Traffic Records Program Assessment Advisory

U.S. Department of Transportation

National Highway Traffic Safety Administration

NHTSA

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KEY TERMS

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

- Data system: One of the six component State traffic records databases, such as crash, injury surveillance, etc.

- Data file (such as "crash file" or "State Hospital Discharge file"): A data system may contain a single data file—such as a State's driver file—or more than one. For instance, the injury system has several data files.

- 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.

- Data element code value: The allowable code values or attributes for a data element.

- Data Governance: A set of processes that ensure that important data assets are formally managed throughout the enterprise.

- Data linkages: The links established by matching at least one data element in 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 or integration 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 supports critical business processes and enhances data quality.

- Data integration: The discrete linking of databases for analytic purposes.

- State: The 50 States, the District of Columbia, Puerto Rico, the Territories, and the Bureau of Indian Affairs. These are the jurisdictions eligible to receive State data improvement grants. The word "State" should be understood to include these additional jurisdictions.

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LIST OF ACRONYMS

Acronym	Definition
§ 408	State Traffic Safety Information System Improvement Grants
AAAM	Association for the Advancement of Automotive Medicine
AADT	average annual daily traffic
ACS	American College of Surgeons
AIS	Abbreviated Injury Score
ANSI	American National Standards Institute
BAC	blood alcohol concentration
CATS	Commercial Auto Theft Section
CDC	Centers for Disease Control and Prevention
CDLIS	Commercial Driver's License Information System
CODES	Crash Outcome Data Evaluation System
DDACTS	Data Driven Approaches to Crime and Traffic Safety
DHS	Department of Homeland Security
DMV	Department of Motor Vehicles
DOH	Department of Health
DOJ	Department of Justice
DOT	Department of Transportation
DPPA	Drivers Privacy Protection Act
DUA	data use agreement
DUI	driving under the influence
DUID	driving under the influence of drugs
DWI	driving while intoxicated
ED	emergency department
EMS	Emergency Medical Service
FARS	Fatalities Analysis Reporting System
FDEs	Fundamental Data Elements
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
GCS	Glasgow Coma Scale
GDL	graduated driver licensing
GHSA	Governors Highway Safety Association
GIS	geographic information system
GJXDM	Global Justice XML Data Model
GRA	Government Reference Architecture
HIPPA	Health Information Privacy Protection Act
HITECH	
HSIP	Highway Safety Improvement Plan
HSP	Highway Safety Plan
ICD-10	International Classification of Diseases and Related Health Problems
IRB	Institutional Review Board

ISS	Injury Severity Scale
IT	information technology
JIEM	Justice Information Exchange Model
LEIN	Law Enforcement Information Network
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 Guideline
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
NAPHSIS	National Association for Public Health Statistics and Information Systems
NCHS	National Center for Health Statistics
NCIC	National Crime Information Center
NCSC	National Center for State Courts
NDR	National Driver Register
NEMSIS	National EMS Information System
NHTSA	National Highway Traffic Safety Administration
NIBRIS	National Incident-Based Reporting System
NIEM	National Information Exchange Model
NLETS	National Law Enforcement Telecommunications System
NTDS	National Trauma Data Standard
PAR	police accident report
PDO	property damage only
PDPS	Problem Driver Pointer System
PII	personally identifiable information
RMS	records management system
RPC	Regional Planning Commission
SAVE	Systematic Alien Verification for Entitlements
SHSP	Strategic Highway Safety Plan
SSOLV	Social Security Online Verification
TRCC	Traffic Records Coordinating Committee
UCR	Uniform Crime Reports
VIN	vehicle identification number
XML	extensible markup language

SECTION 1: INTRODUCTION

High-quality State traffic records data is critical to effective safety programing, 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.

PURPOSE

Like the 2006 edition, this updated *Traffic Records Program Assessment Advisory* gives States 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.

In addition, the updated *Advisory* outlines a comprehensive approach for assessing the systems and processes that govern the collection, management, and analysis of traffic records data. The *Advisory* now provides a uniform set of questions derived from the ideal system as described above. The questions are used by a group of qualified independent assessors to determine how close a State's capabilities come to the described ideal. There are three gradations: (a) meets the description of the ideal traffic records system, (b) partially meets the ideal description, and (c) does not meet the ideal description. The *Advisory* also provides State respondents with standards of evidence that identify the specific information necessary to answer each assessment question. This assessment instrument highlights a State traffic records system's strengths as well as opportunities for improvement.

SCOPE

The *Advisory* provides guidance to States 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 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" (TRCC strategic plan), the Commercial Vehicle Safety Plan (CMVSP), the Highway Safety Plan (HSP), and the Strategic Highway Safety Plan (SHSP). States need timely, accurate, complete, and uniform traffic records to identify and prioritize traffic safety issues and to choose appropriate counter measures and evaluate their effectiveness.

In undertaking the 2012 update to the *Advisory*, NHTSA and its partners strove to achieve a balance between preserving the ability to assess contemporary State traffic records systems and addressing the innovative technologies that will shape the field in the future. As the primary output of the assessment

process is a comprehensive, uniform assessment of a State's traffic records system, the former was given precedent when choices had to be made between these two factors. Both the *Advisory* and the assessment process will be updated to keep pace with State traffic records systems as technologies and innovations such as data warehousing, cloud computing, and a NIEM-compliant transportation XML domain are developed and enter into common use.

CRITICAL CONCEPTS

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

The IDEAL System

This version of the *Advisory*—like prior editions—describes the IDEAL traffic records system as determined by a diverse group of subject matter experts over a months-long iterative review process. The assessment questions are derived from this description and will reveal how State systems are performing relative to the ideal. However, the ideal and related questions serve solely as a uniform measurement tool; they are not goals in and of themselves. While the assessment's objective is ultimately to help States improve their traffic records systems, there is no expectation that States must achieve the ideal as described in the *Advisory*.

Interface & Integration

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 at all times. 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.

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 & Metrics

The *Advisory*—as well as NHTSA's 2011 *Model Performance Measures for State Traffic Records Systems* (Report No. DOT HS 811 441, available at www-nrd.nhtsa.dot.gov/Pubs/811441.pdf)—makes a clear distinction between 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 from (a) the crash date to (b) the date the crash report is entered into the database*. If a State then wishes to establish a performance metric or goal, it can do so. 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 or not to establish performance metrics and to set any metrics' parameters based on their own goals.

Terminology

The following terms are used as indicated throughout the *Advisory*:

- Data system – One of the six component State traffic records systems, which may comprise several independent databases or a single database 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 file (e.g., a State driver file) or more than one (e.g., the separate Emergency Medical Service, emergency department, hospital discharge, trauma registry, and vital records files that comprise the injury surveillance system).
- Record – All the data entered into a file for a specific event (e.g., a crash, a patient hospital discharge).
- Data element – Individual information fields within a record (e.g., first name, last name, address).
- Data element code value – The allowable code values or attributes for a given data element.

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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 the effectiveness of countermeasures. 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" (TRCC strategic plan). The development and management of a State's traffic records system, a fully functioning TRCC, and TRCC 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 two-tiered TRCC

The ideal TRCC comprises an executive and technical level. The executive group members hold positions within their agencies that enable them to establish policy, direct resources within their areas of responsibility, and set the vision and mission for the technical TRCC. The executive TRCC's portfolio also includes the review and approval of actions proposed by the technical group.

The TRCC's technical group includes representatives from all stakeholder groups and organizations and is responsible—as defined by the executive TRCC—for the oversight and coordination of the State's traffic records system. Together, the two tiers of the TRCC are responsible for developing strategies, coordinating implementation, and tracking progress of programs and projects detailed in the TRCC's strategic plan described in Section 2-B.

Ensure TRCC Membership is Representative

The ideal State TRCC is composed of members representing the interests of traffic safety data collectors, managers, and users. At 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 executive TRCC includes individuals that have resource allocation responsibilities within each of the custodial agencies. Specifically, these entities include: crash (State law enforcement, DMV, DOT, Highway Safety Office), 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's technical group ideally includes individuals tasked with the oversight and coordination of the traffic records system. Specifically, these individuals represent all appropriate stakeholder entities, including those on the executive TRCC and some or all of the following: State IT agency and offices, State Fatalities Analysis Reporting System (FARS) analyst, metropolitan and regional planning agencies, county/city engineers, judges, prosecutors, Crash Outcome Data Evaluation System (CODES) grantees,

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. 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—at both the executive and technical level—formally chartered by memorandum of understanding, charter, or other foundational document that describes the powers and duties of each 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 TRCC strategic plan; (2) influences agency policy decisions that impact the State's traffic records system; (3) allocates 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 technical TRCC chair and the TRCC coordinator. These roles may, in some cases, be assumed by the same individual.

The technical TRCC chair is either elected by the TRCC or appointed by the executive TRCC. The chair provides leadership for committee activities as specified in the TRCC strategic plan. The ideal individual is employed by the State's highway safety office 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 or appropriate foundational document.

The TRCC coordinator is designated by the committee to aid the technical TRCC chair, the executive TRCC, and technical TRCC. The coordinator may be an employee of a key custodial agency or a contractor. Specific duties include coordination of the technical TRCC at the direction of the chair;

coordination of the development, implementation, and maintenance of the TRCC strategic plan; and providing secretariat support for the executive TRCC.

Conduct Regular Meetings

The TRCC meets regularly. The executive TRCC meets—at a minimum—annually. The technical TRCC meets at least quarterly. The TRCC creates working sub-committees to address specific issues or projects. These sub-committees may need to meet more frequently.

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 is a part of the technical 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*.

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 trainings are a part of the technical TRCC's regular meetings. The TRCC monitors and encourages the deployment and promotion of training programs such as the TR101 online and training sessions held at the International Forum on Traffic Records and Highway Safety Information Systems (TRF).

Coordinate Grant Funds

The TRCC oversees 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. The TRCC discusses how to optimally invest available traffic records improvement funds and coordinate the used of these resources—in particular DOT grand funds that can be used for State traffic records systems data improvement projects.

ASSESSMENT QUESTIONS: TRAFFIC RECORDS COORDINATING COMMITTEE

1. Does the State have both an executive and a technical TRCC?
   - Rank: very important.
   - Evidence: Provide a charter and/or MOU. Also provide a roster with all members' names, affiliations, and titles for both the executive and technical TRCC.

2. Do the executive TRCC members have the power to direct their agencies' resources for their respective areas of responsibility?
   - Rank: very important.
   - Evidence: Provide a charter and/or MOU. Also provide a roster with all members' names, affiliations, and titles for the executive TRCC.

3. Does the executive TRCC review and approve actions proposed by the technical TRCC?
   - Rank: very important.
   - Evidence: Provide a narrative example of recent actions or programs approved by the executive TRCC (e.g., an approved project or funding proposal).

4. Does the TRCC include representation from the core data systems at both the executive and technical levels?
   - Rank: very important.
   - Evidence: Identify the executive and technical TRCC members that represent the core data systems: crash, driver, vehicle, roadway, citation and adjudication, and injury surveillance.

5. Does the TRCC consult with the appropriate State IT agency or offices when planning and implementing technology projects?
   - Rank: somewhat important.
   - Evidence: Provide a narrative example of the TRCC's process of consulting the appropriate IT agency or offices. Identify the appropriate agency or offices and their responsibilities.

6. Is there a formal document authorizing the TRCC?
   - Rank: very important.
   - Evidence: Provide the authorizing document (e.g. MOU, charter).

7. Does the TRCC provide the leadership and coordination necessary to develop, implement, and monitor the TRCC strategic plan?
   - Rank: very important.
   - Evidence: Provide a narrative describing the TRCC's role in developing the TRCC strategic plan as well as implementation of a project detailed in the plan.

8. Does the TRCC influence policy decisions that impact the State's traffic records system?
   - Rank: somewhat important.
   - Evidence: Provide a narrative describing a specific example of how the TRCC is engaged by component agencies in the course of their decision-making processes.

9. Does the TRCC allocate Federal traffic records improvement grant funds?
   - Rank: very important.
   - Evidence: Specify what funds the TRCC is responsible for allocating (e.g., § 408) and provide a narrative describing how the TRCC allocated the most recent program year's funding.

10. Does the TRCC identify core system performance measures and monitor progress?
    - Rank: very important.
    - Evidence: Provide at least one performance measure for each of the six core systems and describe how the TRCC identified it and has tracked its progress over time.

11. 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?
    - Rank: somewhat important.
    - Evidence: Provide the charter or MOU and minutes from the two most recent technical TRCC meetings.

12. Does the TRCC have a traffic records inventory?
    - Rank: somewhat important.
    - Evidence: Provide the traffic records inventory.

13. Does the technical TRCC have a designated chair?
    - Rank: very important.
    - Evidence: Provide a position description, identify the individual, and describe the chair's responsibilities.

14. Does the TRCC have a designated coordinator?
    - Rank: very important.
    - Evidence: Provide a position description, identify the individual, and describe the coordinator's responsibilities.

15. Does the executive TRCC meet at least once annually?
    - Rank: somewhat important.
    - Evidence: Provide a schedule of executive meeting dates from the past two program years.

16. Does the technical TRCC meet at least quarterly?
    - Rank: somewhat important.
    - Evidence: Provide a schedule of technical TRCC meeting dates for the past program year. If the TRCC has topical sub-committees, identify these groups, their purposes, and meeting dates as well.

17. Does the TRCC oversee quality control and quality improvement programs impacting the core data systems?
    - Rank: very important.
    - Evidence: Provide meeting minutes or reports that document the quality control activities that the TRCC undertake regularly.

18. Does the TRCC address technical assistance and training needs?
- Rank: somewhat important.
- Evidence: Document TRCC discussion of technical assistance and training needs with meeting agendas or minutes.

19. Does the TRCC use a variety of Federal funds to strategically allocate resources for traffic records improvement projects?
- Rank: very important.
- Evidence: Provide an inventory of Federal funds used to support traffic records improvement projects in the last program year.

SECTION 2-B: STRATEGIC PLANNING FOR TRAFFIC RECORDS SYSTEMS

The Traffic Records Coordinating Committee is responsible for developing the TRCC's strategic plan that guides the State's traffic records improvement efforts. This document is a multi-year plan, updated annually, that sets the framework for improving all aspects of the State's traffic records system, providing goals and objectives for activities over the short and long term.

The TRCC 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 TRCC's strategic plan is data-driven, addresses measurable deficiencies, and works towards State-defined performance metrics to enhance system performance. The 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. The strategic plan is a comprehensive plan, developed and approved by the State's TRCC, that:

- Addresses existing data and data system deficiencies and documents how these deficiencies are identified;
- 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 performance-based measures and their corresponding metrics for each of the six core data systems;
- 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 TRCC strategic plan includes the following considerations:

Monitor Opportunities to Use New Technology
The TRCC strategic plan addresses the adoption and integration of new technology at the project level to ensure timely, accurate, and complete traffic safety data, which—in turn—provides the better quality 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 TRCC 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 TRCC strategic plan is responsive to the needs of all stakeholders, including local users and tribal nations.

Coordinate with Federal Data Systems

The TRCC strategic plan's data collection, management, and analysis portfolio includes 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 (PDPS), the Motor Carrier Management Information System (MCMIS), and the Commercial Driver License Information System (CDLIS).

ASSESSMENT QUESTIONS: STRATEGIC PLANNING FOR TRAFFIC RECORDS SYSTEMS

20. Does the TRCC develop the TRCC strategic plan?
     - Rank: very important.
     - Evidence: Document the process undertaken by the TRCC in developing the strategic plan. (Pre-populate with most recent strategic plan.)

21. Does the TRCC strategic plan address existing data and data systems deficiencies and document how these deficiencies are identified?
     - Rank: very important.
     - Evidence: Identify, with appropriate citations, how the strategic plan addresses existing data and data systems deficiencies and documents how they were identified. (Pre-populate with most recent strategic plan.)

22. Does the TRCC strategic plan identify strategies that address the timeliness, accuracy, completeness, uniformity, integration, and accessibility of the six core data systems?
     - Rank: very important.
     - Evidence: Identify, with appropriate citations, how the strategic plan identifies strategies that address the timeliness, accuracy, completeness, uniformity, integration, and accessibility of the six core data systems. (Pre-populate with most recent strategic plan.)

23. Does the TRCC strategic plan indicate what funds are used to undertake efforts detailed in the plan and describe how these allocations contribute to the plan's stated goals?
     - Rank: very important.

- Evidence: Identify, with appropriate citations, how efforts detailed in the plan are funded and explain how these allocations address the plan's stated goals as specified in the strategic plan. (Pre-populate with most recent strategic plan.)

24. Does the TRCC have a process for prioritizing traffic records improvement projects in the TRCC strategic plan?
    - Rank: very important.
    - Evidence: Identify, with appropriate citations, how the TRCC prioritizes traffic records improvement projects as specified in the strategic plan. (Pre-populate with most recent strategic plan.)

25. Does the TRCC have a process for identifying performance measures and corresponding metrics for the six core data systems in the TRCC strategic plan?
    - Rank: very important.
    - Evidence: Identify, with appropriate citations, how the TRCC identifies performance measures and any corresponding metrics for each of the six core data systems as specified in the strategic plan. (Pre-populate with most recent strategic plan.)

26. Does the TRCC have a process for identifying and addressing technical assistance and training needs in the TRCC strategic plan?
    - Rank: somewhat important.
    - Evidence: Identify, with appropriate citations, how the TRCC identifies and addresses technical assistance and training needs as specified in the strategic plan. (Pre-populate with most recent strategic plan.)

27. Does the TRCC have a process for leveraging Federal funds and assistance programs in the TRCC strategic plan?
    - Rank: somewhat important.
    - Evidence: Identify, with appropriate citations, how the TRCC leverages Federal funds and assistance programs as specified in the strategic plan. (Pre-populate with most recent strategic plan.)

28. Does the TRCC have a process for establishing timelines and responsibilities for projects in the TRCC strategic plan?
    - Rank: very important.
    - Evidence: Identify, with appropriate citations, how the TRCC establishes timelines and responsibilities for projects in the plan. (Pre-populate with most recent strategic plan.)

29. Does the TRCC have a process for integrating State and local data needs and goals into the TRCC strategic plan?
    - Rank: very important.

- Evidence: Identify, with appropriate citations, how the TRCC integrates State and local data needs and goals into the TRCC strategic plan. (Pre-populate with most recent strategic plan.)

30. Does the TRCC consider the use of new technology when developing and managing traffic records projects in the strategic plan?
    - Rank: somewhat important.
    - Evidence: Identify, with appropriate citations, a project or projects in the strategic plan whose development included the application or consideration of new technology. (Pre-populate with most recent strategic plan.)

31. Does the TRCC consider lifecycle costs in implementing improvement projects?
    - Rank: somewhat important.
    - Evidence: Identify, with appropriate citations, a project or projects in the strategic plan whose development included consideration of lifecycle costs. (Pre-populate with most recent strategic plan.)

32. Is the strategic plan responsive to the needs of all stakeholders, including local users?
    - Rank: somewhat important.
    - Evidence: Identify, with appropriate citations, specific instances demonstrating that local stakeholder needs are incorporated into the TRCC's strategic plan. (Pre-populate with most recent strategic plan.)

33. Does the strategic plan make provisions for coordination with key Federal traffic records data systems?
    - Rank: somewhat important.
    - Evidence: Provide a narrative demonstrating how the strategic plan coordinates with key Federal traffic records data systems. Provide citations from the strategic plan if appropriate.

34. Are there any impediments to coordination with key Federal traffic records data systems?
    - Rank: very important.
    - Evidence: Provide a narrative detailing any impediments to coordination with key Federal traffic records data systems. Provide citations from the strategic plan if appropriate.

35. Is the TRCC's strategic plan reviewed and updated annually?
    - Rank: very important.
    - Evidence: Provide a narrative detailing the frequency and depth of strategic plan reviews and updates. Identify the stakeholder agencies represented in the review process. Provide a schedule or cite the plan itself if appropriate.

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. (Reportability 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 and 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 vehicle involved in a crash (e.g., make, model, body type, vehicle registration);
- **When:** Information detailing the time a crash occurred (e.g., time of day, day of week)
- **Where:** Information about the crash location (e.g., location name, 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 systems components, the crash data system identifies the roadways, vehicles, and individuals (e.g., drivers, occupants, non-motorists) 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 also used to guide engineering and construction projects, prioritize law enforcement activity, and select and evaluate safety countermeasure programs. Crash data is also to be used in analysis related to emergency response and how to maximize the level of care and the survivability associated with injuries sustained in a crash.

ASSESSMENT QUESTIONS: DESCRIPTION AND CONTENTS OF THE CRASH DATA SYSTEM

36. Is statewide crash date consolidated into one database?
    - Rank: somewhat important.
    - Evidence: Provide a description of the statewide database and specify how the data is consolidated.

37. Is the statewide crash system's organizational custodian clearly defined?
    - Rank: very important.
    - Evidence: Identify what agency has the custodial responsibility for the statewide crash system, detail the extent of the agency's role, and provide all relevant statues.

38. Does the State have fatal crash reporting criteria?
    - Rank: very important.
    - Evidence: Provide the fatal crash inclusion criteria for the statewide crash system.

39. Does the State have injury crash reporting criteria?
    - Rank: very important.
    - Evidence: Provide the injury crash inclusion criteria for the statewide crash system.

40. Does the State have PDO crash reporting criteria?
    - Rank: very important.
    - Evidence: Provide the PDO crash inclusion criteria for the statewide crash system.

41. Does the statewide crash system record crashes occurring in non-trafficway areas (e.g., parking lots, driveways)?
    - Rank: somewhat important.
    - Evidence: Provide the non-trafficway reporting criteria for the statewide crash system.

42. Is data from the crash system used to identify crash risk factors?

- Rank: very important.
- Evidence: Provide example reports and/or analyses that examine locations, roadway features, behaviors, driver characteristics, or vehicle characteristics as they relate to crash risk. If referencing large documents like the SHSP, please cite relevant page numbers.

43. Is data from the crash system used to guide engineering and construction projects?

- Rank: very important.
- Evidence: Describe the State's network screening and countermeasure selection processes. Identify spending on construction projects identified by analyzing crash data. If referencing large documents like the SHSP, please cite relevant page numbers.

44. Is data from the crash system regularly used to prioritize law enforcement activity?

- Rank: very important.
- Evidence: Provide a sample location-based analysis and any associated law enforcement activities. If a State DDACTS program exists, provide details.

45. Is data from the crash system used to evaluate safety countermeasure programs?

- Rank: very important.
- Evidence: Describe how crash data is used to evaluate safety countermeasure programs. If referencing large documents like the SHSP, HSP, or Crash Facts, please cite relevant page numbers.

APPLICABLE GUIDELINES FOR CRASH SYSTEMS

There are several guidelines available to States wishing to build and maintain appropriate crash data systems. The MMUCC provides a suggested minimum set of crash-related data elements that enable valid statistical analysis. (www.mmucc.us/). MMUCC is, however, a minimum guideline and States are expected to adopt additional standard data elements and attributes as dictated by their specific data needs.

When creating or updating crash systems, States can also consider two applicable manuals published by the American National Standards Institute. ANSI-D16, the *Manual on Classification of Motor Vehicle Traffic Accidents*, is a standard for statistical motor vehicle traffic accident classifications for nationwide use and provides a common language for crash data reporters, classifiers, analysts, and users.

ANSI-D-20, the *Data Element Dictionary for Traffic Records Systems*, provides standard terminology and coding instructions designed to facilitate representations of data elements communicated between jurisdictions. (http://aamva.gorg/aamva/DocumentDisplay.aspx?id={3D25B551-1E16-4EF5-A74C-F321DE19D6E5})

States are responsible for protecting against unlawful disclosure of personal information as defined in 18 U.S.C. §2725 and relevant State statute. Per the Driver's Privacy Protection Act (DPPA), States may not release personally identifying information without the express consent of the individual in question, with the exception of certain circumstances set forth in 18 U.S.C. §2721. (http://uscodebeta.house.gov/browse/title18/part1/chapter123)

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 as a result of motor vehicle crashes. The FARS manuals are updated annually and unique to each calendar year. States must use the manual appropriate to the current program year. (http://www-nrd.nhtsa.dot.gov/Cats/listpublications.aspx?Id=J&ShowBy=DocType)

ASSESSMENT QUESTIONS: APPLICABLE GUIDELINES FOR THE CRASH DATA SYSTEM

46. Is MMUCC a primary source for identifying what crash data elements and attributes the State collects?
     - Rank: very important.
     - Evidence: Provide a narrative description of the process by which MMUCC was used to identify what crash data elements and attributes are include in the crash database and on the police accident report.

47. Are the ANSI D-16 and ANSI D-20 used as sources for the definitions in the crash system data dictionary?
     - Rank: somewhat important.

- Evidence: Provide a narrative description of the process by which ANSI D-16 and ANSI D-20 were used to define data elements in the crash system's data dictionary and user manual.

DATA DICTIONARY FOR THE CRASH DATA SYSTEM

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

- All data elements in the crash data collection form/software;
- All data elements in the crash database, to include 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).

The data dictionary is kept up to date and consistent with the field data collection manual, coding manual, crash report, 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.

ASSESSMENT QUESTIONS: DATA DICTIONARY FOR THE CRASH DATA SYSTEM

48. Does the data dictionary provide a definition for each data element and define that data element's allowable values?
- Rank: very important.
- Evidence: Provide a copy of the data dictionary.

49. Does the data dictionary document the system edit checks and validation rules?
- Rank: somewhat important.
- Evidence: Provide a copy of the data dictionary. If the system edit checks and validation rules are documented elsewhere, provide the appropriate document.

50. Is the data dictionary up to date and consistent with the field data collection, manual coding manual, crash report, and any training materials?
- Rank: very important.
- Evidence: Describe the process—to include time lines and change summaries—used to ensure consistence among the State's crash system data dictionary, field data collection manual, coding manual, crash report, and training materials.

51. Does the crash system data dictionary indicate the data elements populated through links to other traffic records system components?
- Rank: somewhat important.
- Evidence: Provide a list of data fields are linked to other traffic records system components (e.g., the driver file, the vehicle file).

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 MMUCC guidelines 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.

ASSESSMENT QUESTIONS: PROCEDURES AND PROCESS FLOWS FOR CRASH DATA SYSTEMS

52. Do all law enforcement agencies collect crash data in the field?
    - Rank: somewhat important.
    - Evidence: Provide a list of all reporting agencies and specify their data collection methods. Specify any State plans for achieving 100% electronic in-field data collection.

53. Do all law enforcement agencies collecting crash data electronically in the field also submit the data to the statewide crash system electronically?
    - Rank: very important.
    - Evidence: Describe—using a narrative or flow diagram—all data submission processes used to transmit data from collecting agencies to the statewide crash data system.

54. 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?
    - Rank: very important.

- Evidence: Describe the validation processes used by the collecting agencies. Specify if the validation rules are applied to the data prior to submission to the statewide crash system.

55. 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?
    - Rank: very important.
    - Evidence: Provide a process flow diagram (preferred) or narrative description documenting key processes governing the collection, reporting, and posting of crash data—including the submission of fatal crashes to the State FARS unit and commercial vehicle crashes to SafetyNet.

56. Are the processes for managing errors and incomplete data documented?
    - Rank: very important.
    - Evidence: Provide a process flow diagram (preferred) or narrative description documenting the processes for managing errors and incomplete data.

57. 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?
    - Rank: somewhat important.
    - Evidence: Provide a copy of the retention policy.

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. 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, system interface is useful when circumstances require relationships between traffic records data systems that need to be connected and accessible at all times. 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 (RMS), 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 assure 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 t	- 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.)

ASSESSMENT QUESTIONS: CRASH DATA SYSTEMS INTERFACE WITH OTHER COMPONENTS

58. Does the crash system interface with the driver system?
    - Rank: somewhat important.
    - Evidence: Provide narrative description of the crash-to-driver system interfaces that enable: verification and validation of the driver's personal information, access to driver records, identification of inconsistencies between the crash and driver records, and/or identification of the driver's prior crash involvement?

59. Does the crash system interface with the vehicle system?
    - Rank: somewhat important.

- Evidence: Provide narrative descriptions of the crash-to-vehicle system interfaces that enable: verification and validation of the vehicle information, access to vehicle records, and/or identification of inconsistencies between the crash and vehicle records.

60. Does the crash system interface with the roadway system?
- Rank: somewhat important.
- Evidence: Provide narrative descriptions of the crash-to-roadway interfaces that enable: verification and validation of the roadway information, and/or identification of inconsistencies between the crash and roadway records.

61. Does the crash system interface with the citation and adjudication systems?
- Rank: somewhat important.
- Evidence: Provide narrative descriptions of the crash-to-citation and –adjudication interfaces that enable: verification and validation of citations and/or alcohol or drug test information in the crash record; identification of any inconsistencies between crash and citation records; and access to criminal history, contact history, and location history.

62. Does the crash system interface with the injury surveillance system?
- Rank: somewhat important.
- Evidence: Provide narrative descriptions of the crash-to-injury surveillance interfaces that enable: verification and validation of EMS information, and identification of inconsistencies between crash and EMS records.

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 data 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. 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 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 used the reports to identify problems and develop countermeasures.

ASSESSMENT QUESTIONS: DATA QUALITY CONTROL PROGRAMS FOR THE CRASH SYSTEM

63. 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?
    - Rank: very important.
    - Evidence: Provide the formal methodology or describe the process by which automated edit checks or validation rules ensure entered data falls within the range of acceptable values and is logically consistent between fields.

64. 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?
    - Rank: somewhat important.
    - Evidence: Provide the formal methodology or describe the process by which limited State-level correction authority is granted to quality control staff working with the statewide crash database.

65. Are there formally documented processes for returning rejected crash reports to the originating officer and tracking resubmission of the report in place?
    - Rank: very important.
    - Evidence: Provide the formal methodology or describe the process by which rejected crash reports are returned to the originating officer and then resubmitted to the statewide crash database.

66. Are there timeliness performance measures tailored to the needs of data managers and data users?
    - Rank: very important.
    - Evidence: Provide a complete list of crash system timeliness measures the State uses, including the most current baseline and actual values for each.

67. Are there accuracy performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of crash system accuracy measures the State uses, including the most current baseline and actual values for each.

68. Are there completeness performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of crash system completeness measures the State uses, including the most current baseline and actual values for each.

69. Are there uniformity performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of crash system uniformity measures the State uses, including the most current baseline and actual values for each.

70. Are there integration performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of crash system integration measures the State uses, including the most current baseline and actual values for each.

71. Are there accessibility performance measures tailored to the needs of data managers and data users?
- Rank: somewhat important.
- Evidence: Provide a complete list of crash system accessibility measures the State uses, including the most current baseline and actual values for each.

72. Has the State established numeric goals—performance metrics—for each performance measure?
- Rank: very important.
- Evidence: Provide the specific, State-determined numeric goals associated with each performance measure in use.

73. Is there performance reporting that provides specific timeliness, accuracy, and completeness feedback to each law enforcement agency?
- Rank: very important.
- Evidence: Provide a sample report, list of receiving law enforcement agency, and specify the frequency of issuance.

74. 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?
- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which high frequency errors are used to generate new training content and data collection manuals, update the validation rules, and prompt form revisions.

75. 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?
- Rank: somewhat important.
- Evidence: Provide the formal methodology or describe the process by which quality control reviews comparing the narrative, diagram, and coded contents of the report are considered part of the statewide crash database's data acceptance process.

76. Are independent sample-based audits periodically conducted for crash reports and related database contents?
- Rank: somewhat important.
- Evidence: Describe the formal audit methodology, provide a sample report or other output, and specify the audits' frequency.

77. Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions?
- Rank: very important.
- Evidence: Describe the analyses, provide a sample report or other output, and specify the analyses' frequency.

78. Is data quality feedback from key users regularly communicated to data collectors and data managers?
- Rank: somewhat important.
- Evidence: Describe the process for transmitting and using key users' data quality feedback to inform changes.

79. Are data quality management reports provided to the TRCC for regular review?
- Rank: very important.
- Evidence: Provide a sample quality management report and specify how frequently they are issued to the TRCC.

SECTION 3-B: 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 and 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 in order 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.

ASSESSMENT QUESTIONS: DESCRIPTION AND CONTENTS OF THE VEHICLE DATA SYSTEM

80. 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?
- Rank: somewhat important.
- Evidence: Provide the custodial agency's name.

81. Does the State or its agents validate every VIN with a verification software application?
- Rank: less important.
- Evidence: Describe the circumstances in which the VIN is validated and used.

82. 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?

- Rank: very important.
- Evidence: Provide sample documentation and descriptions of the information encoded for all barcode forms in use.

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. 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. Ideally, States are also active participants in the Performance Registration System and Management (PRISM) 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 among 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.

ASSESSMENT QUESTIONS: APPLICABLE GUIDELINES FOR THE VEHICLE DATA SYSTEM

83. Does the vehicle system provide title information data to the National Motor Vehicle Title Information System at least daily?
    - Rank: somewhat important.
    - Evidence: Explain how and how often the State uploads data to NMVITS, specifying the manner of transmittal and its frequency (e.g., real-time, nightly, weekly).

84. Does the vehicle system query NMVITS before issuing new titles?
    - Rank: very important.
    - Evidence: Provide the NMVITS query processing instructions or provide a screen print of the query tool.

85. Does the State adhere to AAMVA's title brand guidelines?
    - Rank: very important.
    - Evidence: Provide the list of the State's title brands and their definitions.

86. Does the State participate in the Performance Registration System and Management program?
    - Rank: very important.
    - Evidence: Provide the PRISM query processing instructions or provide a screen print of the query tool.

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.

ASSESSMENT QUESTIONS: VEHICLE SYSTEM DATA DICTIONARY

87. Does the vehicle system have a documented definition for each data field?
    - Rank: somewhat important.
    - Evidence: Provide a narrative description of the data dictionary and provide an extract.

88. Does the vehicle system include edit check and data collection guidelines that correspond to the data definitions?
    - Rank: somewhat important.
    - Evidence: Provide a narrative description of the data dictionary's edit check and data collection guidelines and provide an extract.

89. Are the collection, reporting, and posting procedures for registration, title, and title brand information formally documented?
    - Rank: very important.
    - Evidence: Provide a narrative description of the data dictionary's procedure documentation and provide an extract.

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 are in compliance 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 base 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 or not 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.

ASSESSMENT QUESTIONS: PROCEDURES AND PROCESS FLOWS FOR THE VEHICLE DATA SYSTEM

90. Is there a process flow diagram describing the vehicle data system?
    - Rank: somewhat important.
    - Evidence: Provide the process flow diagram.

91. Does the vehicle system flag or identify vehicles reported as stolen to law enforcement authorities?
    - Rank: very important.
    - Evidence: Provide a narrative description of the procedures for flagging and identifying vehicles reported as stolen, and how that information is reported to law enforcement authorities. Provide the appropriate excerpt from the policy manual.

92. 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?
    - Rank: very important.

- Evidence: Provide a narrative description of how the flags are removed. Provide the appropriate excerpt from the policy manual.

93. Does the State record and maintain the title brand history (previously applied to vehicles by other States)?
    - Rank: very important.
    - Evidence: Provide a narrative description of how title brand history is applied. Provide the appropriate excerpt from the policy manual.

94. Are the steps from initial event (titling, registration) to final entry into the statewide vehicle system documented in a process flow diagram?
    - Rank: very important.
    - Evidence: Provide the process flow diagram. If diagram does not exist, provide a narrative describing the process in detail.

95. Is the process flow diagram or narrative annotated to show the time required to complete each step?
    - Rank: somewhat important.
    - Evidence: Provide the process flow diagram. If diagram does not exist, provide a narrative describing the process in detail.

96. Does the process flow diagram or narrative show alternative data flows and timelines?
    - Rank: somewhat important.
    - Evidence: Provide the process flow diagram that specifies alternative data flows and timelines. If diagram does not exist, provide a narrative describing the process in detail.

97. Does the process flow diagram or narrative include processes for error correction and error handling?
    - Rank: somewhat important.
    - Evidence: Provide the process flow diagram that specified the processes for error correction and error handling. If diagram does not exist, provide a narrative describing the process in detail.

98. Does the process flow diagram or narrative explain the timing, conditions, and procedures for purging records from the vehicle system?
    - Rank: somewhat important.
    - Evidence: Provide the process flow diagram that specifies the schedule and process for purging records. If diagram does not exist, provide a narrative describing the process in detail.

VEHICLE DATA SYSTEM INTERFACE WITH OTHER TRAFFIC RECORDS SYSTEM COMPONENTS

The vehicle data system interfaces with other traffic records 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, system interface is useful when circumstances require relationships between traffic records data systems that need to be connected and accessible at all times. 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 in particular 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 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 are essential to the efficient access of vehicle file information when populating a citation or crash record.

**Table 3: 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

ASSESSMENT QUESTIONS: VEHICLE DATA SYSTEM INTERFACE WITH OTHER COMPONENTS

99. Are the driver and vehicle files unified in one system?
- Rank: somewhat important.
- Evidence: Provide a narrative description of the unified system's main components and identify the variables that link the vehicle and driver files.

100. If the driver and vehicle files are separate, is personal information entered into the vehicle system using the same conventions used in the driver system?
- Rank: very important.
- Evidence: When the driver and vehicle systems are separate, provide extracts from the driver and vehicle system manuals detailing the data entry conventions for each.

101. Can vehicle system data be used to verify and validate the vehicle information during initial creation of a citation or crash report?
- Rank: somewhat important.
- Evidence: Provide a narrative description of the procedures governing the use of vehicle system data to verify and validate vehicle information during initial creation of a citation or crash report.

102. When discrepancies are identified during data entry in the crash data system, are vehicle records flagged for possible updating?
- Rank: less important.
- Evidence: Provide an appropriate extract from the vehicle system manual that details the process for addressing a record flagged by the crash system.

103. Are VIN, title number, and license plate number the key variables used to retrieve vehicle records?
- Rank: very important.
- Evidence: Provide an appropriate extract from the vehicle system manual listing the key variables used to retrieve vehicle records.

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 between 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. Measures can be aggregated from collectors, users, and the State 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 4 are examples of high-level quality management indicators. The State is encouraged to develop additional measures that address their specific needs.

Table 4: 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 data the status change is entered into the database. • The percentage of vehicle record updates entered into the database within XX* days of the critical status change. *e.g., 30, 60, or 90 days.
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 State vehicle 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 lager 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 are 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 HS811411, 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 each law enforcement agency 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 comparing the narrative, diagram, and coded report contents are considered part of the statewide vehicle database's data acceptance process.

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 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 used the reports to identify problems and develop countermeasures.

ASSESSMENT QUESTIONS: DATA QUALITY CONTROL PROGRAMS FOR THE VEHICLE DATA SYSTEM

104. Is the vehicle system data processed in real-time?
     - Rank: very important.
     - Evidence: Provide a narrative statement explaining the vehicle system's ability to process data in real-time.

105. 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?
     - Rank: very important.

- Evidence: Provide the formal methodology or describe the process by which automated edit checks or validation rules ensure entered data falls within the range of acceptable values and is logically consistent between fields.

106. Is limited State-level correction authority granted to quality control staff working with the statewide vehicle system to amend obvious errors and omissions?
- Rank: somewhat important.
- Evidence: Provide the formal methodology or describe the process by which limited State-level correction authority is granted to quality control staff working with the statewide vehicle database.

107. Are there timeliness performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of vehicle system timeliness measures the State uses, including the most current baseline and actual values for each.

108. Are there accuracy performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of vehicle system accuracy measures the State uses, including the most current baseline and actual values for each.

109. Are there completeness performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of vehicle system completeness measures the State uses, including the most current baseline and actual values for each.

110. Are there uniformity performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of vehicle system uniformity measures the State uses, including the most current baseline and actual values for each.

111. Are there integration performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of vehicle system integration measures the State uses, including the most current baseline and actual values for each.

112. Are there accessibility performance measures tailored to the needs of data managers and data users?
- Rank: somewhat important.
- Evidence: Provide a complete list of vehicle system accessibility measures the State uses, including the most current baseline and actual values for each.

113. Has the State established numeric goals—performance metrics—for each performance measure?
- Rank: very important.
- Evidence: Provide the specific, State-determined numeric goals associated with each performance measure in use.

114. 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?
- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which high frequency errors are used to generate new training content and data collection manuals, update the validation rules, and prompt form revisions.

115. Are independent sample-based audits conducted periodically for vehicle reports and related database contents for that record?
- Rank: somewhat important.
- Evidence: Describe the formal audit methodology, provide a sample report or other output, and specify the audits' frequency.

116. Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions?
- Rank: very important.
- Evidence: Describe the analyses, provide a sample report or other output, and specify the analyses' frequency.

117. Is data quality feedback from key users regularly communicated to data collectors and data managers?
- Rank: somewhat important.
- Evidence: Describe the process for transmitting and using key users' data quality feedback to inform changes.

118. Are data quality management reports provided to the TRCC for regular review?
- Rank: very important.
- Evidence: Provide a sample quality management report and specify how frequently they are issued to the TRCC.

SECTION 3-C: 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, once 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.

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. 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 analysis 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 5 below.

Table 5: Critical Information Maintained by the Driver Data System

• Personally identifying 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 type of license, name of 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 data system, and the citation and adjudication systems (for both original charges and the final dispositions of all traffic citations).

ASSESSMENT QUESTIONS: DESCRIPTION AND CONTENTS OF THE DRIVER DATA SYSTEM

119. Does custodial responsibility for the driver system—including commercially-licensed drivers—reside in a single location?
    - Rank: very important.
    - Evidence: Provide a narrative identifying the custodial agency.

120. Can the State's DUI s data system be linked electronically to the driver system?
- Rank: very important.
- Evidence: Provide a narrative explanation of a State's linking protocols that demonstrated how a citation on the DUI data system is linked to a record on the driver system. Include identification of the linkage portal and organizations responsible for maintaining the link and the linking fields used.

121. Does the driver system capture novice drivers' training histories, including provider names and types of education (classroom or behind-the-wheel)?
- Rank: less important.
- Evidence: Provide a narrative documenting the availability of novice driver training history (including motorcycle and commercial license training), and specify the pertinent data fields and audit checks in the data dictionary or provide a sample system report.

122. Does the driver system capture drivers' traffic violation and/or driver improvement training histories, including provider names and types of education (classroom or behind-the-wheel)?
- Rank: less important.
- Evidence: Provide a narrative documenting the availability of traffic violation and/or driver improvement training history, including motorcycle and commercial license training, by specifying the pertinent data fields and audit checks in the data dictionary or provide a sample report.

123. Does the driver 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)?
- Rank: somewhat important.
- Evidence: Provide a narrative documenting the availability of original issuance dates for all permits, licensing, and endorsements by specifying the pertinent data fields and audit checks in the data dictionary or provide a sample report.

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 (NDR) Problem Driver Pointer System (PDPS) and FMCSA's Commercial Driver's License Information System (CDLIS). 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.

ASSESSMENT QUESTIONS: APPLICABLE GUIDELINES FOR THE DRIVER DATA SYSTEM

124. Is driver information maintained in a manner that accommodates interaction with the National Driver Register's PDPS and the CDLIS?
    - Rank: very important.
    - Evidence: Demonstrate functional integration with the PDPS and CDLIS. AAMVA audit reports can be provided as supporting documentation.

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.

ASSESSMENT QUESTIONS: DATA DICTIONARY FOR THE DRIVER DATA SYSTEM

125. Are the contents of the driver system documented with data definitions for each field?
- Rank: very important.
- Evidence: Provide, at a minimum, a table of contents and sample elements from the data dictionary or a sample data dictionary report.

126. Are all valid field values—including null codes—documented in the data dictionary?
- Rank: very important.
- Evidence: Provide sample valid data field values from the data dictionary.

127. Are there edit checks and data collection guidelines for each data element?
- Rank: very important.
- Evidence: Provide an example edit check and data collection guideline.

128. Is there guidance on how and when to update the data dictionary?
- Rank: very important.
- Evidence: Provide a narrative explanation of the controls and procedures that ensure the data dictionary is kept up to date.

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 citations and 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 appropriate system and information security.

The custodial agency also maintains detailed process flow diagrams outlining the driver system's key data process flow, 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 relicensure. 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 drivers' licenses, and provide background checks before issuing hazardous materials endorsements.

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.

ASSESSMENT QUESTIONS: PROCEDURES AND PROCESS FLOWS FOR THE DRIVER DATA SYSTEM

129. Does the custodial agency maintain accurate and up-to-date documentation detailing the licensing, permitting, and endorsement issuance procedures (manual and electronic, where applicable)?
  - Rank: somewhat important.

- Evidence: Provide a process flow document for this specific process area, or provide a narrative explaining how these processes are documented and how that documentation is maintained. Include the percentage of reporting that is accomplished manually and electronically.

130. Does the custodial agency maintain accurate and up-to-date documentation detailing the reporting and recording of relevant citations and convictions (manual and electronic, where applicable)?
     - Rank: somewhat important.
     - Evidence: Provide a process flow document for this specific process area, or provide a narrative explaining how these processes are documented and how that documentation is maintained. Include the percentage of reporting that is accomplished manually and electronically.

131. Does the custodial agency maintain accurate and up-to-date documentation detailing the reporting and recording of driver education and improvement course (manual and electronic, where applicable)?
     - Rank: somewhat important.
     - Evidence: Provide a process flow document for this specific process area, or provide a narrative explaining how these processes are documented and how that documentation is maintained. Include the percentage of reporting that is accomplished manually and electronically.

132. Does the custodial agency maintain accurate and up-to-date documentation detailing the reporting and recording of other information that may result in a change of license status (manual and electronic, where applicable)?
     - Rank: somewhat important.
     - Evidence: Provide a process flow document for this specific process area, or provide a narrative explaining how these processes are documented and how that documentation is maintained. Include the percentage of reporting that is accomplished manually and electronically.

133. Does the custodial agency maintain accurate and up-to-date documentation detailing any change in license status (e.g., sanctions, withdrawals, reinstatement, revocations, and restrictions)?
     - Rank: somewhat important.
     - Evidence: Provide a narrative or flow diagram describing the processes and procedures governing the actual change to the license status, including timelines for each type of change.

134. Is there a process flow diagram that outlines the driver data system's key data process flows, including inputs from other data systems?
- Rank: very important.
- Evidence: Provide the process flow diagram.

135. Are the processes for error correction and error handling documented for: license, permit, and endorsement issuance; reporting and recording of relevant citations and 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?
- Rank: somewhat important.
- Evidence: Provide the documentation or flow diagram that describes the processes and procedures for error correction and error handling in each of the listed process areas.

136. Are there processes and procedures for purging data from the driver system documented?
- Rank: somewhat important.
- Evidence: Provide the documentation or flow diagram that describes the processes and procedures for purging data and the timelines for these actions.

137. In States that have the administrative authority to suspend licenses based on a DUI arrest independent of adjudication, are these processes documented?
- Rank: somewhat important.
- Evidence: Provide the documentation or flow diagram that describes the processes and procedures for administrative license suspension.

138. Are there established processes to detect false identity licensure fraud?
- Rank: very important.
- Evidence: Provide a narrative describing the systems or processes used to detect individuals attempting licensure under a new identity.

139. Are there established processes to detect internal fraud by individual users or examiners?
- Rank: very important.
- Evidence: Provide a narrative describing the systems or processes used to detect internal fraud by individual users or examiners.

140. Are the established processes to detect CDL fraud (including hazmat endorsements)?
- Rank: very important.
- Evidence: Provide a narrative describing the systems or processes used to detect commercial driver's license fraud, including for hazmat endorsements.

141. Are there policies and procedures for maintaining appropriate system and information security?

- Rank: very important.
- Evidence: Provide copies of the relevant policies and procedure manuals.

142. Are there procedures in place to ensure that driver system custodians track access and release of driver information adequately?

- Rank: very important.
- Evidence: Provide copies of the relevant procedures or manuals.

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, system interface is useful when circumstances require relationships between traffic records data systems that need to be connected and accessible at all times. 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 explicitly defined linking variable that ensure more accurate and up-to-date information. Some common linking variables can be found in Table 6.

Table 6: 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 t	• 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

ASSESSMENT QUESTIONS: DRIVER SYSTEM INTERFACE WITH OTHER COMPONENTS

143. Can the State's crash system be linked to the driver system electronically?
     - Rank: very important.
     - Evidence: Provide a narrative explanation of a State's linkage protocols that demonstrates how records in the crash system are linked to the driver record. Include identification of the linkage portal and the organization responsible for maintaining the link and the linking fields used.

144. Can the State's citation system be linked to the driver system electronically?
     - Rank: very important.
     - Evidence: Provide a narrative explanation of a State's linkage protocols that demonstrates how records in the citation system are linked to the driver record. Include

identification of the linkage portal and the organization responsible for maintaining the link and the linking fields used.

145. Can the State's adjudication system be linked to the driver system electronically?
    - Rank: very important.
    - Evidence: Provide a narrative explanation of a State's linkage protocols that demonstrates how records in the adjudication system are linked to the driver record. Include identification of the linkage portal and the organization responsible for maintaining the link and the linking fields used.

146. Is there an interface link between the driver 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?
    - Rank: very important.
    - Evidence: Provide a narrative description of the linking processes between the driver system and the PDPS, CDLIS, SSOLV, and SAVE.

147. Does the custodial agency have the capability to grant authorized law enforcement personnel access to information in the driver system?
    - Rank: very important.
    - Evidence: Provide a narrative description of the protocols granting authorized law enforcement personnel access to information in the driver system.

148. Does the custodial agency have the capability to grant authorized court personnel access to information in the driver system?
    - Rank: very important.
    - Evidence: Provide a narrative description of the protocols granting authorized law enforcement personnel access to information in the driver system.

149. Does the custodial agency have the capability to grant authorized personnel from other States access to information in the driver system?
    - Rank: very important.
    - Evidence: Provide a narrative description of the protocols granting authorized law enforcement personnel access to information in the driver system.

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. 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 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 Driver Data Systems

Timeliness	- The median or mean number of days from (a) the date of a driver's adverse action to (b) the data 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 of time determined by the State
Accuracy	The percentage of driver records with no errors in critical data elements.
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 are 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.

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 driver 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 comparing the narrative and coded report contents are considered part of the statewide driver database's data acceptance process.

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 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 used the reports to identify problems and develop countermeasures.

ASSESSMENT QUESTIONS: DATA QUALITY CONTROL PROGRAMS FOR THE DRIVER SYSTEM

150. Is there a formal, comprehensive data quality management program for the driver system?
- Rank: very important.
- Evidence: Provide a narrative description of the driver system's data quality management programs and the most recent data quality reports issued.

151. 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?
- Rank: very important.

- Evidence: Provide the formal methodology or describe the process by which automated edit checks or validation rules ensure entered data falls within the range of acceptable values and is logically consistent between fields.

152. Are there timeliness performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of driver system timeliness measures the State uses, including the most current baseline and actual values for each.

153. Are there accuracy performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of driver system accuracy measures the State uses, including the most current baseline and actual values for each.

154. Are there completeness performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of driver system completeness measures the State uses, including the most current baseline and actual values for each.

155. Are there uniformity performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of driver system uniformity measures the State uses, including the most current baseline and actual values for each.

156. Are there integration performance measures tailored to the needs of data managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of driver system integration measures the State uses, including the most current baseline and actual values for each.

157. Are there accessibility performance measures tailored to the needs of data managers and data users?
- Rank: somewhat important.
- Evidence: Provide a complete list of driver system accessibility measures the State uses, including the most current baseline and actual values for each.

158. Has the State established numeric goals—performance metrics—for each performance measure?
- Rank: very important.
- Evidence: Provide the specific, State-determined numeric goals associated with each performance measure in use.

159. 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?
- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which high frequency errors are used to generate new training content and data collection manuals, update the validation rules, and prompt revisions.

160. Are independent sample-based audits conducted periodically for the driver reports and related database contents for that record?
- Rank: somewhat important.
- Evidence: Describe the formal audit methodology, provide a sample report or other output, and specify the audits' frequency.

161. Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions?
- Rank: very important.
- Evidence: Describe the analyses, provide a sample report or other output, and specify the analyses' frequency.

162. Is data quality feedback from key users regularly communicated to data collectors and data managers?
- Rank: somewhat important.
- Evidence: Describe the process for transmitting and using key users' data quality feedback to inform changes.

163. Are data quality management reports provided to the TRCC for regular review?
- Rank: very important.
- Evidence: Provide a sample quality management report and specify how frequently they are issued to the TRCC.

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 (State-maintained roadways and, in some cases, local roadways) as well as data from local sources such as county and municipal public works agencies and metropolitan planning organizations. The ideal statewide system incorporates sufficient information on all public roads to support valid, system-wide network screening and countermeasure development, deployment, and evaluation.

There are currently no requirements for the collection of roadway inventory information for safety purposes. Recognizing this deficiency, the FHWA developed the Model Inventory of Roadway Elements to provide an extensive listing of data elements dealing with road segments, intersections, interchanges, and traffic. MIRE's significant size led to the establishment of the Fundamental Data Elements (FDEs), a subset of key MIRE elements. Ideally, MIRE elements should be collected for all public roads; however, resource limitations will likely not permit such comprehensive data collection in the near term. State roadway data collection is dictated by available resources and the FHWA guidance document *Fundamental Roadway and Traffic Data Elements to Improve the Highway Safety Improvement Program*.

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 [LRS], geographic information system [GIS]). Ideally, the State's referencing system is inclusive of all public roadways within the State and is able to identify crash locations. Common analysis tools such as 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, States are encourages to review the MIRE and identify which additional elements would best serve the State's data needs and be included in the roadway inventory.

Table 8: Fundamental Roadway and Traffic Data Elements

Roadway Segment	Intersection	Ramp/Interchange
- Segment ID - Route name - Alternate route name - Route type - Area type - Date opened to traffic - Start location - End location - Segment length - Segment direction - Roadway class - Media type - Access control - Two-way vs. one-way operation - Number of through lanes - Interchange influence area on mainline freeway - Average annual daily traffic (AADT) - AADT/year	- Intersection ID - Location - Intersection type - Date opened to traffic - Traffic control type - Major road AADT - Major road AADT/year - Minor road AADT - Minor road AADT/year - Intersection leg ID - Leg type - Leg segment ID	- Ramp ID - Date opened to traffic - Start location - Ramp type - Ramp/interchange configuration - Ramp length - Ramp AADT - Ramp AADT/year

ASSESSMENT QUESTIONS: DESCRIPTION AND CONTENTS OF THE ROADWAY DATA SYSTEM

164. Are all public roadways within the State located using a compatible location referencing system?
    - Rank: very important.
    - Evidence: Provide a map displaying all public roads that represents the system's statewide capabilities. Identify what percentage of the public road systems is State-owned or maintained. Explain whether the State uses a single compatible location referencing system for all public roads of if it has a set of compatible location referencing systems. Prior reports are acceptable.

165. Are the roadway and traffic data elements located using a compatible location referencing system (e.g., LRS, GIS)?
    - Rank: very important.
    - Evidence: Provide a map displaying roadway features and traffic volume (FDEs) for all public roads (State and non-State routes) that is representative of the system's statewide capabilities. Explain whether the State uses a single compatible location

referencing system for all public roads of if it has a set of compatible location referencing systems. Prior reports are acceptable.

166. Is there an enterprise roadway information system containing roadway and traffic data elements for all public roads?
- Rank: very important.
- Evidence: Describe the enterprise roadway information system, which should enable linking between the various roadway information systems including: roadway, traffic, location reference, bridge, and pavement data.

167. Does the State have the ability to identify crash locations using a referencing system compatible with the one(s) used for roadways?
- Rank: very important.
- Evidence: Provide a map displaying crash locations on all public roads that is representative of the system's statewide capabilities. Explain whether the State uses a single compatible location referencing system for crash, roadway features, and traffic volume on all public roads or if it has a set of compatible location referencing systems. Prior reports are acceptable

168. Is crash data incorporated into the enterprise roadway information system for safety analysis and management use?
- Rank: very important.
- Evidence: Describe how the crash data is incorporated into the enterprise roadway information system and provide an example of how it is used for safety analysis.

APPLICABLE GUIDELINES FOR THE ROADWAY DATA SYSTEM

MIRE is the major guideline pertaining to the roadway system. There are a total of 202 elements that comprise MIRE Version 1.0 and 38 of those elements have been identified as FDEs. The MIRE elements are divided among three broad categories: roadway segments, roadway alignment, and roadway junctions. Each MIRE element has a definition, a list of attributes (coding) a priority rating, a reference to safety analysis 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 causality can be investigated.

ASSESSMENT QUESTIONS: APPLICABLE GUIDELINES FOR THE ROADWAY DATA SYSTEM

169. Are all the MIRE Fundamental Data Elements collected for all public roads?
    - Rank: somewhat important.
    - Evidence: Provide a list of FDEs collected and their definitions. Specify if the data collected is for all public roads or State roads only. If the State wishes to cite the data dictionary directly, please identify the FDEs.

170. Do all additional collected data elements for any public roads conform to the data elements included in MIRE?
    - Rank: somewhat important.
    - Evidence: Provide a list of additional MIRE data elements collected. Specify if the data collected is for all public roads or State roads only.

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.

ASSESSMENT QUESTIONS: DATA DICTIONARY FOR THE ROADWAY DATA SYSTEM

171. Are all the MIRE Fundamental Data Elements for all public roads documented in the enterprise system's data dictionary?
     - Rank: somewhat important.
     - Evidence: Identify, with appropriate citations, the FDE-related contents of the enterprise system's data dictionary. Specify if the data dictionary applies to all public roads or to State roads only.

172. Are all additional MIRE data elements for any public roads documented in the data dictionary?
     - Rank: somewhat important.
     - Evidence: Identify, with appropriate citations, the additional MIRE data elements included in the data dictionary. Specify if the data dictionary applies to all public roads or to State roads only.

173. Does roadway data imported from local or municipal sources comply with the data dictionary?
     - Rank: very important.
     - Evidence: Provide a narrative statement explaining the degree to which imported roadway data complies with the data dictionary.

174. Is there guidance on how and when to update the data dictionary?
     - Rank: very important.
     - Evidence: Provide a narrative explanation of the controls and procedures that ensure the data dictionary is kept up to date.

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. Specific roles and responsibilities are also defined in the documentation.

Creating, updating, and using roadway information for safety analysis are all complex processes that must be well documented in order 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 agencies manage and collect the roadway data they contribute to the State roadway data inventory.

ASSESSMENT QUESTIONS: PROCEDURES AND PROCESS FLOWS FOR THE ROADWAY DATA SYSTEM

175. 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?
     - Rank: very important.
     - Evidence: Provide official documentation or a narrative explanation of the process for adding a new MIRE element to the roadway system. Identify who is responsible for each step in the process.

176. Are the steps for updating roadway information documented to show the flow of information?
     - Rank: very important.
     - Evidence: Provide official documentation or a narrative explanation of the procedures for updating existing traffic volume and roadway feature elements to the roadway system. Identify who is responsible for each step in the process.

177. Are the steps for archiving and accessing historical roadway inventory documented?
     - Rank: somewhat important.

- Evidence: Provide official documentation or a narrative explanation of the process for archiving and accessing historical roadway inventory. Identify who is responsible for each step in the process.

178. Are the procedures that local agency (e.g., county, MPO, municipality) use to collect, manage, and submit roadway data to the statewide inventory documented?
     - Rank: somewhat important.
     - Evidence: Provide official documentation or a narrative explanation of the local agency procedures for collecting, managing, and submitting data to the State roadway inventory. Identify who is responsible for each step in the process.

179. Are local agency procedures for collecting and managing the roadway data compatible with the State's enterprise roadway inventory?
     - Rank: very important.
     - Evidence: Provide official documentation or a narrative explanation of the how compatibility between local data systems and the State roadway inventory is achieved. Identify who is responsible for each step in the process.

180. Are there guidelines for collection of data elements as they are described in the State roadway inventory data dictionary?
     - Rank: very important.
     - Evidence: Provide the guidelines and cite an example of data collection pursuant to the data dictionary.

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 in order 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 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.

ASSESSMENT QUESTIONS: INTRASTATE ROADWAY SYSTEM INTERFACE

181. Are the location coding methodologies for all State roadway information systems compatible?
      - Rank: very important.
      - Evidence: Describe the location referencing system and the information systems that use it. If there is more than one location referencing system in use, list each and the associated systems.

182. Are there interface linkages connecting the State's discrete roadway information systems?
      - Rank: very important.
      - Evidence: Provide a narrative that describes the interface links connecting the State's roadway information systems. Provide the result of a single query (e.g., table, view) that includes both roadway features and traffic data for a segment of road.

183. Are the location coding methodologies for all regional and local roadway systems compatible?
      - Rank: somewhat important.

- Evidence: Provide a narrative describing the location referencing system and the associated regional and local roadway systems. If there is more than one location referencing system in use, list each and the associated regional and local systems.

184. Do roadway data systems maintained by regional and local custodians (e.g., MPOs, municipalities) interface with the State enterprise roadway information system?
- Rank: somewhat important.
- Evidence: Provide a narrative that describes the interface links connecting the regional or local roadway information systems to the State's enterprise roadway information system. Provide the result of a single query (e.g., table, view) that includes both roadway features and traffic data for a local road segment.

185. Does the State enterprise roadway information system allow MPOs and local transportation agencies on-demand access to data?
- Rank: somewhat important.
- Evidence: Provide a narrative that describes the system or process that enables localities to query the data system.

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 5 are examples of high-level management indicators of quality taken from NHTSA's (performance measures report). 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.

Table 9: 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 are 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 HS811411, Model Performance Measures for State Traffic Records Systems

ASSESSMENT QUESTIONS: DATA QUALITY CONTROL PROGRAMS FOR THE ROADWAY DATA SYSTEM

186. Do Roadway system data managers regularly produce and analyze data quality reports?
    - Rank: very important.
    - Evidence: Provide a sample report and specify the release schedule for the reports.

187. Is the overall quality of information in the Roadway system dependent on a formal program of error/edit checking as data is entered into the statewide system?
    - Rank: very important.
    - Evidence: Describe the formal program of error/edit checking, to include specific procedures for both automated and manual processes.

188. Are there procedures for prioritizing and addressing detected errors?
    - Rank: very important.
    - Evidence: Describe the procedures for prioritizing and addressing detected errors in both automated and manual processes. Please specify where these procedures are formally documented.

189. Are there procedures for sharing quality control information with data collectors through individual and agency-level feedback and training?
    - Rank: very important.
    - Evidence: Describe all the procedures used for sharing quality control information with data collectors.

190. Is there a set of established performance measures for the timeliness of the State enterprise roadway information system?
    - Rank: very important.
    - Evidence: Provide the metrics used.

191. Is there a set of established performance measures for the timeliness of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)?
    - Rank: somewhat important.
    - Evidence: Provide the metrics used.

192. Is there a set of established performance measures for the accuracy of the State enterprise roadway information system?
    - Rank: very important.
    - Evidence: Provide the metrics used.

193. Is there a set of established performance measures for the accuracy of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)?
    - Rank: somewhat important.
    - Evidence: Provide the metrics used.

194. Is there a set of established performance measures for the completeness of the State enterprise roadway information system?
- Rank: very important.
- Evidence: Provide the metrics used.

195. Is there a set of established performance measures for the completeness of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)?
- Rank: somewhat important.
- Evidence: Provide the metrics used.

196. Is there a set of established performance measures for the uniformity of the State enterprise roadway information system?
- Rank: very important.
- Evidence: Provide the metrics used.

197. Is there a set of established performance measures for the uniformity of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)?
- Rank: somewhat important.
- Evidence: Provide the metrics used.

198. Is there a set of established performance measures for the accessibility of State enterprise roadway information systems?
- Rank: very important.
- Evidence: Provide the metrics used.

199. Is there a set of established performance measures for the accessibility of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)?
- Rank: somewhat important.
- Evidence: Provide the metrics used.

200. Is there a set of established performance measures for the integration of State enterprise roadway information systems and other critical data systems?
- Rank: very important.
- Evidence: Provide the metrics used.

201. Is there a set of established performance measures for the integration of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.) and other critical data systems?
- Rank: very important.
- Evidence: Provide the metrics used.

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 remain 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 offence, 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 in order 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 provides 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 actually be shared between organizational custodians. The citation tracking systems, for example, are often maintained by law enforcement agencies, courts, and the licensing agency. 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 the law enforcement information network (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 actually posted to the driver history (e.g., court records custodian and the licensing agency).

ASSESSMENT QUESTIONS: DESCRIPTION AND CONTENTS OF THE CITATION AND ADJUDICATION DATA SYSTEMS

202. Is there a statewide system that provides real-time information on individuals' driving and criminal histories?
- Rank: very important.
- Evidence: Provide a narrative description of the statewide system that provides real-time information on individuals' driving and criminal histories.

203. 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?
- Rank: very important.
- Evidence: Provide a narrative description of the statewide system that provides real-time information on individuals' driving and criminal histories, specifying the law enforcement, parole, probation and court agencies that have access. Provide access protocols for each agency.

204. Is there a statewide authority that assigns unique citation numbers?
- Rank: very important.
- Evidence: Identify the agency responsible and describe the protocols used to generate and assign unique citation numbers. Provide a copy of the relevant statute or gubernatorial order.

205. Are all citation dispositions—both within and outside the judicial branch—tracked by the statewide data system?
- Rank: somewhat important.
- Evidence: Provide a narrative description of the processes by which all citation dispositions—including administrative license revocations, deferred prosecutions, and

mail-ins—are captured by the statewide data system. Specify the reporting percentages for each type of citation disposition captured by the system.

206. Are final dispositions (up to and including the resolution of any appeals) posted to the driver data system?
- Rank: somewhat important.
- Evidence: Provide a flow chart or audit report documenting how all types of dispositions are posted to the driver file.

207. Are the courts' case management systems interoperable among all jurisdictions within the State (including local, municipal, and State)?
- Rank: very important.
- Evidence: Provide the protocols demonstrating the interoperability and communications capabilities of the case management systems and a sample query.

208. Is citation and adjudication data used for traffic safety analysis to identify problem locations, areas, problem drivers, and issues related to the issuance of citations, prosecution of offenders, and adjudication of cases by courts?
- Rank: very important.
- Evidence: Provide an example analysis and describe the policy or enforcement actions taken as a result.

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;
- National Law Enforcement Telecommunication System; and
- Law Enforcement Information Network.

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

ASSESSMENT QUESTIONS: APPLICABLE GUIDELINES AND PARTICIPATION IN NATIONAL DATA EXCHANGE SYSTEMS FOR THE CITATION AND ADJUDICATION SYSTEMS

209. Do the appropriate components of the citation and adjudication systems adhere to the National Crime Information Center data guidelines?
     - Rank: less important.
     - Evidence: Provide a narrative statement detailing the systems and their adherence to the NCIC guidelines. If not, specify if a comparable guideline is being used.

210. Do the appropriate portions of the citation and adjudication systems adhere to the Uniform Crime Reporting Program guidelines?
     - Rank: somewhat important.
     - Evidence: Provide a narrative statement detailing the systems and their adherence to the UCR program guidelines. If not, specify if a comparable guideline is being used.

211. Do the appropriate portions of the citation and adjudication systems adhere to the National Incident-Based Reporting System guidelines?
     - Rank: somewhat important.

- Evidence: Provide a narrative statement detailing the systems and their adherence to the NIBRS guidelines. If not, specify if a comparable guideline is being used.

212. Do the appropriate portions of the citation and adjudication systems adhere to the National Law Enforcement Telecommunications System guidelines?
    - Rank: somewhat important.
    - Evidence: Provide a narrative statement detailing the systems and their adherence to the NLETS guidelines. If not, specify if a comparable guideline is being used.

213. Do the appropriate portions of the citation and adjudication systems adhere to the National Law Enforcement Information Network guidelines?
    - Rank: important.
    - Evidence: Provide a narrative statement detailing the systems and their adherence to the LEIN guidelines. If not, specify if a comparable guideline is being used.

214. Do the appropriate portions of the citation and adjudication systems adhere to the Functional Requirement Standards for Traffic Court Case Management?
    - Rank: somewhat important.
    - Evidence: Provide a narrative statement detailing the systems and their adherence to the Functional Requirement Standards for Traffic Court Case Management. If not, specify if a comparable guideline is being used.

215. Do the appropriate portions of the citation and adjudication systems adhere to the NIEM Justice domain guidelines?
    - Rank: somewhat important.
    - Evidence: Provide a narrative statement detailing the systems and their adherence to the NIEM Justice domain guidelines. If not, specify if a comparable guideline is being used.

216. Does the State use the National Center for State Courts guidelines for court records?
    - Rank: somewhat important.
    - Evidence: Provide a narrative statement detailing the systems and their adherence to NCSC guidelines for court records. If not, specify if a comparable guideline is being used.

217. Does the State use the Global Justice Reference Architecture?
    - Rank: somewhat important.
    - Evidence: Provide a narrative statement detailing the systems and their adherence to GRA guidelines. If not, specify if a comparable guideline is being used.

218. Does the State have an impaired driving data tracking system that meets the specifications of NHTSA's Model Impaired Driving Records Information System?

- Rank: somewhat important.
- Evidence: Provide a narrative statement detailing the systems and their adherence to MIDRIS guidelines. If not, specify if a comparable guideline is being used.

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.

ASSESSMENT QUESTIONS: DESCRIPTION AND CONTENTS OF THE CITATION AND ADJUDICATION DATA SYSTEMS

219. Does the citation system have a data dictionary?
     - Rank: very important.
     - Evidence: Provide a list of all reporting agencies and whether or not they have a data dictionary for the citation system. Specify if multiple agencies use the same dictionary. In addition, provide copies of the data dictionaries used by the three largest reporting jurisdictions in the State (by percentage of total citations issued).

220. Do the citation data dictionaries clearly define all data fields?
     - Rank: very important.
     - Evidence: Provide copies of the data dictionaries used by the three largest reporting jurisdictions in the State (by percentage of total citations issued). [Note to assessors: compare the definitional units for common meaning and points of confusion for several fields to demonstrate the adequacy of the dictionaries.]

221. Are the citation system data dictionaries up to date and consistent with the field data collection manual, training materials, coding manuals, and corresponding reports?
     - Rank: very important.

- Evidence: Provide a narrative describing the process—including timelines and the summary of changes—used to ensure uniformity in the field data collection manuals, training materials, coding manuals, and corresponding reports.

222. Do the citation data dictionaries indicate the data fields that are populated through interface linkages with other traffic records system components?
    - Rank: very important.
    - Evidence: Provide a list of data fields from populated through interface linkages with other traffic records system components.

223. Do the courts' case management system data dictionaries provide a definition for each data field?
    - Rank: very important.
    - Evidence: Provide a list of all reporting courts and whether or not they have a data dictionary for the citation system used. Specify if multiple agencies use the same dictionary. In addition, provide the data dictionaries for the three largest reporting jurisdictions in the State (by percentage of total citations issued).

224. Do the courts' case management system data dictionaries clearly define all data fields?
    - Rank: somewhat important.
    - Evidence: Provide data dictionaries for the three largest reporting jurisdictions in the State (by percentage of total citations issued). [Note to assessors: compare the definitional units for common meaning and points of confusion for several fields to demonstrate the adequacy of the dictionaries.]

225. Do the courts' case management system data dictionaries indicate the data fields populated through interface linkages with other traffic records system components??
    - Rank: somewhat important.
    - Evidence: Provide a list of data fields from populated through interface linkages with other traffic records system components.

226. Do the prosecutors' information systems have data dictionaries?
    - Rank: somewhat important.
    - Evidence: Provide a list of all prosecutors' offices and specify whether or not they have a data dictionary for the citation system. Specify if multiple agencies use the same dictionary. In addition, provide the data dictionaries for the three largest reporting jurisdictions in the State (by percentage of total citations issued).

PROCEDURES AND PROCESS FLOWS FOR THE CITATION AND ADJUDICATION DATA SYSTEMS

Citation and adjudication systems for traffic safety related purposed 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 system 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 in to 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, the ideal citation and adjudication systems must include those DUI offender records and must be 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.

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
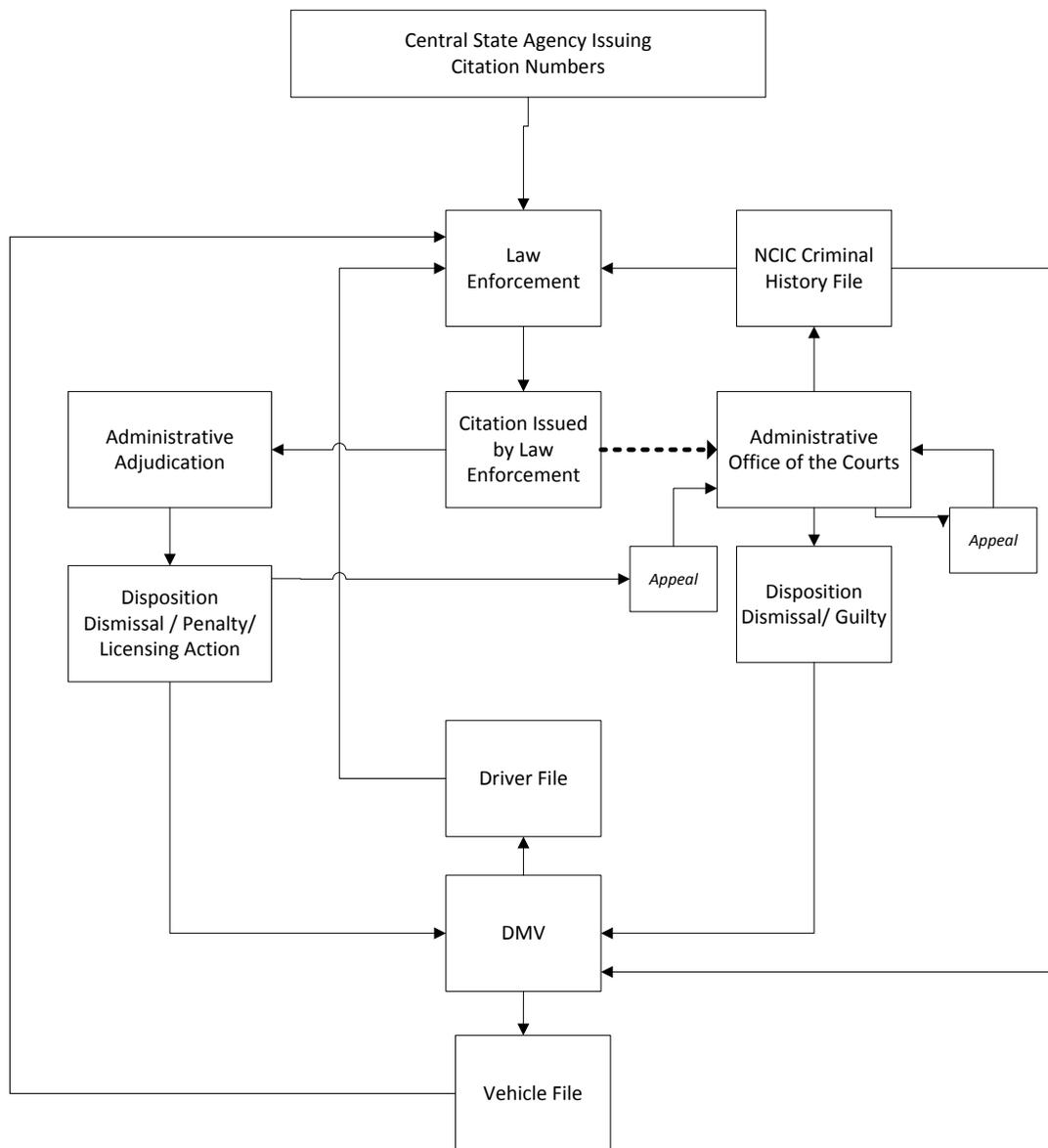
ASSESSMENT QUESTIONS: PROCEDURES AND PROCESS FLOWS FOR THE CITATION AND ADJUDICATION DATA SYSTEMS

227. Can the State track citations from point of issuance to posting on the driver file?
   - Rank: very important.
   - Evidence: Provide a flow diagram documenting citation lifecycle process that identifies key stakeholders. Ensure that alternative flows are included (e.g., manual and electronic submission).

228. Does the State measure compliance with the process outlined in the citation lifecycle flow chart?
   - Rank: somewhat important.
   - Evidence: Provide a narrative describing how the State measures compliance with the citation lifecycle process specified in the flow chart. If there are official guidance documents, provide them.

229. Is the State able to track DUI citations?
   - Rank: very important.
   - Evidence: Provide a flow chart that documents the criminal and administrative DUI processes, identifies all key stakeholders, and includes disposition per the criminal and administrative charges

230. Does the DUI tracking system include BAC and any drug testing results?
   - Rank: very important.
   - Evidence: Provide a narrative describing the protocol for linking toxicology reports to the criminal and/or driver records.

231. Does the State have a system for tracking administrative driver penalties and sanctions?
   - Rank: very important.
   - Evidence: Provide a narrative describing the protocol for reporting (posting) the penalty and/or sanction to the driver and/or vehicle file.

232. Does the State have a system for tracking traffic citations for juvenile offenders?
   - Rank: very important.
   - Evidence: Provide a flow chart that documents the processing of juvenile offenders' traffic citations, specifying any charges or circumstances that cause juveniles to be processed as adult offenders.

233. Does the State distinguish between the administrative handling of court payments in lieu of court appearances (mail-ins) and court appearances?
   - Rank: somewhat important.

- Evidence: Provide a flow chart documenting the processing of administrative handling of court payments (mail-ins).

234. Does the State track deferral and dismissal of citations?
    - Rank: somewhat important.
    - Evidence: Provide a flow chart documenting the deferral and the dismissal of citations.

235. Are there State and/or local criteria for deferring or dismissing traffic citations and charges?
    - Rank: somewhat important.
    - Evidence: Provide the criteria for deferring or dismissing traffic citations and charges.

236. If the State purges its records, are the timing conditions and procedures documented?
    - Rank: somewhat important.
    - Evidence: Provide a narrative documenting whether or not the State purges records. If so, list the types of records the State purges and provide the criteria for doing so.

237. Are the security protocols governing data access, modification, and release officially documented?
    - Rank: somewhat important.
    - Evidence: Provide the official security protocols governing data access, modification, and release.

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, system interface is useful when circumstances require relationships between traffic records data systems that need to be connected and accessible at all times. 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 in order to collect driver information, to carry out administrative actions (e.g., suspension, revocation, cancellation, interlock), and to determine applicable charges. Citation data is linked with 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 the post the dispositions to the driver file. Adjudication data is linked with 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 10.

**Table 10: 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

238. Is citation data linked with the driver system to collect driver information, to carry out administrative actions (e.g., suspension, revocation, cancellation, interlock) and determine the applicable charges?
     - Rank: very important.
     - Evidence: Provide the results of a sample query and describe how the linked information is used to carry out administrative actions and determine the applicable charges.

239. Is adjudication data linked with the driver system to collect certified driver records and administrative actions (e.g., suspension, revocation, cancellation, interlock) to determine the applicable charges and to post the dispositions to the driver file?
     - Rank: very important.
     - Evidence: Provide the results of a sample query and describe how the linked information is used to collect certified driver records and administrative charges and to post dispositions to the driver file.

240. Is citation data linked with the vehicle file to collect vehicle information and carry out administrative actions (e.g., vehicle seizure, forfeiture, interlock)?
     - Rank: somewhat important.
     - Evidence: Provide the results of a sample query and describe how the linked information is used to collect vehicle information and carry out administrative actions.

241. Is adjudication data linked with the vehicle file to collect vehicle information and carry out administrative actions (e.g., vehicle seizure, forfeiture, interlock mandates and supervision)?
     - Rank: somewhat important.
     - Evidence: Provide the results of a sample query and describe how the linked information is used to collect vehicle information and carry out administrative actions.

242. Is citation data linked with the crash file to document violations and charges related to the crash?
     - Rank: somewhat important.
     - Evidence: Provide the results of a sample query and describe how the linked information is used to document violations and charges related to the crash.

243. Is adjudication data linked with the crash file to document violations and charges related to the crash?
     - Rank: somewhat important.
     - Evidence: Provide the results of a sample query and describe how the linked information is used to document violations and charges related to the crash.

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 11.

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. There for, in some citation and adjudication systems, 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 are 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 issuance of the number through final disposition. Specifically, this will capture information on intermediate dispositions (e.g., deferrals, dismissals) should be captured.

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.

QUALITY CONTROL PROGRAMS FOR THE CITATION AND ADJUDICATION SYSTEMS

244. Is there a set of established performance measures for the timeliness of the citation systems?
   • Rank: somewhat important.
   • Evidence: Provide a complete list of systems (including county and municipal) within the State and specify the timeliness measures used, including the most recent values for each.

245. Is there a set of established performance measures for the accuracy of the citation systems?
- Rank: very important.
- Evidence: Provide a complete list of systems (including county and municipal) within the State and specify the accuracy measures used, including the most recent values for each.

246. Is there a set of established performance measures for the completeness of the citation systems?
- Rank: somewhat important.
- Evidence: Provide a complete list of systems (including county and municipal) within the State and specify the completeness measures used, including the most recent values for each.

247. Is there a set of established performance measures for the uniformity of the citation systems?
- Rank: somewhat important.
- Evidence: Provide a complete list of systems (including county and municipal) within the State and specify the uniformity measures used, including the most recent values for each.

248. Is there a set of established performance measures for the integration of the citation systems?
- Rank: somewhat important.
- Evidence: Provide a complete list of systems (including county and municipal) within the State and specify the integration measures used, including the most recent values for each.

249. Is there a set of established performance measures for the accessibility of the citation systems?
- Rank: less important.
- Evidence: Provide a complete list of systems (including county and municipal) within the State and specify the accessibility measures used, including the most recent values for each.

250. Is there a set of established performance measures for the timeliness of the adjudication systems?
- Rank: somewhat important.
- Evidence: Provide a complete list of systems (including county and municipal) within the State and specify the timeliness measures used, including the most recent values for each.

251. Is there a set of established performance measures for the accuracy of the adjudication systems?

- Rank: very important.
- Evidence: Provide a complete list of systems (including county and municipal) within the State and specify the accuracy measures used, including the most recent values for each.

252. Is there a set of established performance measures for the completeness of the adjudication systems?
    - Rank: somewhat important.
    - Evidence: Provide a complete list of systems (including county and municipal) within the State and specify the completeness measures used, including the most recent values for each.

253. Is there a set of established performance measures for the integration of the adjudication systems?
    - Rank: somewhat important.
    - Evidence: Provide a complete list of systems (including county and municipal) within the State and specify the integration measures used, including the most recent values for each.

254. In States that have an agency responsible for issuing unique citation numbers, is information on intermediate dispositions (e.g., deferrals, dismissals) captured?
    - Rank: very important.
    - Evidence: Provide documentation detailing the numbers of citations issued from the 10 largest law enforcement agencies and the number of dispositions for those citations that are in the driver file over a three month period.

255. Do the State's DUI tracking systems have additional quality control procedures to ensure the accuracy and timeliness of the data?
    - Rank: somewhat important.
    - Evidence: Provide a narrative description of the additional quality control measures for the DUI tracking systems and specify which systems use which measures.

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 (EMS), 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
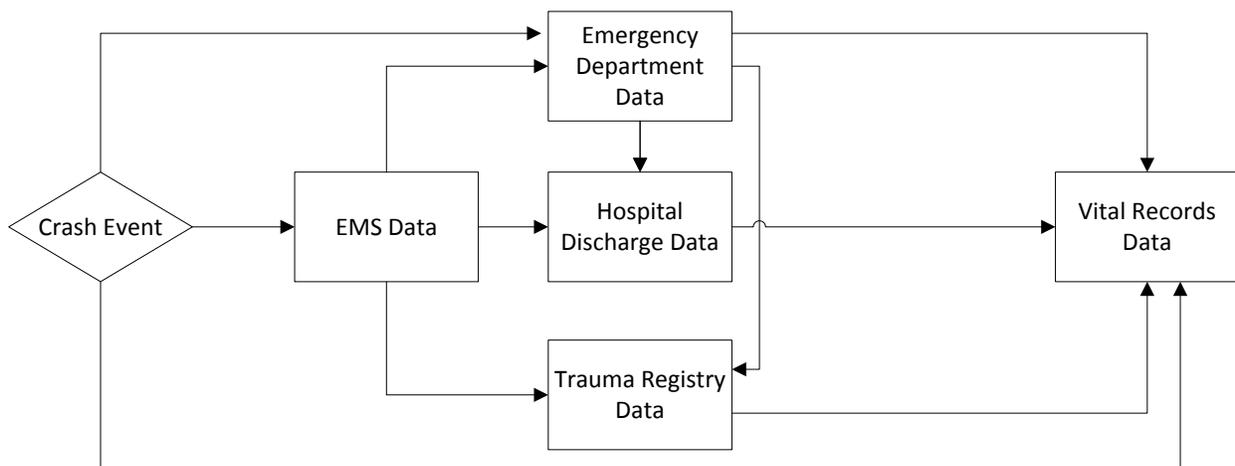
256. Does the injury surveillance system include EMS data?
- Rank: very important.
- Evidence: Provide a sample report using EMS data in addition to data from other injury surveillance system files or databases.

257. Does the injury surveillance system include emergency department data?
- Rank: very important.
- Evidence: Provide a sample report using emergency department data in addition to data from other injury surveillance system files or databases.

258. Does the injury surveillance system include hospital discharge data?
- Rank: very important.
- Evidence: Provide a sample report using hospital discharge data in addition to data from other injury surveillance system files or databases.

259. Does the injury surveillance system include trauma registry data?
- Rank: very important.
- Evidence: Provide a sample report using trauma registry data in addition to data from other injury surveillance system files or databases.

260. Does the injury surveillance system include rehabilitation data?
- Rank: very important.
- Evidence: Provide a sample report using rehabilitation data in addition to data from other injury surveillance system files or databases.

261. Does the injury surveillance system include vital records data?
- Rank: very important.
- Evidence: Provide a sample report using vital records data in addition to data from other injury surveillance system files or databases.

262. Does the injury surveillance system include other data?
- Rank: very important.
- Evidence: List any other databases or sources included in the injury surveillance system and provide a sample report using data from each of these sources in addition to data from the primary injury surveillance system components. Additional data resources may include medical examiner reports, payer-related databases, traumatic brain injury registry, and spinal cord injury registry.

263. Does the EMS system track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
    - Rank: very important.
    - Evidence: Provide the most recent motor vehicle-related incident counts for the EMS system, any injury severity categorizations applied, and the provider's primary impression.

264. Does the emergency department data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
    - Rank: very important.
    - Evidence: Provide the most recent motor vehicle-related incident counts for the emergency department data, any injury severity categorizations applied (e.g., Abbreviated Injury Score, Injury Severity Scale), and principal diagnosis.

265. Does the hospital discharge data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
    - Rank: very important.
    - Evidence: Provide the most recent motor vehicle-related incident counts for the hospital discharge data, any injury severity categorizations applied (e.g., Abbreviated Injury Score, Injury Severity Scale), and principal diagnosis.

266. Does the trauma registry data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
    - Rank: very important.
    - Evidence: Provide the most recent motor vehicle-related incident counts for the trauma registry data, any injury severity categorizations applied (e.g., Abbreviated Injury Score, Injury Severity Scale), and principal diagnosis.

267. Does the vital records data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
    - Rank: very important.
    - Evidence: Provide the most recent motor vehicle-related incident counts from the vital records data and the cause of death.

268. Is the EMS data available for analysis and used to identify problems, evaluate programs, and allocate resources?
    - Rank: very important.
    - Evidence: Provide a sample report or narrative description of a highway safety project that used EMS data to identify a problem, evaluate a program, or allocate resources.

269. Is the emergency department data available for analysis and used to identify problems, evaluate programs, and allocate resources?
- Rank: very important.
- Evidence: Provide a sample report or narrative description of a highway safety project that used emergency department data to identify a problem, evaluate a program, or allocate resources.

270. Is the hospital discharge data available for analysis and used to identify problems, evaluate programs, and allocate resources?
- Rank: very important.
- Evidence: Provide a sample report or narrative description of a highway safety project that used hospital discharge data to identify a problem, evaluate a program, or allocate resources.

271. Is the trauma registry data available for analysis and used to identify problems, evaluate programs, and allocate resources?
- Rank: very important.
- Evidence: Provide a sample report or narrative description of a highway safety project that used trauma registry data to identify a problem, evaluate a program, or allocate resources.

272. Is the vital records data available for analysis and used to identify problems, evaluate programs, and allocate resources?
- Rank: very important.
- Evidence: Provide a sample report or narrative description of a highway safety project that used vital records data to identify a problem, evaluate a program, or allocate resources (e.g., research in support of helmet or GDL legislation).

APPLICABLE GUIDELINES FOR THE INJURY SURVEILLANCE SYSTEM

Given the numerous files and datasets that comprise the injury surveillance system, there are a correspondingly large number of data standards and applicable guidelines for data collection.

EMS

NHTSA manages the National Emergency Medical Services Information System, 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.

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, UB-04, 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 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 Certificates of Birth and Death and the Report of Fetal Death are the principal means of promoting uniformity in the 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 cause of death coding based on ICD-10 standards.

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 injures to multiple body regions. Additionally, the Glasgow Coma Scale is used to assess the neurologic state of a patient.

Privacy Laws and Regulations

In addition to any applicable State statutes, State healthcare data custodians must comply with the pertinent aspects of the HIPPA Act of 1996 as amended by the Heath Information Technology for

Economic and Clinical Heath Act. HIPPA sets forth protections for patient privacy and confidentiality. For Data sharing purposes it is helpful to notes that NHTSA is a public health authority as defined by HIPPA.

ASSESSMENT QUESTIONS: APPLICABLE GUIDELINES FOR THE INJURY SURVEILLANCE SYSTEM

273. Does the State have a NEMSIS-compliant statewide database?
- Rank: very important.
- Evidence: Demonstrate submission to the nationwide NEMSIS database and provide any relevant State statutes or regulations. If not compliant, provide narrative detailing the State's efforts to achieve NEMSIS compliance.

274. Does the State's emergency department and hospital discharge data conform to the most recent uniform billing standard?
- Rank: very important.
- Evidence: Provide the data dictionaries for both the emergency department and hospital discharge data as appropriate as well as any relevant State statutes or regulations.

275. Does the State's trauma registry database adhere to the National Trauma Data Standards?
- Rank: very important.
- Evidence: Provide the trauma registry data dictionary and any relevant State statutes or regulations.

276. Are AIS and ISS derived from the State emergency department and hospital discharge data for motor vehicle crash patients?
- Rank: somewhat important.
- Evidence: Provide a distribution of AIS and ISS scores for the most recent year available.

277. Are AIS and ISS derived from the State trauma registry for motor vehicle crash patients?
- Rank: very important.
- Evidence: Provide a distribution of AIS and ISS scores for the most recent year available.

278. Does the State EMS database collect the GCS data for motor vehicle crash patients?
- Rank: less important.
- Evidence: Provide a distribution of GCS scores for motor vehicle crash patients for the most recent year available.

279. Does the State trauma registry collect the GCS data for motor vehicle crash patients?
- Rank: less important.
- Evidence: Provide a distribution of GCS scores for motor vehicle crash patients for the most recent year available.

280. Are there State privacy and confidentiality laws that supersede HIPPA?
- Rank: very important.
- Evidence: Provide the applicable State laws and describe how they are interpreted—including the identification of situations that may impede data sharing within the State and among public health authorities.

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 ISS and AIS scales. 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.

ASSESSMENT QUESTIONS: DATA DICTIONARIES AND CODING MANUALS FOR THE INJURY SURVEILLANCE SYSTEM

281. Does the EMS system have a formal data dictionary?
    - Rank: very important.
    - Evidence: Provide the data dictionary including, at a minimum, the variable names and definitions.

282. Does the EMS system have formal documentation that provides a summary dataset—characteristics, values, limitations and exceptions, whether submitted or user created—and how it is collected, managed, and maintained?
    - Rank: very important.
    - Evidence: Provide the documentation.

283. Does the emergency department dataset have a formal data dictionary?
    - Rank: very important.
    - Evidence: Provide the data dictionary including, at a minimum, the variable names and definitions.

284. Does the emergency department dataset have formal documentation that provides a summary dataset—characteristics, values, limitations and exceptions, whether submitted or user created—and how it is collected, managed, and maintained?
    - Rank: very important.
    - Evidence: Provide the documentation.

285. Does the hospital discharge dataset have a formal data dictionary?
    - Rank: very important.
    - Evidence: Provide the data dictionary including, at a minimum, the variable names and definitions.

286. Does the hospital discharge dataset have formal documentation that provides a summary dataset—characteristics, values, limitations and exceptions, whether submitted or user created—and how it is collected, managed, and maintained?

- Rank: very important.
- Evidence: Provide the documentation.
-

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

- Rank: very important.
- Evidence: Provide the data dictionary including, at a minimum, the variable names and definitions.

288. Does the trauma registry dataset have formal documentation that provides a summary dataset—characteristics, values, limitations and exceptions, whether submitted or user created—and how it is collected, managed, and maintained?

- Rank: very important.
- Evidence: Provide the documentation.

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

- Rank: very important.
- Evidence: Provide the data dictionary including, at a minimum, the variable names and definitions.

290. Does the vital records system have formal documentation that provides a summary dataset—characteristics, values, limitations and exceptions, whether submitted or user created—and how it is collected, managed, and maintained?

- Rank: very important.
- Evidence: Provide the documentation.

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 the 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.

Ideally, data is 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.

ASSESSMENT QUESTIONS: PROCESSES AND PROCEDURES FOR THE INJURY SURVEILLANCE SYSTEM

291. Is there a single entity that collects and compiles data from the local EMS agencies?
- Rank: very important.
- Evidence: Identify the State agency or third party to which the EMS data is initially submitted.

292. Is there a single entity that collects and compiles data on emergency department visits from individual hospitals?
- Rank: very important.
- Evidence: Identify the State agency or third party to which the data on emergency department visits is initially submitted.

293. Is there a single entity that collects and compiles data on hospital discharges from individual hospitals?
- Rank: very important.
- Evidence: Identify the State agency or third party to which the data on hospital discharges is initially submitted.

294. Is there a process flow diagram that outlines the EMS system's key data process flows, including inputs from other systems?
- Rank: very important.
- Evidence: Provide the flow diagram. Alternatively, provide a narrative description of the EMS data process flows from dispatch to submission of the report to the State EMS repository.

295. Is there a process flow diagram that outlines the emergency department data's key data process flows, including inputs from other systems?
- Rank: very important.
- Evidence: Provide the flow diagram. Alternatively, provide a narrative description of the emergency department data process flows from patient arrival to submission of the uniform billing data to the State repository.

296. Is there a process flow diagram that outlines the hospital discharge data's key data process flows, including inputs from other systems?
- Rank: very important.
- Evidence: Provide the flow diagram. Alternatively, provide a narrative description of the hospital discharge data process flows from patient arrival to submission of the uniform billing data to the State repository.

297. Is there a process flow diagram that outlines the trauma registry's key data process flows, including inputs from other systems?
- Rank: very important.
- Evidence: Provide the flow diagram. Alternatively, provide a narrative description of the hospital discharge data process flows from trauma activation to submission of the trauma data to the State registry.

298. Are there separate procedures for paper and electronic filing of EMS patient care reports?
- Rank: less important.
- Evidence: Provide a copy of the official procedures for paper and electronic filing or a narrative describing the procedures.

299. Are there procedures for collecting, editing, error-checking, and submitting emergency department and hospital discharge data to the statewide repository?
- Rank: very important.
- Evidence: Provide a copy of the official procedures or a narrative describing the procedures.

300. Does the trauma registry have documented procedures for collecting, editing, error checking, and submitting data?

- Rank: very important.
- Evidence: Provide a copy of the official procedures or a narrative describing the procedures.

301. Are there procedures for collecting, editing, error-checking, and submitting data to the statewide vital records repository?
- Rank: very important.
- Evidence: Provide a copy of the official procedures or a narrative describing the procedures.

302. Are there documented procedures for returning data to the reporting EMS agencies for quality assurance and improvement (e.g., correction and resubmission)?
- Rank: very important.
- Evidence: Provide a copy of the official procedures or a narrative describing the procedures.

303. Are there documented procedures for returning data to the reporting emergency departments for quality assurance and improvement (e.g., correction and resubmission)?
- Rank: very important.
- Evidence: Provide a copy of the official procedures or a narrative describing the procedures.

304. Are there documented procedures for returning hospital discharge data to the reporting hospitals for quality assurance and improvement (e.g., correction and resubmission)?
- Rank: very important.
- Evidence: Provide a copy of the official procedures or a narrative describing the procedures.

305. Are there documented procedures for returning trauma data to the reporting trauma center for quality assurance and improvement (e.g., correction and resubmission)?
- Rank: very important.
- Evidence: Provide a copy of the official procedures or a narrative describing the procedures.

306. Are there documented procedures for returning data to the reporting vital records agency for quality assurance and improvement (e.g., correction and resubmission)?
- Rank: very important.
- Evidence: Provide a copy of the official procedures or a narrative describing the procedures.

307. Is aggregate EMS data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
- Rank: very important.
- Evidence: Provide a copy of the data access policy, data use agreement, or link to appropriate data access website.

308. Is aggregate emergency department data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
- Rank: very important.
- Evidence: Provide a copy of the data access policy, data use agreement, or link to appropriate data access website.

309. Is aggregate hospital discharge data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
- Rank: very important.
- Evidence: Provide a copy of the data access policy, data use agreement, or link to appropriate data access website.

310. Is aggregate trauma registry data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
- Rank: very important.
- Evidence: Provide a copy of the data access policy, data use agreement, or link to appropriate data access website.

311. Is aggregate vital records data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
- Rank: very important.
- Evidence: Provide a copy of the data access policy, data use agreement, or link to appropriate data access Web site.

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, system interface is useful when circumstances require relationships between traffic records data systems that need to be connected and accessible at all times.

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. Interface between injury surveillance components may significantly improve subsequent integration with other traffic records systems.

HIPPA 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 health care data.

Assessment Questions: Data Interfaces Within the Injury Surveillance System

312. Is there an interface among the EMS data and emergency department and hospital discharge data?
    - Rank: somewhat important.
    - Evidence: Provide a narrative description of the interface link between the EMS data and the emergency department and hospital discharge data. If available provide the applicable data exchange agreement.

313. Is there an interface between the EMS data and the trauma registry data?
    - Rank: very important.
    - Evidence: Provide a narrative description of the interface link between the EMS data and the trauma registry data. If available provide the applicable data exchange agreement.

314. Is there an interface between the vital statistics and hospital discharge data?
    - Rank: somewhat important.
    - Evidence: Provide a narrative description of the interface link between the vital statistics and hospital discharge data. If available provide the applicable data exchange agreement.

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 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 reviews 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 12 are examples of high-level management indicators of quality. The State may develop additional measures that address their specific business needs.

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 discharge file within XX* days after the EMS run. **e.g., 5, 30, or 90 days*.
Accuracy	• The percentage of EMS patient care reports with no errors in critical data elements. Example: Response 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 National Emergency Medical Service Information System (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 (NTDS) State Vital Records & National Association for Public Health Statistics and Information Systems (NAPHSIS)
Integration	• The percentage of appropriate records in the EMS file that are 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 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.

ASSESSMENT QUESTIONS: QUALITY CONTROL PROGRAMS FOR THE INJURY SURVEILLANCE SYSTEM

Emergency Department and Hospital Discharge Component

315. 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?
    - Rank: very important.
    - Evidence: Provide the formal methodology or describe the process by which automated edit checks and validation rules ensure entered data falls within the range of acceptable values and is logically consistent among fields.

316. Is limited State-level correction authority granted to quality control staff working with the statewide EMS database in order to amend obvious errors and omissions without returning the report to the originating entity?
    - Rank: somewhat important.
    - Evidence: Provide the formal methodology or describe the process by which limited State-level correction authority is granted to quality control staff working with the statewide EMS database.

317. Are there formally documented processes for returning rejected EMS patient care reports to the collecting entity and tracking resubmission to the statewide EMS database?
    - Rank: very important.
    - Evidence: Provide the formal methodology or describe the process by which rejected EMS patient care reports are returned to the collecting agency and tracked through resubmission to the statewide EMS database.

318. Are there timeliness performance measures tailored to the needs of EMS system managers and data users?
    - Rank: very important.
    - Evidence: Provide a complete list of timeliness performance measures for the EMS system and explain how these measures are used to inform decision-making.

319. Are there accuracy performance measures tailored to the needs of EMS system managers and data users?
    - Rank: very important.
    - Evidence: Provide a complete list of accuracy performance measures for the EMS system and explain how these measures are used to inform decision-making.

320. Are there completeness performance measures tailored to the needs of EMS system managers and data users?
    - Rank: very important.

- Evidence: Provide a complete list of completeness performance measures for the EMS system and explain how these measures are used to inform decision-making.

321. Are there uniformity performance measures tailored to the needs of EMS system managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of uniformity performance measures for the EMS system and explain how these measures are used to inform decision-making.

322. Are there integration performance measures tailored to the needs of EMS system managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of integration performance measures for the EMS system and explain how these measures are used to inform decision-making.

323. Are there accessibility performance measures tailored to the needs of EMS system managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of accessibility performance measures for the EMS system and explain how these measures are used to inform decision-making.

324. Has the State established numeric goals—performance metrics—for each EMS system performance measure?
- Rank: somewhat important.
- Evidence: Provide specific numeric goals and related performance measures for each attribute as determined by the State.

325. Is there performance reporting for the EMS system that provides specific timeliness, accuracy, and completeness feedback to each submitting entity?
- Rank: very important.
- Evidence: Provide a sample report, list of receiving agencies, and specify frequency of issuance.

326. Are high frequency errors used to update EMS system training content, data collection manuals, and validation rules?
- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which high frequency errors are used to update EMS system training content, data collection manuals, and validation rules.

327. Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the EMS system?
- Rank: somewhat important.
- Evidence: Provide a sample quality control review of injury records that details the system's data completeness.

328. Are periodic comparative and trend analyses used to identify unexplained differences in the EMS data across years and agencies?
- Rank: less important.
- Evidence: Describe the analyses, provide a sample record or output, and specify their frequency.

329. Is data quality feedback from key users regularly communicated to EMS data collectors and data managers?
- Rank: somewhat important.
- Evidence: Describe the process for transmitting and using key users' data quality feedback to inform program changes.

330. Are EMS data quality management reports produced regularly and made available to the State TRCC?
- Rank: somewhat important.
- Evidence: Provide a sample quality management report and specify frequency of transmission to the State TRCC.

Emergency Department and Hospital Discharge Component

331. 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?
- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which automated edit checks and validation rules ensure entered data falls within the range of acceptable values and is logically consistent among fields.

332. Is limited state-level correction authority granted to quality control staff working with the statewide emergency department and hospital discharge databases in order to amend obvious errors and omissions without returning the report to the originating entity?
- Rank: somewhat important.
- Evidence: Provide the formal methodology or describe the process by which limited State-level correction authority is granted to quality control staff working with the statewide emergency department and hospital discharge databases.

333. Are there formally documented processes for returning rejected emergency department and hospital discharge records to the collecting entity and tracking resubmission to the statewide emergency department and hospital discharge databases?

- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which rejected emergency department and hospital discharge records are returned to the collecting agency and tracked through resubmission to the statewide emergency department and hospital discharge databases.

334. Are there timeliness performance measures tailored to the needs of emergency department and hospital discharge database managers and data users?

- Rank: very important.
- Evidence: Provide a complete list of timeliness performance measures for the emergency department and hospital discharge databases and explain how these measures are used to inform decision-making.

335. Are there accuracy performance measures tailored to the needs of emergency department and hospital discharge database managers and data users?

- Rank: very important.
- Evidence: Provide a complete list of accuracy performance measures for the emergency department and hospital discharge databases and explain how these measures are used to inform decision-making.

336. Are there completeness performance measures tailored to the needs of emergency department and hospital discharge database managers and data users?

- Rank: very important.
- Evidence: Provide a complete list of completeness performance measures for the emergency department and hospital discharge databases and explain how these measures are used to inform decision-making.

337. Are there uniformity performance measures tailored to the needs of emergency department and hospital discharge database managers and data users?

- Rank: very important.
- Evidence: Provide a complete list of uniformity performance measures for the emergency department and hospital discharge databases and explain how these measures are used to inform decision-making.

338. Are there integration performance measures tailored to the needs of emergency department and hospital discharge database managers and data users?

- Rank: very important.

- Evidence: Provide a complete list of integration performance measures for the emergency department and hospital discharge databases and explain how these measures are used to inform decision-making.

339. Are there accessibility performance measures tailored to the needs of emergency department and hospital discharge database managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of accessibility performance measures for the emergency department and hospital discharge database and explain how these measures are used to inform decision-making.

340. Has the State established numeric goals—performance metrics—for each emergency department and hospital discharge database performance measure?
- Rank: somewhat important.
- Evidence: Provide specific numeric goals and related performance measures for each attribute as determined by the State.

341. Is there performance reporting for the emergency department and hospital discharge databases that provides specific timeliness, accuracy, and completeness feedback to each submitting entity?
- Rank: very important.
- Evidence: Provide a sample report, list of receiving agencies, and specify frequency of issuance.

342. Are high frequency errors used to update emergency department and hospital discharge database training content, data collection manuals, and validation rules?
- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which high frequency errors are used to update emergency department and hospital discharge database training content, data collection manuals, and validation rules.

343. Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the emergency department and hospital discharge databases?
- Rank: somewhat important.
- Evidence: Provide a sample quality control review of injury records that details the system's data completeness.

344. Are periodic comparative and trend analyses used to identify unexplained differences in the emergency department and hospital discharge data across years and agencies?
- Rank: less important.

- Evidence: Describe the analyses, provide a sample record or output, and specify their frequency.

345. Is data quality feedback from key users regularly communicated to emergency department and hospital discharge data collectors and data managers?
- Rank: somewhat important.
- Evidence: Describe the process for transmitting and using key users' data quality feedback to inform program changes.

346. Are emergency department and hospital discharge data quality management reports produced regularly and made available to the State TRCC?
- Rank: somewhat important.
- Evidence: Provide a sample quality management report and specify frequency of transmission to the State TRCC.

Trauma Registry Component

347. 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?
- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which automated edit checks and validation rules ensure entered data falls within the range of acceptable values and is logically consistent among fields.

348. Is limited State-level correction authority granted to quality control staff working with the statewide trauma registry in order to amend obvious errors and omissions without returning the report to the originating entity?
- Rank: somewhat important.
- Evidence: Provide the formal methodology or describe the process by which limited State-level correction authority is granted to quality control staff working with the statewide trauma registry.

349. Are there formally documented processes for returning rejected data to the collecting entity and tracking resubmission to the statewide trauma registry?
- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which rejected data is returned to the collecting agency and tracked through resubmission to the statewide trauma registry.

350. Are there timeliness performance measures tailored to the needs of trauma registry managers and data users?
- Rank: very important.

- Evidence: Provide a complete list of timeliness performance measures for the trauma registry and explain how these measures are used to inform decision-making.

351. Are there accuracy performance measures tailored to the needs of trauma registry managers and data users?
    - Rank: very important.
    - Evidence: Provide a complete list of accuracy performance measures for the trauma registry and explain how these measures are used to inform decision-making.

352. Are there completeness performance measures tailored to the needs of trauma registry managers and data users?
    - Rank: very important.
    - Evidence: Provide a complete list of completeness performance measures for the trauma registry and explain how these measures are used to inform decision-making.

353. Are there uniformity performance measures tailored to the needs of trauma registry managers and data users?
    - Rank: very important.
    - Evidence: Provide a complete list of uniformity performance measures for the trauma registry and explain how these measures are used to inform decision-making.

354. Are there integration performance measures tailored to the needs of trauma registry managers and data users?
    - Rank: very important.
    - Evidence: Provide a complete list of integration performance measures for the trauma registry and explain how these measures are used to inform decision-making.

355. Are there accessibility performance measures tailored to the needs of trauma registry managers and data users?
    - Rank: very important.
    - Evidence: Provide a complete list of accessibility performance measures for the trauma registry and explain how these measures are used to inform decision-making.

356. Has the State established numeric goals—performance metrics—for each trauma registry performance measure?
    - Rank: somewhat important.
    - Evidence: Provide specific numeric goals and related performance measures for each attribute as determined by the State.

357. Is there performance reporting for the trauma registry that provides specific timeliness, accuracy, and completeness feedback to each submitting entity?

- Rank: very important.
- Evidence: Provide a sample report, list of receiving agencies, and specify frequency of issuance.

358. Are high frequency errors used to update trauma registry training content, data collection manuals, and validation rules?
    - Rank: very important.
    - Evidence: Provide the formal methodology or describe the process by which high frequency errors are used to update trauma registry training content, data collection manuals, and validation rules.

359. Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the trauma registry?
    - Rank: somewhat important.
    - Evidence: Provide a sample quality control review of injury records that details the system's data completeness.

360. Are periodic comparative and trend analyses used to identify unexplained differences in the trauma registry data across years and agencies?
    - Rank: less important.
    - Evidence: Describe the analyses, provide a sample record or output, and specify their frequency.

361. Is data quality feedback from key users regularly communicated to trauma registry data collectors and data managers?
    - Rank: somewhat important.
    - Evidence: Describe the process for transmitting and using key users' data quality feedback to inform program changes.

362. Are trauma registry data quality management reports produced regularly and made available to the State TRCC?
    - Rank: somewhat important.
    - Evidence: Provide a sample quality management report and specify frequency of transmission to the State TRCC.

Vital Records

363. 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?
    - Rank: very important.

- Evidence: Provide the formal methodology or describe the process by which automated edit checks and validation rules ensure entered data falls within the range of acceptable values and is logically consistent among fields.

364. Is limited State-level correction authority granted to quality control staff working with vital records in order to amend obvious errors and omissions without returning the report to the originating entity?
- Rank: somewhat important.
- Evidence: Provide the formal methodology or describe the process by which limited State-level correction authority is granted to quality control staff working with vital records.

365. Are there formally documented processes for returning rejected data to the collecting entity and tracking resubmission to vital records?
- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which rejected data is returned to the collecting agency and tracked through resubmission to vital records.

366. Are there timeliness performance measures tailored to the needs of vital records managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of timeliness performance measures for vital records and explain how these measures are used to inform decision-making.

367. Are there accuracy performance measures tailored to the needs of vital records managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of accuracy performance measures for vital records and explain how these measures are used to inform decision-making.

368. Are there completeness performance measures tailored to the needs of vital records managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of completeness performance measures for vital records and explain how these measures are used to inform decision-making.

369. Are there uniformity performance measures tailored to the needs of vital records managers and data users?
- Rank: very important.

- Evidence: Provide a complete list of uniformity performance measures for vital records and explain how these measures are used to inform decision-making.

370. Are there integration performance measures tailored to the needs of vital records managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of integration performance measures for vital records and explain how these measures are used to inform decision-making.

371. Are there accessibility performance measures tailored to the needs of vital records managers and data users?
- Rank: very important.
- Evidence: Provide a complete list of accessibility performance measures for vital records and explain how these measures are used to inform decision-making.

372. Has the State established numeric goals—performance metrics—for each vital records performance measure?
- Rank: somewhat important.
- Evidence: Provide specific numeric goals and related performance measures for each attribute as determined by the State.

373. Is there performance reporting for vital records that provides specific timeliness, accuracy, and completeness feedback to each submitting entity?
- Rank: very important.
- Evidence: Provide a sample report, list of receiving agencies, and specify frequency of issuance.

374. Are high frequency errors used to update vital records training content, data collection manuals, and validation rules?
- Rank: very important.
- Evidence: Provide the formal methodology or describe the process by which high frequency errors are used to update vital records training content, data collection manuals, and validation rules.

375. Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the vital records?
- Rank: somewhat important.
- Evidence: Provide a sample quality control review of injury records that details the system's data completeness.

376. Are periodic comparative and trend analyses used to identify unexplained differences in the vital records data across years and agencies?
- Rank: less important.
- Evidence: Describe the analyses, provide a sample record or output, and specify their frequency.

377. Is data quality feedback from key users regularly communicated to vital records data collectors and data managers?
- Rank: somewhat important.
- Evidence: Describe the process for transmitting and using key users' data quality feedback to inform program changes.

378. Are vital records data quality management reports produced regularly and made available to the State TRCC?
- Rank: somewhat important.
- Evidence: Provide a sample quality management report and specify frequency of transmission to the State TRCC.

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 databases 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 systems add 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 in order 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 to 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 a desired level of data content and availability;
- Support for multiple perspective 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;
- 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 particular contributing factors or behaviors (e.g., Crash Outcome Data Evaluation System, CODES);
- Analyses illuminating more effective allocation of law enforcement resources (e.g., Data Driven Approaches to Crime and Traffic Safety, DDACTS);
- 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. They are 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 past 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 identifies 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 in particular, 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. The traffic records system components are also best when designed to give the public appropriate access to these resources as well.

ASSESSMENT QUESTIONS: DATA USE AND INTEGRATION

379. Do behavioral program managers have access to traffic records data and analytic resources for problem identification, priority setting, and program evaluation?
    - Rank: very important.
    - Evidence: Identify the data source and provide examples of program-specific analyses (e.g., reports, fact sheets, Web pages, contact ad hoc analyses).

380. Does the State have a data governance process?
    - Rank: somewhat important.
    - Evidence: Provide a narrative detailing the State's data governance process, identifying the personnel involved and describing how it supports traffic safety data integration and formal data quality management.

381. Does the State have a formal traffic records system inventory that identifies linkages useful to the State and data access policies?

- Rank: very important.
- Evidence: Provide a copy of the system inventory specifying all traffic records data sources, system custodians, data elements and attributes, linkage variables, linkages useful to the State, and data access policies.

382. Does the TRCC promote data integration by aiding in the development of data governance, access, and security policies for integrated data?
- Rank: somewhat important.
- Evidence: Identify, with appropriate citations, the TRCC strategic plan sections that demonstrate the promotion of data integration. (Pre-populate with latest strategic plan.)

383. Is driver data integrated with crash data for specific analytical purposes?
- Rank: very important.
- Evidence: Document an integrative crash-driver link, the linkage variables, and example analysis, and the frequency of linkage. Example analyses could include an assessment of graduated drivers' license law effectiveness or of crash risk associated with motorcycle rider training, licensing, and behavior.

384. Is vehicle data integrated with crash data for specific analytical purposes?
- Rank: very important.
- Evidence: Document an integrative crash-vehicle link, the linkage variables, and example analysis, and the frequency of linkage. Example analyses could include crash trends among vehicle types or vehicle weight restriction by road classification.

385. Is roadway data integrated with crash data for specific analytical purposes?
- Rank: important.
- Evidence: Document an integrative crash-roadway link, the linkage variables, and example analysis, and the frequency of linkage. Example analyses could include the identification of high crash locations and locations with similar roadway attributes or an assessment of engineering countermeasures' effectiveness. Section 4 of the State Roadway Safety Data Capability Assessment may also be provided as evidence.

386. Is citation and adjudication data integrated with crash data for specific analytical purposes?
- Rank: very important.
- Evidence: Document an integrative crash-citation or adjudication link, the linkage variables, and example analysis, and the frequency of linkage. Example analyses could include an assessment of the relationship between illegal actions and crashes for specific driver subpopulations (e.g., older drivers) or of crash-involved DUI offenders' adjudications.

387. Is injury surveillance data integrated with crash data for specific analytical purposes?

- Rank: very important.
- Evidence: Document an integrative crash-injury surveillance link, the linkage variables, and example analysis, and the frequency of linkage. Example analyses could include injury outcomes by specific crash type or injuries associated with occupant protection.

388. Are there examples of data integration among crash and two or more of the other component systems?

- Rank: somewhat important.
- Evidence: Document an integrative link among crash and multiple data systems, the linkage variables, and example analysis, and the frequency of linkage. Example analyses could include an assessment of the safety impact of differential speed limits for different vehicle types.

389. Is data from traffic records component systems—excluding crash—integrated for specific analytical purposes?

- Rank: somewhat important.
- Evidence: Document an integrative link among crash and multiple data systems, the linkage variables, and example analysis, and the frequency of linkage. Example analyses could include an assessment of recidivism among specific driver populations.

390. Do decision-makers have access to resources—skilled personnel and user-friendly access tools—for the use and analysis of integrated datasets?

- Rank: somewhat important.
- Evidence: Identify the analytical resources available: personnel, software, or online resources. Specify the decision-makers who have access to these resources.

391. Does the public have access to resources—skilled personnel and user-friendly access tools—for the use and analysis of integrated datasets?

- Rank: somewhat important.
- Evidence: Identify the analytical resources available: personnel, software, or online resources. Specify who has access to these resources.

APPENDICES

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

- Commercial Driver License Program Improvement Grant (Pub. L. 109-59 § 4124)
- CDL Information System Grant (Pub. L. 109-59 § 4123)
- Commercial Vehicle Information Systems and Networks (Pub. L. 109-59 § 4126
- Motor Carrier Safety Assistance Program Basic and Incentive Grant (49 U.S.C. § 31104)
- MCSAP High Priority Grant (Pub. L. 109-59 § 4101)
- Performance and Registration Information Systems Management Grant (Pub. L. 109-59 § 4109)
- Safety Data Improvement Program Grant (Pub. L. 109-59 § 4128)

NHTSA Funding Sources

- Highway Safety Programs (23 U.S.C. § 402)
- Occupant Protection Incentive Grants (23 U.S.C. § 405)
- Safety Belt Performance Grants (23 U.S.C. § 406)
- Alcohol-Impaired Driving Countermeasures (23 U.S.C. § 410)-Data improvements relevant to alcohol programs only
- State Traffic Safety Information System Improvement Grants (23 U.S.C. § 408)

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The 2012 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 particular help in making this effort a successful one.

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