KENTUCKY TRAFFIC RECORDS STRATEGIC PLAN

2017-2021

Prepared for

Kentucky Transportation Cabinet

Prepared by

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In cooperation with

Kentucky Traffic Records Coordinating Committee

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Millions of people travel Kentucky's roadways each year, and their safety is a top priority. Our highway safety mission is an ongoing process of collaboration, coordination, and evaluation by a broad and dedicated group of professionals representing all of the Commonwealth.

This plan outlines goals, performance measures, proposed strategies, and ongoing evaluation to be taken over the next five years to improve the traffic records data systems in Kentucky. Improvements are guided by the "six-by-six matrix", which identifies the six core state traffic records systems and six performance attributes. These are:

Traffic Records Data Systems	Performance Attributes
Crash	Timeliness
Vehicle	Accuracy
Driver	Completeness
Roadway	Uniformity
Citation/Adjudication	Integration
Emergency Medical Services/Injury Surveillance	Accessibility

The shared vision of "Toward Zero Deaths" can become our reality through continued collaboration, cooperation, shared knowledge, and resources, and the continued implementation of all programs under the umbrella of Kentucky's Strategic Highway Safety Plan, including this Traffic Records Strategic Plan. It also requires a commitment by each stakeholder, agency, and member to make highway safety our #1 priority every time we travel.

I extend my sincere thanks and appreciation to the Kentucky Transportation Cabinet, the Kentucky Traffic Records Coordinating Committee, the Kentucky Office of Highway Safety, the University of Kentucky Transportation Center, our partners in the Federal Highway Administration, National Highway Transportation Safety Administration, and numerous local and community stakeholders across the Commonwealth in their effort to develop the 2017-2021 Kentucky Traffic Records Strategic Plan.

Dr. Noelle Hunter, Executive Director

Kentucky Office of Highway Safety

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Contents

1. Executive Summary

The Kentucky Traffic Records Strategic Plan (TRSP) serves as a guide for the Kentucky Traffic Records Coordinating Committee (KTRAC) in its efforts to improve the traffic records database system in Kentucky. The Plan, which covers the years 2017 through 2021, serves as a blueprint for measuring progress in terms of accessibility, accuracy, completeness, consistency, timeliness, and uniformity of the traffic records systems.

Accurate and complete data is essential for the effective creation of a safer highway system in Kentucky. As part of the strategic planning approach, traffic records are critical to the development and advancement of Strategic Highway Safety Plan (SHSP) emphasis areas. KTRAC provides support to the Emphasis Area Task Teams in the form of traffic data interpretation or application. In addition, KTRAC provides data and analysis to support the mission of the Governor's Executive Committee on Highway Safety (GECHS), which oversees programs to improve highway safety in Kentucky.

The Kentucky traffic records systems include databases containing crash data, roadway data, driver data, vehicle data, citation and adjudication records, and emergency medical services data as well as other sources of injury surveillance data. The Kentucky TRSP identifies specific performance measures and goals for each of the data systems. In all, the Kentucky TRSP provides agencies with a shared vision toward improving these data systems through system upgrades, efforts to integrate, and data analyses used in highway safety research.

Beginning in 2013, the Kentucky Transportation Center (KTC) worked with the Kentucky Traffic Records Coordinating Committee and other database officials to self-assess the state of the traffic records systems in Kentucky and to identify potential performance measures to guide improvement. A second phase—completed in 2014 and 2015—had three main tasks: 1) assess the ability and willingness of database officials to collect data for the performance measures, also referred to as metrics; 2) obtain quantitative data on the measures deemed useful; 3) evaluate whether it would be possible to incorporate more of the Federal Highway Administration's (FHWA) Model Minimum Uniform Crash Criteria (MMUCC) elements into the CRASH database. These assessments are discussed in detail in Chapter 5 of the TRSP.

The assessment results provided a broad portrait of the current state of Kentucky's traffic records systems and established a number of performance measure baselines against which improvements can be monitored and assessed. The research yielded documented shortcomings as well as improvements in some of the databases. The findings were followed up in 2016 with more data collection, as well as interviews with all database liaisons in order to firm up and further explore the best strategies to improve the traffic records data system. The findings and metrics formed the basis for the development of this Traffic Records Strategic Plan.

Strategic Plan Development

The Kentucky Transportation Center worked with KYTC and KTRAC in the development of the TRSP. Development of the strategic plan was informed by several helpful guidelines, including FHWA's *State Traffic Records Coordinating Committee Noteworthy Practices* and NHTSA's *Traffic Records Program Assessment Advisory*. Other state traffic records strategic plans were also reviewed to further guide this plan's development.

In spring of 2017, a workshop was held at the Kentucky Transportation Cabinet, and liaisons from each of the agencies that administer the databases were invited to attend. At this workshop, specific performance measures of accessibility, accuracy, completeness, consistency, timeliness, and uniformity for each of the six traffic records database systems were reviewed and discussed. Results from the completed traffic records internal assessments were presented and used to identify what types of performance measures

are viable for each system and to determine appropriate goals for improvement. These performance measures are presented and discussed more fully in Chapter 6 of the TRSP.

The Strategic Plan

The specific performance measures and goals discussed in this section constitute the substance of the traffic records strategic plan. Taken together, their overarching effect will be to raise the quality and utility of the data in each database. Reaching the goals will entail a variety of database reforms—from more use of electronic reporting to more integration across databases.

Many of the performance measures detailed below call for improvements in the accuracy and completeness of injury data and its integration with the crash database. As the numbers in this report's tables indicate, Kentucky appears to already generate useful data. Still, there is room for improvement.

Taken together, the adoption of the proposed performance measures and related goals will contribute to better data for analysis and decision-making. Kentucky will be able to shine a brighter and more informative light on the causes of crashes on its roadways. In doing so, the state will be better positioned to find ways to reduce crashes and the associated injuries and fatalities. The knowledge gained will inform safer highway design. It will also facilitate the development of more effective and comprehensive first responder practices and organization.

The goals laid out in the plan can be supplemented with other database refinements as needs and funding sources and strategies emerge. In addition, database officials are interested in formalizing many of their operations by, for instance, updating data dictionaries, officially extending the years of data retention, and devising data flow diagrams.

The selection and scheduling of projects to increase database quality and utility will follow Kentucky Traffic Records Coordinating Committees standard procedures for project development. It must be noted that the quality of data is often upgraded by database officials, without additional funding as they work steadily to improve their operations. Improvements over the past few years are documented in Appendix 4.

2. Introduction

The Kentucky Traffic Records Strategic Plan (TRSP) serves as a guide for the Kentucky Traffic Records Coordinating Committee (KTRAC) in its efforts to improve the traffic records database system in Kentucky. The Plan, which covers the years 2017 through 2021, serves as a blueprint for measuring progress in terms of accessibility, accuracy, completeness, consistency, timeliness, and uniformity of the traffic records systems. The Kentucky traffic records systems include databases containing crash data, roadway data, driver data, vehicle data, citation and adjudication records, emergency medical services data as well as other sources of injury surveillance data. The Kentucky TRSP identifies specific performance measures and goals for each of the data systems. In all, the Kentucky TRSP provides agencies with a shared vision toward improving these data systems through system upgrades, efforts to integrate, and data analyses used in highway safety research.

2.1. Toward Zero Deaths

This Plan is aligned with the goals of the national traffic safety plan Toward Zero Deaths (TZD), a strategy for improving highway safety, which has been adopted by the Kentucky Transportation Cabinet (KYTC), the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), and the American Association of State Highway and Transportation Officials (AASHTO). Its ultimate objective is the elimination of all deaths on the transportation system. Like TZD, TRSP supports a data-driven approach that targets specific areas for improvements and employs proven traffic safety countermeasures. TZD leverages an interdisciplinary approach by integrating highway engineering, law enforcement, public information campaigns, and emergency services strategies.

Using the TZD approach, the Commonwealth of Kentucky developed its 2015-2019 Strategic Highway Safety Plan (SHSP). The SHSP serves as the umbrella guide for all highway safety improvement efforts in Kentucky, including this TRSP. A consensus-based effort, the plan calls forth contributions, collaboration and commitment from many partners.

TZD serves as a unifying vision that brings together all stakeholders throughout the U.S. with a role in highway safety. The TZD National Strategy on Highway Safety (the National Strategy) brings these stakeholders together, making possible both their individual and collaborative efforts.

The National Strategy envisions a highway system free of fatalities through a sustained and even accelerated decline in transportation-related deaths and serious injuries. Safety organizations and professionals embracing this vision have agreed to aggressively work toward achieving intermediate goals specific to their jurisdiction. Kentucky first adopted the Toward Zero Deaths vision in 2010.

2.2. Mission/Vision Statement

Vision: Continued highway safety improvements in line with the TZD strategy.

Mission: Generate the ability of stakeholders and partners to identify countermeasures that address traffic safety by improving the timeliness, accuracy, completeness, uniformity, integration, and accessibility of traffic records data and systems.

2.3. Integration with other State plans

The TRSP is one of several state plans that operate under the umbrella of the Kentucky Strategic Highway Safety Plan, which was last updated to cover the years 2015 through 2019. These plans include:

• FHWA - Highway Safety Improvement Program (HSIP)

• NHTSA - Highway Safety Plan (HSP)

• FMCSA - Motor Carrier Safety Assistance Program (MCSAP)

• FMCSA - Commercial Vehicle Safety Plan (CVSP)

• Kentucky Traffic Records Assessment Committee (KTRAC) – Traffic Records Strategic Plan

• Kentucky Transportation Cabinet (KYTC) Statewide and Metropolitan Planning Organizations (MPO) Long Range Transportation Plans

Funding from these sources is used to implement both the infrastructure and behavioral strategies and programs contained in the Kentucky SHSP. In addition, recommendations from the SHSP are expected to influence the priorities set in the aforementioned plans.

Accurate and complete data is essential for the effective creation of a safer highway system in Kentucky. As part of the strategic planning approach, traffic records are critical to the development and advancement of SHSP emphasis areas. KTRAC provides support to the Emphasis Area Task Teams in the form of traffic data interpretation or application. In addition, KTRAC provides data and analysis to support the mission of the Governor's Executive Committee on Highway Safety (GECHS), which oversees programs to improve highway safety in Kentucky.

3. Strategic Planning Process

3.1.1. Assessment of Current Situation

Beginning in 2013, the Kentucky Transportation Center (KTC) worked with the Kentucky Traffic Records Coordinating Committee and other database officials to self-assess the state of the traffic records systems in Kentucky and to identify potential performance measures to guide improvement. A second phase—completed in 2014 and 2015—had three main tasks: 1) assess the ability and willingness of database officials to collect data for the performance measures, also referred to as metrics; 2) obtain quantitative data on the metrics deemed useful; 3) evaluate whether it would be possible to incorporate more of the Federal Highway Administration's (FHWA) Model Minimum Uniform Crash Criteria (MMUCC) elements into the CRASH database. These assessments are discussed in more detail in Chapter 5 of the TRSP.

The assessment results documented the current state of Kentucky's traffic records systems and established a performance measure baseline against which improvements could be monitored. The research yielded documented shortcomings as well as improvements in some of the databases. The findings were followed up in 2016 with more data collection, as well as interviews with all database liaisons in order to firm up and further explore the best strategies to improve the traffic records data system. The findings and metrics formed the basis for the development of this Traffic Records Strategic Plan.

3.1.2. Strategic Plan Development

The Kentucky Transportation Center worked with KYTC and KTRAC in the development of the TRSP. Development of the strategic plan was informed by several sources, including FHWA's *State Traffic Records Coordinating Committee Noteworthy Practices* and NHTSA's *Traffic Records Program Assessment Advisory*. Other state traffic records strategic plans were reviewed as well to further guide this plan's development.

In spring of 2017, a workshop was held at the Kentucky Transportation Cabinet, and liaisons from each of the agencies that administer the databases were invited to attend. At this workshop, specific performance measures of accessibility, accuracy, completeness, consistency, timeliness, and uniformity for the six traffic records database systems were reviewed and discussed. Results from the completed traffic records internal assessments were presented and used to identify what types of performance measures are viable for each system and to determine appropriate goals for improvement. These performance measures are presented and discussed more fully in Chapter 6 of the TRSP.

3.1.3. Implementation and Monitoring

The Kentucky Transportation Center will continue to coordinate with KYTC and KTRAC to monitor the implementation of Kentucky's TRSP. Progress on the performance measures for each of the traffic records systems databases will be monitored, documented, and reported back to KTRAC on an annual basis. KTRAC will use that information when considering projects to fund in coming years.

As part of the implementation process, KTC will coordinate with KYTC and KTRAC to develop an action plan for future prioritized projects by year. The action plan will align with the goals and metrics identified in this Strategic Plan.

For new project ideas that are submitted to KTRAC each year, the TRSP will serve as a guiding document in deciding which of these projects should be funded. The TRCC works with its members and researchers on an annual basis to select, fund, review and make final presentations of projects designed to improve the quality and utility of the data in the individual traffic records databases. The rating method used to determine which projects receive funding is detailed in Chapter 7 of this plan.

4. Kentucky Traffic Records Coordinating Committee (KTRCC)

4.1. Governance and Structure

Increasing highway safety is a critical transportation policy priority. To further the goal of improving the public's safety on the nation's highways, federal legislation beginning with the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (Public law 109-59; SAFETEA-LU) called for the states to improve their traffic records data systems. To that end, the Federal Highway Administration (FHWA) and the National Highway Transit Safety Administration (NHTSA) have encouraged the states to measure the performance of their traffic records data systems. Section 405 of Title 23, U.S.C. authorizes funding for improvements in state traffic safety information systems. Funds for measurement of database effectiveness have been authorized in all the recent federal transportation bills, including MAP-21 and Fixing America's Surface Transportation Act (FAST Act), both of which call for collection of more accurate and complete data on fatalities and serious injuries. Examples are reforms to improve data on accident locations, seat belt usage, and ambulance time to hospital.

The Commonwealth of Kentucky seeks to identify and then capitalize on all opportunities to enhance the traffic records database system with the overarching goal of reducing the risk of fatalities, injuries and crashes. The Kentucky Transportation Cabinet, Division of Highway Safety Programs, serves as the Governor of Kentucky's Office of Highway Safety, and is responsible for highway safety planning and action among all agencies and organizations. The Kentucky Traffic Records Assessment Committee (KTRAC) was established to enhance the effectiveness and application of traffic records, as part of the overall mission to reduce the number of fatalities and injuries and the severity of injuries related to road trauma. KTRAC has the authority, with executive-level input from the Governor's Executive Committee on Highway Safety, to ensure that a statewide Traffic Records System implementation is successfully completed.

KTRAC's Charter establishes that it:

(i) Has authority to review any of the State's highway safety data and traffic records systems and any changes to such systems before the changes are implemented;

(ii) Considers and coordinates the views of organizations in the State that are involved in the collection, administration, and use of highway safety data and traffic records systems, and represent those views to outside organizations;

(iii) Reviews and evaluates new technologies to keep the highway safety data and traffic records system current; and

(iv) Annually approves the membership of the TRCC, the TRCC coordinator, any change to the State's multi-year Strategic Plan and performance measures to be used to demonstrate quantitative progress in the accuracy, completeness, timeliness, uniformity, accessibility or integration of a core highway safety database.

4.2. TRCC Roles and Responsibilities

KTRAC's responsibilities related to the state's Traffic Records System include:

- Providing coordination and oversight responsibilities;
- Providing administrative and technical guidance;
- Facilitating communications and cooperation between and among the member organizations and agencies represented on the committee;
- Establishing goals for improving the Traffic Records System;

- Developing recommended procedures to assist localities and State agencies that are users and/or providers of the Traffic Records System in understanding and accepting their mutual responsibilities and interdependence;
- Recommending upgrades to reporting forms and formats and procedures to gather, maintain and disseminate crash records/traffic records information;
- Reviewing laws dealing with traffic records for consistency and for conformity with modern technology;
- Reviewing the need for legislation to facilitate the development and operation of the Traffic Records System;
- Fostering the development of new technologies for reporting, processing, storing and using data at both the local and State levels;
- Reviewing and recommending requirements for file linkage;
- Stimulating the creation and maintenance of a coordinated comprehensive statewide Traffic Records System that provides adequate data in an efficient, cost effective and timely manner;
- Continuously developing cooperation and support from local and State agencies as well as from the non-profit and private sectors;
- Providing continuing evaluation for the Traffic Records Systems;
- Developing and maintaining a comprehensive Strategic Highway Safety Plan, which shall provide a foundation for improving traffic records systems within the State;
- Reviewing and discussing the potential impacts of projects as noted within the Strategic Plan prior to implementation; and,
- Annually updating and approving the Strategic Highway Safety Plan.

KTRAC membership meets on a quarterly basis, generally at the Kentucky Transportation Cabinet. Administrative support for committee activities is provided by the KYTC Division of Highway Safety Programs. KYTC designates a full-time coordinator for KTRAC. Nathan Dean currently serves as the KTRAC coordinator.

The responsibilities of the full-time coordinator are to:

- Preside over all KTRAC meetings.
- Set agendas and maintain meeting minutes.
- Monitor membership through ongoing attendance, and ensure membership is representative.
- Foster relationships with traffic records interested parties.
- Represent KTRAC at all highway safety grant reviews and meetings.
- Help maintain current project and performance information.
- Seek input for and approval of the Strategic Plan from all KTRAC members.

The full-time coordinator, in coordination with the Kentucky Office of Highway Safety and sponsoring agencies, identifies and approves projects for funding in support of the Traffic Records Strategic Plan.

KTRAC is both interagency and intergovernmental in structure, and membership is voluntary. As is established in its charter, KTRAC is to include membership from the following:

- KY Transportation Cabinet, Division of Highway Safety Programs
- KY Transportation Cabinet, Office of Information Technology
- KY Transportation Cabinet, Division of Motor Vehicle Licensing
- KY Transportation, Division of Driver's Licensing
- KY Transportation Cabinet, Division of Planning
- Kentucky Board of Emergency Medical Services

- University of Kentucky, Kentucky Injury Prevention Research Center
- KY Justice & Public Safety Cabinet, Kentucky State Police
- University of Kentucky, Kentucky Transportation Center
- Lexington Police Department

KTRAC conducts traffic records assessment in cooperation with FHWA and the Kentucky Transportation Center (KTC). KTC works with liaison officials from the six core agencies responsible for the collection and maintenance of traffic records databases:

1. Collision reporting and analysis (CRASH)—the repository for law enforcement crash reports
2. Vehicle—the vehicle registration system
3. Driver—the repository for information on licensed drivers and their histories
4. Roadway—a database that stores information on the roads in the state highway system
5. Citation/adjudication—a repository containing the records of traffic citations, arrests, and final disposition charges
6. Emergency Medical Services (EMS) Injury Surveillance— the component repositories for data on motor-vehicle related serious injuries and deaths. These can have multiple databases: for example, pre-hospital EMS data, hospital emergency department data, hospital discharge data, trauma registries, and death records.

On a continuing basis, officials who oversee the databases provide quantitative data each year on one or more metrics. This includes several years of data along with reports of improvements in some of the traffic records data systems. Taken together, the findings and changes below indicate progress toward the goal of a more complete and informative traffic records data system.

KTRAC works with officials from the traffic record databases to collect data and assist in efforts to improve its timeliness, accuracy, completeness, uniformity, accessibility, and integration, as well as usefulness for safety upgrades.

4.3. Technical Committees

As part of its Charter, The KTRAC may establish subcommittees to provide more targeted traffic records planning and implementation efforts. These subcommittees are to be led by subject matter experts and meet as necessary for the success of the projects. These teams may change as the needs of Kentucky's traffic records system change. Technical committees and their memberships are listed in Appendix 1.

5. Summary of Assessments of Traffic Records Database Deficiencies

This assessment of Kentucky's traffic records databases is based on two sources of data: (1) the results of Kentucky's ongoing database performance measurement program, which created and tracked data on specific metrics for each database for three years; and (2) the results of a survey conducted in February 2017 of database officials that used the NHTSA Advisory questions to identify the presence or absence of the qualities and capacities NHTSA considers part of an ideal database.

For each database, results are presented from both data sources. The findings from these two data sources suggest possible areas for improvements in database quality and utility.

5.1. Kentucky's Ongoing Assessment of Metrics

Kentucky chose to develop its own performance measures, which are referred to as metrics. During the first phase of the Kentucky assessment—conducted in 2013—the Kentucky Transportation Center (KTC) worked with the Kentucky Traffic Records Coordinating Committee and other database officials to identify potential performance measures. In all, 117 metrics were developed. There are six performance attributes for each database—timeliness, accuracy, consistency/uniformity, completeness, integration, and accessibility. For many of the performance attributes more than one metric was proposed.

The second phase—completed in 2014, 2015, and 2016—had two main tasks: 1) assess the ability and willingness of database officials to collect data for the metrics; and 2) obtain quantitative data on the metrics deemed useful.

KTC discussed each of the proposed metrics with the appropriate database liaison. They rejected many of the proposed metrics, typically giving one of three rationales for rejecting: (1) the metric concerned an aspect of the database that currently worked well; (2) data were unavailable; or (3) too much effort or cost would be required. Based on feedback received from the liaisons, metrics thought to be of limited use for improving or reforming the traffic record system were removed, as were metrics described as too difficult to assemble in quantitative form. Left in were a few metrics that the liaisons were willing to collect in the future if funding were to become available. After the discussions, the number of metrics was reduced from 117 to 52. With this reduction, many of the databases have no metrics for specific performance attributes.

The liaisons varied widely in the number of metrics they thought they could measure. There are one or more metrics for each database except driver licensing, whose liaison said there was no need to track any of the suggested metrics. In contrast, the Kentucky State Police, who administer the CRASH database, approved 10 metrics and were able to provide data for 9 of them.

The results of tracking metrics over three years are in Appendix 1, presented as a set of tables that identify the metrics for each database and the data gathered. From these tables and liaison interviews, KTC identified some trends in database quality and liaison suggestions for improvements in database utility and function.

The performance metric assessment had two primary objectives: (1) find deficiencies in the traffic records databases and (2) encourage efforts to improve the databases. Thus far, Kentucky's effort has identified deficiencies, documented some recent improvements, and elicited some suggestions for improvements. Most of the suggestions appear to concern the accuracy and completeness of the data, a concern in line with the recommendations in the *Crash Data Improvement Program Final Report.* To a lesser extent the suggestions address ways to improve timeliness and integration. None of the databases appear to have lost ground, although some have experienced initial problems with timeliness due to the installation of new software programs.

The liaison at **driver licensing** said his database is working effectively and saw no need to track any of the metrics. He noted that the state's DUI data system can be linked to the driver database.

The liaison for the **motor vehicle** database was also content with the effectiveness of his database, stating that there was no room for improvement in the vehicle registration and tracking processes. But he saw a critical need to better integrate the CRASH database with vehicle registration.

The liaison with the **Administrative Office of the Courts** reported no change in the use of electronic reports; but suggested two ways to improve the Citation/Adjudication database: 1) require that all arrest and citation records be entered electronically; and 2) remove old codes from submitted forms. These suggested reforms would improve uniformity across all records.

The liaison for **roadway/traffic** said he wanted to improve the process by which changes in local road systems are updated. He has implemented a new reporting system and believes it has expedited the reporting of changes in local road systems.   Currently, roadway/traffic collects 95% of the MIRE fundamental data elements. The liaison suggested two methods to improve the roadway database. He wanted immediate updates on changes in local road systems (e.g., a new road or lane), and he needed average annual daily traffic counts (AADT) information for local roads.

The **Crash Database** was 69% MMUCC compliant in 2014; today it is 89% compliant. In the 2015 reporting, the average number of days to enter data—a timeliness metric—went down and fewer reports were sent back to local agencies for correction, and accuracy metric. The number of daily queries on the public site—an accessibility metric—rose substantially from 1,457 to 3,995 as did the number of accident reports purchased daily, which rose from 217 to 295.

The liaison for CRASH said he would like to see all the reporting jurisdictions in the state use the uniform electronic reporting system.

Emergency Medical Services reported progress in the number and percent of services using the Kentucky Emergency Medical Service Information System (KEMSIS), which is NEMSIS compliant, to report call data. Use of KEMSIS by service providers increased from 15.2% to 96.8%. In 2016 the percent of calls received by the reporting deadline was 99.6%. The liaison offered several suggestions to improve his database. He recommended a new metric for completeness: percent use of occupant safety equipment. At this time, EMS is in the process of creating validation rules that will improve the accuracy and completeness of its data.

The **Kentucky Injury Research Prevention Center** (KIPRC) gathered injury reports from government agencies and hospitals. It reports substantial improvements in data quality on death certificates. From 2013 to 2016, eight of ten variables on the death certificate showed improvement. Missing values for injury description have dropped from 43.9% in 2010 to 0.9% in 2014. As well, KIPRC has documented some improvements in the hospital emergency and hospital inpatient databases. The completeness metric for the emergency departments shows a small decline in the percent of injury records with missing E-codes from 16.1% in 2010 to 13.6% in 2014. The percent of inpatients injury records with missing E-codes dropped from 15.7% in 2010 to 9.0% in 2014. These improvements are especially important, as a Cambridge Systematics study recommends use of hospital discharge data as the best measure of serious injury and considers it clearly preferable to reliance on police accident reports.*(8)* These improvements also align with the FAST Act call for improved data on fatalities and serious injuries.

The KIPRC liaison wants funding to measure accuracy metrics for the inpatient database. Specifically, he recommends funding to measure agreement with linked CRASH on external cause of injury. The liaison would also like to correct the problems with missing E-codes to improve completeness as well as accuracy. This could require aligning with revised injury surveillance measures.

Trauma registry also shows improved database performance from 2014 to 2015. Agreement with linked CRASH records on common variables—the accuracy metric—rose from 91.6% in the 2014 report to 98% in the 2015 report. But the percent of cases with a missing EMS time variable (time to scene, time to hospital) declined from 50% of the records to 42% of the records.

To improve the completeness, accuracy, and uniformity of data reporting, the liaison called for training of the trauma registrars once a year, for 2 full days, to help them properly update the facility registry mappings to reflect the changes in the NTDB standards for the new year of data submission. To make the data collection more accessible to the public, she called for the development of a web querying system. Regarding integration with other databases, she said that the registrars need access to EMS records to obtain information on EMS run numbers, injury county, facility from/to for the transferred trauma patients, in order to facilitate the integration with CRASH, hospitalization and emergency department visits databases. She also called for adding more hospitals to the trauma dating reporting system.

5.2. Deficiencies Identified from NHTSA Traffic Records Assessment (internal)

Designated liaisons and other officials at each database answered questions from the National Highway Traffic Safety Administration's (NHTSA's) Traffic Records Program Assessment Advisory Document. The Advisory contains a list of questions for each traffic records database. The questions in the Advisory are designed to provide a broad portrait of the qualities and capacities of each database along with questions to assess the current ability of database officials to use their data to improve database performance. The databases are: Driver, Vehicle, Emergency Medical Services (EMS), Roadway, Citation/Adjudication, and Injury Surveillance. The latter contains questions for several distinct databases: hospital emergency department; hospital discharge, vital records, and the trauma registry.

There were approximately 30 to 60 questions for each database. The appropriate questions were electronically mailed to each database liaison. Each question asked about the presence in a specific database of a quality or capacity or use of the database that NHTSA considers important. The response categories were: (1) yes the database has the quality or capacity or use, (2) no it does not, or (3) don't know if the database has it.

NHTSA has three ratings for the quality or capacity referred to in a particular question. These imply the importance of the quality or capacity or use in question. They are: very important (VI), somewhat important (SI), and less important (LI).

In reporting the results for a specific database quality or capacity the importance rating is indicated: VI, SI, or LI. The descriptions of the databases are grouped under thematic headings. These tend to vary depending on the specific concerns of the database.

The results under each thematic heading are placed in two categories: qualities and capacities that are currently present in the database and qualities and capacities that are either absent or about which the correct answer is unknown.

NHTSA has established a requirement that each database have a measurement for each database attribute (timeliness, accuracy, etc.) and a related goal to improve performance on each database attribute. **Kentucky had no established goals at the time of the survey administration for its databases**. It had some performance measures, and missing attributes will be indicated.

The full summary of the results (presence of a desired database capacity as well as its absence or a "don't know" response) are presented in Appendix 3. The next section presents only the deficiencies (i.e., the absence of the desired database capacities) as indicated by the respondent answers to the NHTSA questions. We include as deficient those on which the respondent answered "don't know".

5.2.1. CRASH Database—Deficiencies from NHTSA Survey Results

Interface with Other Databases

The CRASH database has no permanent links with either the citation and adjudication database or the injury surveillance system. However, it has been integrated with injury surveillance data on several occasions in recent years.

Data Use for Highway Safety

The document retention and archival storage policies do not meet the needs of safety engineers and other users with a legitimate need for long-term access to the crash data reports (SI). They are kept for ten years, at which point the documents are purged. Safety engineers often need more than 10 years of data.

Data Dictionary and Definitions

The officials responsible for the CRASH database said that they do not have a formal data dictionary. However, they have a list of code values and descriptions. This type of barebones data dictionary does not explain how the codes are used within the database or contain the tables that house the codes.
They answered "don't know" to these questions: "Are the ANSI-D 16 and ANSI S- D20 used as sources for the definitions in the crash system data dictionary (SI)?" and "Does the data dictionary provide a definition for each data element and define that data elements allowable values (SI)?"

They indicated that MMUCC is **not** the primary source for identifying what crash data elements and attributes the state collects (VI). They said that the data dictionary does not document the system edit checks and validation rules (SI); **nor** is it up to date and consistent with the field data collection manual, coding manual, crash report, and any training materials (VI). Lastly, it does not indicate the data elements populated through links to other traffic records system components (SI).

The state does not 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 (VI).

The respondents said they did not know if 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 (SI)?

Use of Organizational Data to Improve Performance

They answered in the negative to these queries: "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 (VI)?" "Are independent sample-based audits periodically conducted for crash reports and related database contents (SI)?
They said they didn't know the answer to these queries: "Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions (VI)?" and "Are data quality management reports provided to the TRCC for regular review (SI)?"

5.2.2. Emergency Medical Services—Deficiencies from NHTSA Survey Results

Interface with Other Databases

There is **no** interface between the EMS data and trauma registry data (VI).

Database Organization/Structure

The EMS system does **not** report on the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the state (VI). Currently, however, the KStARS system does capture information on injuries from traffic crashes but there is no process for routinely reporting on that data.

There is **no** process flow diagram that outlines the EMS system's key data process flows, including inputs from other systems (VI). **Nor** are there separate procedures for paper and electronic filing of EMS patient care reports (LI).

Data Correction and Quality Control
Limited state-level correction authority is **not** 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 (SI) and there are **no** formally documented processes for returning rejected EMS patient care reports to the collecting entity and tracking resubmission to the statewide EMS database (VI). **Nor** are there documented procedures for returning data to the reporting EMS agencies for quality assurance and improvements (e.g., correction and resubmission) (VI).

Performance Measures
There are **no** performance measures for integration and accessibility.

Use of Organizational Data to Improve Performance
The respondent indicated that it did none of the following: use high frequency errors to update EMS system training content, data collection manuals, and validation rules (VI); conduct quality control reviews to ensure the completeness, accuracy, and uniformity of injury data in the EMS system (SI); use periodic comparative and trend analyses to identify unexplained differences in the EMS data across years and agencies (LI); regularly communicate data quality feedback from key users to EMS data collectors and data managers(SI); and produce data quality management reports and make them available to the state TRCC (SI). Also, there are **no** documented procedures for returning data to the reporting EMS agencies for quality assurance and improvements (e.g., correction and resubmission) (VI)

5.2.3. Citation/Adjudication—Deficiencies from NHTSA Survey Results
Interface with Other Databases
There is **no** statewide system that provides real-time information on individuals' driving and criminal histories (VI) and **no** agency participates in and has access to a system providing real-time information on individuals driving and criminal histories (VI). Also **no** statewide data system tracks citation dispositions ((SI).
The courts' case management systems are **not** interoperable among all jurisdictions within the state (VI).

Final dispositions are **not** posted on the driver data system (SI). Adjudication data is **not** linked to 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 (VI). Citation data is **not** linked with the vehicle file to collect vehicle information and to carry out administrative actions (e.g., suspension, revocation, cancellation, interlock, interlock mandates and supervision) (VI).

Neither Citation data **nor** adjudication data is linked with the crash file to document violations and charges related to the crash (SI).

Database Organization/Structure
Kentucky does **not** use the Global Justice Reference Architecture (SI).
The respondent did not know if the appropriate components of the citation and adjudication systems adhere to the National Law Enforcement Telecommunications System guidelines (SI) or to the National Law Enforcement Information Network guideline (SI) or to the Functional Requirement Standards for Traffic Court Case Management (SI) or to the NIEM Justice Domain guidelines (SI).

The respondent did not know if the state has an impaired driving data tracking system that meets the specifications of NHTSA's Model Impaired Driving Records Information System (SI).

Data Dictionary
The respondent did not know if the citation system has a data dictionary (VI) and answered "don't know" in response to these questions: "Do the citation dictionaries clearly define all data fields?" (VI) and "Are the citation system data dictionaries up to date and consistent with the field data collection manual, training materials, coding manuals and corresponding reports?" (VI) and "Do the citation dictionaries indicate the data fields that are populated through interface linkages with other traffic records system component?" (VI)
Regarding the courts' case management data dictionaries, they do **not** provide a definition for each data field and do **not** clearly define all data fields (VI). **Nor** do the courts' case management system data dictionaries indicate the data fields populated through interface linkages with other traffic records system components (SI).

The respondent did **not** know if the prosecutors' information systems have data dictionaries (SI).

Tracking Capability
The respondent did **not** know if the state could track citations from point of issuance to posting on the driver file (VI). **Nor** did she know if the state measures compliance with the process outlined in the citation lifecycle flow chart (SI).
The respondent did **not** know if the state's DUI tracking systems have additional quality control procedures to ensure the accuracy and timeliness of the data (SI). **Nor** did she know if the state's impaired driving data tracking system meets the specifications of the NHTSA's Model Impaired Driving records Information System (SI).

Performance Measures
There is only one performance measure for citation—uniformity of the citation system (paper versus electronic) (SI). The respondent said there are **no** performance measures for the adjudication system.

Use of Organizational Data to Improve Performance
The respondent did **not** know if citation and adjudication data is 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 the courts (VI).

5.2.4. Vehicle—Deficiencies from NHTSA Survey Results
Database Organization/Structure
The state does **not** participate in the Performance Registration System and Management program (VI). Vehicle registration documents are **not** barcoded—using at a minimum the 2D standard—to allow rapid, accurate collection of vehicle information by law enforcement officers in the field using barcode readers or scanners (VI).

Interface with Other Databases
The driver and vehicle files are not unified into one system (SI).
When discrepancies are identified during data entry into the crash data system, vehicle records are not flagged for possible updating (LI).

Performance Measures
Vehicle has **no** performance measures for three performance attributes: accuracy, completeness, and uniformity. It has them for timeliness, integration and accessibility.

Use of Organizational Data to Improve Performance

Vehicle does **not** conduct independent sample-based audits for periodic vehicle reports and related database contents for that record (SI). Periodic comparative and trend analyses are not used to identify unexplained differences in the data across years and jurisdictions (VI).

The respondent did **not** know if data quality management reports are provided to the TRCC for regular review (VI).

5.2.5.   Roadway—Deficiencies from NHTSA Survey Results

Database Organization/Structure and Interface

The location coding methodologies for all state roadway information systems are **not** compatible (VI). The respondent did **not** know if the location coding methodologies for all regional and local roadway systems are compatible (SI).

There are interface linkages connecting some, but not all (which is desired), of the state's discrete roadway information systems (VI). Roadway data systems maintained by regional and local custodians (e.g., MPOs, municipalities) do **not** interface with the state roadway information system (SI).

Crash data is **not** incorporated into the roadway information system for safety analysis and management use (VI).

MIRE Fundamental Data Elements

Respondent stated all collected data elements for any public roads conform to MIRE (SI). However, the metrics study finds that one or two are **not** collected.

Data Dictionary

The steps for incorporating new elements into the roadway information system (e.g., a new MIRE element) are **not** documented to show the flow of information (VI), **nor** are the steps for updating roadway information documented to show the flow of information (VI). Last, the steps for archiving and accessing historical roadway inventory are **not** documented (SI).

Local Agency Data Procedures

The respondent did **not** know if the local procedures for collecting and managing the roadway data are compatible with the state's roadway inventory (VI).

Performance Measures

There are none for integration (VI) and accessibility (VI), and there are **no** performance measures for roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)

5.2.6.   Driver Database—Deficiencies from NHTSA Assessment Results

Issuance and Novice Driver Policies

The database does **not** capture novice driver's training histories, including provider names and types of education (classroom or behind the wheel (LI)).

Quality Control

There are **no** established processes to detect internal fraud by individual users or examiners (VI). The system does **not** have edit checks and data collection guidelines for each data element (VI). **Nor** is there a formal, comprehensive data quality management program for the driver system (VI).

Policies and procedures for purging data from the driver system are **not** documented (SI). **Nor** are processes documented to suspend licenses based on a DUI arrest independent of adjudication (SI).

Data Dictionary
The data dictionary does **not** document all field values including null codes (VI). <u>Nor</u> is there guidance on how or when to update the data dictionary (VI).
There is **no** process flow diagram that outlines the driver data system's key data process flows, including inputs form other data systems (VI).

Electronic Links
The driver database lacks the capability to grant authorized personnel from other states access to information in the driver system (VI).

Performance Measures
There are performance measures for integration and accessibility. There are **no** performance measures tailored to the needs of data managers and data users for the following performance attributes: timeliness, accuracy, completeness, and uniformity.

Use of Data to Improve Performance
Detection of high frequency errors is **not** used to generate updates to training content and data collection manuals, update the validation rules, and prompt form revisions (VI). **Nor** are periodic comparative and trend analyses used to identify unexplained differences in data across years and jurisdictions (VI). Data quality management reports are **not** provided to the TRCC for regular review (VI).

5.2.7. Injury Surveillance System—Deficiencies from NITSA Survey Results

The injury surveillance system gathers data from several sources including: EMS, hospital records, death certificate records and trauma registry. Therefore, the NHTSA survey questions for the injury surveillance system are more numerous than the questions for the other databases. The EMS and trauma registry questions were removed to separate surveys answered respectively by an EMS official and a trauma registry official.

Employees at the Kentucky Injury Prevention Research Center (KIPRC) gather data from the other agencies and are best situated to respond to the NHTSA survey questions concerning death certificates, hospital emergency department and hospital discharge. Questions are subdivided into the following categories: general questions, applicable guidelines for the injury system, data dictionaries and coding manuals, processes and procedures, data interfaces, quality control for the hospital departments of hospital emergency and hospital discharge and death certificate records. Trauma registry is in a separate section.

General Questions
EMS data does not track data on frequency, severity, and nature of injuries (VI). Injury surveillance does **not** track other data (VI).

Use of Applicable Guidelines
The AIS and ISS are **not** derived from the state emergency department and hospital discharge data for motor vehicle crash patients (SI). The respondent did **not** know if there are state privacy and confidentiality standards that supersede HIPPA (VI).

<u>Formal documentation</u>
The vital records system does **not** have formal documentation that provides a summary dataset—characteristics, values, limitations, and exceptions, whether submitted or created—and how it is collected, managed and maintained (VI).

<u>Data Control</u>
The respondent did **not** know whether there is a data governance process (SI).

<u>Interfaces and integration within the Injury Surveillance system</u>
According to NHTSA, "system interface describes a timely, seamless relationship and a high degree of interoperability between systems. In contrast, system integration refers to discrete linking of databases for analytic purposes. 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."
There is **no** interface between EMS and either emergency department or hospital discharge databases (SI). **Nor** does EMS data interface with trauma registry data (VI). Lastly, there is **no** interface between vital statistics and hospital discharge data (SI). The state does **not** have a formal traffic records system inventory that identifies linkages useful to the state and data access policies (VI).

The TRCC does **not** promote data integration by aiding the development of data governance, access, and security policies for integrated data (SI). But the TRCC does promote data integration through funding for integration projects. However, according to the KIPRC liaison a more formal approach to data governance at the executive level (i.e., GECHS) could further advance traffic records integration in Kentucky. He said that Kentucky is reaching the limit of data integration that can be accomplished without intervention and leadership from the executive level to facilitate access to additional data sources.

Neither driver (VI) **nor** vehicle data (VI) **nor** citation and adjudication data (VI) is integrated with crash data for specific analytical purposes.

The respondent said that data from traffic records component systems—excluding crash—is **not** integrated for specific analytical purposes (SI).

Neither decision-makers (SI) **nor** the public (SI) has access to resources—skilled personnel and user-friendly access tools—for the use and analysis of integrated datasets.

The respondent did not know if behavioral program managers have access to traffic records data and analytic resources for problem identification, priority setting and program evaluation.

<u>Quality Control for Hospital Emergency Department and Hospital Discharge</u>
The respondent did not know if there is limited state level 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 **(SI**).

Performance Measures for Hospital Emergency Department and Hospital Discharge

<u>Performance Measures</u>
There are performance measures for the following attributes tailored to the needs of emergency department and hospital discharge managers and data users, all of which are rated very important (VI): timeliness, accuracy, completeness, and integration. There are no measures for uniformity (VI) and accessibility (VI).

The respondent did **not** know if there is performance reporting for the emergency department and hospital discharge database that provides timeliness, accuracy, and completeness feedback to each submitting entity (VI). **Nor** did the respondent know if high frequency errors are used to update emergency department and hospital discharge database system training content, data collection manuals, and validation rules (VI). He also did **not** know if quality control reviews are conducted to ensure the completeness, accuracy and uniformity of injury data in the emergency department and hospital discharge database (SI).

The respondent said he did <u>not</u> know the answer to these two Questions:

"Is data quality feedback from key users regularly communicated to emergency department and hospital discharge database data collectors and data managers (SI)?"

And "Are emergency department and hospital discharge data quality management reports produced regularly and made available to the state TRCC (SI)?

5.2.8. Death Certificate Records—Deficiencies from NHTSA Survey Results
<u>Quality Control</u>
The respondent did **not** know if there 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 (SI).

<u>Performance Measures</u>
Regarding performance measures, all of which are rated very important (VI), there are measures for timeliness, completeness and integration. There are **no** performance measures for accuracy, uniformity, and accessibility.

<u>Use of Organizational Data to Improve Performance</u>
There is **no** performance reporting for vital records that provides specific timeliness, accuracy, and completeness feedback to each submitting entity (VI). And vital records quality reports are **not** produced regularly and made available to the state TRCC (SI). The respondent did **not** know if quality feedback from key users is regularly communicated to vital records data collectors and data managers (SI). **Nor** did the respondent know if high frequency errors are used to update vital records training content, data collection manuals and validation rules (VI).

5.2.9. Trauma Registry—Deficiencies from NHTSA Survey Results
According to the respondent, the major issue confronting the trauma registry is low hospital enrollment—only 28 of 93 hospitals are reporting. However, most of the largest hospitals are reporting. One reason for low participation is the rigorous nature of the National Trauma Data Standards.

Performance Measures
There are performance measures for five attributes tailored to the needs of trauma registry managers and data users; the performance measures cover these attributes: timeliness, accuracy, completeness, uniformity, and integration. There is no performance measure for accessibility (VI).
Use of Organizational Data to Improve Performance. Trauma registry data quality management reports are **not** produced regularly and made available to the State TRCC (SI).

Data Dictionary and Documentation
The state does **not** have a process flow diagram that outlines the trauma registry's key data process flows, including inputs from other systems (VI)

5.3. Response to NHTSA's KY Traffic Records Assessment

This section lists and discusses NHTSA's recommendations arising from its recent traffic records assessment of Kentucky. Many of the goals presented above will contribute to fulfillment of the recommended improvements in the traffic records system.

Strategic Planning Recommendations

- Strengthen the TRCC's abilities for strategic planning to reflect best practices identified in the Traffic Records Program Assessment Advisory.

The TRCC will work with the Kentucky Transportation Center to create an implementation plan that will facilitate the completion of a wide range of database reforms. The TRCC will emphasize more accurate and complete data gathering including the writing of data dictionaries as recommended.

Crash Recommendations

- Improve the data dictionary for the Crash data system to reflect best practices identified in the Traffic Records Program Assessment Advisory.
- Improve the interfaces with the Crash data system to reflect best practices identified in the Traffic Records Program Assessment Advisory.
- Improve the data quality control program for the Crash data system to reflect best practices identified in the Traffic Records Program Assessment Advisory.

If funding is available a comprehensive data dictionary will be composed. The integration goal is to identify appropriate links between the driver and vehicle databases and the crash file. The crash database has two goals that increase data quality: increase the percent of crashes locatable with roadway location method above the current level of 94.6% and reduce missing critical data elements by 10%.

Vehicle Recommendations

- Improve the interfaces with the Vehicle data system to reflect best practices identified in the Traffic Records Program Assessment Advisory.
- Improve the data quality control program for the Vehicle data system to reflect best practices identified in the Traffic Records Program Assessment Advisory.

As noted above, an effort will be made to increase links with the crash database.

Driver Recommendations

- Improve the data dictionary for the Driver data system to reflect best practices identified in the Traffic Records Program Assessment Advisory.
- Improve the data quality control program for the Driver data system to reflect best practices identified in the Traffic Records Program Assessment Advisory.

If funding is available a comprehensive data dictionary will be constructed.

Roadway Recommendations

- Improve the applicable guidelines for the Roadway data system to reflect best practices identified in the Traffic Records Program Assessment Advisory.

- Improve the data dictionary for the Roadway data system to reflect best practices identified in the Traffic Records Program Assessment Advisory.
- Improve the data quality control program for the Roadway data system to reflect best practices identified in the Traffic Records Program Assessment Advisory.

If funding is available, the roadway database will produce a comprehensive data dictionary. To improve data quality, officials at the roadway database have adopted these goals: implement a facility data audit methodology as an accuracy check of the highway information system and a methodology to check statewide centerline coverage.

Citation / Adjudication Recommendations

- Improve the data dictionary for the Citation and Adjudication systems to reflect best practices identified in the Traffic Records Program Assessment Advisory.
- Improve the procedures/ process flows for the Citation and Adjudication systems to reflect best practices identified in the Traffic Records Program Assessment Advisory.
- Improve the interfaces with the Citation and Adjudication systems to reflect best practices identified in the Traffic Records Program Assessment Advisory.
- Improve the data quality control program for the Citation and Adjudication systems to reflect best practices identified in the Traffic Records Program Assessment Advisory.

If funding is available, citation/adjudication will assemble a comprehensive data dictionary.

EMS / Injury Surveillance Recommendations

- Improve the interfaces with the Injury Surveillance systems to reflect best practices identified in the Traffic Records Program Assessment Advisory.
- Improve the data quality control program for the Injury Surveillance systems to reflect best practices identified in the Traffic Records Program Assessment Advisory.

EMS has the goal of increasing the percent of appropriate records in the EMS file linked to other database systems. To do so it will identify links and funding opportunities. EMS has adopted two goals for augmenting data quality: increase the percent of records with no errors in critical data elements and raise the percent of first responders recording use of seatbelts from current 70 percent to above 90 percent.

Data Use and Integration Recommendations

- Improve the traffic records systems capacity to integrate data to reflect best practices identified in the Traffic Records Program Assessment Advisory.

The TRCC will assist its databases in their efforts to increase linkages across databases.

6. The Performance Measures and Goals of the Strategic Plan

The strategic plan contains two approaches to database improvement. The first approach involved the development of performance measures and related goals, the latter to be achieved by 2020. The second approach is a response to NHTSA's recommendations from its 2017 NHTSA's KY Traffic Records Assessment. Upon completion of the assessment NHTSA made a list of recommendations for improvements in Kentucky's traffic records system.

These recommendations were issued on June 16, 2017, which provided little time for a detailed response. However many of the recommendations are addressed in the goals created during the development of the plan. Thus, the specific performance measures and goals discussed in this section constitute the substance of the traffic records strategic plan. Taken together, their overarching effect will be to raise the quality and utility of the data in each database. Reaching the goals will entail a variety of database reforms—from more use of electronic reporting to more integration across databases.

Many of the performance measures detailed below call for improvements in the accuracy and completeness of injury data and its integration with the crash database. NHTSA's recommendations also highlight these concerns.

The performance measures and goals build upon Kentucky's ongoing efforts to measure performance. Moreover, as the numerical goals in the tables below indicate, Kentucky appears to already generate useful data. Still, as NHTSA concluded, there is room for improvement.

Taken together, the adoption of the proposed performance measures and related goals will contribute to better data for analysis and decision-making. Kentucky will be able to shine a brighter and more informative light on the causes of crashes, injuries, and deaths on its roadways. In doing so, Kentucky will be better positioned to find ways to reduce crashes and the associated injuries and fatalities. The knowledge gained will inform safer highway design. It should also facilitate the development of more effective and comprehensive first responder practices and organization.

The goals laid out in the plan will be supplemented with many of the database refinements suggested by NHTSA, as funding sources and strategies emerge. Some of NHTSA's recommendations may be addressed without additional funding; for example, database officials are interested in formalizing many of their operations by, for instance, updating data dictionaries.

NHTSA's recommendations are discussed after the presentation of the performance measures and goals. It is Kentucky's intent to create an implementation plan in the coming year, which will endeavor to cover the NHTSA recommendations not addressed in the goals laid out here.

6.1. CRASH Database Performance Measures and Goals

Currently, the number of days from a crash event to data entry is 6.61 days for E-reports. The Kentucky State Police have set a goal of reducing that number to 3 days or fewer. The accuracy performance measure is the percent of crashes locatable with the current roadway location method. KSP intends to improve upon its current level of 94.6%. At this time there is no measure for completeness; however, KSP will adopt the NHTSA recommended one: the percent of crash records with no missing critical data elements. After selecting a critical data element, the goal will be a 10% reduction in the missing data from the baseline to be established in the first year. A number of law enforcement agencies are still submitting paper reports. Kentucky intends to increase the number of crash reports submitted electronically to 95% over the next five years.

Increasing links across databases is complex and costly. Kentucky intends to *increase appropriate real-time links of crash with the driver and vehicle systems.* To that end, its immediate goal is to identify appropriate links for consideration along with funding opportunities. The public has access to crash reports. KSP intends to increase the number of citizens querying its database above the current level of 3,994 daily.

Table 6.1 CRASH Database Performance Measures and Goals.

Attribute	Performance Measures	Goals
Timeliness	# of days from crash event to data entry	Reduce number of days to 3
Accuracy	% of crashes locatable w/ roadway location method	Increase % from current level of 94.6%
Completeness	% of crash records with no missing critical data elements	Reduce missing elements by 10% after establishing a baseline
Uniformity	Percent of crash reports submitted electronically	Increase to 95% over next 5 years
Integration	Increase appropriate real-time links of crash with driver and vehicle systems	Identify appropriate links and funding opportunities
Accessibility	Number of queries on public site daily	Increase above current baseline of 3,994 daily

6.2. Emergency Medical Services Database Performance Measures and Goals

Currently, 99.6% of call records are submitted by the reporting deadline. Kentucky intends to improve upon that percentage over the next five years. In regards to a performance measure for accuracy, Kentucky will select a critical data element for measurement. After establishing a baseline in the first year, EMS will seek to reduce errors in the critical element by 20 percent.

EMS has already identified a critical element to improve the completeness of data—the percent of incident reports in which the use of seat belts is recorded. Currently, the percent is 69.9. The goal will be reporting completeness above 90%. The Kentucky Emergency Medical Services Information System (KEMSIS) is NEMSIS compliant. Kentucky's goal is to have 98 to 100 percent of services reporting KEMSIS. EMS is not linked to another system. Its goal related to integration is to identify appropriate real-time links of other systems and funding opportunities to create the links. The goal for improved accessibility to increase by 20% the percent of EMS agencies using an online system to submit run reports electronically to the trauma registry.

Table 6.2 EMS Database Performance Measures and Goals.

Attribute	New or same Performance Measures	Performance Goals
Timeliness	% of records (calls) received by reporting deadline	Improve on current level of 99.6%
Accuracy	% of EMS records with no errors in a critical data	In first year create a baseline for element and then improve 20%
Completeness	% use of occupant safety equipment(seat belts)	Improve to above 90% from current level of 69.9%
Uniformity	# and % of services reporting KEMSIS	98 to 100%
Integration	The percent of appropriate records in the EMS file that are linked to another system	Identify appropriate links and funding opportunities
Accessibility	Percent of EMS agencies using online system to submit run reports electronically to trauma registry	In first year create a baseline for element and then improve 20%

6.3. Roadway/Traffic Database Performance Measures and Goals

The roadway/traffic information database is housed in the Division of Planning of the Kentucky transportation Cabinet. Roadway officials intend to collect two timeliness metrics: (1) the Average number of calendar days between completion of state project and roadway database update; and (2) a measure for completion of traffic counts within 3 years. The latter will be developed and implemented in the first year. After establishing baselines for each measure, the division of planning's goal is improvement above the baseline in the following years. To measure data accuracy, officials will develop and implement a facility data audit methodology of the highway information system. The goal is improvement above a baseline to be created in the first year. Regarding data completeness, they will develop a methodology to check statewide centerline coverage. A baseline for gauging increases in completeness will be established in the first year.

The uniformity goal is adoption, if funding is available, of the remaining fundamental data elements of MMIRE. Planning intends to have 100% of crashes locatable with the current location coding method. Improvements in accessibility will be measured with the number of web hits downloading service requests over specific periods of time.

Table 6.3 Roadway Database Performance Measures and Goals.

Attribute	New performance measure	Goals
Timeliness	Average number of calendar days between completion of state project and roadway database update	Improvement above a baseline to be created in first year
	Develop and implement a timeliness performance measure for completion of traffic counts within 3 years	Improvement above a baseline to be created in first year
Accuracy	Implement a facility data audit methodology as an accuracy check of HIS	Improvement above a baseline to be created in first year
Completeness	Develop a methodology to check statewide centerline coverage (comparison with probe data shapefiles)	Improvement above a baseline to be created in first year
Uniformity	If a reasonable collection method for the remaining FDEs can be devised, collect data for all FDE elements of MMIRE	All FDE elements
Integration	% of crashes locatable using location coding method	100%
Accessibility	Develop a method to measure accessibility in the first year	Improvement above a baseline to be created in first year

6.4. Citation/Adjudication Database Performance Measures and Goals

Officials with responsibility for the citation/adjudication database have adopted the goal of reducing the median length of time between citation filing date and the charge filing date. Currently the length of time is 2.7 days for e-citations and 6.77 days for manual citations. Improvement in timeliness is contingent upon the availability of funding. The accuracy goal is to maintain or improve the match of traffic violations to valid criminal history, which now stands at 99.8%.

Citation/adjudication will adopt the following performance measure for completeness—the percent of charges in traffic cases with a Uniform Offense Reporting codes. The goal is to maintain the current level of 99.99% of charges with UOR codes.

In regards to uniformity of reporting, the performance measure is the percent of cases on a uniform e-citation. The goal is to increase e-citations from 81% of citations to more than 90% over 5 years. This will require funding for the smaller law enforcement agencies still reporting manually to accomplish the transition to e-reporting. Regarding linkage, 99.1% of traffic violations correctly link to citation data at this time. The goal is to maintain or improve that percent. Accessibility will be measured with the number of requests for records. The goal is to increase the number over the next 5 years.

Table 6.4 Citation/Adjudication Database Performance Measures and Goals.

Attribute	Performance Measures	Goals
Timeliness	Median length of time between citation filing date and charge filing date	Reduce median length of time from current mean 2.72 days (e-citation) and 6.77 days (manual citation) if funding is available
Accuracy	Match traffic violation charges to valid criminal history key	Maintain or improve current accuracy match of 99.8%
Completeness	Ensure that charges in traffic cases have Uniform Offense Reporting (UOR) Code	Maintain or improve current 99.99%
Uniformity	Percent of cases on a uniform e-citation	Increase e-citations from 81% to more than 90% over 5 years, if funding is available for law enforcement agencies
Integration	99.1% of traffic violations correctly link to citation data	Maintain or improve in subsequent years
Accessibility	Number of requests for records	Establish baseline and increase number in subsequent years

6.5. Vehicle Database Performance Measures and Goals

At this time, officials with the vehicle registration database have agreed to gather data on three of the performance measures in table 6.5: the timeliness metric (average time to post by county clerks), the integration performance measure (percent of NMVTIS standards-compliant elements in system), and the accessibility performance measure (# of users able to perform inquiries). Currently, Kentucky is implementing a new vehicle information system—the Kentucky Automated Vehicle Information System (KAVIS). It should be operational in the next two years, at which time it will be possible to establish numerical goals and work toward attaining them for the timeliness and integration goals. Vehicle registration has provided data for the accessibility performance measure. In 2015, the database was accessed 3,500 times. The goal is to increase that number.

Vehicle Registration has yet to confirm interest in the proposed accuracy, completeness, and uniformity performance measures and related goals.

Table 6.5 Vehicle Database Performance Measures and Goals.

Attribute	Current and Possible New Performance Measures	Goal
Timeliness	Average time to post by county clerks	Once KAVIS is operational, a baseline will be established and steps taken to reduce time to post
Accuracy	Percent of vehicle records with no errors in critical data elements	Will select critical elements and establish a baseline to Maintain or improve Upon
Completeness	Percent of unknowns or blanks in critical data elements	Will select critical elements and establish a baseline to maintain or improve upon
Uniformity	Percent of NMVTIS standards-compliant elements in system	Will create a team to estimate current number and prepare steps to increase number
Integration	KAVIS will check against NMVTIS and VIN Assist	Once KAVIS is operational, a baseline will be established and steps taken to reach 100% check against NMTIS and VIN
Accessibility	# of users able to perform inquiries	Increase number of times database is accessed above 2015 number of 3,500

6.6. Injury Surveillance Performance Measures and Goals

The performance measures and goals for injury surveillance draw on several data sets, including hospital inpatient, trauma registry, death certificate, and crash records. The overarching concern of these measures and goals is the accuracy and completeness of injury data and its connection to the location and pertinent details of specific crashes. Improvements in accuracy and completeness will contribute to better data and analysis of the causes of crashes on Kentucky roadways and the associated injuries and fatalities. The knowledge gained will facilitate the design of safer highway facilities and the adoption of more effective first responder practices.

Currently, 96% of in-state traffic deaths are registered within 90 days of the crash event. The goal is to raise the percentage above that level over the next five years. The accuracy performance measure is agreement of linked trauma records and CRASH data on common variables. In 2012 the concordance was 91.6%. The goal is to increase the concordance. The completeness goal is a reduction in the percent of hospital inpatient injury records with missing E-codes from 7.4% to less than 5%.

The performance measure for uniformity is the number of trauma cases reported. This will entail increasing the number of trauma centers reporting. The goal is to increase the number of cases from 13,000 in 2016 to more than 15,000 by 2020. The integration goal is to link CRASH with hospital in-patient on an annual basis. This will require funding. EMS has an accessibility performance measure—the percent of EMS agencies using an online system to submit run reports electronically to trauma registry. This should contribute to improved data accuracy as well as accessibility.

Table 6.6 Injury Surveillance Database Performance Measures and Goals.

Attribute	Performance Measure	Goal
Timeliness	% of in-state traffic deaths registered within 90 days	Increase above the current level of 96%
Accuracy	Agreement of linked trauma records and CRASH on common variables	Improve concordance above the 91.6% measured in 2012
Completeness	Ensure that charges in traffic cases have Uniform Offense Reporting (UOR) Code	Maintain or improve current 99.99%
	% of traffic deaths that have post-mortem toxicology results for drugs and alcohol listed on the death certificate	To be Specified
	Number of trauma cases reported	Increase number of cases from 13,000 in 2016 to more than 15,000 in 2020
Uniformity	% of data elements that conform to National Trauma Data Bank and Kentucky Trauma Registry definitions for case identification and specific data elements	Increase e-citations from 81% to more than 90% over 5 years, if funding is available for law enforcement agencies
Integration	Number of injury/EMS data sets linked with CRASH annually	5
	Number of times CRASH and driver files linked	1
	Number of times CRASH and vehicle files linked	1
	Number of times Crash and citation files linked	1
Accessibility	Number of analysts using linked KY CRASH data for active research projects	1

6.7. Driver Database—Proposed Performance Measures and Goals

The officials responsible for the driver database have not agreed to track any performance measures and related goals. KTC has suggested the measures and goals in Table 6.6

Table 6.7 Driver Database Performance Measures and Goals.

Attribute	Possible Performance Measures	Goals
Timeliness	Average # of days from driver's adverse action to date the adverse action enters database	Reduce number of days over next three years
Accuracy	% of drivers' files with SSN verified using social security online verification system (SSOLV)	100% over 5 years
Completeness	% of driver records with no missing critical data elements	Select critical data element and establish a baseline in first year; increase % in subsequent years
Uniformity	% of ICD Version 6.0 compliant data elements in driver system	Establish baseline in second year and improve in subsequent years
Integration	% of conviction records submitted to the DMV electronically	Establish baseline in second year and improve in subsequent years
Accessibility	Number of users accessing traffic records data	Establish baseline in second year and improve in subsequent years

7. Rating Method to Prioritize and Fund Projects for Database Integration and Improvement

The selection and scheduling of projects to increase database quality and utility will follow Kentucky Traffic Records Coordinating Committees standard procedures for project development. It must be noted that the quality of data is often upgraded by database officials, without additional funding as they work steadily to improve their operations. Improvements over the past few years are documented in Appendix 4.

The process and schedule by which the Traffic Records Advisory Committee reviews, approves, and monitors funded projects is as follows:

Sequence of Steps in Project Section Process

January
>Each year in January, the Kentucky Office of Highway Safety (KOHS) issues a call for research proposals to improve the quality of traffic records data and the use of that data. Proposals are received from the agencies responsible for data collecting as well as from university and government researchers involved in the analysis of safety related data. These are submitted in abstract form to the TRCC.

February
>In February of that year, the KOHS TRC and the NHTSA Region 3 RPM review submission for consideration. The Transportation Traffic Records Coordinating Committee and the Technical Committee review the proposals and the proposers of the more promising research are invited to present their proposal to the TRCC. The TRCC takes into consideration the likely impact of the proposal on the six database attributes: timeliness, accuracy, completeness, uniformity, integration, and accessibility. It also considers efforts to comply with Federal Highway safety goals, procedures and standards.

March
>In March, upon completion of the review, the TRCC technical committee recommends proposals to the KOHS Grant Committee for its assessment. Those considered most likely to improve one or more of the six database attributes are selected for funding; as long as federal funds and other funding is available.
>
>The recommending funding level of the selected traffic records grants is used to generate the operational programs budget. All task matrixes, performance measures and goals are specified and carried forward in the grant contract.

April-May
>During April and May, The KOHS then devises and drafts all contracts and related memorandum of understanding. Contracts and MOUs are then cross referenced from contract number to project number and finalized with research products and schedules specified in detail based upon the grant's contents, funding level, and location in the federal planning cycle.

June-July
>During June and July, contracts and denial notifications are dispatched via email and U.S. Postal Service to notify the entities. The contracts are signed and collected for entry into the Kentucky Finance EMARS system.

October
>New projects begin October 1 and follow the Federal Fiscal Year, concluding June 30th.

During the course of the grant, project directors submit monthly progress reports, describing tasks undertaken and related expenses, and provide all other necessary documentation agreed to in the contract or deemed necessary for performance management.

Grant Completion Requirements

Prior FFY projects conclude on September 30, at which time a final report describing the research findings must be submitted with the final reimbursement claim.

Any grant related claims arriving in the KOHS, **unless written prior approval is authorized**; after November 30th close of business are not eligible for reimbursement.

November

In November, the grantees report to the Technical Committee on the outcomes of the previous year's projects. If it is advisable to have a project carryover into the next fiscal year, the researchers advise the Technical Committee of the next year's matrix and planned outcomes.

Appendices

Appendix 1: List of KTRAC Membership

Christopher Van Brackel
Officer
Lexington-Fayette Police Department
Database – Crash, Citation/Adjudication

Josh Wentz
Systems Consultant IT
KY Transportation Cabinet
Division of Planning
Database –Roadway

Brad Frazier
Traffic Engineer
City of Lexington, KY
Database – Roadway, Crash

Brent Sweger
Engineer, Division of Highway Design
KY Transportation Cabinet
Database – Roadway, Crash

Carla Crane
Executive Director
KY Office of Health Policy
Database – EMS/Injury Surveillance

Chad Shive
Engineer, Division of Maintenance
KY Transportation Cabinet
Database – Roadway, Crash

Lt. David Holland
Lieutenant
KY State Police, Criminal ID and Records
Database – Crash, Citation/Adjudication

Eric Green
Research Engineer
UK, KY Transportation Center
Database – Crash, Roadway

Paul Phillips
Director of Field Operations
Kentucky Board of Emergency Medical Services
Database – EMS/Injury Surveillance

Drew Chandler
Database Administrator
Kentucky Board of Emergency Medical Services
Database – EMS/Injury Surveillance

Andy Rush
Transportation Planner
Louisville Metropolitan Planning Organization
Database – Crash, Roadway

Matthew Cole
Director, Driver Licensing Division
KY Transportation Cabinet
Database – Driver

Sgt. Tim Moore
Sergeant
KY State Police, Criminal ID and Records
Database – Crash, Citation/Adjudication

Lt. Chad Mills
Crash Reconstructionist
KY State Police, Operations Division
Database – Crash, Citation

Chandra Venettozzi
Healthcare Data Administrator
KY Office of Health Policy
Database – EMS/Injury Surveillance

Ed Harding
Systems Consultant IT
KY Transportation Cabinet
Enterprise Data Services Branch
Database – Crash, Roadway, Vehicle, Driver

Kathy Schiflett
Research Consultant
KY Administrative Office of the Courts
Database – Citation/Adjudication

Godwin Onodu
Assistant Director, Division of Motor Vehicles
KY Transportation Cabinet
Database – Vehicle

Jamie Fiepke
President/CEO
KY Motor Transport Association
Database – Vehicle

Elizabeth Lucas
Director, Implementation & Court Services
KY Administrative Office of the Courts
Database – Citation/Adjudication

Larry Newton
Lieutenant/Commander
KY State Police, Criminal ID and Records
Database – Crash, Citation/Adjudication

Jon Totty
Engineer
Palmer Engineering
Database – Roadway, Crash

Keith Dotson
Division of Planning
KY Transportation Cabinet
Database – Roadway

Ken Agent
Research Engineer
UK, KY Transportation Center
Database – Crash, Roadway

Peter Rock
Research/Data Coordinator
UK, Injury Prevention & Research Center
Database – EMS/Injury Surveillance

Michael Singleton
State Injury Surveillance Coordinator
UK, KY Injury Prevention & Research Center
Database – EMS/Injury Surveillance

Linda Goodman
Division Administrator
Federal Motor Carrier Safety Association
Database – Vehicle

Ben Blandford
Research Scientist
UK, KY Transportation Center
Database – Crash, Roadway

Tracy Lovell
Engineer, Division of Traffic Operations
KY Transportation Cabinet
Database – Crash, Roadway

Mike Vaughn
Engineer, Division of Traffic Operations
KY Transportation Cabinet
Database – Crash, Roadway

John Smoot
Federal Program Coordinator
KY State Police, Commercial Veh. Enforcement
Database – Crash, Citation/Adjudication

Julia Costich
Professor/Associate Director
UK, Injury Prevention & Research Center
Database – EMS/Injury Surveillance

John Moore
Director, Division of Planning
KY Transportation Cabinet
Database – Roadway

Jennifer Edwards
Administrative Services Supervisor
Bowling Green Police Department Records
Database – Crash, Citation/Adjudication

Michael Neal
Branch Manager, Division of Driver Licensing
KY Transportation Cabinet
Database – Driver

Nathan Dean
Traffic Records Coordinator, Highway Safety
KY Transportation Cabinet
Database – Crash

Clay Bryan
Admin. Coordinator, Div. of Vehicle Registration
KY Transportation Cabinet
Database – Vehicle

Reginald Souleyrette
Professor/Research Engineer
UK, KY Transportation Center
Database – Crash, Roadway

Jason Siwula
Assistant State Highway Engineer
KY Transportation Cabinet
Database – Roadway, Crash

Srinivasa Gutti
Engineer, Division of Planning
KY Transportation Cabinet
Database – Roadway

Timothy Cleary
Officer
Elizabethtown Police Department
Crash, Citation/Adjudication

Terry Runner
Law Enforcement Training Instructor
Department of Criminal Justice Training
Database – Crash, Citation/Adjudication

Lenahan O'Connell
Research Investigator
UK, KY Transportation Center
Database – Roadway, Crash

Ryan Fisher
Branch Manager, Highway Safety
KY Transportation Cabinet
Database – Crash

Monica Robertson
Data Coordinator
Kentucky Board of Emergency Medical Services
Database – EMS/Injury Surveillance

Shiann Sharpe
Program Manager, Highway Safety
KY State Police Criminal ID & Records Branch
Database – Crash, Citation

Ryan Tenges
Safety Engineer
Federal Highway Administration
Database – Roadway, Crash

Terry Bunn
Director
UK, KY Injury Prevention & Research Center
Database – EMS/Injury Surveillance

Todd Morrison
Safety Circuit Rider
UK, KY Transportation Center
Database –Roadway, Crash

Tony Young
Highway Safety Specialist
Federal Highway Administration
Database – Crash

Michael Schwendau
Assistant Director, Highway Safety
KY Transportation Cabinet
Database – Crash

Matt McCoy
Program Manager, Highway Safety
KY Transportation Cabinet
Database – Crash

Samantha G. Lickliter
Program Coordinator
KY State Police Criminal ID & Records Branch
Database – Crash, Citation

KTRAC-TRCC Executive and Technical Subcommittee and Chairs (Coordinators)

Ed Harding – KTRAC Co-Chair

Nathan Dean – KTRAC Co-Chair

Crash Subcommittee
Eric Green – Co-Chair
Sgt. Tim Moore – Co-Chair

KY Traffic Records Systems Assessment/Need
Jarrod Stanley – Co- Chair
Reginald Souleyrette – Co-Chair
Ben Blandford – Co-Chair

Roadway Subcommittee
Keith Dotson – Chair
Josh Wentz – Co-Chair

Vehicle Subcommittee
Godwin Onodu – Chair
Stephanie Williams – Co-Chair

Driver Subcommittee
Matthew Cole – Co-Chair
Michael Neal – Co-Chair

Citation/Adjudication Subcommittee
Elizabeth Lucas – Co-Chair
Kathy Schiflett – Co-Chair

EMS and Injury Surveillance Subcommittee
Michael Singleton – Co-Chair
Drew Chandler – Co-Chair
Monica Robertson – Co-Chair

Appendix 2: Traffic Records Projects

FY 2018

Project Number: M3DA-18-01
Project Title: Traffic Records Program Management (Kentucky Office of Highway Safety)
Description: Includes salaries and benefits, travel, training, and office supply expenses for one staff member of the Office's Division of Highway Safety Programs. This pays for personnel who supply traffic records analysis to all safety partners, internal and external.
Budget: $80,000.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-18-02
Project Title: University of Kentucky**,** KY Injury Prevention & Research Center – CRASH, Injury and Roadway Integration
Description: This project will integrate previously linked CRASH, hospital, and emergency department records with Kentucky roadway files to support analyses. The project aims to link Kentucky's roadway databases to already-linked CRASH and injury files (emergency department visit and hospital discharges) for 2008-2014. The linked database will be used to assess the impact of cable median barriers on reducing injury severity and preventing specific types of injury. We will look for reductions in potentially long-term disabling injuries such as traumatic brain and spinal cord injuries.
Budget: $92,595.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-18-03
Project Title: University of Kentucky, KY Injury Prevention & Research Center - Improving Motor Vehicle Crash-Related Data Quality
Description: Provide analysis of Kentucky trauma data, improve trauma data management system, and increase the number of hospitals reporting to Kentucky Trauma Registry. The Kentucky Trauma Advisory Council will recruit four new hospitals as members of the trauma system. The new member hospitals will then initiate reporting to the state trauma registry. The Trauma registry staff will perform a comprehensive evaluation of the state's trauma data to assure that reported cases meet national criteria and are coded consistently. The results of this evaluation will be presented to the Trauma Advisory Council for review, and the council will provide guidance regarding potential quality improvements. The trauma registrars at each participating hospital will have two opportunities for in-person training and will be encouraged to consult with staff as needed during the year. Because there is considerable turnover in trauma registrar staffing, newly appointed registrars will be given the opportunity to participate in training as soon as feasible. Feedback from the registrars will be incorporated into training evaluations and planning for future educational programming.
Budget: $92,976.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-18-04
Project Title: Kentucky Emergency Medical Services Information System (KEMSIS)
Description: This project is a statewide initiative for collection, analysis, and integration of EMS System and Patient Care Data. The KEMSIS project is aimed to improve the accessibility and portability of patient care information between Kentucky EMS agencies and the KEMSIS system. The ultimate goal is to have 100% of EMS agencies electronically reporting their calls to the Kentucky Board of EMS database system. During the next fiscal year, the project will increase the completeness and quality of EMS incident reports by adopting and implementing national and state validation rules, conducting analysis and publishing

findings. The Kentucky Board of Emergency Medical Services will publish the findings of report analysis looking at such elements as seatbelt usage, alcohol and drug use indicators, and transport times. KBEMS will also strive to educate external stakeholders on the robustness of EMS data and make it an accessible tool using data sharing agreements to query EMS data for items such as severity of injury, and also identify trends.
Budget: $75,000.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-18-05
Project Title: University of Kentucky Transportation Center - Improvement of Fatal Crash Analysis and Follow-up
Description: Assess, identify, and recommend actions to improve the accuracy and completeness of fatal collision reporting. The project will review all fatal crash reports for 2016, analyze and document the consistency of investigations for fatal collisions, and then compare results from police reported fatal collision data and FARS data to identify differences. Results from the analysis could be used to identify countermeasures (legislation, engineering, education, and enforcement, emergency medical) to reduce fatal crashes. In addition, a subset of all fatal crashes, those involving alcohol and drugs would be given special attention. Following analysis, recommendations will be given where appropriate to the processes and procedures to improve inconsistencies between police reported fatal collision data and FARS data. Also, recommend supplemental types of data for inclusion in fatal crash reports and identify countermeasures to reduce fatal crashes.
Budget: $75,004.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-18-06
Project Title: University of Kentucky Transportation Center - Traffic Records Strategic Plan Implementation
Description: A new Kentucky traffic records strategic plan was developed during FY2017 and put into place June 30, 2017. The University of Kentucky Transportation Center, in co-operation with both the Kentucky Traffic Records Advisory Committee (KTRAC) and the KY Office of Highway Safety, will continue to analyze, identify, refine, improve, and monitor status of performance metrics from the Traffic Records Strategic Plan. This project will continue the development and implementation of procedures for regularly monitoring the quality of traffic records in Kentucky. The procedures and data collection will facilitate the efforts of the KTRAC data quality improvement sub-committee team to effectively review the existing traffic records system, identify potential improvements, and report to the KTRAC membership. The research will update and advance the Traffic Records Implementation Plan (TRIP), which is being developed to assist the Kentucky traffic records community in meeting the goals and objectives identified in the Strategic Plan.
Budget: $75,000.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-18-07
Project Title: University of Kentucky Transportation Center - Traffic Safety Data Service (KTSDS)
Description: Develop and execute a traffic records data and analysis quick response team at the Kentucky Transportation Center (KTC). The Kentucky Transportation Center has considerable resources and expertise for identifying and addressing safety concerns using a variety of traffic records databases and tools. The aim of this project is to increase access to data from the six traffic record systems, but especially to increase access to expert resources with a more in-depth knowledge of the databases. Accordingly, KTC will develop and host a free traffic data service to enable users to access an expert to conduct small studies and get answers to traffic safety problems. These answers would ordinarily be out of reach due to a)

difficulty and expense of contracting, or b) lack of awareness that such expert resources exist and are available to them. The project will also develop a website documenting and publicizing the service.
Budget: $28,606.00 (NHTSA 405C MAP-21 funds)

FY 2017

Project Number: M3DA-17-02
Project Title: University of Kentucky, Kentucky Transportation Center – KY Traffic Records Assessment Program
Description: The Kentucky Transportation Center will work with the Kentucky Transportation Cabinet, Kentucky State Police, Department of Criminal Justice Training, Kentucky Board of Emergency Medical Services, KIPRC, and other agencies as appropriate and available, to collaboratively develop metrics and obtain data to evaluate the quality among the following traffic records systems: crash, roadway, vehicle, driver, citation/adjudication and injury surveillance.
Budget: $25,000.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-17-03
Project Title: Kentucky State Police – Training Modules for KYOPS
Description: Recently, with KYTC funding the Kentucky Stated Police updated and enhanced the KyOPS/CRASH client application, traffic safety related wizards, and Web Portal. The new version of KyOPS includes feature-rich components that help the user search and analyze data like never before. Because some these features did not exist in the old version and require special attention to utilize, detailed training is required. The new version is less familiar for users; therefore, new training must be established.
Budget: $37,500.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-17-04
Project Title: Kentucky Emergency Medical Services Information System (KEMSIS)
Description: This project is a statewide initiative for collection, analysis, and integration of EMS System and Patient Care Data. The KEMSIS project is aimed to improve the accessibility and portability of patient care information between Kentucky EMS agencies and the KEMSIS system. The goal is to have 100% of EMS agencies electronically reporting their calls to the Kentucky Board of EMS database system. Approximately 40% of EMS agencies in Kentucky still utilize paper copies to track patient information. The continuance of this project will allow those agencies to adopt an electronic system of submission for their patient care reports, and allow KBEMS to set a goal to accept data from at least 90% of Kentucky EMS agencies by September 30, 2017. The project will also allow stakeholder agencies to query EMS data for items such as severity of injury, and identify trends.
Budget: $80,000.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-17-05
Project Title: University of Kentucky**,** KY Injury Prevention & Research Center – Enhance Completeness, Timeliness and Accuracy of Kentucky Motor Vehicle Trauma Data
Description: This ongoing project expects to have 32 reporting facilities by the end of FY 2016. During FY2017, the goal is to add an additional five hospitals providing data to the Kentucky Trauma Registry (KTR) strategically located in areas of need. The goals of this grant include: 1) to improve the completeness of Kentucky highway traffic safety data by increasing the number of hospitals reporting data to the Kentucky Trauma Registry by 5 in FY 2017; 2) to improve the completeness of Kentucky highway traffic safety data by increasing the number of patient records reported to the Kentucky Trauma Registry from 12,525 in FY 2015 (preliminary data) to 13,525 in FY 2017; 3) to improve the timeliness of highway traffic safety data reports provided to state officials and policymakers, including the Kentucky Trauma Registry annual report and other analyses addressing areas of concern, by providing support for professional staff and software upgrades throughout the budget year; 4) to improve the accuracy of Kentucky highway traffic safety data with training and education for trauma registrars individually upon request and as a

group at least once at a statewide meeting during FY 2017; 5) to improve the ability of the Kentucky trauma registry to reduce highway traffic-related injuries and deaths by adding data fields that support the development of uniform performance standards for participating hospitals statewide.
Budget: $100,000.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-17-06
Project Title: University of Kentucky, KY Injury Prevention & Research Center (KIPRC) Improving Identification of Drugged Driving Collisions and Injuries Using Multiple Data Sources
Description: With support from NHTSA's Crash Outcome Data Evaluation System (CODES) program and Section 405/408 traffic records improvement grants from the Kentucky Office of Highway Safety, KIPRC has linked CRASH records with several injury databases. The goal of this grant is to improve the completeness of drugged driving data on Kentucky's CODES files. We will do this by consolidating information on drug involvement captured in injury surveillance databases that have been linked with CRASH, including FARS, hospital inpatient claims records, emergency department claims records, and trauma registry records.
Budget: $12,650.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-17-07
Project Title: University of Kentucky, KY Injury Prevention & Research Center Ramp Crash Reconciliation and Estimation of Missing Ramp Volumes
Description: Despite the high quality of crash and roadway data in Kentucky, the accuracy of data for ramps has been problematic. Many routes, particularly interstates, in Kentucky have exaggerated crash experiences due to ramp crashes being incorrectly assigned to them. An effort to estimate the missing ramp traffic volumes would allow researchers to better understand the safety issues they face. More accurately locating ramp crashes, along with a more complete inventory of ramp volumes, will be beneficial to safety professionals.
Budget: $49,720.00 (NHTSA 405C MAP-21 funds

FY 2016

Project Number: M3DA-16-02
Project Title: University of Kentucky, Kentucky Transportation Center – KY Traffic Records Assessment Program
Description: The Kentucky Transportation Center will work with the Kentucky Transportation Cabinet, Kentucky State Police, Department of Criminal Justice Training, Kentucky Board of Emergency Medical Services, KIPRC, and other agencies as appropriate and available, to collaboratively develop metrics and obtain data to evaluate the quality among the following traffic records systems: crash, roadway, vehicle, driver, citation/adjudication, and injury surveillance.
Budget: $70,478.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-16-03
Project Title: University of Kentucky**,** KY Injury Prevention & Research Center –
Enhance Completeness, Timeliness and Accuracy of Kentucky Motor Vehicle Trauma Data
Description: This project will support the inclusion of the expanded trauma data set, which is part of a uniform national data set in the statewide trauma registry report. A growing number of hospitals have expressed interest in trauma system participation. This project intends to add new reporting entities, including one major south central Kentucky hospital, making a total of at least 34 providing data to the Kentucky Trauma Registry (KTR). This grant will: 1) provide modest first-year financial support for facilities that seek Level III or IV status within the state's trauma system, allowing them to connect with the online reporting network; 2) update and expand the software for the state's reporting system; 3) add data fields to the KTR that support the development of uniform performance standards for participating hospitals statewide; and 4) provide the analytical expertise necessary to produce the annual statewide KTR report as well as ad hoc reports requested to address specific areas trauma data concern.
Budget: $98,906.95 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-16-04
Project Title: University of Kentucky, KY Injury Prevention & Research Center
CRASH-FARS-Death Certificate Integration
Description: The primary aim of this project is to link the NHTSA Fatality Analysis Reporting System (FARS) and the Kentucky death certificate databases for 2010 through 2014, and provide a link between the Kentucky CRASH databases and the linked FARS-Death Certificate records. The integration of the CRASH, FARS and Death Certificate systems through this project will enhance Kentucky's capacity to conduct surveillance and research on fatal crashes involving Kentucky residents.
Budget: $45,406.79.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-16-05
Project Title: University of Kentucky, KY Injury Prevention & Research Center
CRASH-Hospital Integration (CODES)
Description: This project has two primary aims. First will be to link (integrate) the Kentucky CRASH, hospital inpatient and hospital outpatient (including emergency department) databases for 2014. Second is to use this linked database, and similar databases from previous years, to produce a comprehensive report on charges resulting from traffic crashes in Kentucky from 2008 to 2014. The objective of the second aim is to increase accessibility to the integrated CRASH-Inpatient-Outpatient data, particularly the data on crash-related hospital and emergency department charges.
Budget: 83,942.87 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-16-06
Project Title: Kentucky Emergency Medical Services Information System (KEMSIS)
Description: This project is a statewide initiative for collection, analysis, and integration of EMS System and Patient Care Data. The KEMSIS project is aimed to improve the accessibility and portability of patient care information between Kentucky EMS agencies and the KEMSIS system. The goal is to have 100% of EMS agencies electronically reporting their calls to the Kentucky Board of EMS database system. Approximately 40% of EMS agencies in Kentucky still utilize paper copies to track patient information. The continuance of this project will allow those agencies to adopt an electronic system of submission for their patient care reports, and allow KBEMS to set a goal to accept data from at least 90% of Kentucky EMS agencies by September 30, 2016. The project will also allow stakeholder agencies to query EMS data for items such as severity of injury, and identify trends.
Budget: $80,000.00 (NHTSA 405C MAP-21 funds)

FY 2015

Project Number: M3DA-15-04
Project Title: University of Kentucky, Kentucky Transportation Center – KY Traffic Records Assessment Program
Description: The Kentucky Transportation Center will work with the Kentucky Transportation Cabinet, Kentucky State Police, Department of Criminal Justice Training, Kentucky Board of Emergency Medical Services, KIPRC, and other agencies as appropriate and available, to collaboratively develop metrics and obtain data to evaluate the quality among the following traffic records systems: crash, roadway, vehicle, driver, citation/adjudication, and injury surveillance.
Budget: $75,000.00 (NHTSA 405C MAP-21 funds)

Project Number: M3DA-15-05
Project Title: University of Kentucky, Kentucky Transportation Center – CRASH-EMS Traffic Records Integration
Description: This project will link the CRASH database for 2014 from Kentucky State Police with the Emergency Medical Services (EMS) database for 2014 from the Kentucky Board of EMS and the hospital inpatient and emergency department databases for 2014 from the Kentucky Office of Health Policy. The project will also link CRASH, hospital inpatient, and ED databases for 2014. This is essentially a project to expand traffic records linkages formerly done under the NHTSA CODES project to include the EMS database.
Budget: $86,651.00 (NHTSA 405C MAP-21 funds)

Project Number: K9-15-01
Project Title: Kentucky Emergency Medical Services Information System (KEMSIS)
Description: This project is a statewide initiative for collection, analysis, and integration of EMS System and Patient Care Data. The KEMSIS project is aimed to improve the accessibility and portability of patient care information between Kentucky EMS agencies and the KEMSIS system. The goal is to have 100% of EMS agencies electronically reporting their calls to the Kentucky Board of EMS database system. Approximately 40% of EMS agencies in Kentucky still utilize paper copies to track patient information. The continuance of this project will allow those agencies to adopt an electronic system of submission for their patient care reports, and allow KBEMS to set a goal to accept data from at least 90% of Kentucky EMS agencies by September 30, 2015. The project will also allow stakeholder agencies to query EMS data for items such as severity of injury, and identify trends.
Budget: $80,000.00 (408 SAFETEA-LU funds)

Project Number: K9-15-02
Project Title: University of Kentucky**,** KY Injury Prevention & Research Center – Improving Scope and Quality of KY Trauma Data
Description: This project will support the inclusion of the expanded trauma data set, which is part of a uniform national data set in the statewide trauma registry report. A growing number of hospitals have expressed interest in trauma system participation. This project intends to add 10 new reporting entities, including one major south central Kentucky hospital, making a total of at least 30 providing data to the Kentucky Trauma Registry (KTR). This grant will: 1) provide modest first-year financial support for facilities that seek Level III or IV status within the state's trauma system, allowing them to connect with the online reporting network; 2) update and expand the software for the state's reporting system; 3) support essential staff travel to attend in-state meetings; and 4) provide the analytical expertise necessary to

produce the annual statewide KTR report as well as ad hoc reports requested to address specific areas trauma data concerns.
Budget: $110,237.00 (408 SAFETEA-LU funds)

Project Number: K9-15-03
Project Title: University of Kentucky, KY Transportation Center – Quality Control of HIS Data
Description: The purpose of this study will be to perform a quality check of critical Highway Information System data elements. This study will limit its focus to planning data (HIS, Traffic, and Class Counts). The study will determine a statistically significant data comparison of these data elements, report findings by state, Highway District Office (HDO), Metropolitan Planning Organizations (MPO), and Area Development Districts (ADDs), and summarize any systemic issues uncovered with the data audit. The project will develop a baseline of quality of HIS data by September 2015, with the goal to decrease the number erroneous HIS elements from this baseline to under 5% in 2016.
Budget: $50,000.00 (408 SAFETEA-LU funds)

Project Number: K9-15-04
Project Title: University of Kentucky, KY Transportation Center – HIS Asset for Safety Roadway Features
Description: Several low-cost, systemic countermeasures have been applied to Kentucky's roadways in the last few years. While the safety benefit of these treatments is assumed to exist, there is a need to quantify them, and furthermore, track their application. Currently none of these safety treatments are included in the Highway Information System (HIS) database. Such features include rumble strips, centerline rumble stripes, edge line rumble stripes, safety edge, and high friction treatments. This project will identify the location and increase the inventory in the HIS database of cable barrier, rumble stripes, rumble strips, safety edge, and high friction surface treatments from 0% to 100% by September 2015.
Budget: $50,000.00 (408 SAFETEA-LU funds)

Project Number: K9-15-05
Project Title: University of Kentucky, KY Transportation Center – usRAP Methodology
Description: Few safety data elements are available for non-state-maintained county secondary roads. However, crashes on these roads can often be severe due to high speeds, narrow lanes, sharp curves, and severe roadsides. The Kentucky Transportation Center (KTC) will select 10 counties in which to collect roadway safety data on 500 miles of rural secondary roads using the US Roadway Assessment Program (usRAP) methodology. KTC will collect and upload all data to usRAP tools online program for processing. The tool develops countermeasure improvement programs for highway authorities. KTC will use the processed data to create a Safer Roads Investment Program which will be provided to officials in each of the 10 counties. KTC will provide all processed data in GIS format to the Kentucky Transportation Cabinet for inclusion in the Highway Information System database.
Budget: $50,000.00 (408 SAFETEA-LU funds)

Project Number: K9-15-06
Project Title: University of Kentucky, Kentucky Injury Prevention & Research Center – Trauma Registry CRASH Data
Description: The new project will probabilistically link the 2014 CRASH and Trauma Registry data. Goals of the project include: 1) increase the percentage of appropriate records in the 2014 Trauma Registry that are linked to 2014 CRASH records by 10% compared with the 2012 baseline linkage. The improvement in the linkage is expected as a result of the new state-specific data fields added in 2013 trauma registry data collection, including EMS run number, transport origin, and transport agency; 2) Establish a baseline percentage on the completeness of the data elements in both systems pertaining to commercial vehicle

occupants; 3) Establish a baseline percentage on accuracy of the information in the both systems pertaining to commercial vehicle occupants.
Budget: $80,245.00 (408 SAFETEA-LU funds)

Project Number: K9-15-07
Project Title: Kentucky State Police E-crash and KyOPS Web Portal
Description: The current version of Kentucky's Open Portal Solutions (KyOPS) client and the traffic safety-related client wizards are written in the Microsoft's Visual Basic 6, which has not been supported since April 8, 2008. During this project, the KyOPS client application will be rewritten in the latest supported programming language Microsoft Visual Studio 2013. The following updates are scheduled to be completed during this grant year: 1) There will be new ways to collect and capture data, eliminating duplicate data entry, which will dramatically decrease the time it takes to create KyOPS reports and increase the accuracy of the data; 2) Redesign how created and archived reports are stored, accessed, and managed on the KyOPS Client, improving reporting timeliness and accessibility; 3) A new client mapping component will be created with street level view mapping functionality for increased accuracy of incident location data; 4) The latest version of the Model Minimum Uniform Crash Criteria (MMUCC) 4th Edition Guidelines will be incorporated into the E-Crash wizard module during the grant cycle; 5) The KyOPS Web Portal will be rewritten with improved analytics, better identification of problem areas, enhanced search features, the ability to save searches and customizable output variables within search results.
Budget: $1,031,490.00 (408 SAFETEA-LU funds)

Appendix 3: Summary of Deficiency Assessment Using NHTSA Questions

Survey Results

Designated liaisons and other officials at each database answered questions from the National Highway Traffic Safety Administration Advisory Document. The advisory contains a list of questions for each traffic records database. The questions in the advisory are designed to provide a broad portrait of the qualities and capacities of each database along with questions to assess the current ability of database officials to use their data to improve database performance. The databases are: Driver, Vehicle, Emergency Medical Services (EMS), Roadway, Citation/Adjudication, and Injury Surveillance. The latter contains questions for several distinct databases: hospital emergency department; hospital discharge, vital records, and the trauma registry

There were approximately 30 to 60 questions for each database. The appropriate questions were electronically mailed to the liaison for each database. Questions asked about the presence of a quality, capacity, or use of each database that NHTSA considers important. The response categories are:

- Yes, the database has the quality or capacity or use
- No, it does not
- Don't know if the database has it

NHTSA has three ratings for the quality or capacity particular questions refer to. These imply the importance of the quality, capacity, or use in question. They are: Very Important (VI); Somewhat Important (SI); and Less Important (LI).

The importance rating is indicated in reporting results for a specific database's quality or capacity: VI, SI, or LI. Database descriptions are grouped under thematic headings. These vary depending on the specific concerns of the database.

The results under each thematic heading are placed in two categories: qualities and capacities that are currently in the database, and qualities and capacities that are either absent or about which the correct answer is unknown.

CRASH Database—NHTSA Survey Responses

The survey of the CRASH database can be divided into several categories of questions:

- Interface with other databases
- Database consolidation and custodian
- Reporting criteria
- Data use for highway safety
- Sources of data definitions
- Data gathering method and submission
- Data documentation; correction of errors
- Performance measures and goals
- Organizational data use to improve performance

Interface with Other Databases

Present

The CRASH database has the following interface links with the driver database: driver name and date of birth, license number, and driver address. CRASH has the following links with the vehicle system: vehicle

make and model, year, license plate number, and vehicle identification number. It has the following links with the roadway database: precise location, latitude/longitude coordinates, route and milepost, and street address. All links are rated somewhat important (SI).

<u>Absent or unknown</u>

The CRASH database has **no** permanent links with either the citation and adjudication database or the injury surveillance system. All links are rated somewhat important (SI). However, it has been integrated with injury surveillance data on several occasions in recent years.

Database Organization/Structure

<u>Present</u>

The statewide CRASH database is consolidated into one database (VI). Kentucky State Police is the custodian (VI).

Reporting Criteria

<u>Present</u>

Kentucky has reporting criteria for the following: fatal crashes, injury crashes, property damage crashes, and crashes occurring in non-traffic areas (e.g., parking lots, driveways). All are rated VI.

Data Use for Highway Safety

<u>Present</u>

Data from the crash system are used to identify crash risk factors (VI). They are used to do the following, all of which are rated VI: guide engineering and construction projects, prioritize law enforcement activity, and evaluate safety countermeasure programs.

<u>Absent or Unknown</u>

Document retention and archival storage policies **do not** meet the needs of safety engineers and other users who legitimately require long-term access to crash data reports (SI). They are kept for 10 years, at which point the documents are purged. Safety engineers often require more than 10 years of data.

Sources of Data Definitions

<u>Present, but perhaps in need of updating</u>

Officials responsible for the CRASH database said that they do not have a formal data dictionary. However, they have a list of code values and descriptions. This skeletal data dictionary does not explain how the codes are used within the database or contain the tables that house the codes.

<u>Absent or unknown</u>

Respondents answered **do not know** to these questions: "Are the ANSI-D 16 and ANSI S- D20 used as sources for the definitions in the crash system data dictionary (SI)?" and "Does the data dictionary provide a definition for each data element and define that data elements allowable values (SI)?"

Respondents indicated that MMUCC **is not** the primary source for identifying the crash data elements and attributes the state collects (VI). Respondents said that the data dictionary **does not** document the system edit checks and validation rules (SI). It **is not** up to date and consistent with the field data collection manual, coding manual, crash report, and any training materials (VI). Last, **it does not** indicate the data elements populated through links to other traffic records system components (SI).

Data Gathering Methods and Submission

All law enforcement agencies collect crash data in the field (SI). Those performing electronic data collection submit the data electronically to the statewide crash system (VI). They apply validation rules consistent with those in the statewide crash system prior to submission (VI).

Documentation

Present

The processes for managing errors and incomplete data are documented.

Absent or Unknown

The state **does not** 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 submission of fatal crash data to the state FARS unit and commercial vehicle crash data to SafetyNet (VI).

Respondents **did not know** if 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 (SI)?

Data Correction and Quality Control

Present

There are 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 (VI). 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 officers (SI). There are formally documented processes established for returning rejected crash reports to the originating officer and tracking resubmission of the report (VI).

Performance Measures

Present

Respondents stated that they have performance measures for all six attributes. All the performance measures are rated VI.

Numeric Goals

Respondents said that the state has established numeric goals for each performance metric. This appears to reflect a confusion caused by the question wording, as goals and metrics are conceptually distinct. Currently the CRASH system has metrics (performance measures) but **not** numeric goals.

Use of Organizational Data to Improve Performance

Present

Respondents stated that data quality feedback from key users is regularly communicated to data collectors and data managers (SI).

Absent or Unknown

Respondents answered these queries **in the negative**: "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 (VI)?" "Are independent sample-based audits periodically conducted for crash reports and related database contents (SI)?

Respondents **did not know** the answer to these queries: "Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions (VI)?" and "Are data quality management reports provided to the TRCC for regular review (SI)?"

CRASH Database Metrics Data and Suggestions for Improvements

CRASH--Kentucky State Police

The CRASH database is now significantly more MMUCC compliant. In the 2014 reporting, the CRASH database was 69% MMUCC compliant; today it is 89% compliant. In the 2016 reporting, the average number of days to enter data—a timeliness metric—improved for E-reports (dropping from 11.6 days in 2014 to 6.61 days in 2016), but rose slightly for paper reports (from 8.8 days to 9.5 days). The percentage of reports returned to local agencies for correction dropped from 1.6% to 0.4% while the number of E-reports with user entry override increased from 18 to 25. The number of daily queries on the public site rose substantially, from 1,457 to 3,995, as did the number of accident reports purchased daily, which increased from 217 to 295.

KSP—CRASH Database Suggestion for Improvement

The CRASH liaison would like to see all the reporting jurisdictions in the state use the same form—one that is electronic—to enhance uniformity.

Possible Goals for Improvements for CRASH Database

1. Identify the resources, tools and technologies needed to begin collecting data on three measures of traffic incident management (TIM): Roadway Clearance Rate; Incident Clearance Time; and Secondary Crashes (completeness).
2. Assess the current level of timeliness, uniformity, accuracy, completeness and accessibility of TIM data.
3. Reduce the variance of police reported alcohol and drug-related data on fatalities compared to FARS data from 175% to 0%.
4. Link CRASH, roadway, and injury data.
5. Increase the document retention and archival storage policies from 10 years to 20 years.
6. 100% use of E-reporting by the reporting law enforcement jurisdictions.

Emergency Medical Services—NHTSA Survey Results

Present

One entity collects and compiles data from local EMS agencies (VI).

Interface with Other Databases

Present

There is an interface among the EMS database and the emergency department and hospital discharge databases (SI).

Absent or Unknown

There **is no** interface between EMS data and trauma registry data (VI).

Database Organization/Structure

The state has a NEMSIS-compliant statewide database (VI); the state EMS database collects GCS data for motor vehicle crash patients (LI).

<u>Absent or Unknown</u>

The EMS system **does not** track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the state (VI).

There **is no** process flow diagram that illustrates the EMS system's key data process flows, including inputs from other systems (VI). <u>Likewise, there **are no** </u>separate procedures for paper and electronic filing of EMS patient care reports (LI).

Data Correction and Quality Control

<u>Present</u>

There are automated edit checks and validation rules to ensure that entered data fall within a range of acceptable values and that there is logical consistency among data elements (VI).

<u>Absent or unknown</u>

Quality control staff working with the statewide EMS data base **do not have** limited state-level correction authority to amend obvious errors and omissions without returning the report to the originating entity (SI). There **are no** formally documented processes for returning rejected EMS patient care reports to the collecting entity and tracking resubmission to the statewide EMS database (VI). <u>There **are no** </u>documented procedures for returning data to the reporting EMS agencies for quality assurance and improvements (e.g., correction and resubmission) (VI).

Performance Measures

<u>Present</u>

There are performance measures, tailored to the needs of the EMS system managers and data users, for the following performance attributes: timeliness, accuracy, completeness, and uniformity.

<u>Absent or unknown</u>

There **are no** performance measures for integration and accessibility. All performance measures are rated VI.

Numeric Goals

<u>Absent</u>

The state **has not established** numeric goals for the performance attributes (SI).

Data Dictionary

<u>Present</u>

The EMS system has a formal data dictionary (VI). The EMS system also has formal documentation that provides a summary dataset—characteristics, values, limitations, and exceptions, whether submitted or created—and details how it is collected, managed, and maintained (VI).

Use of Organizational Data to Improve Performance

<u>Present</u>

Aggregate EMS data are available to outside parties (e.g., university, traffic safety professionals) for analytical purposes (VI).

Absent or Unknown

The respondent indicated that the EMS database **does none of the following**: use high frequency errors to update EMS system training content, data collection manuals, and validation rules (VI), conduct quality control reviews to ensure the completeness, accuracy, and uniformity of injury data in the EMS system (SI); use periodic comparative and trend analyses to identify unexplained differences in the EMS data across years and agencies (LI); regularly communicate data quality feedback from key users to EMS data collectors and data managers(SI); and produce data quality management reports and make them available to the state TRCC (SI). Also, there **are no** documented procedures for returning data to the reporting EMS agencies for quality assurance and improvements (e.g., correction and resubmission) (VI).

Possible Goals for Improvements for EMS Database

EMS database

1. Increase the number of EMS agencies reporting data to the KEMSIS (uniformity).
2. Implement national standard and state-specific validation rules to increase the completeness and accuracy of reported data (completeness and accuracy).
3. Conduct analysis, publish reports, and execute data sharing agreements with external stakeholders (accessibility).
4. Create a uniform data dictionary.

Citation/Adjudication—NHTSA Survey Results
Interface with Other Databases

Present

The Kentucky State Police assign unique citation numbers (VI).

The respondent indicated citation data are linked with the drivers system to collect driver information, carry out administrative actions (e.g., suspension, revocation, cancellation, interlock), determine the applicable charges, and post the dispositions to the driver file (VI).

Absent or unknown

There **is no** statewide system that provides *real-time* information on individuals' driving and criminal histories (VI). **No** agency participates in or has access to a system providing *real-time* information on individuals' driving and criminal histories (VI). **No** statewide data system tracks citation dispositions (SI).

The courts' case management systems **are not** interoperable among all jurisdictions within the state (VI).

Final dispositions **are not** posted on the driver data system (SI).

Compared to the use of citation data, the respondent said adjudication data **is not** linked to the driver system to collect certified driver records and administrative actions (e.g., suspension, revocation, cancellation, interlock) to determine the applicable charges and post the dispositions to the driver file (VI). Citation data **are not** linked with the vehicle file to collect vehicle information and carry out administrative actions (e.g., suspension, revocation, cancellation, interlock, interlock mandates and supervision) (VI).

Citation data and adjudication data **are not** linked with the crash file to document violations and charges related to the crash (SI).

Database Organization/Structure

Present

The appropriate components of the citation and adjudication systems adhere to the National Crime Information Center data guidelines and the Uniform Crime Reporting Program guidelines (LI). They also adhere to the National Incident-Based Reporting system guidelines (SI).

Kentucky uses the National Center for State Courts guidelines for court records (SI).

Absent or unknown

Kentucky **does not** use the Global Justice Reference Architecture (SI).

The respondent **did not know** if the appropriate components of the citation and adjudication systems adhere to the National Law Enforcement Telecommunications System guidelines (SI), the National Law Enforcement Information Network guideline (SI), the Functional Requirement Standards for Traffic Court Case Management (SI), or the NIEM Justice Domain guidelines (SI).

The respondent **did not know** if the state has an impaired driving data tracking system that meets the specifications of NHTSA's Model Impaired Driving Records Information System (SI).

Data Dictionary

Absent or unknown

The respondent **did not know** if the citation system has a data dictionary (VI) and answered don't know in response to these questions: "Do the citation dictionaries clearly define all data fields? (VI)" "Are the citation system data dictionaries up to date and consistent with the field data collection manual, training materials, coding manuals and corresponding reports? (VI) Do the citation dictionaries indicate the data fields that are populated through interface linkages with other traffic records system component? (VI)

The courts' case management data dictionaries **do not** provide a definition for each data field or clearly define all data fields (VI). The courts' case management system data dictionaries **do not** indicate the data fields populated through interface linkages with other traffic records system components (SI).

The respondent **did not know** if prosecutors' information systems have data dictionaries (SI).

Tracking Capability

Present

The state can track DUI citations (VI); its tracking system includes BAC and drug testing results (VI). The state has a system for tracking administrative driver penalties and sanctions (VI). The state also has a system for tracking juvenile offender citations (VI) and can distinguish between the administrative handling of courts payments in lieu of court appearances (mail-ins) and court appearances (SI).

Absent or unknown

The respondent **did not know** if the state can track citations from point of issuance to posting on the driver file (VI). They also **did not know** if the state measures compliance with the process outlined in the citation lifecycle flow chart (SI).

The respondent **did not know** if the state's DUI tracking systems have additional quality control procedures to ensure the accuracy and timeliness of the data (SI). They also **did not know** if the state's

impaired driving data tracking system meets the specifications of the NHTSA's Model Impaired Driving records Information System (SI).

Performance Measures

Present

There is a performance measure for uniformity of the citation system (paper versus electronic) (SI).

Absent or unknown

The respondent said there **were no** performance measures for the adjudication system. Both citation and adjudication have the same ratings for the attributes: timeliness (SI), accuracy (VI), integration (SI), accessibility (LI), completeness (SI), and integration (SI).

Numeric Goals

The state has not established numeric goals

Use of Organizational Data to Improve Performance

Absent or unknown

The respondent **did not know** if citation and adjudication data are 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 the courts (VI).

Possible Goals for Improvements for Citation/Adjudication Database

Citation/Adjudication

1. A data dictionary with all of NHTSA's desired attributes.
2. 100% electronic reporting.
3. Removal of old codes from forms.

Vehicle—NHTSA Survey Results
Database Organization/Structure

Present

Custodial responsibility for the identification and ownership of vehicles registered in the state resides in a single location (SI). State records contain vehicle make, model, year of manufacture, body type and title brands (SI). The state adheres to the AAMVA's title brand guidelines (VI).

Absent or unknown

The state **does not** participate in the Performance Registration System and Management program (VI). Vehicle registration documents **are not** barcoded—using at a minimum the 2D standard—to allow rapid, accurate collection of vehicle information by law enforcement officers in the field using barcode readers or scanners (VI).

Interface with Other Databases

Present

Personal information entered in the vehicle system uses the same conventions used in the driver system (VI). When a citation or crash report is created, vehicle system data can be used and processed in real time (VI) to verify and validate the vehicle information (SI). The VIN, title number, and license plate number are the key variables used to retrieve the vehicle records (VI).

The vehicle system provides title information data to the National Vehicle Tile Information System daily (VI) and queries NMVTIS before issuing new titles (VI). The state validates every VIN with a verification software application (LI).

<u>Absent or unknown</u>

Driver and vehicle files are not unified into one system (SI).

When discrepancies are identified during data entry into the crash data system, vehicle records **are not** flagged for possible updating (LI).

Data Dictionary and Process

<u>Present</u>

In the vehicle system each data field has a documented definition (SI). The collection, reporting, and posting procedures for registration, title, and title brand information are formally documented (VI). In addition, there is a process flow diagram describing the vehicle data system (SI). The steps from the initial event (title, registration) to final entry in the statewide vehicle system are documented in the process flow diagram (SI). The diagram also shows alternative data flows and timelines (SI). The diagram or narrative is annotated to show the time required to complete each step (SI). And the diagram explains the timing, conditions, and procedures for purging records from the vehicle system (SI). The process flow diagram or narrative contains processes for error correction and error handling (SI).

The state records and maintains the title brand history previously applied to other states (VI).

Data Correction and Quality Control

<u>Present</u>

The vehicle system includes edit checks and data collection guidelines that correspond to the data definitions (SI). There are 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 (VI). See next section for more on error detection and handling.

Limited state-level correction authority is granted to quality control staff working with the statewide vehicle system to amend obvious errors and omissions (SI).

System Operation and Capabilities

<u>Present</u>

The vehicle system flags or identifies vehicles reported as stolen to enforcement (VI) and removes the flags when the vehicle has been recovered or junked (VI).

The state records and maintains the title brand history of automobiles previously registered in other jurisdictions (VI). The steps from the initial event (title, registration) to the final entry into the statewide vehicle system are documented in a process flow diagram (VI) that contains processes for error correction and error handling (SI). And the process flow diagram is annotated to show the time required to complete each step (SI). The process flow diagram also shows alternative data flows and timelines (SI). It explains the timing, conditions, and procedures for purging records from the vehicle system (SI).

Performance Measures

Vehicle has performance measures for three performance attributes: timeliness, integration and accessibility.

Absent or unknown

Vehicle has no measures for uniformity, accuracy, and completeness. All performance measures are rated VI except accessibility, which is rated SI.

Numeric Goals

The state **has not** established numeric goals for each performance measure (VI).

Use of Organizational Data to Improve Performance

Present

High frequency errors are used to update training content and data collection manuals, update the validation rules, and prompt form revisions (VI). Data quality feedback from key users is regularly communicated to data collectors and data managers (SI).

Absent or unknown

Vehicle **does not** conduct independent sample-based audits for periodic vehicle reports and related database contents for that record (SI). Periodic comparative and trend analyses are not used to identify unexplained differences in the data across years and jurisdictions (VI).

The respondent **did not know** if data quality management reports are provided to the TRCC for regular review (VI).

Motor Vehicle Database Suggestions for Improvement

The liaison saw a critical need to integrate the CRASH database with vehicle registration. They mentioned an effort to do so in 2012 that failed.

Possible Goals for Improvements for Vehicle Database

1. Participate in the Performance Registration System and Management program.
2. Conduct periodic comparative and trend analyses are not used to identify unexplained differences in the data across years and jurisdictions.

Roadway—NHTSA Survey Results
Database Organization/Structure and Interface

Present

All public roadways in the state are located using a compatible location referencing system (VI). All roadway and traffic data elements are located using a compatible location referencing system (e.g., LRS, GIS) (VI). All public roads are included in the system (VI).

The state can identify crash locations using a referencing system compatible with the one(s) used for roadways (VI).

Absent or unknown

The location coding methodologies for all state roadway information systems **are not** compatible (VI). The respondent **did not know** if the location coding methodologies for all regional and local roadway systems are compatible (SI).

There are interface linkages connecting some, but not all (which is desired), of the state's discrete roadway information systems (VI). Roadway data systems maintained by regional and local custodians (e.g., MPOs, municipalities) **do not** interface with the state roadway information system (SI).

Crash data **are not** incorporated into the roadway information system for safety analysis and management use (VI).

MIRE

Note. The respondent crossed out the word 'enterprise' in the phrase "state's enterprise roadway inventory" wherever it occurred.

Present

All MIRE Fundamental Data Elements for all public roads are collected (SI). All additional collected data elements for any public roads conform to the data elements included in MIRE (SI).

Data Dictionary

Present

The system's data dictionary documents all the MIRE fundamental Data Elements for all public roads (SI). It also documents all additional MIRE data elements for any public roads (SI). All roadway data imported from local or municipal sources comply with the data dictionary (VI). Moreover, there is guidance on how and when to update the data dictionary (VI). And there are guidelines for collecting data elements as they are described in the state roadway inventory data dictionary (VI).

Absent or unknown

The steps for incorporating new elements into the roadway information system (e.g., a new MIRE element) **are not** documented to show the flow of information (VI), **nor** are the steps for updating roadway information documented to show the flow of information (VI). The steps for archiving and accessing historical roadway inventory **are not** documented (SI).

Local Agency Procedures

Present

The procedures that a local agency (e.g., county, MPO, municipality) uses to collect, manage, and submit roadway data to the statewide inventory are documented (SI).

The respondent **did not know** if the local procedures for collecting and managing the roadway data are compatible with the state's roadway inventory (VI).

Data Correction and Quality Control

Present

There is a formal program of error/edit checking as data is entered in the statewide system for the overall quality of information in the roadway system (VI). And there are procedures for prioritizing and addressing detected errors (VI).

There are procedures for sharing quality control information with data collectors through individual- and agency-level feedback and training (VI). The overall quality of information in the roadway system depends on a formal program of error/edit checking as data are entered in the statewide system (VI).

There are interface linkages connecting the state's discrete roadway information systems (VI).

Performance Measures

Present

There are performance measures for the following attributes of the **state** roadway information system: timeliness (VI), accuracy (VI), completeness (VI), uniformity (VI).

There are no performance measures for integration (VI) and accessibility (VI). And, there **are no** performance measures for roadway data maintained by **regional and local custodians** (e.g., municipalities, MPOs)

Performance measures for the **state** system are labelled very important, while those for the **regional and local custodians** are deemed somewhat important.

Numeric Goals

The state **has not** established number goals.

Use of Organizational Data to Improve Performance

Present

Roadway system data managers regularly produce and analyze reports (VI). The state roadway information system gives MPOs and local transportation agencies on-demand access to data (SI).

Driver Database—NHTSA Assessment Results
Database Structure and Content

Present

Driver information is maintained in a manner that accommodates interaction with the National Driver Register's PDPS and the CDLIS (VI). The contents of the driver system are documented with data definitions for each field (VI).

Custodial responsibility for the driver system—including commercially licensed drivers—resides in a single location (VI). The custodial agency maintains accurate and up-to-date documentation detailing the licensing, permitting, and endorsement issuance procedures (manual and electronic, where applicable (SI)).

Among its responsibilities, the custodial agency does the following:

a. Maintains accurate and up to date documentation detailing the reporting and recording of relevant citations and convictions (manual and electronic where applicable(SI))
b. Maintains accurate and up-to-date documentation detailing the reporting and recording of driver education and improvement course (manual and electronic where applicable(SI))
c. Maintains 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(SI))

d. Maintain accurate and up-to-date documentation detailing any change in license status (e.g., sanctions, withdrawals, reinstatement, revocation, or restrictions (SI)).

The state's DUI data system can be linked electronically to the driver system (VI).

Issuance and Novice Driver Policies

Present

The driver system captures and retains the dates of original issuance for all permits, licenses, and endorsements (e.g., learner's permits, provisional license, commercial driver's license, and motorcycle license (SI)).

The system captures novice driver's traffic violations and/or driver improvement training histories, including provider names and types of education (classroom or behind the wheel (LI)).

Absent or unknown

It **does not** capture novice driver's training histories, including provider names and types of education (classroom or behind the wheel (LI)).

Quality Control

Present

There are automated edit checks and validation rules to ensure entered data falls within a range of acceptable values and are logically consistent among data elements (VI). There are processes for error correction and error handling documented for: license, permit, and endorsement issuance; reporting and recording of relevant improvements courses; and reporting and recording of other information that may result in a change of license status (SI).

There are established processes to detect false identity, licensure fraud (VI), and CDL fraud (including hazmat endorsements (VI)). There are policies and procedures for maintaining appropriate system information security (VI) as well as procedures to ensure that driver system custodians track access and release of driver information adequately (VI).

Absent or unknown

There **are no** established processes to detect internal fraud by individual users or examiners (VI). The system **does not** have edit checks and data collection guidelines for each data element (VI). **Nor** is there a formal, comprehensive data quality management program for the driver system (VI).

Policies and procedures for purging data from the driver system **are not** documented (SI). **Nor** are processes documented to suspend licenses based on a DUI arrest independent of adjudication (SI).

Data Dictionary

Absent or unknown

The data dictionary **does not** document all field values including null codes (VI). There **is no** guidance on how or when to update the data dictionary (VI).

There **is no** process flow diagram that outlines the driver data system's key data process flows, including inputs form other data systems (VI).

Electronic Links

Present

The state's crash and citation and adjudication systems can be linked electronically to the driver system. All these links are rated very important (VI).

There is 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 (VI)

The custodial agency can grant authorized law enforcement personnel access to information in the driver system (VI).

The driver database **does not have** the capability to grant authorized personnel from other states access to information in the driver system (VI).

Performance Measures

Present

There are performance measures for integration and accessibility.

There **are no** performance measures tailored to the needs of data managers and data users for the following performance attributes: timeliness, accuracy, completeness, and uniformity. All performance measures for attributes are said to be very important (VI).

Numeric Goals

The state **has not** established numeric goals for the performance measures (VI).

Use of Organizational Data to Improve Performance

<u>Present</u>

Data quality feedback from key users is regularly communicated to data collectors and data managers (VI). Independent sample-based audits are conducted periodically for the driver reports and the related database contents for that record (SI).

<u>Absent or unknown</u>

Detection of high frequency errors **is not** used to generate updates to training content and data collection manuals, update the validation rules, or prompt form revisions (VI). **Nor** are periodic comparative and trend analyses used to identify unexplained differences in data across years and jurisdictions (VI).

Data quality management reports **are not** provided to the TRCC for regular review (VI).

Driver Metrics

Driver Licensing chose not to track any metrics. The liaison at Driver Licensing stated there was no way to improve the process. He stated that KSP can access their database to confirm the status of a driver's license. KSP can also confirm that a vehicle is registered.

Possible Goals for Improvements in Driver Database

1. Create a system for edit checks and data collection guidelines for each data element.
2. Improve the data dictionary so it conforms to NHTSA standards.
3. Send data quality management reports to the TRCC for regular review.

Injury Surveillance System—NHTSA Survey Results

The injury surveillance system gathers data from several sources including: EMS, hospital records, death certificate records, and the trauma registry. As such, there are more NHTSA survey questions for the injury surveillance system than for the other databases. The EMS and trauma registry questions were included in separate surveys and answered, respectively, by an EMS official and a trauma registry official.

Employees at the Kentucky Injury Prevention Research Center (KIPRC) gather data from the other agencies and are best situated to respond to the NHTSA survey questions concerning death certificates, hospital emergency department, and hospital discharge.

Questions are subdivided into the following categories: general questions, applicable guidelines for the injury system, data dictionaries and coding manuals, processes and procedures, data interfaces, quality control for the hospital departments of hospital emergency, and hospital discharge and death certificate records. Trauma registry is in a separate section.

General Questions about Data

Present

The injury surveillance system includes data from EMS (VI), hospital emergency departments (VI), hospital discharge (VI), trauma registry (VI), rehabilitation data (VI), and vital records (VI).

Data from the following departments are available and used to identify problems, evaluate programs, and allocate resources: vital records, emergency, hospital discharge, vital records and trauma registry. All these are rated very important (VI) EMS data are not available and used for these purposes (VI).

The following departments track data on the frequency (VI), severity (VI), and nature of the injuries sustained in motor vehicle crashes in the state (VI): emergency department (VI), hospital discharge, vital records (VI), and trauma (VI).

Absent or unknown

EMS data do not track frequency, severity, and nature of injuries (VI). Injury surveillance **does not** track other data (VI).

Use of Applicable Guidelines for the Injury Surveillance System

Present

The state EMS database is NEMSIS-compliant (VI).

The state's emergency department and hospital discharge data conform to the most recent uniform billing standard (VI).

Absent or unknown

The AIS and ISS **are not** derived from the state emergency department and hospital discharge data for motor vehicle crash patients (SI).

The respondent **did not know** if there are state privacy and confidentiality standards that supersede HIPPA (VI).

The vital records system **does not have** formal documentation that provides a summary dataset—characteristics, values, limitations, and exceptions, whether submitted or created—and details on how it is collected, managed and maintained (VI).

Process and Procedures for the Injury Surveillance System Data Quality

There is a single entity that collects and compiles data on emergency department visits from individual hospitals (VI) as well as a single entity that collects and compiles data on hospital discharges from individual hospitals (VI).

There are procedures for collecting, editing, error-checking, and submitting emergency department and hospital discharge data to the statewide repository (VI). There are also procedures for collecting, editing, error-checking, and submitting data to the statewide vital records repository (VI).

There are documented procedures for returning data to the reporting emergency departments for quality assurance and improvement (e.g., correction and resubmission) (VI) and returning hospital discharge data for quality assurance and improvement (VI). There are also procedures for returning vital records data to reporting agencies for quality assurance and improvement (VI).

The respondent **did not know** whether there is a data governance process (SI).

Use of Organizational Data to Improve Performance

Present

Aggregate emergency department data (VI), vital records data (VI), and hospital discharge data (VI) are available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes.

Interfaces and integration within the Injury Surveillance system

According to NHTSA, "system *interface* describes a timely, seamless relationship and a high degree of interoperability between systems. In contrast, system *integration* refers to discrete linking of databases for analytic purposes. 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."

Present

Roadway data are integrated with crash data for specific analytical purposes (I). Injury surveillance data are integrated with crash data for specific analytical purposes ((VI). There are examples of data integration among crash and two or more of the other component systems (SI).

Absent or unknown

There **is no** interface between EMS and either emergency department or hospital discharge databases (SI). **Nor** does EMS data interface with trauma registry data (VI). There **is no** interface between vital statistics and hospital discharge data (SI).

The state **does not have** a formal traffic records system inventory that identifies linkages useful the state and data access policies (VI).

The TRCC **does not promote** data integration by aiding the development of data governance, access, and security policies for integrated data (SI).

Driver data (VI), vehicle data (VI), and citation and adjudication data (VI) **are not** integrated with crash data for specific analytical purposes.

The respondent said that data from traffic records component systems—excluding crash—**are not** integrated for specific analytical purposes (SI).

Neither decision-makers (SI) **nor** the public (SI) has access to resources—skilled personnel and user-friendly access tools—for the use and analysis of integrated datasets.

The respondent **did not know** if behavioral program managers have access to traffic records data and analytic resources for problem identification, priority setting and program evaluation.

Quality Control for Hospital Emergency Department and Hospital Discharge

Present

There are automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and are logically consistent among data elements (VI). There are also formally documented processes for returning rejected emergency department and hospital discharge reports to the collecting entity and tracking resubmission to the statewide emergency department and hospital discharge databases **(VI).**

Absent or unknown

The respondent **did not know** if there is limited state level authority granted to quality control staff working with the statewide emergency department and hospital discharge databases to amend obvious errors and omissions without returning the report to the originating entity (SI).

Performance Measures for Hospital Emergency Department and Hospital Discharge

There are performance measures for the following attributes tailored to the needs of emergency department and hospital discharge managers and data users, all of which are rated very important (VI): timeliness, accuracy, completeness, and integration.

There are no measures for uniformity (VI) and accessibility (VI).

Numeric Goals

There **are no** state-established numeric goals for each emergency department and hospital discharge database performance measure (SI).

Use of Organizational Data to Improve Performance

Present

Periodic comparative and trend analyses are used to identify unexplained differences in the emergency department and hospital discharge data across years and agencies (LI).

Absent or unknown

The respondent **did not know** if there is performance reporting for the emergency department and hospital discharge database that provides timeliness, accuracy, and completeness feedback to each submitting entity (VI). **Nor** did the respondent know if high frequency errors are used to update emergency department and hospital discharge database system training content, data collection manuals, and validation rules (VI). He also **did not know** if quality control reviews are conducted to ensure the completeness, accuracy, and uniformity of injury data in the emergency department and hospital discharge database **(SI).**

The respondent **did not know** the answer to these questions:

"Is data quality feedback from key users regularly communicated to emergency department and hospital discharge database data collectors and data managers (SI)?"

"Are emergency department and hospital discharge data quality management reports produced regularly and made available to the state TRCC (SI)?

Death Certificate Records

Quality Control

<u>Present</u>

There are automatic edit checks and validation rules to ensure that entered data falls within a range of acceptable values and are logically consistent among data elements (VI).

<u>Absent or unknown</u>

The respondent **did not know** if there is limited state-level correction authority granted to quality control staff working with vital records to amend obvious errors and omissions without returning the report to the originating entity (SI).

Performance Measures for Vital Records

<u>Present</u>

Regarding performance measures, all of which are rated very important (VI), there are measures for timeliness, completeness and integration.

<u>Absent or unknown</u>

 There **are no** performance measures for accuracy, uniformity, and accessibility.

Numeric Goals

The state **has not established** numeric goals for each vital performance measure (SI).

Use of Organizational Data to Improve Performance

<u>Present</u>

Quality control reviews are conducted to ensure the completeness, accuracy, and uniformity of injury data in vital records (SI). Also, periodic comparative and trend analyses are used to identify unexplained differences in vital records data across years and agencies (LI).

<u>Absent or unknown</u>

There **is no** performance reporting for vital records that provides specific timeliness, accuracy, and completeness feedback to each submitting entity (VI). And vital records quality reports **are not** produced regularly and made available to the state TRCC (SI).

The respondent **did not know** if quality feedback from key users is regularly communicated to vital records data collectors and data managers (SI). **Nor** did the respondent know if high-frequency errors are used to update vital records training content, data collection manuals and validation rules (**VI**).

Trauma Registry—Results of NHTSA Survey

<u>Present</u>

The trauma registry tracks the frequency, severity, and nature of injuries sustained in motor vehicle crashes (VI). The respondent observed that the trauma registry conforms to the verification requirements and standards of the National Trauma Data Bank (VI). AIS and ISS are derived from the state trauma registry for motor vehicle crash patients (VI). The state trauma registry collects the GCS data form motor vehicle crash patients (LI).

According to the respondent, the major issue confronting the trauma registry is low hospital enrollment—only 28 of 93 hospitals are reporting. However, most of the largest hospitals are reporting. One reason for low participation is the rigorous nature of the National Trauma Data Standards.

Quality control

Present

There are automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and are logically consistent among data elements (VI). Also, limited state-level correction authority is granted to quality control staff working with the statewide trauma registry to amend obvious errors and omissions without returning the report to the originating entity (SI). There are formally documented processes for returning rejected emergency department and hospital discharge reports to the collecting entity and tracking resubmission to the statewide trauma registry (VI). In addition, quality control reviews are conducted to ensure the completeness, and accuracy, and uniformity of injury data in the trauma registry (SI).

Performance Measures

Present

There are performance measures for five attributes tailored to the needs of trauma registry managers and data users; the performance measures cover these attributes: timeliness, accuracy, completeness, uniformity, and integration (VI).

Absent or unknown

There **is no** performance measure for accessibility (VI).

Numeric Goals

The state **has not established** numeric goals for each trauma registry performance measure (VI).

Use of Organizational Data to Improve Performance

Present

Performance reporting for the trauma registry provides specific timeliness, accuracy, and completeness feedback to each submitting entity.

Periodic comparative and trend analyses are used to identify unexplained differences in trauma registry data across years and agencies (LI). High frequency errors are used to update trauma registry training content, data collection manuals, and validation rules (VI).

Data quality feedback from key users is regularly communicated to trauma registry data collectors and data managers (SI).

Aggregate vital records data are available to outside parties (e.g., universities, traffic safety professionals) for analytic purposes (VI)

Absent or unknown

Trauma registry data quality management reports **are not** produced regularly and made available to the State TRCC (SI).

Data Dictionary and Documentation

Present

The state has a formal data dictionary (VI). The state also has formal documentation that provides a summary dataset—characteristics, values, limitations, and exceptions, whether submitted or created—and details on how it is collected, managed, and maintained (VI).

The trauma registry has documented procedures for collecting, editing, error checking, and submitting data (VI) and it has documented procedures for returning trauma data to the reporting trauma center for quality assurance and improvements (e.g., correction and resubmission) (VI). There are also formally documented processes for returning rejected trauma registry reports to the collecting entity and tracking resubmission to the statewide trauma registry (VI).

<u>Absent or unknown</u>

The state **does not** have a process flow diagram that outlines the trauma registry's key data process flows, including inputs from other systems (VI)

Appendix 4: Database Metrics Tables and Discussion

CRASH Database Metrics Data and Suggestions for Improvements

CRASH--Kentucky State Police

The CRASH database is now significantly more MMUCC compliant. In the 2014 reporting, the CRASH database was 69% MMUCC compliant; today it is 89% compliant. In the 2016 reporting, the average number of days to enter data—a timeliness metric—improved for E-reports (dropping from 11.6 days in 2014 to 6.61 days in 2016); but rose slightly for paper reports (from 8.8 days to 9.5 days). The percentage of reports sent back to local agencies for correction dropped from 1.6% to 0.4% while the number of E-reports with user entry override increased from 18 to 25.

KSP—CRASH Database Suggestion for Improvement

The liaison for CRASH would like to see all the reporting jurisdictions in the state use the same form—one that is electronic—to enhance uniformity.

Possible Goals for Improvements for CRASH Database

1. Identify the resources, tools and technologies needed to begin collecting data on three measures of traffic incident management (TIM): Roadway Clearance Rate; Incident clearance time; and Secondary Crashes (completeness).
2. Assess the current level of timeliness, uniformity, accuracy, completeness and accessibility of TIM data.
3. Reduce the variance of police reported alcohol and drug-related data on fatalities compared to FARS data from 175% to 0%.
4. Link CRASH, roadway, and injury data.
5. Increase the document retention and archival storage policies from 10 years to 20 years.
6. 100% use of E-reporting by the reporting law enforcement jurisdictions.

Crash Metrics in the Form of Numerical Data and Other Responses*

Type	Metric	First Report July 2013-July 2014	Second Report July 2014-July 2015	Third Report July 2015-July 2016
Timeliness 1	# of days from crash event to receipt for data entry	E-reports 11.58 days Paper Reports 8.82 days	8.04 days Paper 8.99	E-reports 6.61 days Paper 9.52
Timeliness 2	Average # of days to enter data	E-reports 11.58 Days Paper 8.22days	E-reports 8.04 days Paper 8.99 days	E-reports 6.61 days Paper 9.52 days
Timeliness 3	Average # of days to enter backlogged reports	There is no backlog	There is no backlog	There is no backlog
Accuracy 1	% of crashes locatable w/ roadway location method	95.4%	95.7%	95.7%
Accuracy 2	% of crash reports sent back to local agencies for correction	1.6%	1.6%	.40%
Accuracy 3	# of E-reports w/ user entry override	18	13	25
Completeness 1	% of FARS/State Crash Fatality Match-yearly	100% after yearly reconciliation in March each year	Same	Same
Completeness 2	% of LEAs with more than 10% unexplained drop in notifications	Not available or useful, as LEA accident notification has too many variables	N/A	N/A
Accessibility 1	Average number of queries on public site daily	1,457 daily	3,210 daily	3,995 daily
Accessibility 2	Average number of accident reports purchased daily	216.67 daily 79,086/365	262.87 daily 95,949/365	294.82 daily 107,612/365

EMS Metrics and Suggestions for Improvements

Between 2014 and 2016, the number and percentage of EMS services reporting with KEMSIS rose dramatically from 34 (15.2%) to 212 (96.8%). However, the percentage of calls received by the reporting deadline dropped from 99 percent in 2014 to 62 percent in 2015, because of software changes and an increase in the number of services reporting calls. Upon correction, it returned to 99.6% in 2016

In 2014 and 2015, the liaison could not report the completeness metric—% of submitted records with incomplete data. In consultation, it was decided to re-conceptualize this metric as '% use of occupant safety equipment'. In 2016, the percent use of safety equipment (seat belts) was 69%.

Emergency Medical Services Suggestions for Improvements

The liaison offered several suggestions to improve the database. Regarding timeliness, they would like to change the reporting requirement from 15th of the month after the reporting period has closed to one closer to real-time reporting.

Concerning improvements in public access to information, the liaison said that their office is proposing a KTRAC project to add a data analyst position to create useful public information.

EMS is in the process of creating validation rules that will improve the accuracy and completeness of its data.

When asked about ways to make better integrate data with other databases, the liaison made the following points. (1) Everyone does not speak the same language. There needs to be a consensus data dictionary that would allow for more accurate reporting. (2) There is no technical capability that allows the data to be warehoused and reported in aggregate. Creating a repository for the data with a reporting mechanism attached would allow the reporting that is needed.

EMS Metrics in the Form of Numerical Data and Other Responses

Type	Metric	First Report-July 2014	Second Report-July 2015	Third Report-July2016
Timeliness 1	Percent of records (calls) received by reporting deadline	99.89% (8,087/8,096)	62.0% (37,517/60,502)	99.61% (62,002/62,246)
Accuracy 1	Average number of data elements NOT completed correctly	1,990 errors/113,344 data elements = 1.76%	Not available	Not available
Completeness 1	% of submitted records with incomplete data	Not available	Not available	This was re-conceptualized as '% Use of Occupant Safety equipment' (20047/28681) or 69.90%
Completeness 2	# and % of services reporting KEMSIS	34 of 223 or 15.2%	161 of 222 or 72.5%	212/219 or 96.8%

Possible Goals for Improvements for EMS Database

EMS database

1. Increase the number of EMS agencies reporting data to the KEMSIS (uniformity).
2. Implement national standard and state specific validation rules to increase the completeness and accuracy of reported data (completeness and accuracy).
3. Conduct analysis, publish reports, and execute data sharing agreements with external stakeholders (accessibility).
4. Create a uniform data dictionary.

Citation/Adjudication Metrics and Suggestions for Improvements

The Administrative Office of the Courts sends data on one metric—the percent of cases submitted on the uniform E-citations (80.5% in the second quarter of 2014 and 80.2% of 2015). The remaining cases were reported manually (19.5% in the second quarter of 2014 and 19.8% in 2015). The percent of E-citations rose slightly in the second quarter of 2016 to 81.3%. The liaison said that manual citations often include additional citations because the manual forms have room for only five citations per case.

Table 5. Adjudication/Arrest Metric for Traffic Cases in the Form of Numerical Data and Other Responses

Type	Metric	First Report—April-June 2014	Second report—April-June 2015	Third report—April-June 2016
Uniformity Metric	% of cases on a Uniform E-Citation	80.48% E-citation 19.52% Manual citation	80.17% E-citation 19.83% Manual Citation	81.3% E-citation 18.7% Manual Citation

Adjudication/Arrest Database—Suggestions for Improvement

The liaison suggested two ways to improve the adjudication database: 1) require that all arrest and citation records be entered electronically (80 percent are currently electronic); and 2) remove old codes from submitted forms. These suggested reforms would improve uniformity across all records.

Possible Goals for Improvements for Citation/Adjudication Database

1. A data dictionary with all of NHTSA's desired attributes.
2. 100% electronic reporting.
3. Removal of old codes from forms.

Vehicle Registration Metrics and Suggestion for Improvements

The liaison for Vehicle Registration could not provide data in either 2014 or 2015 in response to our request because the Kentucky Automated Vehicle Information System (KAVIS) is not yet operational. When it is operational, KAVIS will be used to check against the National Motor Vehicle Title Information System (NMVTIS) and Vehicle Information Number Assist (VINA). In their 2015 response to a request for records the liaison reported that the go-live date for KAVIS had been postponed. They expect some incremental KAVIS-related releases within the next two years. Each post will have a date and stamp in the system.

In his 2016 response to the request for data for the metrics, the liaison offered a status update on KAVIS, reporting that KAVIS is being implemented in modules and would not be fully implemented until 2019. They added that the print on-demand decal software (PODD) that allows real-time posting of title work from county clerks to KYTC has been implemented and that Vehicle Registration is now using VINtelligence, a software package that enables KYTC to decipher inaccurate VINs during the title process.

The liaison did not specify the precise number of individuals and agencies that could access their database; but for 2015, he reported that 3,500 parties accessed the database the previous year. They reported the same number in 2016. Agencies that currently use the automated vehicle information system (AVIS) and plan to use KAVIS in the future include Revenue; state, county and city law enforcement agencies; KSP; FBI; the Attorney General's office; Department of Insurance; county clerks' staff members; PVAs; Vehicle Regulation; and Health and Family Services. The number of agencies and individuals is in the hundreds. The number of times the database is used will be available on KAVIS.

Vehicle Registration Metrics in the Form of Numerical Data and Other Responses

Type	Metric	July 2014 Response	July 2015	2016 Response
Timeliness	Average time to post by county clerks	KAVIS is not in operation	Same	KAVIS is being implemented in modules and will not be fully implemented until 2019. However, PODD is implemented and it allows real-time posting of title work from county clerks to KYTC.
Integration	KAVIS will check against NMVTIS and VIN Assist	With KAVIS in operation, it will check against VINA and NMVTIS, but not VIN	Same	KAVIS will check against VINtelligence and NMVTIS
Accessibility	# of times database is used	When KAVIS is fully implemented	Same	Same
Accessibility	# of users able to perform inquiries	A number of agencies use AVIS and will use KAVIS—among them Revenue, state county and city law enforcement agencies, KSP, FBI, Attorney General's office, Dept. of Insurance, county clerks' staff, PVAs, Vehicle Regulation, Health and Family services	3,500 parties accessed the database	Same

Motor Vehicle Database Suggestions for Improvement

The liaison saw a critical need to integrate the CRASH database with vehicle registration, mentioning an effort to do so in 2012 that failed.

Possible Goals for Improvements for Vehicle Database

1. Participate in the Performance Registration System and Management program.
2. Conduct periodic comparative and trend analyses are not used to identify unexplained differences in the data across years and jurisdictions.

Roadway Metrics and Suggestions for Improvements

The liaison with responsibility for the roadway/traffic information database works in the Division of Planning of the Kentucky Transportation Cabinet (KYTC). They provided data for eight of their nine metrics.

Planning contracts with each of the 15 Area Development Districts (ADDs) to collect updates to KYTC's database on local road centerlines and corresponding attributes (owner, name, type of operation, and surface type). In 2014, 2015, and 2016, it took one to two weeks after the completion of a state highway project until the file on the highway's characteristics is updated.

However, for local roads it can be one to three years. The KYTC Division of Planning has put in place a reform to expedite the reporting process. In the past, approximately 40 counties were assigned responsibility for an update each year. Over three years, each of Kentucky's 120 counties performed at least one update on their roads. As a result, some updates were not submitted to Planning until 2-3 years after the changes occurred. In the fall of 2014, Planning eliminated the assignment of specific counties and reduced or eliminated some of the administrative/ancillary contract requirements. These changes were made to allow and encourage the ADDs to submit updates more frequently as road changes occur at the local level. The results of this change in procedure are positive. Planning is receiving more timely updates. The results, however, are not quantifiable at this time.

With respect to the first accuracy metric, the liaison stated that KTC will establish the number of errors found during audits of critical elements. The Division of Planning cannot report this number.

With respect to the other accuracy metric—the percent of crashes on state roads that are locatable using the location coding method—it was rated at 100 percent in both years, although it was dependent on the update cycle of KY-OPS.

Of the two consistency/uniformity metrics, 48% of the Model Inventory Roadway Elements (MIRE) are missing, while 5% of Fundamental Data Elements (FDE) are missing. These numbers did not change between 2014 and 2016.

Concerning data completeness, a full 98% of the traffic data reported in 2014 was based on actual traffic counts less than three years old. The corresponding number in 2015 and 2016 was 95%.

There are three accessibility metrics. In both years, 100% of users were able to perform independent information inquiries, and the public can access all databases within KYTC. However, no quantitative data were provided on the number of users or web hits. The Office of Information Technology did not provide this necessary function for the planning's webpages. However, all KYTC public information is available and the public has access to web reports.

Roadway/Traffic Suggestions for Improvements

The liaison for roadway/traffic said they wanted to improve the process by which changes in local road systems are updated. The liaison suggested two methods to improve the roadway database. They wanted immediate updates on changes in local road systems (e.g., a new road or lane) and needed average annual

daily traffic counts (AADT) information for local roads. This information would be helpful to 911, KSP, and EMS. But at this time, the data are not provided in a timely manner.

Table 7: Roadway/traffic Metrics in the Form of Numerical Data and Other Responses

Type	Metric	First Annual Report 2014	Second Annual Report 2015	Third Annual Report 2016
Timeliness 1	For state roads, # of days from completion to file update	State Roads 1-2 weeks Local Roads 1-3 YEARS	1-2 Weeks The reporting policy has been changed and has improved timeliness of reporting (see text)	Same
Accuracy 1	% errors during audits of critical elements	KTC to provide	Same	Same
Accuracy 2	For state roads, % of crashes locatable using location coding method	100% (dependent upon the update cycle of KY-OPS)	Same	Same
Consistency/ Uniformity 1	# of MMIRE elements that are missing	48%	Same	Same
Consistency/ Uniformity 2	# of FDE elements of MMIRE that are missing	5%	Same	Same
Completeness 1	% of traffic data based on actual counts no more than 3 years old	98%	95%	Same
Accessibility 1	# of users (web hits) able to perform independent inquiries	100%	Same	Same
Accessibility 2	# of individuals or organizations for reports	All databases within KYTC, Public access to web reports, KSP updated in their system		Same
Accessibility 3	# of web hits, downloads of service requests for any period	Office of Information Technology (OIT) does not provide this function for our webpages but all public information is available	Same	Same

Possible Goals for Improvements in Roadway Database

1. Immediate updates on changes in local road systems (e.g., a new road or lane)
2. Average annual daily traffic counts (AADT) information for local roads.
3. Have roadway data systems maintained by regional and local custodians interface with the state roadway information system (SI).

Death Certificates, Hospital Emergency; and Hospital Discharge—Current Metrics and Suggestions for Improvements

KIPRC reports substantial improvements in data quality on death certificates. For traffic-related deaths in Kentucky, the percent registered within 90 days has risen from 75% in 2010 to 96% in 2015. But the percent of out-of-state deaths of Kentucky residents registered within 90 days has not improved. It was 10% in 2010 and 0.0% in 2014. For those who died in Kentucky crashes, there has been a reduction in the average number of days from date of death to registration from 59 days in 2010 to 30 days in 2015. There has also been progress in the average number of days for out-of-state deaths from 230 days in 2010 to 149 days in 2013. Death certificates have substantially fewer missing values. For example, missing values for injury description have dropped from 43.9% of death certificates in 2010 to 1.1% in 2015. From 2013 to 2014, nine of ten variables on the death certificate showed improvement or no change.

Substantial progress has been made on the completeness metric—the percentage of key injury variables with missing values—although missing values remain on a number of death certificates. One reason for missing values is that funeral directors supply much of the information on death certificates; in some cases they may not possess all the needed information. Funeral directors gather information and report it to the coroner, who then sends it and additional information to the death records repository. In 2010 the state adopted the Electronic Death Registration (EDR) reporting system, which the coroner uses to enter data. This accounts for the substantial decline in missing data beginning in 2011. A last point mentioned by the liaison—a space exists on the death certificates for the county of injury; but the funeral directors do not use it for some unknown reason.

Death Certificate Metrics in the Form of Numerical Data and Other Responses

Type	Metric		
Timeliness 1	% of traffic deaths registered <u>within 90 days</u>—the rest registered after 90 days	Died in Kentucky 2010 75% 2011 98% 2012 97% 2013 98% 2014 99% 2015 96%	Out-of-state (KY resident) 2010 10% 2011 47% 2012 0% 2013 0% 2014 0% 2015 0%
Timeliness 2	Average # of days from date of death to registration	Died in Kentucky 2010 59 days 2011 34 days 2012 33 days 2013 31 days 2014 30 days 2015 30 days	Out-of-state (KY resident) 2010 230 days 2011 109 days 2012 185 days 2013 149 days 2014 Not Available 2015 267 days
Accuracy 1	Agreement with linked CRASH records on common variables	Can't do at this time due to lack of funding for personnel.	
Accuracy 2	Agreement with linked hospital inpatient records on common variables	Can't do at this time due to lack of funding for personnel.	
Completeness 1	% of key injury variables with missing values	See attached table	
Integration	Year Death Cert. and CRASH linked	2010-2014	

The death certificate database was integrated with CRASH and FARS each year from 2010 through 2014. There was no linkage in 2015.

The next table contains data for missing values on 10 injury-related variables. For most of these, the number of missing values has declined. However, all certificates lack information on the county in which the crash occurred. And there has been no improvement in recording information on the occupation and industry of work-related injuries. For the others, the improvement in data has been impressive; for

example, the percentage of death certificates lacking values for injury description dropped from 43.9 percent in 2010 to 0.9 percent in 2013 and 2014. Table 10 shows that progress continued during 2014 and 2015.

Percent of Motor Vehicle Deaths with <u>Missing</u> Values on Injury-Related variables

Year Variable	2010	2011	2012	2013	2014	2015
Injury Date	10.6	3.1	2.3	2.6	0.9	5.6
Injury hour	16.5	8.1	9.7	11.5	6.3	12.8
Injury State (e.g., Ohio)	44.8	6.9	10.0	13.1	1.1	7.0
Injury Location (county)	100*	100	100	100	100	100
Injury Place (Home, Street Highway/farm, etc.	42	21.9	13.5	24.9	17.6	11.8
Injury Description	43.9	6.2	3.4	0.9	0.9	1.1
Work related?	44.4	6.6	2.3	3.4	1.1	4.9
Occupation (If work-related)	0	0	5.6	12.5	0.0	0.0
Industry (If work-related)	0	0	5.6	14.3	0.0	0.0
Person type (driver, passenger, pedestrian)	45.9	7.4	5.3	4.0	2.7	2.7

The liaison provided another table that illustrates a problem with timely data reporting. Many Kentucky residents die in traffic accidents in adjacent states, some of which fail to report the deaths in a timely manner. As table 11 shows, Ohio suffers from reporting delays of three years, while West Virginia has a two-year backlog. Ohio tends to bundle reports over several years, which are then sent to Kentucky.

Number of In-transfer Records Received from Selected Border States (Motor Vehicle Deaths)

	2008	2009	2010	2011	2012	2013	2014	2015
Ohio	20	18	16	0	0	13	**0**	**8**
Tennessee	17	9	41	12	35	75	0	25
West Virginia	12	2	15	13	5	0	0	2

Death Certificate Database Suggestion for Improvement

1. The liaison would like to have funding to measure the accuracy of the data, specifically to measure agreement with the CRASH records and agreement with inpatient records.
2. Create vital records quality reports and regularly make available to the state TRCC.

Hospital Emergency Department and Hospital In-Patient Metrics

The emergency and inpatient departments at hospitals send data on patients injured in traffic crashes to the Office of Health Policy. This office in turn sends it on to KIPRC. The data are broken down according to hospital department— inpatient and emergency. The first table in this section contains the emergency department data, while the subsequent table includes hospital inpatient data.

Emergency Department

The completeness metric for the emergency departments shows a small amount of improvement in the percentage of injury records with missing E-codes (from 16.1% in 2010 to 12.7% in 2015); but no improvement in the percentage of injury records with a nonspecific E-code (5.2% in 2010 and 2015.).

The number of days between the end-of-quarter deadline and the reporting of closed data to OHP—a timeliness metric—rose from 76 to 96 days between 2013 and 2015. This increase in the amount of time for data delivery was attributed to a reformatting of layouts for data reporting, changes that accommodate an increased number of records. The liaison stated that 2015 was a transition year for the emergency department and hospital databases as it saw the conversion from ICD-9-CM to ICD-10-CM.

Accuracy metrics for both emergency and inpatient data are unavailable because of insufficient funding.

Emergency department data were linked with CRASH data in 2008, 2009, 2010, 2011, and 2012.

Emergency Department Database Suggestions for Improvement

Several problems with the database were mentioned. Funding is needed to measure the accuracy metric—agreement with linked CRASH on external cause of injury, which would document problems with accuracy when data is conflicting or missing in the two datasets. Concerning a survey to measure the satisfaction of Kentucky users of the Indicator Based Information System (IBIS), the liaison said it would be useful to know the proportion of users who are unable to obtain information through the ED query module. The liaison can identify missing E-codes and would like to correct the problems with them to improve accuracy and completeness

Emergency Department Injury Metrics in the Form of Numerical Data and Other Responses

Type	Metric	First Report (2013 data)	Second Report (2014 data)	Third Report (2015 data)
Timeliness 1	# of days between the end-of-quarter deadline and reporting of closed data to OHP	76 days inpatient and outpatient (1st quarter)	126 days*(1st quarter)	96 days (1st quarter)
Accuracy 1	Agreement with linked CRASH on external cause of injury	Need funding	Need funding	Need funding
Completeness 1	% of injury records with missing E-codes	ED 2010 16.1% 2011 13.9% 2012 13.5% 2013 14.1%	 2014 13.6%	 2015 12.7%
Completeness 2	% of injury records with a nonspecific E-code	ED 2010 5.2% 2011 6.4% 2012 6.8% 2013 9.6%	 2014 5.1%	 2015 5.2%
Integration	Years linked with CRASH	2008, 2009, 2010, 2011, 2012		2013-2114

*This was the first quarter for expanded outpatient data collection. It involved a reformatting of the layouts to accommodate an increased number of records. This increased amount of time before data availability.

Inpatient Department

The table below includes the percentage of injury records with a missing E-code. This fell from 15.7% in 2010 to 7.4% 2015. The percentage of injury records with a nonspecific E-code was very stable—1.9% in 2010 and 1.6% in 2015. The timeliness metric improved slightly, dropping from an average of 76 days in 2014 to 72 days in 2015. It indicates the time elapsed between the end-of-quarter deadline and the delivery of closed inpatient data. However, this metric is considered a low priority by the liaison because it provides information of trivial importance.

The hospital inpatient database was linked to CRASH in 2011 and 2012.

Hospital Inpatient Database Suggestions for Improvement

The accuracy and completeness of E-codes is a problem with this database. Without legal authority, the liaison cannot provide data for the accessibility metric—the percentage of surveyed users of Kentucky's IBIS system who indicate inability to obtain information thru injury inpatient query module.

Hospital Inpatient Metrics in the Form of Numerical Data and Other Responses

Type	Metric	First Report (2013 data)	Second report (2014 data)	Third report (2015 data)
Timeliness 1	# of days between the end-of-quarter deadline and reporting of closed data to OHP	76 days inpatient and outpatient	72 days inpatient and outpatient	96 days
Accuracy 1	Agreement with linked CRASH on external cause of injury	Need funding	Need funding	Need funding
Accuracy 2	Agreement with linked EMS records on common variables	Need funding	Need funding	Need funding
Completeness 1	% of injury records with missing E-codes	Inpatient 2010 15.7% 2011 17.4% 2012 10.4% 2013 12.3%	2014 9.0%	2015 7.4%
Completeness 2	% of injury records with a nonspecific E-code	Inpatient 2010 1.9% 2011 1.8% 2012 1.9% 2013 1.8%	2014 1.3%	2015 1.6%
Integration	Years linked with CRASH	2011, 2012		2013-2014

Improve accuracy and completeness of injury data

Trauma Registry Metrics and Suggestions for Improvements

Approximately, 21% of the trauma centers were late in submitting their data to Clinical Data Management in 2014. That dropped to 15% in 2015. However, in 2015 it rose to 32%.

The accuracy and three of the four completeness metrics are reported as annual percentages. On the accuracy metric, the concordance between the trauma and CRASH data was 91.6% in 2013 for 1) person category and 2) person type. That metric rose to 98% in 2014. There is no report for 2015, because there was no linkage with CRASH in that year.

The first completeness metric is the percentage of cases with a missing E-code. There were only 49 trauma records (.48%) with missing E-codes in 2013. The percentage with missing E-codes improved to .31% in 2014 and to 0.10% in 2015.

The second completeness metric is the percentage of cases with nonspecific motor vehicle E-codes for occupant position. In 2013, 1.7% of E-codes for the occupant position were listed as 'unspecified' and .34% as 'other specified,' for a total of 2.04% with missing E-codes. In 2014, there was no improvement, as 2.22% of E-codes for occupant position were listed as 'unknown' and .69% as 'other,' for a total of 2.91%. The numbers were similar in 2015: 1.82% coded as 'unknown' and 1.0% as 'other,' producing a total of 2.82%.

The third completeness metric is the percent of cases with missing EMS time variables (time to scene, time to hospital). This dropped from 50% of cases having missing time data in 2013 to 42% in 2014. A downward trend continued in 2015, with 37% of cases having missing time variables.

The fourth completeness metric also indicates a problem—an estimated 8,000 Kentucky residents were not included in the trauma registry because they received treatment at a hospital or clinic that was not a designated trauma center in 2013. This rose to 8,500 Kentucky residents in 2014 and dropped to 37% in 2015.

The trauma registry database and CRASH were linked in 2012 and 2014. They were not linked in 2013 and 2015.

Trauma Registry Database Suggestions for Improvement

The liaison for the trauma registry data said there is a need for dedicated funding for a full-time data analyst to monitor TR data quality, inform trauma registrars' training, analyze trauma registry data, and support trauma researchers on trauma registry data analysis for trauma system improvement.

To improve the completeness, accuracy, and uniformity of the data the liaison called for funding for a training of the trauma registrars, once a year, for two full days, to help them properly update the facility registry mappings to reflect the changes in the NTDB standards for the new year of data submission.

To make the data collection more accessible to the public, they called for the development of a web querying system.

Regarding integration with other databases, the liaison said that the registrars need access to EMS records to obtain information on EMS run numbers, injury county, and facility from/to for the transferred trauma patients to facilitate the integration with CRASH, hospitalization and ED visits databases.

Trauma Registry (TR) Metrics in the Form of Numerical Data and Other Responses

Type	Metric	First Report—2014	Second report—2015	Third Report—2016
Timeliness 1	% of trauma centers reporting data to Clinical Data Management within 90 days after end of quarter	79% on time, 21% late—As of Jul 11, 2014 there were 5 out of 24 trauma centers that were late with first quarter data submission	23 out of 27 reporting facilities submitted their 2014 data by April 1, 2015 deadline (according to the vendor's report from April 2, 2015); 85% on time	18 out of 28 reporting agencies submitted their 2015 data by the April 1, 2016 deadline; 68% on time.
Accuracy 1	Agreement with linked CRASH records on common variables	91.6%—Analyzing only high probability matches (records linked with matched probability above 95%) in linked 2012 CRASH-TR we found a concordance of 91.6% between the listed injured person category (TR) and the person type (CRASH)	98% agreement on motor vehicle crash person role (TR variable) with person type (CRASH variable); The 2% of the high-probability linked records disagreed because of use of "other" and "unknown E-codes in the TR data	No linkage of 2015 data.
Completeness 1	% of cases with missing E-code	0.48%—In 2013; there were only 49 records with missing E-codes; 0.48% of all TR records	0.31% (39/12,731) in the 2014 trauma registry data	0.10% (13/12,921) in the 2015 trauma registry data
Completeness 2	% of cases with nonspecific motor vehicle E-codes for occupant position	2.04%—In 2013 1.7% of the motor-vehicle traffic collision records indicated injured person occupant position as "unspecified" and	2.91%—In 2015, 2.22% coded as 'unknown' occupant position; 0.69% coded as 'other'	2.82% -- In 2015 1.82% coded as 'unknown' and 1% coded as 'other'

		0.34% listed as "other specified"		
Completeness 3	% of cases with missing EMS time variables (time to scene, hospital)	50% of the records that should have been supplied with EMS time information	42% in 2014	37% in 2015
Completeness 4	Estimated # of Kentucky residents not in KTR due to treatment at hospital not designated trauma center	About 8,000	About 8,500	About 7,800
Integration	Years linked with CRASH	2012	2014	No linkage in 2015

Possible Goals for Improvements for Trauma Database

1. Add more hospitals to the trauma data reporting system.
2. Increase the number of trauma cases reported from approximately 13,000 in 2016 to 15,000 in FY2008.
3. Identify strategies to improve and consistency and accuracy of trauma data.
4. Evaluate state data system and perform upgrades in consultation with system leadership.
5. Produce trauma registry data quality management reports and regularly make available to the State TRCC.
6. Create a process flow diagram.