2023 Final Report for Databases in the 2022 Traffic Records Improvement Plan

Kentucky Transportation Center
College of Engineering, University of Kentucky, Lexington, Kentucky

in cooperation with
Kentucky Transportation Cabinet
Commonwealth of Kentucky

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2023 Final Report for Databases in the 2022 Traffic Records Improvement Plan:
Facilitating the Development of Projects to Attain the Goals in the Implementation Plan for the
2022-26 Traffic Records Strategic Plan

Lenahan O'Connell
Research Associate

Samantha Wright
Senior Lecturer in Civil Engineering

and

Reginald Souleyrette
Professor of Civil Engineering

Kentucky Transportation Center
College of Engineering
University of Kentucky
Lexington, Kentucky

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Executive Summary

During fiscal year 2023, with financial support (Grant #M3Da-2022-04) from the Kentucky Office of Highway Safety, the Kentucky Transportation Center (KTC)-continued its work with traffic database officials to facilitate successful attainment of the remaining goals from the 2017-21 Traffic Records Strategic Plan (TRSP), which goals are in the 2022-26 TRSP Transportation Records Improvement Plan (TRIP). For most databases, some new goals were developed; this required further refinement of some projects or strategies to improve database performance. Projects to complete the goals in the TRIP were continued and some completed for the following databases: CRASH, Citation/Adjudication, Injury Surveillance (KIPRC and EMS), Vehicle Registration, Roadway, and Driver Licensing.

1. **Task:** Use staff expertise with records assessments in other states, provide comparisons and generate ideas for further improvements, including links between databases.
    Deliverable: Liaisons were contacted and informed of the pertinent practices of other states. They were asked to consider these for their database and asked to consider these during the next year as possible goals for database improvements. Without exception, they viewed these practices as not relevant or too expensive or infeasible. However, some of the practices that involve linkage across databases were deemed desirable but out-of-reach at this time. The liaisons were asked to respond to NHTSA's recommendations for data improvement. Their responses, many positive, are listed in each of the seven database sections in the report.

2. **Task:** Monitor and document progress toward fulfilling the goals and timetables in the strategic plan. Complete four quarterly updates for six databases.
    Deliverable: This was done by frequent communication with each database liaison. Each liaison was sent written requests for information and a related follow-up telephone call. The emails had attachments with lists of suggestions for new goals and metrics when appropriate.

3. **Task:** Facilitate discussion with database liaisons to resolve any problems that may arise during the development of projects to meet the goals. Meet with liaisons once per quarter.
    Deliverable: Most databases successfully improved one or more database attributes. Some projects did not produce quantitative results, making assessments of improvements described only in narrative form. The latter accounts laid out technical and/or training improvements designed to produce improvements in one or more database attributes.

4. **Task:** Document any necessary changes in the goals, objectives and strategies of the strategic plan or reasons for delays in meeting the delays and/or completing the projects underway.
    Deliverable: Updates are described in the Database Report Cards along with narratives discussing progress and obstacles to reaching goals.

5. **Task:** Submit a progress report that assesses progress in project development and documents successful project completion.
    Deliverable: Many of the goals have been reached or the Liaisons state that their database cannot improve one or more of the database attributes. Each quarter the liaisons were contacted about developing new goals and metrics for one or more of their attributes. Some new ones were developed; but many as noted in the final report have yet to be developed. The current state of the TRIP and progress toward meeting the goals are summarized in this report (see Tables 2.1-2.7).

6. **Task:** Update the infographic or dashboard data to demonstrate long-term database improvements from 2013 to present with identification of specific upgrades in the six attributes of each database.
   Deliverable: The second five-year plan was more successful than the first one. The review found that 2013-2016 implementation plan produced improvements in 14 of 42 database attributes and the 2017-2021 plan resulted in improvements of 23 in 42 database attributes. Liaisons stated that one attribute had no need for improvement in the first plan and 3 in the second plan did not need improvement. There are several changes in 2023 documented in the final report.

Chapter 1 Background

Since 2012, the Kentucky Traffic Records Coordinating Committee (KTRCC), Kentucky Transportation Center (KTC), and liaisons to Kentucky's traffic records databases, have collaborated to develop performance measures and related goals to improve the quality and utility of its traffic records databases: CRASH, Citation/Adjudication, Injury Surveillance (EMS and Trauma Registry), Vehicle Registration, Roadway, and Driver Licensing. KTRCC has also gathered numerical indicators of database performance to document improvements in one or more of the six database attributes (data timeliness, accuracy, completeness, uniformity, integration, and accessibility). Appendix A contains a summary of progress for the last two Traffic Records Strategic Plans and year 2023. The documented advances in database quality and accuracy have facilitated more effective planning for upgrades in highway safety. In June 2022, KTRCC adopted a new Traffic Records Strategic Plan (TRSP) for the years 2022 through 2026, which calls for more advances in database quality. The new plan continued the previous improvement strategy of developing a quantitative metric whenever possible for each database attribute. Due to database improvements since 2012, several liaisons state that some database attributes (e.g., timeliness of data submission) cannot be improved further. Thus, the new transportation improvement plan (TRIP) may lack a performance measure and related improvement goal for one or more of the six attributes of each database. In this report, the traffic records databases are assessed by the extent to which each fulfills the database goals laid out in the 2022-2026 Traffic Records Improvement Plan (TRIP). Some of the performance goals and measures are new and some goals are retained from the 2017-21 TRSP.

In 2022, The National Highway Traffic Safety Administration (NHTSA) conducted a traffic records assessment (TRA) of Kentucky's traffic records systems. NHTSA recommended specific improvements for each database. Many of these concerned the database attributes of accuracy, completeness, and integration. These recommendations were issued after the TRSP was completed. As discussed in the following sections, some new performance measures and goals for some database attributes were developed following the TRA. These will be incorporated into the new Traffic Records Improvement Plan (TRIP) and will be funded in part by the office of highway safety (OHS) in the Kentucky Transportation Cabinet. For each database, the next sections describe NHTSA's recommendations, database responses and where applicable, highlights quality-improvement efforts based on NHTSA's recommendations.

Chapter 2 Progress Report for Each Database

2.1 CRASH Database

The Kentucky State Police (KSP) maintain the CRASH Database. Over the past ten years, the CRASH database has made substantial improvements in its database and has reached many of its goals for data timeliness, completeness, uniformity, and integration and one of its two for accuracy. The number of days from a crash event to data entry is now two days. The number of crash elements with validation edits is 100%. All crash reports are entered electronically. CRASH has completed the integration of off-road collisions into its database. New goals will be developed this year for accuracy, completeness, and integration.

Regarding progress, the CRASH database has met its goals for data timeliness, one of its accuracy goals, and goals for completeness, and uniformity, as summarized in Table 2.1. Comparison of database improvements over time is provided in Appendix A.

After the 2022 traffic Records Assessment, NHTSA issued recommendations and considerations for the CRASH database, as follows.

2.1.1 NHTSA's 2022 TRA CRASH Recommendations

1. **Recommendation:** Improve the data dictionary to reflect best practices in NHTSA's Traffic Records Program Assessment Advisory (TRPAA).
   Status: This is complete; details provided in Section 2.1.2 below.
2. **Recommendation:** Improve the data quality control program to reflect best practices in the TRPAA.
   Status: This is complete; details provided in Section 2.1.2 below.
3. **Recommendation:** Improve the interfaces to reflect best practices in the TRPAA.
   Status: This has not been addressed, but currently, CRASH has interfaces with the Driver and Vehicle databases.

2.1.2 Description of Major CRASH Projects

Data Dictionary

The data dictionary was successfully completed and is available for authorized users within the KYOPS/CRASH database. The project was generated as a response to the 2022 Kentucky Traffic Records Assessment recommendations. Each field collected on the Kentucky collision report is detailed information about acceptable value inputs and automatic validation edits. For example, in the location detail section, one of the fields is for mile point. To validate, the mile point is checked against a list of valid roadways and the beginning and ending mile points for the given roadway. With the creation of the data dictionary, validation edits are shown for all applicable fields. The dictionary also gives a description of every field. The primary focus of the project is to guide users with information that will assist in advanced data analysis. This goal was accomplished with the introduction of the data dictionary.

The data dictionary and validation edit feature have improved the quality of data, which is now more accurate and complete. The dictionary provides a thorough breakdown of each data field element collected in the Kentucky Crash Data Collection Wizard.

Training

With previous KYTC funding, the KSP was able to update and enhance the KYOPS/CRASH client application, traffic safety-related wizards and web portal. The enhancements required new employee training videos to enable navigating the new and complex features in the KYOPS web portal, KYOPS web administrator, and KYOPS client. Each

video provides a walkthrough tutorial with audio overlay detailing the critical information in each section. Breaking down the module content by section allows employees to easily review KYOPS features should they need refreshing.

The existence and availability of training tools for the new version of KYOPS improves database quality as users have better understanding of how to create or navigate each section and new features. Detailed breakdowns with the on-screen walkthroughs ensure that users are appropriately educated on navigating these updated and complex components. The videos allow for the most effective and efficient way for KSP to meet the challenges of job turnover, unique work schedules, and other relevant factors.

KSP Online Civilian Collision Data Reporting
This database tool enables civilians to report collision data electronically from a KSP hosted website. Before this electronic process, civilian reports were often not available or incomplete, and therefore useless, for research in advanced data analysis. For example, when submitting a collision report, users can pinpoint where the accident occurred on the built-in map. Previously, roadway data was rendered useless or unreliable due to incorrect information.

With the submission of paper civilian collision reports, there was often a significant lag time of up to three weeks or greater in submitting civilian collision reports. Electronic data submissions now require 30 minutes or less. The expediency of the civilian collision reports is useful for all relevant parties involved. Furthermore, the online reporting tool requires users to enter certain data fields, eliminating any previous incomplete, incorrect, or illegible reports that were essentially useless.

Adding these required elements, CRASH now receives more complete data that is helpful in traffic safety analysis, including crash site information and other important factors pertaining to the collision. There are additional fields collected for collision factors (weather, roadway condition, surface, character, control signals (stop sign, yield signal, school zone signs, etc.), Upon submission of the online report, a single data file enters the KYOPS/CRASH repository. Accessible fields are then available for search by authorized users. Researchers and traffic analysts have benefited from the availability of electronic submission of civilian collision data in that it provides a more complete picture of Kentucky crashes.

2.1.3 Possible Future Improvement Projects
1. If funding was available, CRASH could investigate a way to receive up-to-date roadway maps more frequently.
2. KSP could add more precise database elements, eliminating the use of broad categories. For example, the database has the capacity to specify driver drug use or alcohol level or both. Such design updates would improve data accuracy and completeness in the CRASH database.

Table 2.1 CRASH Database Performance Measures, Goals, Baseline Metric, Improvement Project, and Current Status

Attribute	Performance Measures	Goals	Baseline Metric	Project (Proposed or Begun)	Current Status
Timeliness	# of days from crash event to data entry	Reduce number of days to 2	6 days in (2017)		Complete Currently 2 days

Attribute	Performance Measures	Goals	Baseline Metric	Project (Proposed or Begun)	Current Status
Accuracy 1	% of crashes locatable w/ roadway location method	Increase % from current level	95.86%	Submit grant for data dictionary with validation edits	96.46 locatable
Accuracy 2	Improve the specificity of the impaired driver code	Allow officers to specify drug and alcohol use in separate categories	one category (drug/alcohol)	A category for presence of drug use; and another for presence of alcohol use	Accomplished
Completeness	# of crash elements with validation edits included in the new collision data dictionary	Increase from 0 to 100% by 9/30/2019	0%	The goal was realized with the creation of the crash data dictionary's validation edits	Complete 100%
Uniformity	Percent of crash reports submitted electronically	Increase to 100%	The current % is 100%		Complete 100 percent electronic
Integration	Integrate data from off-road collisions with CRASH data	Increase from 0 to 100% by 9-30-2019	0%	The project was realized with completion of online civilian collision reporting tool	Complete 100%
Accessibility	Number of queries on public site annually	Increase above current baseline	40.031	Develop online civilian collision reporting	41,152

2.2 Citation/Adjudication Databases

The citation/adjudication database is compiled by the Kentucky's Administration of the Courts (AOC), which holds the records for traffic related offenses: the initial citation as well as the final court ruling. A record is kept of each offense by a particular driver. Thus, a driver's complete history of offenses is available to the courts.

To improve the timeliness of case clearance submission the AOC is installing National Center of State Courts (NCSC) measures to increase the process flow for case clearance. The liaison reports that Citation/Adjudication has lowered the time from a citation being written to the filing of the charge from 3.26 days to 2.73 days. According to the liaison, there is no practical need to improve the accuracy of violation charges as the current match of violation to valid criminal history stands at 99.8%. Similarly, there is no practical need to raise the incidence of a match of traffic violation charges to the defendant's date-of-birth; the completeness metric is 98.7%.

Data integration will increase with the creation of a comprehensive data dictionary for the AOC databases, which is currently underway. This will facilitate the integration of five databases and the location of data in one place. Regarding data uniformity, the percentage of cases submitted electronically on a uniform e-citation form has risen

from 81% to 89.7% of citations. AOC intends to raise this to 90% by cooperating with law enforcement jurisdictions to encourage a shift to e-citation. Currently, no proposal to do this has been devised.

The liaison stated that there was no practical way to increase the rapidity of response to citizen requests for documents (the accessibility metric), as most are handled in one hour or at most a day, producing a response rate of 100%. Regarding timeliness of data reporting, the database has not obtained case clearance rates due to constraints of the internally developed application and its lack of emphasis on data reporting. On a positive note, citation/adjudication now publishes daily updated pending case reports to all judges and circuit clerks. Previously these were published quarterly.

There are two integration goals. The first is the creation of a comprehensive data dictionary, which is currently being developed. This will accomplish the integration of all five citation/adjudication databases. The second—the reduction in invalid citation numbers—shows a decline in error rate from 1.2 to 0.3 percent.

Regarding progress, citation/adjudication has met its accuracy and completeness goals and is approach its goals uniformity. It reports a significant reduction in the percentage of invalid citation numbers. Additional information regarding database improvements is summarized in Table 2.2. Comparison of database improvements over time is provided in Appendix A.

2.2.1 NHTSA'S 2022 TRA Citation/Adjudication Recommendations and Considerations
1. **Recommendation:** Improve the data dictionary to reflect best practices as identified in the Traffic Records Program Assessment Advisory (TRPAA).
   Status: Development of a comprehensive data dictionary, which will integrate all five citation/adjudication databases, is underway.
2. **Recommendation:** Improve the data quality control program to reflect best practices as identified in the TRPAA.
   Status: Not addressed this year.
3. **Recommendation:** Improve the procedures/process flows to reflect best practices as identified in the TRPAA.
   Status: Not addressed this year. However, the liaison stated that the NCSC measures, which will be installed in 2024, will increase process flows and case clearance.
4. **Consideration:** Target quality control performance measures through a coordinated effort with AOC, OHS and with technical assistance from NHTSA. This group could identify, develop, and maintain measurable performance measures for each system.
   Status: Not addressed this year.

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

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

Citation and Adjudication databases should meet current national law enforcement and court standards. These are established by the National Crime Information Center, Uniform Crime Reporting, the National Incident-based Reporting System, and the National Law Enforcement Telecommunications System. Most of these systems are based on currently applicable guidelines and standings.

Data records should be in conformity with the Functional Requirement Standards for Traffic Court Case Management, managed by the National Center of State Courts; the National Information Exchange Model Justice Domain by the Department of Justice and the Department of Homeland Security; the Model Impaired Driver Records Information System managed by NHTSA.

Table 2.2 Citation/Adjudication Database Performance Measures, Goals, Baseline Metric, Improvement Project, and Current Status

Attribute	Performance Measures	Goals	Baseline Metric	Current Status
Timeliness 1	Develop new measures based on the NCSC Measures	Faster case clearance rates	Current average case clearance time	Project Underway to install NCSC measures to increase process flows
Timeliness 2	Citation to Charge Filing	Reduce time to 2 days	3.26 Days	2.73 days
Accuracy	Match traffic violation charges to valid criminal history key	Maintain or improve current accuracy match of 99.8%	99.8%	Complete, no practical need to improve
Completeness	Reduce the incidence of no match of date-of-birth for defendant entry to valid criminal history key	Reduce incidence of no match by 50%, if funding is available	Current no match Is 99.7%.	Complete, no practical need to improve
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	81%	89.7%
Integration	Create a comprehensive data dictionary for five databases	Integration of comprehensive information in one place	Number of databases integrated	Underway
Integration 2	Percentage of Invalid citation numbers	Reduce percentage	1.2%	0.3%
Accessibility	Response to requests	Maintain rapid response of most in an hour and some next business day	Response rate is 100%.	Complete, no practical way to improve

2.3 Emergency Medical Services (EMS)

In 2021, Emergency Medical Services (EMS) requested changes in its authorizing law that will improve several databases attributes. In 2022, the Kentucky legislature revised the statute that authorizes the Kentucky Board of Emergency Medical Services. Several sections of the revision will improve database timeliness, accuracy, completeness, and uniformity. The relevant passages are below. If implemented, timely submission of data will occur. The Kentucky Emergency Medical Information System (KEMIS) (the data uniformity goal) is completely installed.

In 2018, 22% of crash reports failed to note the presence or absence of driver and passenger use of seatbelts. EMS is currently encouraging agencies to reduce this failure to less than 10 percent of vehicle crashes. This will increase the data accuracy and completeness of this safety metric of great interest to safety researchers. EMS is approaching its goal, with 89% reporting occupant use of seatbelts.

Regarding progress, EMS has met its uniformity goal of 100 percent of services reporting to KEMSIS and it is approaching its goals for data timeliness, accuracy, and completeness. Additional information regarding database improvements is summarized in Table 2.3. Comparison of database improvements over time is provided in Appendix A.

2.3.1 NHTSA's 2022 TRA EMS Database Recommendations and Considerations
1. **Recommendation:** Improve the data quality control program for the Injury surveillance systems to reflect best practices identified in the Traffic Records Program Assessment Advisory (TRPAA).
   Status: The revised EMS Statutes requires incident validation scores. Relevant passages from the new EMS Statute are included in Appendix B.

2. **Recommendation:** Improve the interfaces with the Injury Surveillance System (IJS) to reflect best practices in the TRPAA.
   Status: Currently, there is no linkage between EMS and Trauma Registry Researchers at the Kentucky Injury Prevention Research Center (KIPRC). EMS is communicating with officials at KIPRC to identify opportunities for communicating with other databases. It intends to provide more useful information for research by routinizing greater connectivity with data repositories.

3. **Consideration:** Include data on the severity and nature of injuries in the EMS Annual Report.
   Status: Discussions with the liaison indicate that NHTSA may be referring to NEMSIS eInjury data elements .01 & .03. In v3.4, those are National and State *Required* elements already.

4. **Consideration:** Describe and document the actual procedures in place for reporting to the Kentucky Board of Emergency Medical Services (KBEMS).
   Status: The database liaison is in the process of revising for corrections and accuracy. The current procedures can be found in: https://apps.legislature.ky.gov/law/kar/titles/202/007/540/.

5. **Consideration:** Describe and document the process for automated edit checks and validation rules to ensure that submitted EMS data falls within the range of acceptable values and is logically consistent among fields.
   Status: The liaison states that the IPOP (In-patient and out-patient) manual does not contain validation rules or edit checks for the EMS data system. Validation rules are in the Schematrons, which can be accessed here: https://nemsis.org/technical-resources/version-3/version-3-schematron/. Currently, 3rd party ePCR (patient

care records) vendor Schematrons are not in good condition; accuracy will be improved when Kentucky updates to NEMSIS v3.5 in 2024.

6. **Consideration:** Maintain records on monitoring resubmissions of rejected patient care reports.
   Status: Discussions with liaisons indicate that EMS agencies or their vendors monitor and correct rejected ePCRs and then attempt re-importation into KStARS/KBEMS.

7. **Consideration:** For timeliness, clarify whether the percentage of all call records received within 72 hours was collected at the level of individual EMS systems and reported back to those systems managers.
   Status: Call records are collected at the individual agency Level; efforts are underway to obtain the CY2022 percentage.

8. **Consideration:** For accuracy, change occupant restraint usage to a measure of completeness and explain how it is tailored to meet the needs of EMS system managers and data users.
   Status: This is complete and is updated in Table 2.3.

9. **Consideration:** Replace the current integration metric with: "The number of records that actually find a match as a percent of all records that logically should have a match." Computing this measure at the levels of EMS agencies and hospital trauma centers will provide useful variation for local program managers seeking data quality improvements.
   Status: Currently, this appears to be above scope of influence or capabilities of the database team; further investigation is ongoing into this matter.

10. **Consideration:** Regarding accessibility, NHTSA states that while there are plans to develop data sharing agreements to increase the accessibility of the EMS data system, no accessibility performance measures were provided.
    Status: Work is ongoing to develop an appropriate metric for data accessibility.

11. **Consideration:** NHTSA notes the failure to do or conduct the following: quality control reviews; comparative and trend analyses; data quality feedback from key users regularly communicated to EMS data collectors and data managers; and EMS data quality reports produced and regularly and made available to the state TRCC.
    Status: The liaison states that he might be able to create queries/reports of ePCR importation failures per agency, that could then be emailed to the directors of those agencies.

The emergency medical service is also asking for more use of validation rules to secure data quality. This too will increase data <u>accuracy</u> as well as <u>completeness</u>. EMS also has a program in progress to change the control process by implementing validation rules that require toggling required data elements based on incident type and usefulness. The goal is to elevate the average validity score from its current level of 80.4 to above 90.

Regarding <u>accessibility</u> of data, EMS has six data sharing agreements with state agencies and third parties; it is now working on a streamlined method for data sharing agreements for transferring information.

2.3.2 Recent Activities and Narrative Accounts
For data accuracy, Kentucky can implement any number of validation rules; however, current regulations lack provisions for holding agency personnel accountable for meeting a minimum validation score. The new data

regulation will help in this area. In 2019, for incidents classified as a traffic/transportation incident, 89.0% of records recorded use of occupant safety equipment. This is very close to reaching the accuracy goal of 90%.

EMS collaborated with the Trauma Registry on NEMSIS elements to identify EMS incidents that meet a threshold of interest to the Trauma Registry. A goal was discussed that EMS could provide routine data exports to help Trauma reconcile missing cases and target medical facilities that not be participating in the Registry. Additionally, EMS officials met with the CRASH database owners at Kentucky State Police to learn more about the data captured by their KYOPS program. During the session one of their fields revealed three different option values that all equated to Ambulance as the manner of transport from the scene. EMS suggested replacing these with a single option value and adding a field where the officer in the field could select from a list of Kentucky's ambulance services. No solid plans to move forward are established at this time.

With the goal of streamlining data sharing with another agency, EMS is working on a standard Data Sharing Agreement (DSA) template intended for third parties where data access is more frequent than can be processed under Open Records (FOIA). This DSA will be pre-approved by the attorney, thereby expediting the execution of agreements. This project currently sits with the KBEMS Deputy Executive Director and the KCTCS General Counsel's Office.

Since 2013, Kentucky EMS has established or maintained data sharing agreements with the Kentucky Department for Public Health, Kentucky Injury Prevention Center/UK College of Public Health, Biospatial Inc., Kentucky Health Information Exchange, and KYTC.

EMS has proposed two future projects: a funded project to enable routine EMS data exports to help the Trauma Registry reconcile missing cases; and a grant to target medical facilities that not providing patient data to the Trauma Registry. This would enhance data integration as well as data completeness; a project to enhance the use of data validation by registrars to ensure data accuracy and completeness; and a project to improve data accessibility by streamlining the data sharing agreements.

2.3.3 The Contributions of KEMSIS to Database Improvement

Prior to the KEMSIS project Kentucky's landscape of EMS data ranged from paper-based documentation to non-standards based electronic charts; data was inconsistently collected at the state level. The state's EMS repository is now based on the National EMS Information System (NEMSIS) standard. Adopting NEMSIS and requiring licensed ambulance services to use standard software streamlines the upstream submission process by eliminating additional data transformation or reformatting.

KEMSIS improves the capacity of agencies to directly query EMS data for such items as severity of injury. Prior to this project, ambulance service personnel had to review physical documentation to answer questions about trauma severity, use of occupant safety equipment, and patient demographics. Now this data, and more, is reportable at the agency and state level.

With KEMSIS, the national and state validation rules improve data accuracy and completeness by guiding the inputting of database elements. The inputting guidance reduces common data entry errors such as recording out of sequence dates and times or selecting the wrong county from preset lists.

The database is now used regularly to evaluate the specific medical procedures and medications administered. This information is being used to assist in a rewrite of the Kentucky State Emergency Medical Services Medical Protocols.

It is also being queried in relation to response times in urban and rural areas. Medicaid is using this information to adjust reimbursements. Additional information explaining the improvements arising from KEMSIS can be obtained here: https://kbems.kctcs.edu/kstars/DataReports.aspx.

Table 2.3 Emergency Medical Services Database Performance Measures, Goals, Baseline Metrics and Current Status

Database Attribute	TRSP Performance Measures	Performance Goals	Baseline Metrics	Current Status
Timeliness	Percent of EMS agencies reporting within 72 hours	95% reporting within 72 hours	66% of incidents were reported within 72 hours	Updated Statute requires data submission within 120 hours after accident.
Accuracy	Raise validity score point value	Improve validity score point value to 90 or better	The average validity score point value is 80.4	Data not available
Complete-ness	Percent of EMS records with no errors in a critical data element (filled in occupant restraint usage)	Improve record to above 90% from current level	Currently 89% report Occupant restraint usage	Data not available
Uniformity	Number and % of services reporting to KEMSIS.	98 to 100%	The current level of participating agencies is 100%	Currently there is no practical project to increase data uniformity
Integration	Establish connectivity with Trauma Registry	Provide useful information to Trauma Registry researchers	No linkage exists between EMS and Trauma Registry	If funding is available, conduct a feasibility study with trauma registry to develop routine data exports to trauma registry
Accessibility	Develop a more streamlined method to share data to databases with sharing agreements	Improved transfer of data upon request	Will be determined by the project	Develop streamlined method to execute data sharing and transfer of information

2.4 Trauma Registry Database

The Kentucky Injury Prevention center (KIPRC) is responsible for compiling data on crash-related trauma fatalities and injuries. The trauma registry has developed and submitted several funding proposals. To improve timeliness, it has developed a proposal to decrease the reporting time of trauma registry data by convening a working group, which is working on strategies to increase the current trauma registry workforce. Personnel turnover requires improved methods for training new employees. The registry is developing new training methods and sessions for new practices and staff. This will increase data accuracy.

KIPRC has also developed and submitted a proposal to improve data uniformity by raising the percentage of trauma registry records in conformity with the National Trauma Data Standard. This will require a comprehensive reassessment of trauma registry data. The Registry has two goals for data completeness: 1) KIPRC seeks to increase

the number of trauma cases submitted from 13,000 to more than 15,000; it will create a new strategy to ensure hospitals fulfill reporting obligations and 2) it will add more Level 3 and 4 trauma centers reporting to the Registry. A research team at the University of Louisville is developing a method to integrate EMS and trauma registry data. With funding in the future, this method will enable researchers to use integrated data from both databases to answer research questions. KIPRC is seeking funding to raise the accessibility of integrated CRASH-Injury data to researchers. This may be possible by 2026.

Regarding progress, the trauma registry has developed new training for registrars and trauma staff. Additional information regarding database improvements is summarized in Table 2.4. Comparison of database improvements over time is provided in Appendix A.

2.4.1 NHTSA's 2022 TRA Trauma Registry Considerations

1. **Consideration:** Provide evidence that the emergency department tracks the frequency, nature, severity of injuries related to motor vehicle crashes.
   Status: This material will be provided in 2024.

2. **Consideration:** Provide an example of the trauma registry being used for analysis to identify problems, evaluate programs, and allocate resources.
   Status: Examples along with related database improvements will be provided.

3. **Consideration:** Develop a description of the procedures that a researcher might use to request custom aggregate trauma registry data for analysis.
   Status: This material will be developed in 2024.

4. **Consideration:** Provide clarification for the timeliness metric; it is not clear whether the measure applies to trauma centers, file submissions, or individual records. The reporting deadline is not provided.
   Status: Data is from trauma registrars and is submitted quarterly to specified deadlines.

5. **Consideration:** Consider the following metric for data accuracy: "An assessment of the error rate on critical fields such as cause codes, personal identifiers needed for billing or linkage, or vital signs and other fields needed to assess the trauma system."
   Status: If possible, an appropriate metric will be selected.

6. **Consideration:** Regarding the completeness metric, consider changing the metric to increase the number of traffic crash cases reported to the trauma center.
   Status: This is complete and is updated in Table 2.4.

7. **Consideration:** Consider changing the uniformity metric to increase the percentage of trauma registry records to the National Trauma Registry Standard.
   Status: This is complete and is updated in Table 2.4.

8. **Consideration:** Develop a baseline number for the accessibility performance measure (increase the number of users of the trauma registry).
   Status: If obtainable, this will be done in 2024.

9. **Consideration:** Create a formal process to provide data quality feedback from key users, regularly communicated to trauma registry data collectors and data managers.
   Status: If possible, this will be done in 2024.

10. **Consideration:** Produce regular data quality reports and make them available to the state TRCC.
    Status: Prior to TRCC meetings, the registry will report data quality issues to the state TRCC.

2.4.2 Discussion about Trauma Center Practices and Connections to EMS
As part of coordination with the database liaisons, the following discussion points were recorded regarding the trauma center practices and connections to EMS.

1. Regarding data quality, how many training programs were conducted by ESO (a software and training company serving EMS and fire operations) and your staff over the past two years?
   The trauma registry staff consists of the database liaison and a 12% Full Time Equivalent (FTE) data analyst, so there is not capacity to conduct training within KIPRC. Training for trauma registrars typically takes place one-on-one. ESO provides direct support and training but also conducts national webinars and other training programs. ESO provides interactive on-demand training as described at this website:
   https://www.eso.com/resources/on-demand-learning-class-demo/.

2. Please provide pre/post findings on error reduction from the ESO. Estimates are sufficient if numbers are not available.
   Registrars submit data online to ESO and an ESO representative reviews the data for system-generated problem indicators. If a registrar submits data that fails to meet the system criteria for completeness and accuracy, the submission is returned to the registrar with specific directions for correcting it. Most, if not all, problems are corrected in this way.

3. Please describe the degree of linkage to EMS and how it is being used to upgrade trauma data. This can be a description of what was done and why it will make linkage now or in the future more useful to researchers.
   Dr. Robert Kluger, an engineering professor at the University of Louisville, has undertaken linkage of statewide EMS and trauma registry data. This work is currently in progress, but a pilot project in Jefferson County (Louisville) provided new information on topics such as EMS calls for individuals who requested transport to a non-trauma-system hospital and geographic clusters of specific types of injuries (notably gunshot wounds).

4. In what ways is the work with Prof. Kluger likely to improve the trauma registry data in the future?
   Dr. Kluger's work with statewide EMS-trauma registry data linkage will help answer some longstanding questions, such as: 1) the proportion of trauma patients cared for in verified trauma centers, 2) geographic variation in injury type and severity, 3) areas where a significantly lower proportion of trauma patients receives EMS services (e.g., due to EMS shortages), and 4) transport to out-of-state trauma centers.

5. In what ways did ICD-10-CM (a cause of injury matrix tool) improve data when it added codes for specific causes and types of injuries? This seems likely to contribute to increases in both accuracy and completeness and perhaps other database attributes.
   ICD-10-CM includes a wealth of specific codes, but coding is performed primarily for billing and reimbursement purposes, and most of the new injury-related codes have no influence on billing categories or reimbursement amounts. The contribution of the trauma registry data is to supplement the administrative datasets that rely on ICD-10-CM data for diagnostic coding, making the trauma registry far more nuanced than ICD-10-CM coded

data. Strategies to increase the use of new codes despite their lack of relevance in their primary context are currently being pursued with funding from the CDC's National Center for Injury Prevention and Control.

6. Please describe any plans for upgrades to the trauma database that you will make or _would like to make_ if funding is available during the years 2022 through 2026.

    The current data management vendor plans to upgrade its offerings, which is good news, but the cost of the new products is at least triple the current charges, and far beyond the budget of the state trauma registry and participating facilities. Current products will be supported for at least three more years, but other options must be explored. There is only one other vendor serving the trauma registry market. A positive note is that the second vendor has worked with Kentucky EMS for several years, so there may be some synergy by aligning with them. Estimates will be requested for EMS-trauma registry integration from the second vendor as well as ESO.

7. If you had funding, what projects would you like to undertake?

    Primarily EMS-trauma registry integration as noted above, but there may also be options for creating some data management capacity independent of the vendors.

8. If so, how would the planned changes improve one or more of the database attributes (database timeliness, accuracy, completeness, uniformity, integration with other databases, and accessibility). Feel free to speculate about this.

    Timeliness: It seems unlikely that this would change because the trauma registrars submit data quarterly for internal and national purposes as well as for the state registry.

    Completeness: Integration with EMS data would enhance completeness by providing pre-hospital information that is often lacking in the current data.

    Uniformity and integration with other databases: These criteria are fundamental to the entire trauma registry system because data must conform to and integrate with the National Trauma Data Bank reporting system, administered by the American College of Surgeons.

Table 2.4 Trauma Registry Performance Measures, Goals, Baseline Metrics, and Current Status

Attribute	TRSP Performance Measure	Goal	Baseline Metric	Current Status
Timeliness	Reporting time of trauma registry data	Increase reporting of trauma registry data by deadline	95% complete by deadline	82% complete by deadline
Accuracy	Develop new training for registrars and trauma staff	Annual training sessions for new practices and new staff	3 trainings conducted in 2022	3 individual and 2 group trainings in 2023
Completeness	Number of traffic crash cases reporting to the trauma registry	Increase number of cases from 13,000 to more than 15,000 by 2026	13,000 reported	13,824
Completeness	Increase the number of level 3 and 4 trauma centers reporting	Add trauma centers	Current level of 3 and 4 centers is 16	Current level 3 and 4 centers is 16

Attribute	TRSP Performance Measure	Goal	Baseline Metric	Current Status
Integration	Integration of EMS and trauma registry data	Will require a funded project		Related research has been conducted in Louisville
Uniformity	The percentage of trauma registry records in conformity to the National Trauma Data Standard.	Raising the percentage of trauma registry records in conformity to the National Trauma Data Standard.		Records out of compliance Will be automatically rejected by the system
Accessibility	Improve accessibility of integrated CRASH-Injury data to Researchers	Increase number of researchers using data by 2026	Provide descriptions of situation with numbers if possible	Not funded

2.5 Roadway and Traffic Database

Officials in the KYTC Division of Planning are responsible for maintaining the database of state and local roads. The state highway district offices report data on the state highway system. Local governments report changes in local road systems to their Area Development Districts (ADDs), who shoulder the responsibility to report any changes to the roads in their respective districts.

When a new road or a road maintenance project is completed, the roadway central office is notified. The timeliness metric for this database is to have all information about completed state owned road projects sent to the central office within 2 weeks. The performance goal is a response rate of 95% within two weeks. To that end, roadway officials are improving communication between the central office and the state district highway offices.

To improve accuracy, Roadway will develop a proposal to ensure that critical data elements are within reasonable ranges. The current level is 90% in the desired range. This will be done by obtaining funds to improve the training of personnel. To maintain or upgrade data accuracy, roadway uses Lettings, Permits Database, District personnel knowledge and photovan to keep up with and stay informed of projects that may be changing alignment or roadway data. During the past year they have added new staff and conducted new training of staff.

There are two completeness metrics: one reporting road mileage and elements on local roads and one for road traffic counts. Roadway is currently in year 2 of a system-wide review of all city and county roads. To improve reporting road mileage of local roads, roadway is improving communication with the ADDs. Within the next few years, Roadway's goal is to increase the traffic counts to 98%. However, due to turnover in traffic count technicians and difficulty in hiring replacements in some districts, roadway has not been able to increase the percentage of traffic counts updated within the last three years.

The completeness metric calls for updating traffic counts on all roadway segments every three years. The Roadway database will increase the number of interstate traffic counting loop stations on I-65 and I-69. To increase the uniformity of data, Roadway will update and/or replace the current traffic count devices. Roadway seeks to integrate local road data into the state system. Specifically, it will add local lane mile width data. Currently, only 20% of local lane width data has been added.

To elevate data accessibility, the GIS staff is continually adding new data sets to the Cabinet's website for public use. Also, the Office of Information Technology (OIT) is making modifications to the Cabinets Enterprise database to make data accessibility to the Cabinet more productive.

Regarding progress, Roadway has two new performances measures, one of which will require funding. New baselines were provided for two. Additional information regarding database improvements is summarized in Table 2.5. Comparison of database improvements over time is provided in Appendix A.

2.5.1 NHTSA's 2022 TRA Roadway Recommendations

1. **Recommendation:** Improve the applicable guidelines for the roadway data system to reflect best practices identified in the Traffic Records Program Assessment Advisory TRPAA)
    Status: Not addressed in this cycle.

2. **Recommendation:** Improve the data dictionary for the roadway data system to reflect best practices in TRPAA.
    Status: The data dictionary is maintained and improved when needed; procedures for updates are in development. Additional information is provided in Section 2.5.2.

3. **Recommendation:** Improve the data quality control program to reflect best practices in the TRPAA.
    Status: Not addressed in this cycle.

4. **Consideration:** Include all elements collected in the data dictionary. This includes Model Inventory Roadway Elements (MIRE) Fundamental Data Elements (FDEs), MIRE non-FDEs and state collected elements. Ensure that definitions are included for each element.
    Status: The data dictionary is being updated to address these elements. Additional information is provided in Section 2.5.2.

5. **Consideration:** Continue to develop additional performance measures for each attribute. Include goals, benchmarks, and metrics for each performance measure.
    Status: New baselines and metrics are included in Table 2.5.

6. **Consideration:** Determine if all the MIRE FDEs are collected for all public roads. NHTSA noted that Roadway lacks complete data lane miles for local roads.
    Status: It is estimated that the Roadway database will include the local lane mile data in two years.

7. **Consideration:** Determine if all additional data elements collected for public roads conform to the data elements included in MIRE.
    Status: It is confirmed that all data elements collected conform to MIRE definitions.

8. **Consideration:** Determine if all MIRE FDEs for all public roads are documented in the enterprise system's data dictionary.
    Status: When updated, the data dictionary will contain all the FDEs.

9. **Consideration:** Determine if all additional (non-FDEs) MIRE data elements for all public roads are documented in the data dictionary. NHTSA notes that not all MIRE elements are stored.
    Status: Not addressed this cycle.

2.5.2 NHTSA Definition of Data Dictionary for the Roadway Data System

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

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

Table 2.5 Current Roadway/Traffic Database Performance Measures, Goals, Baseline Metric and Proposed Project or Current Status

Database Attribute	Performance Measurement	Performance Goals	Baseline Metric	Current Status
Timeliness	Mean number of days from state roadway project completion to critical data file update	For State-maintained Roads: 95% reporting within 10 working days	Current % of reporting within 10 working days: 50%	Develop improved communication between central office and Highway District Offices
Accuracy	Percentage of critical elements whose values are within reasonable ranges	Improve the percentage of critical elements whose values are within reasonable ranges	Percentage of critical values within reasonable ranges: 93%	Added new staff and training of new staff
Completeness	Increase the number of interstate traffic counting loop stations	A reduction in the number of missing counting loop stations on I-65 and I-69	The current number of missing counting loop stations: 29	Submit request for funding to increase the number of interstate traffic counting loop stations on I-65 and I-69.
Uniformity	Begin updating/ replacing the current traffic count devices.	Reduce the percent of traffic counting devices in need of updating or replacement	The percent of traffic counting devices in need of updating or replacement: 35%	Submit request for funding for updating or replacing current traffic count devices
Integration	If possible, add data being collected by KTC at UK	Addition of local lane width data to Roadway/ Traffic	The percent of local road lane width data in file: 20%	Obtain data from Kentucky Transportation Center and add to database.
Accessibility	Number of data sets added to the Cabinet's website for public use	Current number of websites	Current number of websites: Nearly 75% complete	Consult with GIS staff about new data sets for addition to website

2.6 Driver Database

The Driver database maintains information on the driver's history as a licensed driver including citations, convictions, and license suspensions, if any. The timeliness metric is described as complete in that the current standard of database timeliness is met: a requirement that data entry occur within 24 to 48 hours after any adverse action, such as a speeding ticket.

The accuracy metric is being met through the ongoing implementation of the Real ID project, which contains a comprehensive data dictionary based on the best practices in NHTSA's Traffic Records Program Assessment Advisory (TRPAA). The implementation of Real ID will also meet the goal of improved completeness of data with more critical data elements available in all 120 counties. This will also meet federal standards, which will provide more data uniformity. Currently, it is nearing completion. Specific coding that does not allow accidental entries. Driver's licensing affirms that it has not had a system breach and complies with all state and federal guidance in cooperation with the Commonwealth Office of Technology (COT) to maintain the highest security possible for systems.

The new comprehensive data dictionary will increase the uniformity of data. All counties will use it to report infractions. Although not yet complete, the REAL ID program is fully functional and ready to assist any Kentucky residents or out of state transfers that would like to apply.

integration metric calls for improvement of the percent of out-of-state conviction records submitted electronically, which currently stands at 20%. Kentucky is on the waiting list to implement state-to-state reporting, which will allow immediate information sharing.

The accessibility metric concerns maintaining the integrity of the data system to prevent inappropriate access to driver database information. There are no known breeches of security at present. The driver database will continue its current security practices to ensure that only those with a legitimate need to access data are able to do so. Regarding progress, the Driver database states that it has meet four goals and is on track to meet two. Additional information regarding database improvements is summarized in Table 2.6. Comparison of database improvements over time is provided in Appendix A.

2.6.1 Reorganization of Driver Licensing and Implementation of Real ID

All drivers licensing services are being moved from the 120 County Clerk Offices to 30 Regional Offices, including regular drivers licensing and Real ID. The new system of 30 regional offices will improve several database attributes. Accessibility is greatly improved through online scheduling, renewal documents list, temporary IDs, and other services. According to the liaison, the reduction of 120 offices to 30 offices will increase the accuracy, completeness, and uniformity of driver licensing records. Real ID will be required for domestic air travel, military base access, and federal buildings by May **7**, 202**5**.

2.6.2 NHTSA's Driver Recommendations and Considerations (Not Addressed this Cycle)

1. **Recommendation:** Improve the data dictionary for the Driver data system to reflect best practices identified in the Traffic Records Program Assessment Advisory (TRPAA).

2. **Recommendation:** Improve the data quality control program for the Driver data base to reflect best practices in the TRPAA.

3. **Recommendation:** Improve the description and contents of the Driver data base system to reflect best practices in the TRPAA.

4. **Consideration:** Create a data dictionary that includes definitions and system edit checks and document a formal process for updating the data dictionary.

5. **Consideration:** Create documented procedures for license issuance and reporting and recording of convictions that includes error corrections guidelines. These documented procedures could assist when training new staff in these program areas.

6. **Consideration:** Explore the feasibility to electronically link the crash and adjudication data systems to the driver system. This would allow timelier updating of data that could adversely affect a driver; thereby improving highway safety.

7. **Consideration:** Improve performance measures by adding and documenting baseline and actual measures for each establishing performance metrics for each attribute.

Table 2.6 Current Driver Database Performance Measures, Goals, Baseline Metric and Current Status

Attribute	TRSP Performance Measures	TRSP Goals	Baseline Metric	Current Status
Timeliness	Average # of days from driver's adverse action conviction to date the adverse action enters database	Maintain timeliness required by standards (15 days per KRS 186.550)	Current database entry time is 24-48 hours	Complete
Accuracy	Correct data entry keying mistakes	Reduce the % not corrected	Current % for in-state is 95% on initial entry of records	Complete
Completeness	Install Real ID	Implement Real ID project in all 120 counties	Current number of regional offices is 11	On track
Uniformity	Current and comprehensive data dictionary—part of real ID	Data dictionary that reflects best practices identified in the TRPAA	Current update is complete.	Complete
Integration 1	% of in-state conviction records submitted to the DMV Electronically	100% electronic submission	Any other agency can be set up to transmit electronically to Driver.	Complete
Integration 2	Out-of-stat e% of conviction records submitted to the DMV Electronically	Establish baseline in and improve in subsequent years	Any other jurisdiction can be set up to transmit electronically to Driver.	On track
Accessibility	Appropriate users accessing traffic records data	Establish baseline and improve	Currently no known breaches of the system	Complete

2.7 Vehicle Database

Owners must register their vehicles with the Division of Motor Vehicles. The DMV contains information on vehicle ownership, vehicle type and year, the vehicle identification number (VIN) and more. Currently, the Commonwealth is finalizing the installation of the new Kentucky Automated Vehicle Identification System (KAVIS), which will improve all six vehicle database attributes. Although liaisons stated that they cannot provide baseline metrics, they are confident they can document attribute improvements once KAVIS is fully installed.

KAVIS is nearing completion and is expected to be fully functional January 3, 2024. However, some of its many modules were active in 2023 statewide. These include the point-of-sale system (2015); the print on demand decal system with data and document image storage (2015); disabled decals/placards (2018); and boat titling and registration (2019). The following modules of interest to the Office of Highway Safety have been installed and tested: vehicle titles and registrations; ATV titles; mobile homes, recreational vehicles; and all other title and registration functions.

The Vehicle liaison preferred to postpone the creation of baselines, for the metrics in Table 2.7 below, until the completion of the new system. KAVIS is expected to improve the six database attributes as discussed in the following section.

2.7.1 KAVIS Features

KAVIS will reduce the average time to post by county clerks (the timeliness goal), by reducing the average length of time to process system changes, and by decreasing the time to process transactions.

KAVIS possesses new features designed to increase the database attributes of data accuracy and completeness. To enhance completeness of vehicle records KAVIS reduces the number of blanks or unknowns in critical data elements. Regarding data accuracy, KAVIS has a data quality control program that requires validation and verification through multiple steps including verification of driver's license, ownership, tax data, regulatory issuance of title, and registration.

Database uniformity will increase with the inclusion of more NMVTIS standard compliant data elements. The data dictionary enhances uniformity of data collection and review when accessing the data warehouse.

A VIN-intelligence interface was added for transactions to identify important vehicle attributes: year, make, model color, and motor type: electric motor, gas powered or hybrid. This will replace manual entry and clerks will no longer need to learn as many data codes as before, which will reduce errors. KAVIS has a close to real-time interface with the National Motor Vehicle Title Information System (NMVTIS). So, VIN-intelligence can also be used to identify stolen vehicles and vehicles for safety recalls.

Since KAVIS is integrated with NMVTIS and VIN-assist, it can validate data across multiple systems. Thus, it will integrate with external and third-party systems to share and provide information to relevant parties, such as law enforcement and other safety agencies, vehicle dealers, rental companies, banks, and insurance companies. KAVIS has the capacity to measure the number of mapped fields to interfaced systems and subsystems. An officer in the field can obtain data about the vehicle and its owner: the registered owner's name and address, vehicle makes and models, and the status of the registration, active or expired. The officer can also identify both in-state and out-of-state stolen vehicles. But the officer cannot obtain information about the driver's history of citations and previous driving-related adjudications.

KAVIS is more user friendly for data entry, which will reduce mistaken entries. KAVIS has validation features that ensure data is entered accurately. For instance, it has drop down boxes to populate fields rather than free-form fields. If a clerk enters data that is inconsistent with other data, the clerk will be alerted to make the appropriate corrections. The improved structure of the data fields provides more accurate data for law enforcement, federal users, other state agencies, approved vendors, and Kentucky citizens. The new KAVIS screens closely resemble the vehicle transfer forms, which facilitates error-free data input including copy and paste data entry.

KAVIS utilizes E-titling and E-liens, which upgrades data accuracy and efficiency. Dealers and lending institutions submit vehicle transfer documents and money through a secure portal. The portal has electronic forms and drop-down fields and validation, which will improve data accuracy and eliminate errors from inconsistent double entry of data. Liens from approved entities will be more accurate with the electronic filing and satisfaction of liens. Fees in E-titling and E-liens are automatically calculated and totaled, reducing data-entry mistakes between dealers and clerks.

KAVIS will use the Driver Licensing database to identify owners and ensure only accurate data is brought into the KAVIS record. Also, KAVIS has an interface with the Kentucky Vehicle Commission (DMC) to ensure dealers are licensed and in good standing before allowing them to sell vehicles. An interface with the Division of Motor Carriers will auto-populate dealer address, license number, FEIN, and salesman information.

Regarding accessibility, KAVIS will increase citizen inquiries by decreasing response time to requests for information. In doing so, it will increase transparency in cross-functional interactions. This will result in an uptick in citizen satisfaction with county and state government services. KAVIS has an on-line Information System (OVIS), through which approved users can access information in real time regarding the vehicle, ownership, lien status, and owner address. This service is used by dealerships, lending institutions, towing services, and other approved entities.

KAVIS is moving toward a customer-centric model with DL verified records. Also, KAVIS has a comprehensive data dictionary with data element definitions based on appropriate data values.

2.7.2 NHTSA's Vehicle Recommendations and Considerations (Not Addressed this Cycle)
After the 2022 traffic Records Assessment, NHTSA issued recommendations and concomitant considerations for the Vehicle database. The description of KAVIS and its manifold features and capacities suggests that it can accomplish, partially or completely.

1. **Recommendation:** Improve the vehicle data quality control program to reflect best practices identified in the Traffic Records Program Assessment Advisory (TRPAA).

2. **Recommendation:** Improve the interfaces with the vehicle data system to reflect the best practices in the TRPAA.

3. **Consideration:** Link vehicle and driver data systems. Also, it would be beneficial to use vehicle discrepancy information during data entry in the crash data system for possible updating of the vehicle data system. Both concerns are partially accomplished with KAVIS.

4. **Consideration:** Process Commonwealth system data <u>in real-time</u> with the implementation of the new KAVIS.

5. **Consideration:** Add the time required to complete each step into the already detailed and comprehensive process flow diagram for the vehicle data system. This information on timeliness is useful to identify potential inefficiencies that need to be improved (this could address data timeliness).

6. **Consideration:** Create a process to detect and track high-frequency errors, which could generate updates to training or system validation rules (this could address the attribute of data base accuracy and completeness). KAVIS has validation built-in.

7. **Consideration:** Develop and implement six data attribute performance measures for the new KAVIS system as planned.

Table 2.7 Vehicle Database Performance Measures, Goals, Baseline Metrics, Proposed Projects, and Current Status

Attribute	Performance Measures	Goals	Baseline Metric	Current Status
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	Not Available	Ongoing
Accuracy	Percent of vehicle records with no errors in critical data elements	Once operational, KAVIS can select critical elements and establish a baseline to maintain or improve upon	Not Available	Ongoing
Completeness	Percent of unknowns or blanks in critical data elements	Once operational KAVIS can select critical elements and establish a baseline to maintain or improve upon	Not Available	Ongoing
Uniformity	Percent of NMVTIS standards-compliant elements in system	Will create a team to estimate current number and prepare steps to increase number	Not Available	Ongoing
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	Not Available	Ongoing
Accessibility	# of users able to perform inquiries	Increase number of times database is accessed above 2015 number of 3,500	3,500	Ongoing

Appendix A Comparison of Traffic Record Improvement Plans Over Time

We could not obtain a full set of quantitative baseline metrics for any of the databases. During the first improvement plan (2013-2017) the liaison for the driver licensing database did not define any metrics deemed measurable or flatly stated that a particular attribute could not be improved. However, over the course of the study for some unworkable metrics, a new metric was substituted.

Another impediment was the slow adoption of new software. When operational the software would improve database performance, but few quantitative indicators of progress were available as a base measure to assess progress numerically. When the liaisons effectively offered credible reasons for their belief that the database changes from new software or other changes in policy or training would result in better performance regarding a specific database attribute, we categorized a database's given attribute as improved, referring to it as a qualitative improvement.

The table below compares the results of two traffic records improvement plans (2013-2016) and (2017-2022). The table contains five categories: (1) a quantitative baseline metric with a measured attribute improvement; (2) the number of attributes without a metric; (3) a qualitative statement of an attribute improvement; and (4) a quantitative metric without an attribute improvement and (5) an attribute said to have no need for an improvement.

The table shows that more progress in meeting the attribute goals of the TRIPS occurred during the second plan. Significantly more quantitative and qualitative goals were met (23 to 15). Significantly fewer attributes lacked a metric (7 to 19); the first TRIP had 7 quantitative metrics without improvements and the second TRIP had 9. During the first TRIP, the liaisons described one attribute as having no need for improvement and during the second TRIP four attributes were so defined.

Table A1 A Comparison of Progress During the Implementation of the 2013-16 Plan Years, 2017-2022 Plan Years, and Most Recent Year (2023)

Database	2012- 2016 Plan	2017-2022 Plan	2023
Quantitative Baseline Metric(s) with measured attribute Improvement	11	15	6
Number of incomplete goal(s) without metric(s)	19	7	6
Qualitative statement of attribute(s) with improvement	4	15	10
Quantitative baseline metric(s) without Attribute(s) improvement	7	3	11*
Attributes Said to Have No Need or Possibility of Goal Improvement	1	3	9

*8 are new goals

Now that many goals have been achieved, new goals will continue to be developed. When possible, quantitative measures will be sought for the qualitative statement of attribute improvement. Totals vary due to some databases having two metrics for a specific database attribute.

Appendix B Relevant Passages from the New EMS Statute

Section 1 (1) The board shall require each licensed ambulance service to collect and submit run report data that aids in identifying patient care needs in the Commonwealth of Kentucky

Section 3 (3) Each service shall ensure data is collected and electronically entered only by the certified or licensed EMS professional involved in the delivery of care for the incident reported. (In practice one person is assigned this duty and is held accountable for it.)

Section 4 (1) The most recent version of the National EMS information System (NEMSIS) data dictionary…shall be Kentucky's standard for required data elements. (This ensures data uniformity.)

Section 5 (1) Each licensed service shall submit data electronically upon the full implementation of KSTARS. (data timeliness of submission and data uniformity).
(2) Data shall be provided electronically to the board no later than 120 hours after incident completion for ninety percent of responses per calendar month (data timeliness).
(3) Failure to timely submit collected data at the rate required by subsection (2) of this section shall subject a service to disciplinary action pursuant to KRS Chapter 311A and late fees pursuant to 202 KAR 7: 030. (Data timeliness)

Section 6 (2) The quality of a service's compliance with data shall be determined by the completeness of the submitted data using incident validation scores (data accuracy and completeness.)
(3) The board shall impose on a service a plan of correction pursuant to KRS 311A.060 and 202 KAR 7:501 if a service's rate of completeness falls below 90 percent for three (3) consecutive months (data accuracy and completeness).

Section 7. (1) Each ambulance service shall provide a copy of the completed run report, or its electronic equivalent, to the receiving medical facility prior to departure (data accuracy and completeness).