allowable values/attributes?
42. Does the data dictionary document the system edit checks and validation rules?
43. Is the data dictionary up-to-date and consistent with the field data collection manual, coding manual, crash report, database schema and any training materials?

44. Does the crash system data dictionary indicate the data elements populated through links to other traffic records system components?

Procedures and Process Flows for Crash Data Systems

45. Does the State collect an identical set of data elements and attributes from all reporting agencies, independent of collection method?
46. Does the State reevaluate their crash form at regular intervals?
47. Does the State maintain accurate and up-to-date documentation detailing the policies and procedures for key processes governing the collection, reporting, and posting of crash data—including the submission of fatal crash data to the State FARS unit and commercial vehicle crash data to SafetyNet?
48. Are the quality assurance and quality control processes for managing errors and incomplete data documented?
49. Do the document retention and archival storage policies meet the needs of safety engineers and other users with a legitimate need for long-term access to the crash data reports?
50. Do all law enforcement agencies **collect** crash data electronically?
51. Do all law enforcement agencies **submit** their data to the statewide crash system electronically?
52. Do all law enforcement agencies collecting crash data electronically in the field apply validation rules consistent with those in the statewide crash system prior to submission?

Crash Data Systems Interface with Other Components

53. Does the crash system have a real-time interface with the driver system?
54. Does the crash system have a real-time interface with the vehicle system?
55. Does the crash system interface with the roadway system?
56. Does the crash system interface with the citation and adjudication systems?
57. Does the crash system have an interface with EMS?

Data Quality Control Programs for the Crash System

58. Are there automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and is logically consistent among data elements?
59. Is limited State-level correction authority granted to quality control staff working with the statewide crash database to amend obvious errors and omissions without returning the report to the originating officer?
60. Are there formally documented processes for returning rejected crash reports to the originating officer and tracking resubmission of the report in place?
61. Does the State track crash report changes after the original report is submitted by the law enforcement agency?
62. Are there timeliness performance measures tailored to the needs of data managers and data users?
63. Are there accuracy performance measures tailored to the needs of data managers and data users?
64. Are there completeness performance measures tailored to the needs of data managers and data users?
65. Are there uniformity performance measures tailored to the needs of data managers and data users?

66. Are there integration performance measures tailored to the needs of data managers and data users?
67. Are there accessibility performance measures tailored to the needs of data managers and data users?
68. Has the State established numeric goals—performance metrics—for each performance measure?
69. Is there performance reporting that provides specific timeliness, accuracy, and completeness feedback to each law enforcement agency?
70. Are detected high-frequency errors used to prompt revisions, update the validation rules, and generate updated training content and data collection manuals?
71. Are quality control reviews comparing the narrative, diagram, and coded contents of the report considered part of the statewide crash database's data acceptance process?
72. Are sample-based audits periodically conducted for crash reports and related database content?
73. Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions?
74. Is data quality feedback from key users regularly communicated to data collectors and data managers?
75. Are data quality management reports provided to the TRCC for regular review?

Description and Contents of the Driver Data System

76. Does custodial responsibility for the driver data system—including commercially-licensed drivers—reside in a single location?
77. Does the driver data system capture details of novice driver, motorcycle, and driver improvement (remedial) training histories?
78. Does the driver data system capture and retain the dates of original issuance for all permits, licensing, and endorsements (e.g., learner's permit, provisional license, commercial driver's license, motorcycle license)?

Applicable Guidelines for the Driver Data System

79. Is driver information maintained in a manner that accommodates interaction with the National Driver Register's PDPS and CDLIS?

Data Dictionary for the Driver Data System

80. Are the contents of the driver data system documented with data definitions for each field?
81. Are all valid field values—including null codes—documented in the data dictionary?
82. Are there edit checks and data collection guidelines for each data element?
83. Is there guidance on how and when to update the data dictionary?

Procedures and Process Flows for the Driver Data System

84. Does the custodial agency maintain accurate and up-to-date documentation detailing: the licensing, permitting, and endorsement issuance procedures; reporting and recording of relevant convictions, driver education, driver improvement course; and recording of information that may result in a change of license status (e.g., sanctions, withdrawals, reinstatement, revocations, cancellations and restrictions) including manual or electronic reporting and timelines, where applicable?

85. Is there a process flow diagram that outlines the driver data system's key data process flows, including inputs from other data systems?
86. Are the processes for error correction and error handling documented for: license, permit, and endorsement issuance; reporting and recording of relevant convictions; reporting and recording of driver education and improvement courses; and reporting and recording of other information that may result in a change of license status?
87. Are there processes and procedures for purging data from the driver data system documented?
88. In States that have the administrative authority to suspend licenses based on a DUI arrest independent of adjudication, are these processes documented?
89. Are there established processes to detect false identity licensure fraud?
90. Are there established processes to detect internal fraud by individual users or examiners?
91. Are there established processes to detect CDL fraud?
92. Does the State transfer the Driver History Record (DHR) electronically to another State when requested due to a change in State of Record?
93. Does the State obtain the previous State of Record electronically upon request?
94. Does the State run facial recognition prior to issuing a credential?
95. Does the State exchange driver photos with other State Licensing agencies upon request?
96. Are there policies and procedures for maintaining appropriate system and information security?
97. Are there procedures in place to ensure that driver system custodians track access and release of driver information?

Driver System Interface with Other Components

98. Does the State post at-fault crashes to the driver record?
99. Does the State's DUI tracking system interface with the driver data system?
100. Is there an interface between the driver data system and: the Problem Driver Pointer System, the Commercial Driver Licensing System, the Social Security Online Verification system, and the Systematic Alien Verification for Entitlement system?
101. Does the custodial agency have the capability to grant authorized law enforcement personnel access to information in the driver system?
102. Does the custodial agency have the capability to grant authorized court personnel access to information in the driver system?

Data Quality Control Programs for the Driver System

103. Is there a formal, comprehensive data quality management program for the driver system?
104. Are there automated edit checks and validation rules to ensure entered data falls within a range of acceptable values and is logically consistent among data elements?
105. Are there timeliness performance measures tailored to the needs of data managers and data users?
106. Are there accuracy performance measures tailored to the needs of data managers and data users?
107. Are there completeness performance measures tailored to the needs of data managers and data users?
108. Are there uniformity performance measures tailored to the needs of data managers and data users?

109. Are there integration performance measures tailored to the needs of data managers and data users?
110. Are there accessibility performance measures tailored to the needs of data managers and data users?
111. Has the State established numeric goals—performance metrics—for each performance measure?
112. Is the detection of high frequency errors used to generate updates to training content and data collection manuals, update the validation rules, and prompt form revisions?
113. Are sample-based audits conducted periodically for the driver reports and related database contents for that record?
114. Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions?
115. Is data quality feedback from key users regularly communicated to data collectors and data managers?
116. Are data quality management reports provided to the TRCC for regular review?

Description and Contents of the Vehicle Data System

117. Does custodial responsibility of the identification and ownership of vehicles registered in the State—including vehicle make, model, year of manufacture, body type, and adverse vehicle history (title brands)—reside in a single location?
118. Does the State or its agents validate every VIN with a verification software application?
119. Are vehicle registration documents barcoded—using at a minimum the 2D standard—to allow for rapid, accurate collection of vehicle information by law enforcement officers in the field using barcode readers or scanners?

Applicable Guidelines for the Vehicle Data System

120. Does the vehicle system provide title information data to the National Motor Vehicle Title Information System (NMVTIS) at least daily?
121. Does the vehicle system query NMVTIS before issuing new titles?
122. Does the State incorporate brand information recommended by AAMVA and/or received via NMVTIS on the vehicle record, whether the brand description matches the State's brand descriptions?
123. Does the State participate in the Performance and Registration Information Systems Management (PRISM) program?

Vehicle System Data Dictionary

124. Does the vehicle system have a documented definition for each data field?
125. Does the vehicle system include edit check and data collection guidelines that correspond to the data definitions?
126. Are the collection, reporting, and posting procedures for registration, title, and title brand information formally documented?

Procedures and Process Flows for the Vehicle Data System

127. Is there a process flow that outlines the vehicle system’s key data process flows, including inputs from other data systems?

128. Does the vehicle system flag or identify vehicles reported as stolen to law enforcement authorities?
129. If the vehicle system does flag or identify vehicles reported as stolen to law enforcement authorities, are these flags removed when a stolen vehicle has been recovered or junked?
130. Does the State record and maintain the title brand history (previously applied to vehicles by other States)?
131. Are the steps from initial event (titling, registration) to final entry into the statewide vehicle system documented?
132. Is the process flow annotated to show the time required to complete each step?
133. Does the process flow show alternative data flows and timelines?
134. Does the process flow include processes for error correction and error handling?

Vehicle Data System Interface with Other Traffic Record System Components

135. Are the driver and vehicle files unified in one system?
136. Is personal information entered into the vehicle system using the same conventions used in the driver system?
137. When discrepancies are identified during data entry in the crash data system, are vehicle records flagged for possible updating?

Data Quality Control Programs for the Vehicle Data System

138. Is the vehicle system data processed in real-time?
139. Are there automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and is logically consistent among data elements?
140. Are statewide vehicle system staff able to amend obvious errors and omissions for quality control purposes?
141. Are there timeliness performance measures tailored to the needs of data managers and data users?
142. Are there accuracy performance measures tailored to the needs of data managers and data users?
143. Are there completeness performance measures tailored to the needs of data managers and data users?
144. Are there uniformity performance measures tailored to the needs of data managers and data users?
145. Are there integration performance measures tailored to the needs of data managers and data users?
146. Are there accessibility performance measures tailored to the needs of data managers and data users?
147. Has the State established numeric goals—performance metrics—for each performance measure?
148. Is the detection of high frequency errors used to generate updates to training content and data collection manuals, update the validation rules, and prompt form revisions?
149. Are sample-based audits conducted for vehicle reports and related database contents for that record?
150. Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions within the State?

151. Is data quality feedback from key users regularly communicated to data collectors and data managers?
152. Are data quality management reports provided to the TRCC for regular review?

Description and Contents of the Roadway Data System

153. Are all public roadways within the State located using a compatible location referencing system?
154. Are the collected roadway and traffic data elements located using a compatible location referencing system (e.g., LRS, GIS)?
155. Is there an enterprise roadway information system containing roadway and traffic data elements for all public roads?
156. Does the State have the ability to identify crash locations using a referencing system compatible with the one(s) used for roadways?
157. Is crash data incorporated into the enterprise roadway information system for safety analysis and management use?

Applicable Guidelines for the Roadway Data System

158. Are all the MIRE Fundamental Data Elements collected for all public roads?
159. Do all additional collected data elements for any public roads conform to the data elements included in MIRE?

Data Dictionary for the Roadway Data System

160. Are all the MIRE Fundamental Data Elements for all public roads documented in the enterprise system's data dictionary?
161. Are all additional (non-Fundamental Data Element) MIRE data elements for all public roads documented in the data dictionary?
162. Does local, municipal, or tribal (where applicable) roadway data comply with the data dictionary?
163. Is there guidance on how and when to update the data dictionary?

Procedures and Process Flows for the Roadway Data System

164. Are the steps for incorporating new elements into the roadway information system (e.g., a new MIRE element) documented to show the flow of information?
165. Are the steps for updating roadway information documented to show the flow of information?
166. Are the steps for archiving and accessing historical roadway inventory documented?
167. Are the procedures used to collect, manage, and submit local agency roadway data (e.g., county, MPO, municipality, tribal) to the statewide inventory documented?
168. Are procedures for collecting and managing the local agency (to include tribal, where applicable) roadway data compatible with the State's enterprise roadway inventory?
169. Are there guidelines for collection of data elements as they are described in the State roadway inventory data dictionary?

Intrastate Roadway System Interface

170. Are the location coding methodologies for all State roadway information systems compatible?

171. Are there interface linkages connecting the State's discrete roadway information systems?
172. Are the location coding methodologies for all regional, local, and tribal roadway systems compatible?
173. Do roadway data systems maintained by regional and local custodians (e.g., MPOs, municipalities, and Federally recognized Indian Tribes) interface with the State enterprise roadway information system?
174. Does the State enterprise roadway information system allow MPOs and local transportation agencies (to include Federally recognized Tribes, where applicable) on-demand access to data?

Data Quality Control Programs for the Roadway Data System

175. Do Roadway system data managers regularly produce and analyze data quality reports?
176. Is there a formal program of error/edit checking for data entered into the statewide roadway data system?
177. Are there procedures for prioritizing and addressing detected errors?
178. Are there procedures for sharing quality control information with data collectors through individual and agency-level feedback and training?
179. Are there timeliness performance measures tailored to the needs of data managers and data users?
180. Are there accuracy performance measures tailored to the needs of data managers and data users?
181. Are there completeness performance measures tailored to the needs of data managers and data users?
182. Are there uniformity performance measures tailored to the needs of data managers and data users?
183. Are there accessibility performance measures tailored to the needs of data managers and data users?
184. Are there integration performance measures tailored to the needs of data managers and data users?
185. Has the State established numeric goals—performance metrics—for each performance measure?
186. Are data quality management reports provided to the TRCC for regular review?

Description and Contents of the Citation and Adjudication Data Systems

187. Is citation and adjudication data used for the prosecution of offenders; adjudication of cases; traffic safety analysis to identify problem locations, problem drivers, and issues related to the issuance of citations; and for traffic safety program planning purposes?
188. Is there a statewide authority that assigns unique citation numbers?
189. Are all citation dispositions—both within and outside the judicial branch—tracked by a statewide citation tracking system?
190. Are final dispositions (up to and including the resolution of any appeals) posted to the driver data system?
191. Are the courts' case management systems interoperable among all jurisdictions within the State (including tribal, local, municipal, and State)?
192. Is there a statewide system that provides real-time information on individuals' driving and criminal histories?

193. Do all law enforcement agencies, parole agencies, probation agencies, and courts within the State participate in and have access to a system providing real-time information on individuals driving and criminal histories?

Applicable Guidelines and Participation in National Data Exchange Systems for the Citation and Adjudication Systems

194. Are DUI convictions and traffic-related felonies reported according to Uniform Crime Reporting (UCR) guidelines?
195. Do the appropriate portions of the citation and adjudication systems adhere to the NIEM Justice domain guidelines?
196. Does the State use any National Center for State Courts (NCSC) guidelines for court records?

Description and Contents of the Citation and Adjudication Data Systems

197. Does the statewide citation tracking system have a data dictionary?
198. Do the courts' case management system data dictionaries provide a definition for each data field?
199. Do the citation data dictionaries clearly define all data fields?
200. Do the courts' case management system data dictionaries clearly define all data fields?
201. Are the citation system data dictionaries up-to-date and consistent with the field data collection manual, training materials, coding manuals, and corresponding reports?
202. Do the citation data dictionaries indicate the data fields that are populated through interfaces with other traffic records system components?
203. Do the courts' case management system data dictionaries indicate the data fields populated through interface linkages with other traffic records system components?

Procedures and Process Flows for the Citation and Adjudication Data Systems

204. Does the State track citations from point of issuance to posting on the driver file?
205. Does the State distinguish between the administrative handling of court payments in lieu of court appearances (mail-ins) and court appearances?
206. Does the State have a system for tracking administrative driver penalties and sanctions?
207. Does the State track the number and types of traffic citations for juvenile offenders?
208. Are deferrals and dismissals tracked by the court case management systems or on the driver history record (DHR) to insure subsequent repeat offenses are not viewed as first offenses?
209. Are there State and/or local criteria for deferring or dismissing traffic citations and charges?
210. Are the processes for retaining, archiving or purging citation records defined and documented?
211. Are there security protocols governing data access, modification, and release in the adjudication system?
212. Does the State have an impaired driving data tracking system that uses some or all the data elements or guidelines of NHTSA's Model Impaired Driving Records Information System (MIDRIS), which provides a central point of access for DUI Driver information from the time of the stop/arrest through adjudication, sanctions, rehabilitation, prosecution and posting to the driver history file?
213. Does the DUI tracking system include BAC and any drug testing results?

Citation and Adjudication Systems Interface with other Components

214. Does the citation system interface with the driver system to collect driver information to help determine the applicable charges?
215. Does the citation system interface with the vehicle system to collect vehicle information and carry out administrative actions (e.g., vehicle seizure, forfeiture, interlock)?
216. Does the citation system interface with the crash system to document violations and charges related to the crash?
217. Does the adjudication system interface with the driver system to post dispositions to the driver file?
218. Does the adjudication system interface with the vehicle system to collect vehicle information and carry out administrative actions (e.g., vehicle seizure, forfeiture, interlock mandates, and supervision)?
219. Does the adjudication system interface with the crash system to document violations and charges related to the crash?

Quality Control Programs for the Citation and Adjudication Systems

220. Are there timeliness performance measures tailored to the needs of citation systems managers and data users?
221. Are there accuracy performance measures tailored to the needs of citation systems managers and data users?
222. Are there completeness performance measures tailored to the needs of citation systems managers and data users?
223. Are there uniformity performance measures tailored to the needs of citation systems managers and data users?
224. Are there integration performance measures tailored to the needs of citation systems managers and data users?
225. Are there accessibility performance measures tailored to the needs of citation systems managers and data users?
226. Has the State established numeric goals—performance metrics—for each citation system performance measure?
227. Are there timeliness performance measures tailored to the needs of adjudication systems managers and data users?
228. Are there accuracy performance measures tailored to the needs of adjudication systems managers and data users?
229. Are there completeness performance measures tailored to the needs of adjudication systems managers and data users?
230. Are there uniformity performance measures tailored to the needs of adjudication systems managers and data users?
231. Are there integration performance measures tailored to the needs of adjudication systems managers and data users?
232. Are there accessibility performance measures tailored to the needs of adjudication systems managers and data users?
233. Has the State established numeric goals—performance metrics—for each adjudication system performance measure?
234. Does the State have performance measures for its DUI Tracking system?
235. Are sample-based audits conducted periodically for citations and related database content for that record?

236. Are data quality management reports provided to the TRCC for regular review?

Injury Severity System

237. Is there an entity in the State that quantifies the burden of motor vehicle injury using EMS, emergency department, hospital discharge, trauma registry and vital records data?
238. Are there any other statewide databases that are used to quantify the burden of motor vehicle injury?
239. Do the State's privacy laws allow for the use of protected health information to support data analysis activities?

Emergency Medical Systems (EMS) Description and Contents

240. Is there a statewide EMS database?
241. Does the EMS data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
242. Is the EMS data available for analysis and used to identify problems, evaluate programs, and allocate resources?

EMS - Guidelines

243. Does the State have a NEMSIS-compliant statewide database?

EMS – Data Dictionary

244. Does the EMS system have a formal data dictionary?

EMS – Procedures & Processes

245. Is there a single entity that collects and compiles data from the local EMS agencies?
246. Is aggregate EMS data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
247. Are there procedures in place for the submission of all EMS patient care reports to the Statewide EMS database?
248. Are there procedures for returning data to the reporting EMS agencies for quality assurance and improvement (e.g., correction and resubmission)?

EMS – Quality Control

249. Are there automated edit checks and validation rules to ensure that entered EMS data falls within a range of acceptable values and is logically consistent among data elements?
250. Are there processes for returning rejected EMS patient care reports to the collecting entity and tracking resubmission to the statewide EMS database?
251. Are there timeliness performance measures tailored to the needs of EMS system managers and data users?
252. Are there accuracy performance measures tailored to the needs of EMS system managers and data users?
253. Are there completeness performance measures tailored to the needs of EMS system managers and data users?
254. Are there uniformity performance measures tailored to the needs of EMS system managers and data users?

255. Are there integration performance measures tailored to the needs of EMS system managers and data users?
256. Are there accessibility performance measures tailored to the needs of EMS system managers and data users?
257. Has the State established numeric goals—performance metrics—for each EMS system performance measure?
258. Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the EMS system?
259. Are periodic comparative and trend analyses used to identify unexplained differences in the EMS data across years and agencies?
260. Is data quality feedback from key users regularly communicated to EMS data collectors and data managers?
261. Are EMS data quality management reports produced regularly and made available to the State TRCC?

Emergency Department - System Description

262. Is there a statewide emergency department (ED) database?
263. Does the emergency department data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
264. Is the emergency department data available for analysis and used to identify problems, evaluate programs, and allocate resources?

Emergency Department – Data Dictionary

265. Does the emergency department dataset have a formal data dictionary?

Emergency Department – Procedures & Processes

266. Is there a single entity that collects and compiles data on emergency department visits from individual hospitals?

267. Is aggregate emergency department data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?

Hospital Discharge – System Description

268. Is there a statewide hospital discharge database?
269. Does the hospital discharge data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
270. Is the hospital discharge data available for analysis and used to identify problems, evaluate programs, and allocate resources?

Hospital Discharge – Data Dictionary

271. Does the hospital discharge dataset have a formal data dictionary?

Hospital Discharge – Procedures & Processes

272. Is there a single entity that collects and compiles data on hospital discharges from individual hospitals?

273. Is aggregate hospital discharge data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?

Emergency Department and Hospital Discharge – Guidelines

274. Are Abbreviated Injury Scale (AIS) and Injury Severity Score (ISS) derived from the State emergency department and hospital discharge data for motor vehicle crash patients?

Emergency Department and Hospital Discharge – Procedures & Processes

275. Are there procedures for collecting, editing, error-checking, and submitting emergency department and/or hospital discharge data to the statewide repository?

Emergency Department and Hospital Discharge – Quality Control

276. Are there automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and is logically consistent among data elements?
277. Are there processes for returning rejected emergency department and/or hospital discharge records to the collecting entity and tracking resubmission to the statewide emergency department and hospital discharge databases?
278. Are there timeliness performance measures tailored to the needs of emergency department and/or hospital discharge database managers and data users?
279. Are there accuracy performance measures tailored to the needs of emergency department and/or hospital discharge database managers and data users?
280. Are there completeness performance measures tailored to the needs of emergency department and/or hospital discharge database managers and data users?
281. Are there uniformity performance measures tailored to the needs of emergency department and/or hospital discharge database managers and data users?
282. Are there integration performance measures tailored to the needs of emergency department and/or hospital discharge database managers and data users?
283. Are there accessibility performance measures tailored to the needs of emergency department and/or hospital discharge database managers and data users?
284. Has the State established numeric goals—performance metrics—for each emergency department and/or hospital discharge database performance measure?
285. Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the emergency department and/or hospital discharge databases?
286. Is data quality feedback from key users regularly communicated to emergency department and/or hospital discharge data collectors and data managers?
287. Are emergency department and/or hospital discharge data quality management reports produced regularly and made available to the State TRCC?

Trauma Registry – System Description

288. Is there a statewide trauma registry database?
289. Does the trauma registry data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
290. Is the trauma registry data available for analysis and used to identify problems, evaluate programs, and allocate resources?

Trauma Registry – Guidelines

291. Does the State's trauma registry database adhere to the National Trauma Data Standards?
292. Are AIS and ISS derived from the State trauma registry for motor vehicle crash patients?

Trauma Registry –Data Dictionary

293. Does the trauma registry have a formal data dictionary?

Trauma Registry –Procedures and Processes

294. Is aggregate trauma registry data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
295. Are there procedures for returning trauma data to the reporting trauma center for quality assurance and improvement (e.g., correction and resubmission)?

Trauma Registry – Quality Control

296. Are there automated edit checks and validation rules to ensure that entered trauma registry data falls within a range of acceptable values and is logically consistent among data elements?
297. Are there timeliness performance measures tailored to the needs of trauma registry managers and data users?
298. Are there accuracy performance measures tailored to the needs of trauma registry managers and data users?
299. Are there completeness performance measures tailored to the needs of trauma registry managers and data users?
300. Are there uniformity performance measures tailored to the needs of trauma registry managers and data users?
301. Are there integration performance measures tailored to the needs of trauma registry managers and data users?
302. Are there accessibility performance measures tailored to the needs of trauma registry managers and data users?
303. Has the State established numeric goals—performance metrics—for each trauma registry performance measure?
304. Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the trauma registry?
305. Is data quality feedback from key users regularly communicated to trauma registry data collectors and data managers?
306. Are trauma registry data quality management reports produced regularly and made available to the State TRCC?

Vital Records – System Description

307. Is there a statewide vital records database?
308. Does the vital records data track the occurrence of motor vehicle fatalities in the State?
309. Is the vital records data available for analysis and used to identify problems, evaluate programs, and allocate resources?

Vital Records – Data Dictionary

310. Does the vital records system have a formal data dictionary?

Vital Records – Procedures & Processes

311. Is aggregate vital records data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?

Vital Records – Quality Control

312. Are there automated edit checks and validation rules to ensure that entered vital records data falls within a range of acceptable values and is logically consistent among data elements?
313. Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the vital records?
314. Are vital records data quality management reports produced regularly and made available to the State TRCC?

Injury Surveillance Data Interfaces

315. Is there an interface among the EMS data and emergency department and hospital discharge data?
316. Is there an interface between the EMS data and the trauma registry data?

Data Use and Integration

317. Do behavioral program managers have access to traffic records data and analytic resources for problem identification, priority setting, and program evaluation?
318. Does the State have a data governance process?
319. Does the TRCC promote data integration by aiding in the development of data governance, access, and security policies for integrated data?
320. Is driver data integrated with crash data for specific analytical purposes?
321. Is vehicle data integrated with crash data for specific analytical purposes?
322. Is roadway data integrated with crash data for specific analytical purposes?
323. Is citation and adjudication data integrated with crash data for specific analytical purposes?
324. Is injury surveillance data integrated with crash data for specific analytical purposes?
325. Are there examples of data integration among crash and two or more of the other component systems?
326. Is data from traffic records component systems—other than crash—integrated for specific analytical purposes?
327. For integrated datasets, do decision-makers have access to resources—skilled personnel and user-friendly access tools—for use and analysis?
328. For integrated datasets, does the public have access to resources—skilled personnel and user-friendly access tools—for use and analysis?

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