

Research Report
KTC -15-02/OHS-14-1F

Assessment Program for Kentucky Traffic Records

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16. Abstract During 2013, the Kentucky Transportation Center identified 117 potential performance metrics for the ten databases in the Kentucky Traffic Records System. This report summarizes the findings of three main tasks completed in 2014: (1) assessment of the utility of each metric and/or the availability of data; (2) collection of data on the metrics deemed useful with available data; and (3) assessment the possibility of incorporating a number of the Model Minimum Uniform Crash Criteria (MMUCC) elements into the CRASH database. Interviews with liaisons for each database reduced the number of metrics from 117 to 51. The reason for rejecting the metric as useless is provided in two tables. Data on the useful and data available metrics is reported in one or more tables for each database. The review of the CRASH database for compliance with MMUCC found that 470 of 682 elements are currently MMUCC compliant. A total of 137 elements could be added to the CRASH database, which would render it 89% MMUCC compliant. A list of tentative conclusions is provided.			
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Research Report

KTC

Assessment Program for Kentucky Traffic Records

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Executive Summary

Improving highway safety is a critical transportation policy priority. In order to improve 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; SAFETY-LU) called for the states to improve their traffic records data systems. To that end, in February 2011, the National Highway Traffic Safety Administration (NHTSA) released a set of Model Performance Measures for State Traffic Records Systems.

NHTSA's reason for improved traffic records is stated thusly: "Quality traffic safety records are critical to the planning, management, and evaluation of any successful state traffic safety program." NHTSA also stated that the purpose of the model measures is to: "help each state improve its own performance. Each state selects the measures it uses, establishes its own definitions of key terms, and may modify the measures to fit its circumstances" (NHTSA 2011:2). Thus, the Model Performance Measures are not mandatory, with NHTSA noting that "states are free to modify them or develop their own." States are thus granted a great deal of flexibility to craft a program that best fits their needs and concerns. Kentucky elected to create its own set of measures.

NHTSA stipulates, however, that the measures must produce quantifiable data. Such data will allow state governments to more effectively monitor the development and implementation of improvements to their traffic record data systems, strategic plans, and grant applications to fund improved data collection. Whether adopting NHTSA's model measures or creating their own, states are expected to have quantitative performance measures of the six core traffic data systems:

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 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.

During the first phase of this study in 2013, the Kentucky Transportation Center (KTC) identified possible performance measures (referred to as metrics) for Kentucky's ten traffic records databases. In all, 117 potential metrics were developed, as one or more metrics was proposed for most of the six performance attributes of each database—timeliness, accuracy, consistency/uniformity, completeness, integration, and accessibility.

Work Completed in 2014

This second phase of the research consisted of three main tasks. The first task was to assess the utility of each proposed metric and the availability of data. This task eliminated those metrics that were deemed to be of little utility or too difficult to measure. The second task involved collecting quantitative data on the remaining metrics. The third was to assess the possibility of incorporating a larger number of the Federal Highway Administration’s (FHWA) Model Minimum Uniform Crash Criteria (MMUCC) elements into the CRASH database. Table 1 lists the 10 databases, the organizations that contributed information to this study, and the liaisons KTC contacted.

This phase of the project began by identifying liaison officials with knowledge of the databases. They were interviewed to ascertain which of the proposed performance metrics they deemed both useful and measurable. This series of meetings and telephone conversations with the liaisons yielded a smaller list of metrics.

Table 1: Traffic Records Database and Persons Contacted—Liaisons and Their Assistants

Traffic Records Database	Organization Providing Information	Persons Contacted—Liaisons and Assistants
CRASH (Collision Reporting and Analysis)	Kentucky State Police (KSP)	Brian Sumner, Fred Scroggins, John Smoot, Ed Harding, Alvin Cook, Steve Roadcap
Roadway/Traffic	Kentucky Transportation Cabinet (KyTC)	Keith Dotson
Licensed Driver	Kentucky Transportation Cabinet (KyTC)	Kevin Edelen
Vehicle Registration	Kentucky Transportation Cabinet (KyTC)	Godwin Onodu
Citation/Adjudication	Administrative Office of the Courts (AOC)	Jason Cloyd, Kat Delaney
Emergency Medical Services (EMS)	Kentucky Board of Emergency Medical Services (EMS)	Paul Phillips
Emergency Department	Kentucky Injury Prevention Research Center (KIPRC)	Mike Singleton
Hospital Inpatient	Kentucky Injury Prevention Research Center (KIPRC)	Mike Singleton
Trauma Registry	Kentucky Injury Prevention Research Center (KIPRC)	Svetla Slavova
Death Certificate	Kentucky Injury Prevention Research Center (KIPRC)	Mike Singleton

During this research phase, KTC refined knowledge of the proposed metrics, doing so by working with officials responsible for a traffic records database. This step in the study provided information on:

1. The benefit of each proposed metric to the agency's mission
2. The agency's present capacity to compile or generate the information related to the metric
3. The agency's likely capacity to compile or generate the information for the metric in the future; and
4. The potential role KTC could play in compiling or generating information for the metric

After identifying a new list of metrics, liaisons were asked to provide quantitative data for them (n = 51). The original plan was to collect data at three month intervals. However, data collection is expensive as well as time-consuming and the liaisons decided that they could only collect data on an annual basis for some of the metrics. For a subset of metrics they had annual data from previous years, in which case they reported previous years as well as the most recent data. This practice enriched the results, and this report contains annual data for numerous metrics for multiple years.

Summary of Findings

The research conducted thus far has yielded the following eight conclusions. These findings are tentative, and more data collection, as well as interviews with liaisons will be initiated to firm these up and further explore the best strategies to improve the traffic records data system.

1. The liaisons saw no merit or insufficient merit (given the effort involved) in gathering information for more than half of the proposed metrics. Interviews with the liaisons reduced the number of metrics from 117 to 51. Moreover, the liaisons would need new funding to measure many of these 51.
2. The liaisons at KIPRC and EMS voiced less satisfaction with their current databases than liaisons at the Kentucky Transportation Cabinet. That is, the latter expressed less interest in improvements to their databases. In all there are ten datasets containing data related to highway safety. Only the Cabinet officials responsible for roadway and traffic data sought more data and more timely data, specifically data describing recent alterations in local road systems.
3. All the liaisons, especially those at KYTC, said they cannot provide the precise number of people who have access to legally appropriate information from their respective databases; but all thought that access is open and unproblematic for the public. Given their beliefs and NHTSA's model performance measures for accessibility that call for surveys of data users, it is advisable to explore further, with the liaisons, some acceptable ways to collect quantitative survey data on accessibility.
4. The liaisons at KIPRC identified several issues with the quality of their data. They documented problems with missing E-codes, incomplete data on death certificates, and non-specific E-Codes. They expressed a desire to improve their data but will require a new funding source to do so.

5. Officials with the Administrative Office of the Courts, who control the database for adjudication/arrest records, recommend standardizing the citation codes by removing old codes and discontinuing the use of paper citations. Doing so would facilitate analysis of their database by researchers.

6. Currently, no liaison can provide data on agreement with linked variables between the database they are responsible for and CRASH, or for any other database. The liaisons contended that KTC or KSP can generate this type of data for the metrics; however in some cases it may be too costly to generate it without tapping into new funding sources.

7. The trauma registry data suggests several areas in need of reform, especially information on ambulance time to the crash scene and time to the hospital. The data would be more complete with the incorporation of information from the 8,000 residents in Kentucky who were treated at a hospital not designated as a trauma center. Perhaps, the concordance between the CRASH database and the trauma registry database can be improved.

8. The review of the CRASH database for compliance with MMUCC found that 470 out of 682 elements are currently MMUCC compliant. There were 75 elements that the review committee did not want to add, and 137 elements that could be added to the crash database to render it more MMUCC compliant. Once this is accomplished, CRASH will be 89 percent compliant with the elements in MMUCC.

Summing up, this ongoing research has produced a living document that can be updated throughout the year. Clearly, the continuation of this research will improve the monitoring of the quality of Kentucky's traffic records. It will also facilitate future efforts to maximize the quality of traffic safety data and analysis—a goal that was laid out by the USDOT Traffic Records Coordinating Committee. This will let researchers more readily identify problems with the current traffic records system. Using this information, it will be possible to justify requests for NHTSA funding for programs to improve traffic records databases.

Chapter 1: Work Plan for Phase 2 of the Assessment Program for Kentucky Traffic Records

Introduction

Improving highway safety is a critical transportation policy priority. In order to improve 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; SAFETY-LU) called for the states to improve their traffic records data systems. To that end, in February 2011, the National Highway Traffic Safety Administration (NHTSA) released a set of Model Performance Measures for State Traffic Records Systems.

NHTSA's reason for improved traffic records is stated thusly: "Quality traffic safety records are critical to the planning, management, and evaluation of any successful state traffic safety program." NHTSA also stated that the purpose of the Model Performance Measures is to: "help each state improve its own performance. Each state selects the measures it uses, establishes its own definitions of key terms, and may modify the measures to fit its circumstances" (NHTSA 2011:2). Thus, the Model Performance Measures are not mandatory, as the measures were suggestive and NHTSA added that "states are free to modify them or develop their own." In sum, the states are granted a great deal of flexibility to craft a program that best fits their needs and concerns. Kentucky elected to create its own set of measures.

One key stipulation of NHTSA is that the measures must produce quantifiable data. Such data let state governments effectively monitor the development and implementation of improvements to their traffic record data systems, strategic plans, and grant applications to fund improved data collection.

Whether adopting NHTSA's model measures or creating their own, states are expected to have quantitative performance measures of the six core traffic data systems:

1. Collision reporting and analysis (CRASH)—the repository for law enforcement crash reports
2. Vehicle—the vehicle registration system
3. Driver—a repository for information on licensed drivers and their histories
4. Roadway—a database that stores information on a state's roads
5. Citation/adjudication—a repository containing records of traffic citations, arrests, and final disposition charges
6. Emergency Medical Services (EMS)/Injury Surveillance—component repositories for data on motor-vehicle related 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.

During the first phase of this study—conducted in 2013, the Kentucky Transportation Center (KTC)—identified possible performance measures (i.e. metrics) for Kentucky's ten traffic records databases. In

all, 117 potential 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

Work Completed in 2014

The second phase—completed in 2014—of this project had three main tasks: 1) assess the usefulness of each metric along with availability of the data, and eliminate those metrics that offered limited insights or were too difficult to measure; 2) collect quantitative data on the selected metrics; 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. Table 1 lists the 10 databases, the organizations that provided the information for this study, and the liaisons contacted.

This research phase began by identifying liaison officials with knowledge of the databases. They were contacted and then interviewed to ascertain which of the proposed performance metrics they considered both useful and measurable. This series of meetings and telephone conversations with the liaisons yielded a reduced list of metrics.

During this research phase, KTC refined its knowledge of each of the 117 metrics proposed during phase one, doing so by working with officials responsible for a traffic records database. This study phase established information on:

1. The benefit of each proposed metric to the agency’s mission
2. The agency’s present capacity to compile or generate the information related to the metric
3. The agency’s likely capacity to compile or generate the information for the metric in the future
4. The potential role KTC can play in compiling or generating information for the metric.

Table 1: Traffic Records Database and Persons Contacted—Liaisons and Their Assistants

Traffic Records Database	Organization	Persons Contacted
CRASH (Collision Reporting and Analysis)	Kentucky State Police (KSP)	Brian Sumner, Fred Scroggins, John Smoot, Ed Harding, Alvin Cook, Steve Roadcap
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Trauma Registry	Kentucky Injury Prevention Research Center (KIPRC)	Svetla Slavova
Death Certificate	Kentucky Injury Prevention Research Center (KIPRC)	Mike Singleton

After identifying the new list of metrics, we asked the liaisons to provide quantitative data for the 51 remaining metrics. Originally, the research plan called for data collection to occur at three-month intervals. However, data collection is expensive as well as time-consuming and the liaisons decided that they could only collect data on an annual basis for some of the metrics. For a subset of metrics, they had annual data from previous years, in which case they reported previous years as well as the most recent data. This annual data enriched our results, and we included these data from multiple years in this report.

Chapter 2: Summary of Discussions with Liaisons on the Feasibility and Usefulness of the Proposed Metrics for Each Database

We discussed each of the proposed metrics with the appropriate database liaison. Based on feedback received from the liaisons, we removed metrics they considered to be of limited use for improving or reforming the traffic record system. We also removed metrics described as too difficult to assemble in quantitative form. But we left in a few that the liaisons were willing to collect in the future if funding were to become available. Collecting data on these latter metrics requires significant labor. After the discussions, the number of metrics was reduced from 117 to 51, for an average of five metrics per traffic records database.

In this chapter, we present the major concerns of the liaisons as well as the reasons they offered for measuring some of the proposed metrics and not measuring others. Some of the liaisons offered explanations for rejecting particular metrics. But on occasion, a liaison would reject a metric as having no value while failing to provide a reason. Here, we present the more informative reasons they gave for accepting or rejecting particular metrics. We also note the specific metrics of marked interest to the liaisons.

Tables 2 and 3 summarize interview results. For each traffic records system, the tables list each proposed metric. Table columns describe the metrics for each traffic records system. The rows summarize the metrics for the performance attributes. Liaisons were asked which of the proposed metrics could not be measured with data. Tables 2 and 3 list the metrics they were willing to measure as well as those they were not willing to measure.

The metrics thought to be measurable are *italicized and underlined*. The wording for many of the proposed metrics has been shortened to fit the table. The complete wording for each metric is in Appendix A. The rough interview summaries with the liaisons are in Appendix B.

Most liaisons had responsibility for one database. However, Michael Singleton, with the Kentucky Injury Prevention Research Center (KIPRC), is the liaison for three databases—Hospital Inpatient; Death Certificate; and Emergency Department, which reports injury visits to hospitals. Svetla Slavova, with the KIPRC as well, is the liaison for the Trauma Registry records. All four databases are collected and analyzed by KIPRC.

Liaisons typically gave one of three rationales for rejecting a proposed metric: (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 given the present limitations.

Interview Results and Discussion

Adjudication/Arrest Database. The Administrative Office of the Courts (AOC) maintains adjudication and arrest records. During our meeting with its representative, the liaison said that he could provide only one of the 10 proposed metrics: the percent of citations sent to AOC on the electronic uniform citation—a consistency/uniformity metric.

Other proposed metrics, in his opinion, did not provide data of any use. For instance, the liaison stated that timeliness is not an issue, as the office sends notice of convictions to the DMV every night. Similarly, timeliness is not a problem for traffic violations that are entered into the KYCourts database. Typically, these data are entered within a few days of the violation.

The liaison, however, suggested two ways to improve the 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.

Motor Vehicle Database. The liaison for this system, which keeps the records on vehicle ownership, said he could provide information for only 1 of 15 proposed metrics immediately—the accessibility metric; but he could provide information for three more as soon as the Kentucky Automated Vehicle Information System (KAVIS) is operational. At that time he will be able to measure the average time to post by county clerks (a timeliness metric) and check titles against 1) the National Motor Vehicle Title Information System (NMVTIS) and 2) Vehicle Identification Number Assist (VINA) (integration metrics).

However, he thought there was no room for improvement in vehicle registration and tracking processes, because 100 percent of vehicle information numbers (VINs) are validated with VIN-checking software and all records are complete. The liaison reported no issues with respect to timeliness and saw no reason to collect timeliness metrics. All title transactions are posted within a day of receipt from the county clerks, who comply with the requirement that all titles be processed within 5 days. One hundred percent of all registrations and title brands are posted within 24 hours. As for ensuring uniformity, the same forms are used in all counties. 100 percent of records include the complete owner name and address.

He mentioned audits are not an issue, as most errors are made by county clerks and measuring this will not yield any benefits. Nor is auditing an issue for the database, as the DMV only audits the money received for special license plates.

With respect to a possible improvement in the database, the liaison said there is a critical need to address the integration of CRASH with vehicle registration. A project was recently proposed to integrate the CRASH and Vehicle databases and perform a study to demonstrate the capabilities of the linked databases. The project was funded and began on Sept 1, 2012. There were, however, problems when attempting to complete a memorandum of understanding (MOU) between the Kentucky Transportation

Cabinet (KYTC) and KIPRC. More recently, the project was re-awarded with KTC's involvement because of its standing MOU with KYTC. Unfortunately, the data were never received to complete the linkage.

Death Certificate Database. This database records deaths from highway-related incidents. Only 4 of the 12 metrics were: two timeliness metrics, the integration metric, and one completeness metric—the percent of key injury variables with non-missing and specific values. The liaison indicated that the two accuracy metrics were obtainable; however new funding would be necessary. He expressed interest in applying for funding to obtain the needed data. The liaison also said that consistency/uniformity metric cannot be measured, as it requires the cooperation of the owner of the records. But the owner is not currently interested in cooperating.

One of the completeness metrics—the percent of injury deaths with an underlying cause of “unspecified injury” by age group—was viewed as irrelevant to the study of traffic deaths. Another—the ratio of out-of-state deaths for Kentucky residents reported in the Kentucky death file to the number reported in the Fatality Analysis Reporting System (FARS)—the liaison stated would be too difficult to measure and not a priority.

The proposed accessibility metric entails surveying users of Kentucky's Indicator-Based Information System for public health (IBIS) to estimate what proportion were unable to obtain the information they sought through the injury mortality module. The liaison stated that this is not currently doable because it is necessary to obtain legal permission; but KIPRC has a list of likely users, making it possible to do an annual survey after gaining permission to do so.

Driver Licensing Database. The liaison for this system, which contains driver records and licenses, stated there was no advantage to tracking any of the 15 proposed metrics. He said the system works effectively at the moment. Drivers' licenses, he asserted, are posted immediately with no delay and there is no way to improve the process. Convictions are posted immediately upon receipt from the courts and are immediately forwarded to the department of motor vehicles (DMV).

The liaison said his office cannot eliminate duplicate records, which he described as a matter of typos and not a significant problem. With respect to audits, he said they did not perform them because there are very few errors in the materials they receive from the courts.

This office does not check immigration documents online, but immigrants are required to take their documents to the licensing field offices, where the documents are checked. The liaison noted that they currently check 100 percent of social security numbers and post 100 percent of drivers' records from out-of-state. At this time it is policy to check 100 percent of driver's records against both the National Driver Register (NDR) and the Commercial Driver's License Information System (CDLIS).

This office obtains information on all drivers moving to Kentucky from another state. All driver information, including that acquired from other states, is posted on a driver's Kentucky record. The

liaison saw no way to improve the acquisition of data from other states. With respect to integration, the office's database is not linked to CRASH; however, KSP can access their database to confirm the status of a driver's license. It can also confirm whether a vehicle is registered.

On the issue of accessibility, the liaison stated that his office has reciprocal agreements with various state agencies to access the database. Yet this access is limited to specific pieces of information. For example, trucking companies can purchase driving records to check on the driving histories of employees and potential hires. But the office cannot pinpoint the exact number of the individuals and organizations able to perform independent queries and the system is not web-based.

Emergency Medical Services Database. This agency maintains records on all emergency medical runs to hospitals and clinics. The liaison for EMS said that it could provide 4 of the 10 metrics—one timeliness metric, one accuracy metric, and two completeness metrics. While it is possible to reach agreement with CRASH on common variables, this would have to be done by KIPRC. In the liaison's opinion, several of the ten metrics were unnecessary. With respect to the proposed consistency/uniformity metric, he said the Kentucky Emergency Medical Information System (KEMIS) presently collects 100 percent of the data elements required by the National Emergency Medical Information System (NEMIS).

The liaison stated that it is possible measure the average number of days between the reporting deadline and entry into the data system—a timeliness metric—but that the effort precludes collecting data. He mentioned that at this time they cannot measure agreement with CRASH on common variables. Nor is it possible to measure agreement with Emergency Department and hospital inpatient records on common variables. All of these activities are considered too labor intensive.

Emergency Department (ED) Database. This database contains records from the emergency departments that treat people injured in highway-related incidents. The liaison for these records was of the opinion that data for five of the seven proposed metrics were obtainable—one timeliness metric, one integration metric, one accuracy metric, and two completeness metrics. However, 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. The liaison described this as requiring information on driver and passenger, crash type, and vehicle type.

The liaison thought there is no need to measure the consistency/uniformity metric: compliance with 837 uniform billing specifications. This is required by statute and the emergency department is currently completely compliant with 837.

There are two completeness metrics: 1) the percent of injury records with missing E-codes and; 2) the percent of injury records with a nonspecific E-code (i.e., without sufficient information to determine the mechanism or manner of injury.) The liaison stated that KIPRC can measure these and that doing so would significantly benefit KIPRC. Both completeness metrics entail identifying the key injury variables and then quantifying the percentage that are incomplete and/or not adequately specific. Currently,

approximately 85 percent of injury-related visits are supplemented with an E-code, which suggests that 15 percent are inadequate—indicating that completeness is a problem.

The accessibility metric is the proportion of users of Kentucky’s Indicator Based Information System (IBIS) that is unable to obtain information through the ED query module. According to the liaison, it would be beneficial to know this number. There are no easy solutions due to legal issues and the need to gain permission. Upon receiving permission, it may be possible to do an annual survey. KIPRC has a list of likely users.

Roadway/Traffic Database. The Roadway/Traffic Section in KYTC’s planning department collects data on the attributes of all state maintained roads along with all minor collectors, major collectors and arterials in the local road systems. The liaison for this data said it is possible to obtain information on 9 of the 14 proposed metrics. His agency can provide data for one timeliness metric, one accuracy metric, two consistency/uniformity metrics, one completeness metric, and three accessibility metrics. He stated that data for three of the metrics can be acquired from other organizations.

KSP possesses data on the number of days needed to code the location of crashes and would know the number of years they were linked to the CRASH database. KTC could identify the number of Fundamental Data Elements (FDE)—a 38 item subset of the 202 Model Inventory Roadway Elements (MIRE)—that are missing. KTC links CRASH to roadway data each year using a crash extract and the Highway Performance Monitoring System (HPMS) database.

The liaison estimated that approximately 5 percent of roads have errors in the data file. He also stated that close to 100 percent of state-maintained roads are listed in the inventory, and that there is no need to measure the exact number. Last, he said that all crashes are locatable on roads for which his office is responsible.

The liaison said it was not necessary to measure the number of roads on which they perform traffic counts, as they do one-third of the state roads each year. At this time, close to 100 percent of roadways are listed in the inventory, so this is not worth measuring. While they cannot identify the number of users of their data, they can count web hits. This gauges the data’s accessibility.

The liaison suggested two methods to improve in 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. This information would be helpful to 911, KSP, and EMS. But at this time, the data are not provided in a timely manner. Each county reports this information to its Area Development District at three-year intervals and this data may not be complete or accurate. KTC is currently studying methods to estimate AADTs for local roads.

Hospital Inpatient Database. The liaison for this database can provide data for 6 of the 8 proposed metrics. However, he considered one of the six—the timeliness metric—to be of trivial importance and

did not want to obtain it. He stated that his office can provide the two accuracy metrics and the two completeness metrics as well as the integration metric.

However, the office lacked the legal authority to provide the accessibility metric. Last, the liaison saw no value in the proposed consistency/uniformity metric.

The liaison stated again that correcting problems with E-codes is vital to KIPRC's mission.

Trauma Registry Database. The liaison said she could provide information for 8 of 9 proposed metrics—one timeliness metrics; two accuracy metrics; four completeness metrics; and the integration metric. Her office had funding through a 405 grant for some of the metrics. The liaison expressed no interest in the proposed consistency/uniformity metric—agreement with the national trauma data standard.

The timeliness metric is the percentage of designated trauma centers reporting data to Clinical Data Management (CDM) for a given quarter within 90 days of that quarter ending. The CDM's responsibility is to maintain the Kentucky Trauma Registry. It supplies trauma data to KIPRC. This, she observed, is a useful metric and quarterly updates are possible, depending on 405 funding. The benefit would outweigh the effort and KIPRC can compute this.

There are two accuracy metrics: 1) agreement with linked CRASH records on common variables; and 2) agreement with linked hospital records on common variables. The trauma system is the only one with information on the severity of injuries. It also reports drug/alcohol information.

For some fields (variables), KIPRC can compare its data with CRASH data for accuracy. The first step in evaluating the extent of agreement is to identify the common variables in the data sets. The second step is to measure the level of agreement on the common variables. KIPRC can do this, but requires 405 funding to do so

The consistency/uniformity metric conforms with the national trauma data standard; however, the liaison said this cannot be done.

CRASH Database. KSP maintains the CRASH database, which contains data gathered at highway crash sites. Representatives from KSP met with representatives of KTC discussed the 17 proposed metrics for the CRASH database records, and there was an agreement to reduce the number of metrics to 8—three timeliness metrics, two accuracy metrics, two completeness metrics, and one accessibility metric. There was no integration metric. The liaison stated that KSP sees no value in the other proposed metrics.

The consistency/uniformity issue was addressed at a separate meeting, which identified elements of MMUCC for incorporation into CRASH. The results of that meeting are summarized in Chapter 4.

Table 2. Measurable (*italicized and underlined*) and Unmeasurable Metrics (All Others) for First Five Traffic Record Systems and Performance Attribute as Indicated by Liaison

Traffic Records Database	Emergency Department	Adjudication/ Arrest Records—Those in Bold were said to be KSPs responsibility with AOC unable to provide them.	CRASH	Death Certificate	Driver Licensing
Performance Attributes					
Timeliness	<u>1: # of days between end-of-quarter and reporting to OHP</u>	1: Average time for citations to AOC—can't do, as KSP has citation data 2: Average time for convictions to be sent to DMV	<u>1: # of days from crash to receipt for data entry</u> <u>2: Average # of days to enter data from paper and electronic</u> <u>3: Average # of days of backlogged paper and electronic reports</u> 4: % of reports entered within 30 days of crash 5: % of reports aged more than 60 days	<u>1: KIPRC can measure the percent of traffic deaths registered in 90 days</u> <u>2: KIPRC can measure average # of days from death to registration</u>	T1: Drivers licenses are posted immediately; there is no way to improve; T2: Convictions are posted same day; T3: time to forward dispositions to the DMV--there is no delay.
Accuracy	<u>1: Agreement with Linked CRASH on common variables</u>	1: % of errors in data elements—this would be difficult. It requires KSP and AOC to ID critical data elements and remove old codes. 2: % of violation narratives that match statute. Can't do—old codes in way	<u>1: % of crashes locatable on roadways w/ location coding method</u> 2: % of VINS that match vehicle records 3: % of interstate carriers matched in MCMIS <u>4: % of reports returned for correction-e reports with user over-ride</u> 5: % of reports with uncorrected 'fatal' errors 6: % with 2 or more uncorrected non-fatal 7: % with 5 or more uncorrected minor errors	<u>There are 2 metrics. 1: agreement with linked CRASH records</u> <u>2: agreement with inpatient records. But the death file is not linked with CRASH and the inpatient hospital records. This can be done with effort.</u>	A1: There is no way to track duplicate records, as they are due to typos in name or birthdate; there is no way to improve; A2: We don't do an audit and take the list of dispositions from the courts, so few or no errors

	Emergency Department	Adjudication/ Arrest Records	CRASH	Death Certificate	Driver Licensing
Consistency/uniformity	<p>Compliance with 837 Uniform Billing Specifications.</p> <p>No value to this—currently in compliance.</p>	<p>% of citations written on uniform citation—KSP can do; <u>AOC can give the % sent to AOC on uniform citation; but not all citations go to AOC</u></p>		<p>KIPRC sees no advantage from assessing compliance with U.S. Standard Certificate of Death</p>	<p>CA1: We check 100% of SS#s. CA2: We don't check immigration documents. They are checked in field offices. CA3: We post 100% of drivers' records from other states.</p>
Completeness	<p><u>1: % of Injury records with missing E-codes</u></p> <p><u>2: % of injury records with nonspecific E-codes</u></p>	<p>% of cases with both original charges and dispositions in citation system. Can't do. KSP handles arrests, Some are not prosecuted and not sent to the AOC.</p>	<p><u>1: % FARS/State crash fatality match (yearly)</u> <u>2: % of LEAs w/ 10% unexplained drop in reporting—year to next</u> 3: % of LEAs w/ 5% of "expected # of crashes each month 4: The ratio of injury crashes to total crashes</p>	<p><u>1: KIPRC can measure the percent of key injury variables with non-missing and specific values</u> 2: The percent of injury deaths with "unspecified injury" was not relevant; 3: The ratio of out-of-state deaths in Kentucky file to those in FARS. 4: # of cases where cause of death is missing with evidence of crash in other variables. 5. % of injury deaths by age groups.</p> <p>Metrics 3, 4, and 5 too difficult to measure and/or not a priority</p>	<p>C1: We check 100 percent of drivers' records moving into state; C2: We add all of the driver's record</p>
Integration with CRASH	<p><u>1: # of years that CRASH and ED databases linked</u></p>	<p><u>Not linked</u></p>		<p><u>It was integrated one year w/ CRASH</u></p>	<p><u>Not linked, but KSP can check for license and registration</u></p>
Accessibility	<p>1: % of survey uses of Kentucky's IBIS system</p>	<p>1: Number of users 2: # who can perform inquiries</p>	<p><u>1: Number of web hits on public site</u></p>	<p>For legal reasons, they cannot currently</p>	<p>A1: Some state agencies can access the database;</p>

	unable to use ED query module—requires legal permission	3: # on distribution lists, 4. # of web hits Can't get precise numbers but many officials have some access and all requests are taken if the data is in the case file		provide the percent of surveyed users of the IBIS system who could not obtain the information they were seeking.	trucking companies can purchase records; A2: No way to measure # who can do queries; 3: Most requests are in-house; other cabinets can request info; 4: The system is not web-based and requests for driver's history vary.
	Emergency Department	Adjudication/ Arrest Records	Crash	Death Certificate	Driver Licensing
Recommended Change		Require arrest and citation records to be entered on-line; remove old codes			They recommend no change; duplicates are seen as unavoidable and not a problem

Table 3. Measurable (*italicized and underlined*) and Unmeasurable Metrics (All Others) for Second Five Traffic Record Systems and Performance Attribute as Indicated by Liaison

Traffic Records Database	EMS	Hospital In-patient	Roadway/Traffic	Trauma Registry	Vehicle
Performance Attributes					
Timeliness	1: <u>We can do % of records by deadline</u> ; 2: Not worth measuring days between deadline and entry into system	<u>KIPRC can measure the days elapsed between the end-of-quarter deadline and the delivery of the closed inpatient data set to OHP</u> ; But it is a low priority and of trivial importance.	T1: Not needed, do traffic counts on 1/3 rd of roads each year; T2: It's KSP's responsibility to code location of crashes; so they can measure # of days from crash to coding. T3 # of days from construction completion to file update. We can do for state roads.	1: <u>% of designated trauma centers reporting data to Clinical Data Management for a given quarter within 90 days.</u> <u>KPRIC can do this.</u>	1: County Clerks, not MVL, post title transactions and MVL does not need info. 2. All are posted within a day. 3. <u>Average time to post by county clerks will be doable with KAVIS.</u> 4. Average time to process title documents—doable with KAVIS but not worth it. 5: Completed titles are produced in 5 days—no room for improvement. 6: 100% of registrations and title brands are posted within 24 hours.
Accuracy	1: <u>We can do Average # of data elements completed correctly</u> ; 2: Cannot do agreement with CRASH on common variables; 3: Agreement with ED and inpatient is too labor intensive	<u>KIPRC can measure both. 1: agreement with linked CRASH records on common variables; 2: Agreement with linked EMS records on common variables</u>	A1: <u>Percent of errors found during data audits of critical data elements—Eric Green is doing this.</u> A2: <u>% of crashes locatable using location coding method. We can do for state roads but local roads do not have timely information.</u>	<u>KIPRIC can measure these metrics this year as part of 405 grant. 1: agreement with linked CRASH records on common variables and 2: agreement with linked hospital records on common variables</u>	1: Percent of duplicate records for individuals— not relevant. 2: Percent errors in audits. They only audit money for special license plates—so no benefit. 3. 100% of VINS are validated with VIN checking software now.
Consistency/uniformity	KEMIS/NEMIS	Compliance with	CU1: <u>We can</u>	1: Agreement	The same forms

	match is 100% now	837 uniform billing specifications. KITRC sees no value in doing this, "it is unclear how it would benefit the traffic records system to assess standards compliance.	<u>measure the # of MMIRE elements that are missing. CU2: # of FDE elements of MMIRE that are missing. It is two for AADT. Eric Green is working on adding these.</u>	with the national trauma data standard. KIPRC indicates little interest with this statement: "It is unclear it would benefit traffic records system."	are used in all counties.
	EMS	Hospital In-patient	Roadway/Traffic	Trauma Registry	Vehicle
Completeness	1: <u>We can do % of Records w/ Incomplete data; and can do 2: % of services reporting KEMESIS, which is part of 405.</u> 3: We can't do % of CRASH records indicating EMS transport that do not link to EMS record	<u>KIPRC can measure both. 1: the percent of injury records with missing E-codes. 2. The percent of injury records with nonspecific E-codes.</u>	<u>C1: % of traffic data based on actual counts no more than 3 years old. We can get this. C2: % of public roadways listed in the inventory. Close to 100, so not worth doing.</u>	<u>KIPRC can measure the four metrics with changed wording in 2 and 4. 1: % of cases with missing E-code. 2: % of cases with nonspecific motor vehicle E-code. 3: % of cases with missing EMS time variables. 4: Estimated # of KY-resident trauma patients not in KTR due to treatment at hospitals not designated trauma centers</u>	100% of records have complete owner name and address.
Integration	<u>Not linked to CRASH</u>	<u>We can list the years we were linked with CRASH</u>	<u>KSP's Ed Harding would know the # of years linked to CRASH</u>	<u>For first year as part of 405 Grant, CRASH and TR files are linked.</u>	<u>KAVIS database will check against NMVTIS and VIN Assist</u>
Accessibility	No metric proposed	% of survey users of IBIS system who indicate an inability to obtain information through the query for ED module. This requires legal	A1: Number of users. Can't do until available, as highway data is not on Datamart website. A2 <u>We can count the number of users (webhits) able to perform</u>	No metric proposed	1: <u>We can document the number of times the database is used. 2: We could determine the number of users able to perform inquiries.</u>

		<p>permission; so can't do currently.</p>	<p><u>independent inquires. A3 we can find the # of individuals or organizations for reports; A4: We can count the # of web hits, downloads of service requests for any period.</u></p>		
<p>Recommended Change</p>		<p>Correcting problems with E-Codes is deemed vital to KIPRC's mission</p>	<p>Two improvements in data: AADT info for local roads and immediate updates for changes in local road systems</p>		

Chapter 3: Metrics Data Tables with Quantitative and Other Responses

In June 2104, we requested data for the 51 metrics associated with each database. The liaisons responded to our requests in July and August. This chapter reports the results of the first request for data. The findings are presented in a series of tables. Whenever the liaison was not able to report information, the metric is listed but no data is present.

DRIVER LICENSING DATABASE

As discussed in the previous chapter, the liaison saw no need to track any of the suggested metrics, and he was not asked to send any data.

CRASH DATABASE

Table 4 contains data from the CRASH records system provided by the Kentucky State Police. KSP stated that it can only provide yearly data because “the reports take considerable time to generate and thus involve expending maintenance hours contracted with their software vendor.”

In all, there are three timeliness metrics but data were provided for only one of them—the number of days to enter data, which is broken down by E-reports and paper reports. E-reports are entered in 4.8 days and paper reports in 6.22 days. Currently there are no reporting backlogs, however no data were provided on the average number of days it takes for receipt for data entry following a crash event.

KSP reports that 95.4% of crashes are locatable using the current roadway location method and only 0.6 percent of reports are returned to local agencies for correction. Eighty-one of the E-reports required a user entry over-ride. Each year the FARS/state fatality crash match is 100 percent after the March reconciliation. The percent of law enforcement agencies (LEAs) with more than a 10% unexplained drop in notifications was unavailable and not useful, due to LEA accident notification having too many variables. With respect to accessibility, there were 1,400 daily queries on the public site with 230 accident reports purchased each day.

Table 4. Crash Metrics in the Form of Numerical Data and Other Responses*

Type	Metric	First Report-July 2014
Timeliness 1	# of days from crash event to receipt for data entry	No data provided
Timeliness 2	Average # of days to enter data	E-reports 4.8 days Paper reports 6.22 days
Timeliness 3	Average # of days to enter backlogged reports	There is no backlog
Accuracy 1	% of crashes locatable w/ roadway location method	95.4%
Accuracy 2	% of crash reports sent back to local agencies for correction	.56%
Accuracy 3	# of E-reports w/ user entry override	81
Completeness 1	% of FARS/State Crash Fatality Match-yearly	100% after yearly reconciliation in March each year
Completeness 2	% of LEAs with more than 10% unexplained drop in notifications	Not available or useful, as LEA accident notification has too many variables
Accessibility 1	Number of queries on public site daily	1,400
Accessibility 2	Number of accident reports purchased	230

- KSP states that it can only provide yearly data because of the significant amount of time they take to generate, which involves expending maintenance hours contracted with their software vendor.

AJUDICATION/ARREST DATABASE

The Administrative Office of the Courts sent data on one metric—the percent of cases submitted on the uniform E-citations (81.2 percent in the first quarter of 2014 and 80.5 percent in the second quarter). The remaining cases were reported manually (18.8 percent in the first quarter of 2014 and 19.5 percent in the second quarter). The liaison said that manual citations often have additional citations added to them 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—January-March 2014	Second Report—April-June 2014
Uniformity Metric	% of cases on a on Uniform E-Citation	81.81% E-citation 18.19% Manual citation	80.48% E-citation 19.52% Manual citation

VEHICLE REGISTRATION DATABASE

The liaison for Vehicle Registration could not provide data at this time in response to our request because the Kentucky Automated Vehicle Information System (KAVIS) was 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).

The liaison did not specify the number of individuals and agencies that could access their database but did mention that numerous agencies currently use the automated vehicle information system (AVIS) and plan to use KAVIS in the future—including Revenue, state, county and city law enforcement agencies, 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.

Table 6: Vehicle Registration Metrics in the Form of Numerical Data and Other Responses

Type	Metric	July 2014 Response
Timeliness	Average time to post by county clerks	KAVIS is not in operation
Integration	KAVIS will check against NMVTIS and VIN Assist	With KAVIS in operation, it will check against VINA and NMVTIS, but not VIN
Accessibility	# of times database is used	When KAVIS is fully implemented
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, county clerks’ staff, PVAs, Vehicle Regulation, Health and Family services

ROADWAY/TRAFFIC DATABASE

The liaison with responsibility for the roadway/traffic information database in the Kentucky Transportation Cabinet provided data for eight of their nine metrics. These data show that it takes 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, because local offices are often slow in submitting reports. He stated that KTC will establish the number of errors found during audits of critical elements. Regarding 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, although it was dependent on the update cycle of KY-OPS.

Of the two consistency/uniformity metrics, 48 percent of the Model Inventory Roadway Elements (MIRE) are missing, while the 5 percent of Fundamental Data Elements (FDE) are missing . Concerning data completeness, a full 98 percent of the traffic data are based on actual traffic counts less than than three years old.

There are three accessibility metrics. 100 percent of users are able to perform independent information inquires, 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 does not provide this necessary function.

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

Type	Metric	First Report-July 2014	Second Report
Timeliness 1	For state roads, # of days from completion to file update	State Roads 1-2 weeks Local Roads 1-3 YEARS	
Accuracy 1	% errors during audits of critical elements	KTC to provide	
Accuracy 2	For state roads, % of crashes locatable using location coding method	100% (dependent upon the update cycle of KY-OPS)	
Consistency/ Uniformity 1	# of MMIRE elements that are missing	48%	
Consistency/ Uniformity 2	# of FDE elements of MMIRE that are missing	5%	
Completeness 1	% of traffic data based on actual counts no more than 3 years old	98%	
Accessibility 1	# of users (web hits) able to perform independent inquiries	100%	
Accessibility 2	# of individuals or organizations for reports	All databases within KYTC, Public access to web reports, KSP updated in their system	
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	

EMERGENCY MEDICAL SERVICES

Emergency Medical Services (EMS) keeps the records on emergency ambulance runs (calls) to hospitals and clinics. It reported that it received data regarding calls for services by the deadline for 99.89 percent of calls. For the accuracy metric, it reported that only 1.76% of data elements were not completed correctly; this amounted to 1990 errors in the 113,344 data elements. EMS stated that the data were not available for one of the completeness metrics—the percent of submitted records with incomplete data. For the other completeness metric—the number and percent of services reporting KEMSIS—34 of 223 or 15.2% used KEMSIS.

Table 8: EMS Metrics in the Form of Numerical Data and Other Responses

Type	Metric	First Report-July 2014
Timeliness 1	Percent of records (calls) received by reporting deadline	99.89% (8,087/8,096)
Accuracy 1	Average number of data elements NOT completed correctly	1,990 errors/113,344 data elements = 1.76%
Completeness 1	% of submitted records with incomplete data	Not available
Completeness 2	The # and % of services reporting KEMSIS	34 of 223 or 15.2%

DEATH CERTIFICATE DATABASE

KIPRC sent data on death certificate metrics. For the timeliness metrics, it provided data for those who died in Kentucky and who died out-of-state for 2010–2013. The numbers reveal significant progress for the two timeliness metrics. In 2010, 75 percent of in-state traffic deaths were registered within 90 days; by 2013, this figure rose to 98 percent. The numbers for out-of-state deaths registered within 90 days improved from 10 percent to 47 percent between 2010 and 2011, but no reports have been submitted for either 2012 or 2013.

The other timeliness metric also reveals progress. The average number of days from date of death to registration for in-state deaths fell from 59 days in 2010 to 31 days in 2013. For out-of-state deaths the average number of days dropped from 230 to 149 over the same time frame. Currently, data are not available for two of the accuracy metrics due to a lack of funding. And while measuring the two accuracy metrics listed in Table 9 would provide more accurate information on fatalities arising from crashes, there is insufficient funding to do so.

Table 9: 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	Out-of-state (KY resident)
		2010 75%	2010 10%
		2011 98%	2011 47%
		2012 97%	2012 0%
Timeliness 2	Average # of days from date of death to registration	Died in Kentucky	Out-of-state (KY resident)
		2010 59 days	2010 230 days
		2011 34 days	2011 109 days
		2012 33 days	2012 185 days
Accuracy 1	Agreement with linked CRASH records on common variables	2013 98%	2013 0%
		2013 31 days	2013 149 days
		Can't do at this time due to lack of funding for personnel.	
		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.	
		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		

Substantial progress has been made on the completeness metric—the percent 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.

Table 10 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 to 0.9 percent over three years.

Table 10: Percent of Motor Vehicle Deaths with Missing Values on Injury-Related variables

Year	2010	2011	2012	2013
Variable				
Injury Date	10.6	3.1	1.9	0.9
Injury hour	16.5	8.1	9.7	11.5
Injury State (e.g., Ohio)	44.8	6.9	6	7.5
Injury Location (county)	100*	100	100	100
Injury Place (Home, Street Highway/farm, etc.)	42	21,5	12.9	16.3
Injury Description	43.9	6.1	3.1	0.9
Work related?	44.4	6.6	2	2.6
Occupation (If work-related)	0	0	5.6	14.3
Industry (If work-related)	0	0	5.6	14.3
Person type (driver, passenger, pedestrian)	45.9	7.4	4.9	4.2

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. A number of Kentucky residents died in Ohio in 2011, 2012, and 2013. Similarly, West Virginia has yet to report traffic deaths for 2012 and 2013.

Table 11: Number of In-transfer Records Received from Selected Border States (Motor Vehicle Traffic Deaths)

	2008	2009	2010	2011	2012	2013
Ohio	20	18	16	0	0	0
Tennessee	17	9	41	12	32	35
West Virginia	12	2	15	13	0	0

EMERGENCY DEPARTMENT DATABASE

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. Table 12 contains the emergency department data, while Table 13 includes hospital inpatient data. We first discuss the emergency department data. However, the timeliness metric is identical—with the average number of days between the end-of-quarter deadline and reporting of closed data to the Office of Health Policy (OHP) being 76 days. Accuracy metrics for both emergency and inpatient data are unavailable because of insufficient funding.

With respect to the completeness metrics for the emergency departments, Table 12 shows that the percentage of injury records with missing E-codes has varied little between 2010, when it was 16.1 percent, and 2013 when it was 14.1 percent. But the percentage of injury records with a nonspecific E-code appears less stable. It was 5.2 percent in 2010 and 9.6 percent in 2013.

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

Table 12: Emergency Department Injury Metrics in the Form of Numerical Data and Other Responses

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

HOSPITAL INPATENT DATABASE

Hospitals report data to the Kentucky Hospital Association, which then sends records to the Office of Health Policy. In turn, it sends them on to KIPRC.

Table 13 includes the percentage of injury records with a missing E-code. This varied little between 2010, when it was 15.7 percent, and 2013 when it fell to 12.3 percent—a modest improvement. The percentage of injury records with a nonspecific E-code was also very stable—1.9 percent in 2010 and 1.8 in 2013. CRASH was linked with Hospital Inpatient database in 2011 and 2012.

For the timeliness metric, an average of 76 days 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 liaison stated that the accuracy metrics are important. There are two that KIPRC can measure given adequate funding: 1) agreement with linked CRASH records on common variables; and 2) agreement with linked EMS records on common variables.

Table 13: Hospital Inpatient Metrics in the Form of Numerical Data and Other Responses

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

TRAUMA REGISTRY DATABASE

Approximately, 21 percent of the trauma centers submitted their data late to Clinical Data Management. 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 percent in 2012 for 1) person category and 2) person type.

For the first completeness metric in 2013, there were only 49 trauma records (.48%) with missing E-codes. For the second completeness metric, 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. The third completeness metric is missing significantly more data—50% of cases have no information on the EMS time to the scene and hospital. 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 not a designated trauma center. The trauma registry database and CRASH were linked in 2012.

Table 14: Trauma Registry (TR) Metrics in the Form of Numerical Data and Other Responses

Type	Metric	First Report
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
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)
Completeness 1	% of cases with missing E-code	0.48%—The most recent completed year of TR data is 2013; there were only 49 records with missing E-codes; 0.48% of all TR records
Completeness 2	% of cases with nonspecific motor vehicle E-codes for occupant position	2.04%—In 2013 there were 1.7% of the motor-vehicle traffic collision (MVTC) records with injured person role in the collision listed as “unspecified” and 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
Completeness 4	Estimated # of Kentucky residents not in KTR due to treatment at hospital not designated trauma center	About 8,000
Integration	Years linked with CRASH	2012

Chapter 4: Integrating Elements of MMUCC into the CRASH Database

Police officers enter data into the CRASH database. This database is stored in the Kentucky Open Portal Solutions (KYOPS) system. The Model Minimum Uniform Crash Criteria (MMUCC) is a set of recommended data fields and elements. It provides a minimal set of data fields and elements for reporting on motor vehicle crashes—a field is a variable that describes a specific factor of a crash, such as the weather conditions when the crash occurred. The elements are the set of possible values (e.g., rain, sun, sleet and hail, etc.).

The National Highway Traffic Safety Administration (NHTSA) and Governors Highway Safety Association (GHSA) developed the MMUCC in collaboration with safety experts from the public and private sectors. Currently, it is a voluntary guideline, the intent of which is to help states determine what crash data to collect.

At this time, state data systems frequently use different terminology and formatting practices for the data fields and elements that they record in their motor vehicle crash reports, which are also referred to as police accident reports (PARs). NHTSA and GHSA have encouraged states to adopt many of the data fields and elements of MMUCC into their PARs. This will increase the standardization of data across states and facilitate data comparisons and sharing. Standardization will improve research by safety experts and contribute to a safer transportation system.

KTC conducted several facilitated meetings to assess how much of Kentucky's crash database was MMUCC compliant. These meetings also helped gauge what level of effort would be necessary to achieve 100% MMUCC compliance. The meetings were designed to be multi-disciplinary—gaining insight and knowledge from the participation of researchers, police officers, software developers, and safety engineers. The meetings catalyzed the production of design documents that will be used to update the Collision Reporting and Analysis (CRASH) reporting system. This effort sought to improve the consistency/uniformity attribute of the CRASH database used by the KSP. KTC initially compared the 4th Edition of the MMUCC to a list of all of the crash fields in Kentucky's CRASH database. A spreadsheet used by Michigan's traffic records coordinating committee (TRCC) guided this review. The following is a summary of the MMUCC items:

- 3 Categories (collision, vehicle, person)
- 77 Fields
- 682 Elements

As an example, field C9.1 in the MMUCC represents the value of front-to-rear damage from a crash/collision impact. Each element in this field was compared to the elements in the same field in

KSP’s CRASH database. Although some were identical, others were not. The latter were flagged for further review after this initial analysis..

A multi-disciplinary team was assembled, comprised of researchers, police representatives, cabinet officials, and the software developers. The team assessed each element in the MMUCC spreadsheet to determine whether or not the CRASH database contained it. Meetings were structured to ensure an efficient process to avoid getting bogged down in tangential details. Individual elements were discussed for a set amount of time. Elements that needed additional follow up were noted. Additionally, eight categories were created to assess the compliance of each element with the MMUCC. *That is, those at the meeting answered this question with respect to each element: do we need to add the particular MMUCC element to the current database?* The following answers were possible:

1. No, we have the element
2. No, it is in another location (noted where)
3. No, but rename it (what should it be called?)
4. No, we have something similar (what is it?)
5. No, not going to add it (why not?)
6. Yes, let’s add it (requiring a new field and a big effort)
7. Yes, let’s add it (requiring a new element and a small effort)
8. Yes, this will be added in a future effort

Meeting participants were asked to consider the context and protocols for data collection at the crash scene. The value of data was assessed in light of the amount of time and effort required of police to collect specific elements. Participants also considered how or when a police officer could misuse an element (e.g. use a particular element as a catch all) or how a researcher might misinterpret an element.

The following table summarizes the MMUCC assessment by assessment category:

Table 15: Assessment of MMUCC Compliance by Assessment Category

Assessment Category	Number of MMUCC Elements
1. No, we have the element	422
2. No, it is in another location	38
3. No, but rename it	5
4. No, we have something similar	5
5. No, not going to add it	75
6. Yes, let’s add it as a new field (big effort)	13
7. Yes, let’s add it as a new element (small effort)	58
8. Yes, this will be added in in a future effort	66
Grand Total	682

The research team calculated the baseline MMUCC compliant percentage by considering all of the elements in the categories that do not require significantly altering the CRASH database (i.e., the elements in Categories 1 through 4). This sum of elements (470) was divided by the total number of elements (682); this yielded a baseline MMUCC compliance of 68.9 percent. Table 15 summarizes the baseline MMUCC compliance percentage. It also includes the expected compliance percentage once the software update is completed. This was computed by adding in the 137 elements from Categories 6 through 8 to the baseline and dividing the resulting total by 682. This produced an expected compliance estimate of 89.0 percent after rewriting the fields and elements. At this time the software update is ongoing.

Table 16: Baseline Compliance with MMUCC and Projected Compliance after Rewrite

Compliance Type	Count	Percentage
Baseline	470/682	68.9%
After Re-write	607/682	89.0%

A Possible Change to Improve the CRASH database

Sixty-three of the 77 fields included an element labeled ‘unknown’. There was a substantial discussion related to this element’s possible misuse and ambiguity, as many, perhaps all, of the instances when law enforcement officers check this element alternative ways exist to capture this information such as ‘other’ or through narratives. Thus, removing the element ‘unknown’ may significantly improve the data in CRASH.

If ‘unknown’ were removed and that removal is considered MMUCC compliant, then the percentage of MMUCC compliant elements increases (shown in Table 17). The total number of elements would decline from 682 to 619, the baseline counts of compliant elements from 470 to 453, and the after re-write counts of all elements from 607 to 583. The baseline compliance rises to 73.2 percent and the after re-write to 94.2 percent.

Table 17: After Removing the Element ‘Unknown’ from 63 Fields, the Baseline Compliance and Projected Compliance after Rewrite

Compliance Type	Count	Percentage
Baseline	453/619	73.2%
After Re-write	583/619	94.2%

Comment on the Process

The success of the MMUCC assessment hinged on several factors. Kentucky's Traffic Records Assessment Committee (KTRAC) meetings were very well-attended and focused on improving the quality of crash-related data. KTC was also able to devote more than just volunteer time during the assessment of the crash database, as it was a funded initiative in the Traffic Records Assessment project. Most of these efforts were previously unfunded and voluntary. Additionally, KYOPS was in the process of an update. This let the assessment team to provide design documents to the development team. Lastly, there has been a cooperative relationship between KYTC, KTC, and KSP. This allowed for meaningful discussions that considered the ideas and needs of all users of crash-related data.

Chapter 5: Conclusions and Implications for Going Forward

The research conducted thus far has yielded the following eight conclusions. These findings are tentative, and more data collection, as well as interviews with liaisons will be initiated to firm these up and further explore the best strategies to improve the traffic records data system.

1. The liaisons saw no merit or insufficient merit (given the effort involved) in gathering information for more than half of the proposed metrics. Interviews with the liaisons reduced the number of metrics from 117 to 51. Moreover, the liaisons would need new funding to measure many of these 51.
2. The liaisons at KIPRC and EMS voiced less satisfaction with their current databases than liaisons at the Kentucky Transportation Cabinet. That is, the latter expressed less interest in improvements to their databases. In all there are ten datasets containing data related to highway safety. Only the Cabinet officials responsible for roadway and traffic data sought more data and more timely data, specifically data describing recent alterations in local road systems.
3. All the liaisons, especially those at KYTC, said they cannot provide the precise number of people who have access to legally appropriate information from their respective databases; but all thought that access is open and unproblematic for the public. Given their beliefs and NHTSA's model performance measures for accessibility that call for surveys of data users, it is advisable to explore further, with the liaisons, some acceptable ways to collect quantitative survey data on accessibility.
4. The liaisons at KIPRC identified several issues with the quality of their data. They documented problems with missing E-codes, incomplete data on death certificates, and non-specific E-Codes. They expressed a desire to improve their data but will require a new funding source to do so.
5. Officials with the Administrative Office of the Courts, who control the database for adjudication/arrest records, recommend standardizing the citation codes by removing old codes and discontinuing the use of paper citations. Doing so would facilitate analysis of their database by researchers.
6. Currently, no liaison can provide data on agreement with linked variables between the database they are responsible for and CRASH, or for any other database. The liaisons contended that KTC or KSP can generate this type of data for the metrics; however in some cases it may be too costly to generate it without tapping into new funding sources.
7. The trauma registry data suggests several areas in need of reform, especially information on ambulance time to the crash scene and time to the hospital. The data would be more complete with the incorporation of information from the 8,000 residents in Kentucky who were treated at a hospital not designated as a trauma center. Perhaps, the concordance between the CRASH database and the trauma registry database can be improved.

8. The review of the CRASH database for compliance with MMUCC found that 470 out of 682 elements are currently MMUCC compliant. There were 75 elements that the review committee did not want to add, and 137 elements that could be added to the crash database to render it more MMUCC compliant. Once this is accomplished, CRASH will be 89 percent compliant with the elements in MMUCC.

Summing up, this ongoing research has produced a living document that can be updated throughout the year. Clearly, the continuation of this research will improve the monitoring of the quality of Kentucky's traffic records. It will also facilitate future efforts to maximize the quality of traffic safety data and analysis—a goal that was laid out by the USDOT Traffic Records Coordinating Committee. This will let researchers more readily identify problems with the current traffic records system. Using this information, it will be possible to justify requests for NHTSA funding for programs to improve traffic records databases.

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APPENDIX A: Metrics Proposed during Phase 1 for Traffic Records Databases

EMS METRICS

Timeliness Metric 1. % percent of records received by reporting deadline

Timeliness Metric 2. Average # of days between reporting deadline and entry into system

Accuracy Metric 1. Average # of data elements completed correctly on submitted records

Accuracy Metric 2. Agreement with CRASH record on common variables

Accuracy Metric 3. Agreement with ED and inpatient records on common variables

Consistency/Uniformity Metric 1. % of NEMSIS Required data elements collected KEMSIS

Completeness Metric 1. % of submitted records with incomplete data

Completeness Metric 2. Number and percent of services reporting KEMSIS

Completeness Metric 3. % OF CRASH records indicating EMS transport that do not Link to EMS record

Integration Metric 1. # of years for which the CRASH and KEMSIS databases have been linked

EMERGENCY DEPARTMENT (ED)

Timeliness Metric 1. # of days elapsed between the end-of-quarter deadline and reporting of the closed data set to OHP

Accuracy Metric 1. Agreement with linked crash on common variables

Consistency/Uniformity Metric 1. Compliance with 837 Uniform Billing **Specifications**

Completeness Metric 1. % of Injury Records with missing E-code

Completeness Metric 2. % of injury records with nonspecific E-codes (without sufficient information to determine mechanism or manner of injury)

Integration metric 1. % of survey users of Kentucky's IBIS system who indicate inability to obtain information thru ED query module

Accessibility Metric 1. # of years for which the CRASH and ED databases have been linked

HOSPITAL INPATIENT METRICS

Timeliness Metric 1. Number of days elapsed between the end-of-quarter deadline and delivery of the closed inpatient data set to OHP

Accuracy Metric 1. Agreement with linked CRASH record on common variables

Accuracy Metric 2. Agreement with Linked EMS record on Common Variables

Consistency/Uniformity Metric 1. Compliance with 837 Uniform Billing Specification

Completeness Metric 1. % of Injury records with Missing E-Code

Completeness Metric 2. % of Injury Records with nonspecific E-codes (i.e., E-codes without sufficient information to determine mechanism or manner of injury)

Integration Metric 1. % of surveyed users of Kentucky's IBIS system who indicate inability to obtain information thru injury inpatient query module

Accessibility Metric 1. Number of years for which the inpatient and CRASH databases have been linked

TRAUMA REGISTRY METRICS

Timeliness Metric 1. % of designated trauma centers reporting data to CDM for a given quarter within 90 days after end of quarter (CDM will confirm data receipt to KIPRC.)

Accuracy metric 1. Agreement with linked CRASH records on common variables

Accuracy Metric 2. Agreement with linked EMS record on common variables

Consistency/uniformity Metric 1. Agreement with linked EMS record on common variables

Completeness Metric 1. % of cases with missing E-code

Completeness Metric 2. % of cases with nonspecific E-codes (codes without sufficient information to determine mechanism of manner of injury)

Completeness metric 3. % of cases with missing EMS time variables (time to scene, hospital, etc.)

Completeness Metric 4. Estimated # of Kentucky-resident trauma patients not in the KTR due to being treated at a designated trauma center outside Kentucky

Accessibility Metric 5. # of years for which CRASH and trauma registry databases have been linked

DEATH CERTIFICATE METRICS

Timeliness Metric 1. % of certificates for motor vehicle traffic deaths registered within 90 days of death

Timeliness metric 2. Average # of days from death until registration for motor vehicle traffic deaths

Accuracy Metric 1. Agreement with linked CRASH record on common variables

Accuracy Metric 2. Agreement with linked hospital inpatient record on common variables

Consistency/Uniformity 1. Compliance with National Center for Health Statistics' U.S. Standard Certificate of Death (2003 version)

Completeness Metric 1. Missing in-state deaths: # of Kentucky resident deaths reported in CRASH for which no Kentucky death certificate exists (requires linkage with CRASH)

Completeness Metric 2. For Missing in-state deaths. # of cases where the underlying cause of death is missing but evidence of a motor vehicle crash exists in other variables

Completeness Metric 3. For Missing Out-of-state deaths: Ratio of # of out-of-state deaths for Kentucky residents reported in Kentucky death file to the number reported in FARS

Completeness Metric 4. For completeness of injury variables, % of key injury variables with non-missing and specific value

Completeness metric 5. For Unspecified Injury--% of injury deaths with underlying cause of "unspecified injury," by age group

Integration Metric 1. % of surveyed users of Kentucky's IBIS who indicate that they were unable to obtain the information they were seeking thru the injury mortality module

Accessibility 1. Number of years for which CRASH and death certificate databases have been linked

CITATION/ADJUDICATION METRICS

Timeliness Metric 1. The average time for citations to be sent from law enforcement agencies (LEAs) to courts

Timeliness Metric 2. The average time for convictions to be sent to DMV.

Accuracy Metric 1. Percent of errors found during data audits of critical data elements

Accuracy Metric 2. Percent of violations narratives that match the proper state statute

Consistency/Uniformity Metric1. Percent of traffic citations statewide written on a single uniform citation

Completeness Metric 1. Percent of cases with both original charges and and dispositions in citation tracking system

Integration Metric 1. There is no integration between CRASH and citation/adjudication databases. They are not linked.

Accessibility Metric 1. Number of users (by database or item or records)

Accessibility Metric 2. Number of users able to perform independent inquires

Accessibility Metric 3. Number of individuals or organizations on distribution list for standardized reports, number of web hits, downloads, or service requests.

VEHICLE METRICS

Timeliness metric 1. The average time for DMV to post title transactions

Timeliness Metric 2. The Percent of title transactions posted within a day of receipt

Timeliness Metric 3. Average time to post registrations (by county clerks

Timeliness Metric 4. The average time to process title documents

Timeliness Metric 5. The Average Time to produce completed titles

Timeliness Metric 6. The percent of registrations and title brands posted within 24 hours

Accuracy Metric 1. Percent of duplicate records for individuals

Accuracy Metric 2. Percent of errors found during data audits of critical data elements

Accuracy Metric 3. The percent of VINs successfully validated with VIN checking software

Consistency/Uniformity 1. The same forms are used in all counties

Completeness Metric 2. Percent of records with complete owner name and address

Is it 99%

Integration Metric1. New database KVIS will check against NMVTIS and VIN assist

Accessibility Metric 1. Number of users (by database or item or records)

Accessibility Metric 2. Number of users able to perform independent inquires

Accessibility Metric 3. Number of individuals or organizations on distribution list for standardized reports, number of web hits, downloads, or service requests.

ROADWAY/TRAFFIC METRICS

Timeliness metric 1. Percent of traffic counts conducted each year

Timeliness metric 2. The number of days from crash event to location coding of crashes

Timeliness Metric 3. Number of days from construction completion to roadway file update

Accuracy Metric 1. Percent of errors found during data audits of critical data elements

Accuracy Metric 2. Percent of crashes locatable using roadway location coding method

Consistency/Uniformity Metric 1. The Percent of All Elements of MIRE that are Missing (as of December 2013 Kentucky had 105 of 202; so 48% were missing)

Consistency/Uniformity Metric 2. Percent of FDE elements of MIRE missing (as of December 2013 two FDE elements were missing—AADT and AADT for every intersecting road.)

Completeness Metric 1. Percent of traffic data based on actual counts no more than 3 years old (currently, is it 95%)

Completeness Metric 2. Percent of public roadways listed in the inventory (between 99 and 100%)

Integration Metric 1. Number of years for which CRASH and roadway data have been linked (CRASH data is linked with roadway data)

Accessibility Metric 1. Number of users (by database or item or records)

Accessibility Metric 2. Number of users able to perform independent inquiries

Accessibility Metric 3. Number of individuals or organizations on distribution list for standardized reports

Accessibility Metric 4. Number of web hits, downloads, or service requests

DRIVER LICENSING METRICS

Timeliness Metric 1. The average time to post driver licenses

Timeliness Metric 2. Average time to post convictions after receipt

Timeliness Metric 3. Average time to forward dispositions from the court to the DMV

Accuracy Metric 1. The percent of duplicate records for individuals

Accuracy Metric 2. The percent of “errors” found during data audits of critical data elements

Consistency/Uniformity 1. The Percent of social security numbers (SSN) verified online

Consistency/Uniformity Metric 2. The percent of immigration documents verified online

Consistency/Uniformity Metric 3. The percent of violations reported from other states added to the driver history

Completeness Metric 1. Percent of drivers’ records checked for drivers moving into the state

Completeness Metric 2. Percent of drivers’ records transferred from prior state

Integration Metric 3. Number of years for which CRASH and Driver License databases have been linked

Accessibility Metric 1. Number of users (by database or item or records)

Accessibility Metric 2. Number of users able to perform independent queries

Accessibility Metric 3. Number of individuals or organizations on distribution list for standardized reports.

Accessibility Metric 4. Number of web hits, downloads, or service requests

CRASH METRICS

Timeliness Metric 1. The number of days from crash event to receipt for data entry on statewide database

Timeliness Metric 2. Average number of days to enter data into the system

Timeliness Metric 3. The average number of days of backlogged crash reports to be entered.

Timeliness Metric 4. The percent of reports entered into the system within 30 days of the crash

Timeliness Metric 5. The percent of reports aged more than 60 days

Accuracy Metric 1. The percent of crashes locatable using roadway location coding method

Accuracy Metric 2. The percent of VINs that are valid (e.g., match to vehicle records that are validated with VIN checking software

Accuracy Metric 3. The percent of interstate motor carriers matched in MCMIS

Accuracy Metric 4. The percent of crash reports returned to local agencies for correction

Accuracy Metric 5. The percent of reports with 1 or more uncorrected “fatal” errors

Accuracy Metric 6. The percent of reports with 2 or more uncorrected “serious, non-fatal errors”

Accuracy Metric 7. The percent of crash reports with 5 or more uncorrected “minor” errors

Completeness Metric 1. Percent of FARS/State crash fatality match

Completeness Metric 2. The percent of LEAs with more than 10 percent unexplained drop in reporting one year to the next

Completeness Metric 3. The percent of LEAs with 5 percent of “expected” number of crashes each month

Completeness Metric 4. The ratio of injury crashes to total crashes

Accessibility Metric 1. The number of web hits on their public site

APPENDIX B: NOTES from INTERVIEWS with LIAISONS and OTHER OFFICIALS

Hospital Inpatient Metrics—Mike Singleton

The hospitals report to the Kentucky Hospital Association, which then sends records to the Office of Health Policy, which in turn sends them to the Kentucky Injury Prevention Research Center. So the latter has the records.

The timeliness metric—the number of days elapsed between the end-of-quarter deadline and the delivery of closed inpatient data set to OHP can be done. However, it is a low priority and provides information of trivial importance.

The accuracy metrics are more important. There are two, which KIPRC can measure: (1) agreement with linked CRASH records on common variables; and (2) Agreement with linked EMS records on common variables. The first step in evaluating the extent of agreement is to identify the common variables in the data sets. The second step is to measure the level of agreement on the common variables. It would be useful to quantify the number of discharges of Kentucky residents who were injured in-state but were transported to out-of-state trauma centers. However, this may not be possible.

There is one consistency/uniformity metric—compliance with 837 Uniform Billing Specification. This was deemed of low priority and would call for a large effort with little return.

There are two completeness metrics, both of which are important and can be accomplished by KIPRC. They are: (1) the percent of injury records with missing E-codes; and (2) the percent of injury records with nonspecific E-codes (i.e., E-codes without sufficient information to determine the mechanism or manner of injury.) This information is vital to KIPRC's mission and needs to be improved.

The accessibility metric—the percent of surveyed users of Kentucky's IBIS system who indicate an inability to obtain information through the injury inpatient query module—can't be done at this time due to the necessity of obtaining legal permission; but it may be possible to do an annual survey after permission is granted. A list of likely users is obtainable.

The integration metric is the number of years for which the inpatient and CRASH databases have been linked. We can identify the years in which they have been linked. But it is probable not worth the effort beyond listing the years.

Death Certificate Metrics—Mike Singleton

There are two timeliness metrics, both of which are worth computing and KIPRC can do: (1) the percent of traffic deaths registered within 90 days of death and (2) the average number of days from death until registration for motor vehicle traffic deaths. It would be useful to obtain information on the time it takes to report out-of-state deaths of Kentuckians killed in crashes.

There are two accuracy metrics, which KIPRC can measure and are worth the effort of obtaining: (1) Agreement with linked CRASH records on common variables; and (2) Agreement with linked hospital inpatient records on common variables. The first step in evaluating the extent of agreement is to identify the common variables in the data sets. The second step is to measure the level of agreement on the common variables. This would produce more accurate information on fatalities arising from crashes.

The consistency/uniformity metric is: compliance with the National Center for Health Statistics' U. S. Standard Certificate of Death (2003 version). This is not possible, as the cooperation of the data owner is needed and the data owner is not interested.

Of the three completeness metrics only one was considered to be useful and worth the effort: the percent of key injury variables with non-missing and specific values. This will require identifying the key injury variables and then quantifying percent that are complete and adequately specific. One of the completeness metrics was not relevant to traffic deaths—for unspecified injury, the percent of injury deaths with an underlying cause of “unspecified injury,” by age group. The last completeness metric was seen as difficult to measure and not a priority—for missing out-of-state deaths, the ratio of number of out-of-state deaths for Kentucky residents reported in Kentucky death file to the number reported in FARS.

The accessibility metric is the percent of surveyed users of Kentucky's IBIS system who indicate that they were unable to obtain the information they were seeking through the injury mortality module. It can't be done at this time due to the necessity of obtaining legal permission; but it may be possible to do an annual survey after permission is granted. We have a list of likely users.

The integration metric is the number of years for which the death certificate and CRASH databases have been linked. We can identify the one year that they were linked.

Emergency Department Injury Visits Metrics—Mike Singleton and Svetla Slavova

There is one timeliness metric: The number of days elapsed between the end-of-quarter deadline and reporting of the closed data set to OHP. The latter maintains compliance; but sends data on to KIPRC, which can compile the data. This is useful information that does not entail too much effort for KIPRC.

The Accuracy Metric is: Agreement with linked CRASH on external cause of injury. This involves information on driver and passenger, crash type, vehicle type and more. This information is of interest to KIPRC; but not of much use to emergency departments, as reimbursement is not tied to E-code on the claim. It is possible to estimate the level of agreement, which would document problems with accuracy when data is conflicting or missing.

There is one consistency/uniformity metric: compliance with 837 uniform billing specifications. This is required by statute. The emergency department is currently completely compliant with 837.

There are two completeness metrics: (1) the percent of injury records with missing E-codes and; (2) the percent of injury records with a nonspecific E-code (i.e., without sufficient information to determine the mechanism or manner of injury.) . Both completeness metrics will require identifying the key injury variables and then

quantifying the percent that are incomplete and/or inadequately specific. At this time approximately 85 percent of injury-related visits are supplemented with an E-code, which suggests inadequacies with 15 percent. So completeness is a problem. KIPRC can do this and it could produce a large benefit for KIPRC.

The accessibility metric is the percent of survey users of Kentucky's IBIS system who indicate an inability to obtain information through the ED query module. It would be beneficial to know this, but there are legal issues and permission will be needed; upon receiving permission, it may be possible to do an annual survey. We have a list of likely users.

The integration metric is the number of years for which the CRASH and ED databases have been linked. We know they were linked in 2008, 2009, and 2010.

Trauma Registry Metrics—Mike Singleton and Svetla Slavova

The timeliness metric is the percent of designated trauma centers reporting data to Clinical Data Management for a given quarter within 90 days after the end of the quarter. The CDM's responsibility is to maintain the Kentucky Trauma Registry. It supplies trauma data to KIPRC. This is a useful metric and quarterly updates are possible, depending on 405 funding. The benefit would outweigh the effort and KIPRC can compute this.

Please pay close attention to the notes below on the accuracy metrics. It may not be accurate and we may not need the metric calling for agreement with the CRASH records.

There are two accuracy metrics, which KIPRC may or may not want to measure: (1) agreement with linked CRASH records on common variables; and (2) Agreement with linked hospital records on common variables. The trauma system is the only system with severity of injury information. It would also have drug/alcohol information. However, the EMS is required to submit an extract of critical elements of run upon leaving hospital and full compliance is expected in the future. On some variables we could compare with police report for accuracy. The first step in evaluating the extent of agreement is to identify the common variables in the data sets. The second step is to measure the level of agreement on the common variables. KIPRC can do this with or without 405 funding (*is that true?*). EMS records should be linked to hospital or trauma data, not crash data, so there may be little benefit to linking with CRASH data. (*Does this mean it is best to just use the second measure of accuracy?*)

The consistency/uniformity metric is agreement with the national trauma data standard. (*Do we have a way to measure this?*)

There are four proposed completeness metrics. *Do we need all four?*

1. Percent of cases with missing E-code
2. Percent of cases with nonspecific E-codes (i.e., codes without sufficient information to determine mechanism or manner of injury)

We were able to measure the first two for other data sets. Can we do it for these?

3. Percent of cases with missing EMS time variables (time to scene, time to hospital, etc.)
4. Estimated number of Kentucky-resident trauma patients not in the KTR due to being treated at a designated trauma center outside Kentucky

The *integration metric* is the number of years for which CRASH and trauma registry databases have been linked. *In what years have they been linked or do we not want to link with another database?*

Summary of the Discussion with Paul Phillips on the EMS Metrics

Timeliness Metric—Percent of records received by reporting deadline. The deadline is the 15th of the month following the month of the EMS run. This can be done at this time.

Timeliness Metric—Average number of days between reporting deadline and entry into system. This can be done but the benefit is out-weighed by the effort involved.

Accuracy Metric—Average number of data elements completed correctly on submitted records. The current regulations require this and it can and will be done.

Accuracy Metric—Agreement with CRASH record on common variables. This can't be done at this time, even though it might be worthwhile. The data can be sent to the KIPRC; but they would have to do the work of linking.

Accuracy Metric—Agreement with ED and inpatient records on common variables. This would be worthwhile but is not possible at this time, as it is too labor intensive.

Consistency/Uniformity Metric—Percent of NEMIS required data elements collected by KEMIS. This is mandatory and is being done at this time. So, the answer is 100 percent. All the EMS service providers are doing this.

Completeness Metric—Percent of submitted records with incomplete data. We can do this. And can provide the data by April 30th.

Completeness Metric—the number and percent of services reporting KEMIS. This is being measured in accordance with a 405 grant.

Completeness Metric—Number and percent of CRASH records indicating EMS transport that do not link to EMS record. This can't be done at this time. But KIPRC might be able to do it.

Accessibility Metric—Number of years for which the CRASH and KEMIS have been linked. They are not linked; so the answer is no years at this time.

Adjudication Metrics--Summary of Discussion with Jason Cloyd—March 17, 2014

Additional comments by Kat Erin Delaney

Background

The Kentucky Administrative Office of the Courts (AOC) keeps arrest records, which are sent to them from each county; E-citations are automatically sent to them; but paper citations and arrests are sent only if they are to be prosecuted. So some paper citations and arrests are not sent. Case files have the name, date of birth, and social security number of each person arrested. But , “These identifiers are only present when the clerk has them available to them and they are entered into the database. Just because a social or date of birth is entered does not mean it is correct. Transposition errors do occur.”

Each file has a case number; but this is not the same as the citation number. So most files have both a case and citation number.

The citations for those ticketed (but not arrested) are maintained by the Kentucky State Police (KSP) and entered into KYOPS. The information on citations is in the state repository.

Citation number is automatically entered into the case file when it is an e-citation. Paper citation numbers may or may not appear in the case file.

Those arrested or given a citation get a case number, but it is not the same number that AOC will use. AOC can match by name, date of birth, and social security number.

Another problem arises from the fact that some traffic citations and arrests are entered on-line and some manually. Requiring all traffic citations and arrests to be entered on-line would make it easier to eliminate obsolete codes and track dispositions. It would make it possible to match narratives to the proper statute or measure the percent that do not match.

Timeliness Metric 1: The Average time for citations to be sent from law enforcement agencies to Kentucky Administration of the Courts. This cannot be done by AOC as the Kentucky State Police have the information on citations. Time from traffic violations to entry into KYCourts/CourtNet can vary. If the violation happens on a weekend or holiday it may take several days for the case to be entered into the KYCourts/CourtNet database.

Timeliness Metric 2: The average time for convictions to be sent to the DMV. This is done each night.

Accuracy Metric 1: Percent of errors found during data audits of critical data elements. AOC tried to do this but could not. It may be possible but first it would be necessary for KSP and AOC to identify critical elements and discuss ending the use of obsolete codes and wrong codes for offenses. We have code number for each type of violation but officers will use old codes or wrong codes. Training of officers will be needed.

Accuracy Metric 2: Percent of violations narratives that match the proper state statute. This can be done by elimination of use of old codes and wrong codes. At this time, we can't do this because.....old codes cannot be

removed from the system since they are still used in older cases. When old codes are used in newer cases that should actually be new codes this is sometimes corrected by amending offenses within the case. There are instances in which a code is made obsolete but never replaced with anything, thus making the old obsolete code necessary.

Consistency/Uniformity Metric: Percent of traffic citations statewide written on a single uniform citation. KSP can do this, but AOC cannot, as it does not keep records of citations.

Completeness Metric: Percent of cases with both original charges and dispositions in citation tracking system. This can't be compiled as AOC does not keep a record of the original charge but only the disposition and the original charge may be amended. KSP would have the original. In order to do this, the following changes would need to be made....

Query: Can you currently do it for those arrested; but not for those given just a traffic citation? Anything arrest related is handled through KSP or local LEOs. Arrest information is not handled by the courts.

Integration Metric—there is no integration between CRASH and adjudication databases. They are not linked. This is true.

Accessibility Metric 1: Number of users (by database or item or records). Any circuit court clerk or the court staff can access the database. Perhaps 1000-2000 people can access it.

Accessibility 2: Number of users able to perform independent inquiries. Some people have limited access that prevents violation of privacy concerns. Kat Delaney can estimate this number. Clerks have the ability to run queries that have been build into the database, such as number of cases in each court or case type. Within Research and Statistics only three individuals have the ability to run a specified query on all aspects of the database. This ability is also available to certain members of Technology Services (uncertain of how many, most likely no more than 6).

Accessibility 3: Number of individuals or organizations on distribution list for standardized reports, number of web hits, downloads, or service requests.

Again, Kat can estimate, but these estimates should separate out requests about adjudications from background checks for employment.

Standardized reports are referred to as Historical reports and are available on the webpage. There is no counter on this page so I cannot estimate the number of hits it has. TS or Public Information may or may not have access to this. I know that many of the judges and clerks as well as DPA and Justice references this information and our unit gets maybe a dozen inquiries a year directly asking about those reports. On average the Research & Statistics Unit will handle 200-400 ad hoc requests in a given year. When legislative session is in session we tend to get more requests for data.

Background check requests we received in CY2013 was 906,485, and the records unit processed 990,932 in CY2013.

In a telephone interview, Kat Erin Delaney said that the AOC takes all requests for data, so long as it's information they possess. They do not have the exact number of requests but it would be in the thousands.

She thinks they could provide data on the number of e-citation and paper reports, they receive; but the paper reports are an underestimate as many are not sent to the AOC.

To improve the system, she recommends eliminating paper citations and arrests and requiring the use of new codes.

Driver Licensing System Interview with Kevin Edelen

Timeliness metric 1—The average time to post driver licenses

They are posted on line, so they are posted immediately with no delay. There is no way to improve the process that is worth the effort.

Timeliness metric 2—Average time to post convictions after receipt

They are posted the same day that we receive them from the courts. Again, there is no delay.

Timeliness Metric 3—Average time to forward dispositions from the court to the DMV

We post them immediately and send them to the DMV immediately. There is no need to improve the process.

Accuracy Metric 1—The percent of duplicate records for individuals

We try to block this from happening and the situation is much improved. This is not tracked at this time.

Is there a way to improve the current number of duplicate records? If yeas, please explain how it could be done?

If not, please explain why not? Because most duplicates are not exact duplicates, but instead a matter of a slight typo in name or Birthdate. If names and birthdates are slightly different, our computer logic has no choice but to consider them as separate drivers.

Is it worth doing? If not, please explain why not? At this point, there doesn't seem to be a way to improve.

Accuracy Metric 2—The percent of “errors” found during data audits of critical data elements

We don't do a routine audit of errors and can't because an audit would require a comparison of our list with the list of dispositions from the courts. We accept what they give us, as they are sent to us. To do this we would need two lists. But, there would be very few or no errors, as we take their list.

Consistency/Uniformity 1— The Percent of social security numbers (SSN) verified online

When people apply for a license, we check their social security number against the social security data base; so it's 100 percent.

Consistency/Uniformity Metric 2—The percent of immigration documents verified online

We do not check immigration documents online; so it is 0.0 percent. People who are not citizens are required to take their documents to one of the driver's licenses field offices to prove that they are in the country legally.

We have discussed joining a program called Systematic Alien Verification Entitlements (SAVE) that would allow online verification.

What if any would be the benefit of joining SAVE? It could perhaps decrease the time required to process non-citizens, although that is really unknown.

Consistency/Uniformity Metric 3—the percent of violations reported from other states added to the driver history

We check their driver's records against The National Driver Register (NDR) and against CDLIS. We post 100 percent on their Kentucky record.

Is there any way to improve the accuracy of the records received? The data received is provided by other states. There is really no way for us to improve the data.

Completeness Metric 1-- Percent of drivers' records checked for drivers moving into the state

We obtain records of all drivers moving in from out of state; so 100 percent.

Completeness Metric 2—Percent of drivers' records transferred from prior state

We don't get partial records and we add all the information to the individual's Kentucky record that we receive.

Integration metric—Number of years for which CRASH and Driver License databases have been linked

We are not linked, but KSP can see if the drivers that they have stopped have a license. That is, KSP can access our database. It can also confirm that the vehicle is registered.

KSP may want to link databases or obtain more access.

Accessibility 1—Number of users by database or item or records

We have agreements with various state agencies to access our database; but their access is limited to specific pieces of information. Trucking companies do not have access; but they can purchase driving records to check on employees and potential hires.

Accessibility 2—Number of users able to perform independent queries

This is not knowable.

Accessibility 3--Number of individuals or organizations on distribution list for standardized reports.

Ninety-eight percent of requests are for in-house use. None of the other Cabinets get a report, but they can request them. Counties frequently request information and reports.

Accessibility Metric 4--Number of web hits, downloads, or service requests

The system is not web based. However anyone can purchase a driver's history for the past 3 years, if they have the person's driver's license number. The purchase price is \$5.00 online and \$3.00 at a field office. The police and courts can obtain a five year history.

Vehicle Metrics—discussion with Godwin Onodu and Loretta Fowler on March 14, 2014

Kentucky is adopting a new system for tracking vehicles. Replacing the old system—Automated Vehicle Information System or AVIS, it will be referred to as KVIS—the Kentucky Vehicle Information System. KVIS will be web-based and user friendly. It will be up within the year.

Timeliness Metric 1: The average time for DMV to post title transactions. The county clerks post the transactions. The Division of Motor Vehicles does not have this information and does not need it.

Timeliness Metric 2: The percent of title transactions posted within a day of receipt. All are posted within a day so there is no benefit to this metric.

Timeliness Metric 3: Average time to post registrations by county clerks. This is not part of DMV's mission and can't be done by the DMV. But it will be doable when KVIS is on line.

Timeliness Metric 4: The average time to process title documents. There is a requirement to process them within 5 days. They will be able to do this with KVIS. This could be measured but there is no benefit to doing so.

Timeliness Metric 5: The average time to produce completed titles. They are all processed within 5 days. However, they are produced (printed) in Tennessee. There is no room for improvement in the processing of titles.

Timeliness Metric 6: The percent of registrations and title brands posted within 24 hours. This is 100 percent; so there is no need to measure this.

Accuracy Metric 1: Percent of duplicate records for individuals. This is of no use to the DMV mission. It has nothing to do with the data being accurate.

Please explain why it does not affect accuracy.

Accuracy Metric 2: Percent of errors found during data audits of critical data elements. This audit occurs once a year and concerns the money received for special license plates (e.g., UK plates) and its distribution. Most of the errors are made by county clerks. Very few errors are made in this office, so there is little benefit to measuring this.

Accuracy Metric 3: The percent of VINs successfully validated with VIN checking software. There is 100 percent compliance with the requirement to validate with the VIN checking software. So there is no room for improvement.

Consistency/Uniformity—The same forms are used in all counties. This is the case at this time.

Completeness Metric: Percent of records with complete owner name and address. This is currently 100 percent. So there is no room for improvement.

Integration Metric: New Database KVIS will check against NMVTIS and VIN assist. This will be done with KVIS, as it is mandatory.

Accessibility Metric 1: Number of users (by database or item or records.) There are a number of users: state police, revenue cabinet, health and family services for child support issues, OVIS provides some limited access to insurance companies, CarFax, financial institutions. We could document the number of times the database is accessed. County attorneys may get access.

Accessibility—Number of users able to perform independent inquires. This could be determined.

Vehicle registration can provide one timeliness metric, which can be done with KVIS:

1. Average time to post by county clerks

Please note that KAVIS implementation has been delayed, and as a result, the requested information may not be available for the next 18 months.

Vehicle registration can provide one integration metric:

1. With the KVIS database, it will check against NMVTIS and VIN Assist

Yes, when KAVIS is fully implemented, it would check against VINA but not VIN Assist. And it would check against NNVTIS in real time. Additionally, the AVIS database does currently check against NMVTIS in real time. Please note that none of the systems would check against any non-conforming VINs or VINs issued prior to 1982.

Vehicle registration can provide two accessibility metrics:

1. The number of times the database is used

Information will not be available until KAVIS is fully implemented.

2. The number of users able to perform inquiries

There might not be a report for this request, however, multiple agencies do use AVIS and would have access to KAVIS. Some of the agencies are Department of Revenue, state, county and city law enforcement agencies, county clerks' staff, Property Valuation Administrators (PVAs), Department of Vehicle Regulation, and the Cabinet for Health and Family Services to name just a few.

Revised CRASH Metrics

At the meeting at the Kentucky Transportation Center on June 20, 2014, we revised the list of metrics to be measured by officials at KSP. A number of the proposed metrics were eliminated as unnecessary or not worth the effort.

The revised list is below. If you have any questions about any of the metrics, please call me at 859 257-7556.

The metrics will be measured every three months, except for those collected yearly, as indicated below. **The first set of metrics is due July 20, 2014.**

Timeliness Metrics

1. The number of days from crash event to receipt for data entry on statewide database.
2. The average number of days to enter data from paper and electronic submissions into the system. Include the number of e-reports and number of paper reports.
3. The average number of days of backlogged paper and e-reports to be entered.

Accuracy Metrics

1. The percent of crashes locatable using roadway location coding method.
2. The percent of crash reports returned to local agencies for correction. Please provide the number of e-reports with user entry override.

Completeness Metrics

1. The percent of FARS/State crash fatality match (yearly). If you can, please provide this for the past three years.

2. The percent of LEAs with more than 10% unexplained drop in reporting one year to the next (yearly). If you can, please provide this for the past three years.

Accessibility Metrics

1. The number of web hits on the public site. Please list by number of buys and number of queries, and number of users

Roadway/traffic Metrics—discussion with Keith Dotson on March 20, 2014

The Roadway/traffic section in Planning is responsible for collecting data on the attributes of all state maintained roads and all minor collectors, major collectors and arterials in the local road systems. Mr. Dotson identified two data needs: (1) AADT information for local roads and (2) live cycle or immediate updates for any changes in local road systems. Mr. Dotson said that they would like data on new roads and changes in roads as soon as they occur. This would be helpful to 911, KSP, and EMS. But at this time, the data is not provided in a timely manner. In fact, each county reports this information to its Area Development District every three years and this data may not be complete or accurate.

Please explain some of the reasons that Judge Executives do not send the information here.

Timeliness Metric 1: Percent of Traffic Counts conducted each year. They conduct traffic counts on a regular schedule. So, all roads are covered over a three year period--approximately 33 to 35 percent of roads in the system undergo a traffic count each year. Therefore there is no need to report this, as it is already known.

Timeliness Metric 2: The number of days from a crash event to location coding of crashes. This is KSP's responsibility. The Cabinet provides the road data to KSP and they code the location of the crashes.

Timeliness Metric 3: Number of days from construction to completion of road work to roadway file update This will require a definition of completion such as the day the road or lane worked on is open to traffic. It would be good to know this, although almost all changes to roads—except local roads--are updated within a week or two. This can be measured for the roads that the cabinet has responsibility for.

Accuracy Metric 1: Percent of errors found during data audits of critical data elements. This can be done and KTC's Eric Green is working on a project to do something like this. First it would be necessary to define the critical elements. Some elements are more important than others, for example, miscoding lane width is less critical than miscoding the number of lanes. It is estimated that about 5 percent of the roads have errors in the data file.

Accuracy Metric 2: Percent of crashes locatable using roadway location coding method. All crashes can be located on the roads that the Roadway/traffic section is responsible for. The problem is that many local roads are not in the data files and KYOPS sometimes does not promptly incorporate the updates that we send every week. The counties send information on the local roads to the ADDs every three years. The ADDs give it to the Cabinet. But even after the data is sent to the ADDs the road data may not be complete for various reasons.

Consistency/Uniformity 1: The percent of all elements of MMIRE that are missing. This can be done, But the Kentucky data and is probably as much as 80 to 85 percent MMIRE complete, not 52 percent complete with 48

percent missing. In other words, It may be the case that more than 105 or the 202 elements are collected by the Cabinet.

Consistency/uniformity Metric 2: Percent of FDE elements of MMIRE missing (as of December 2013 only two elements were missing—AADT and AADT for every intersecting road.) This is being worked on in the project with KTC and Eric Green. We can find out the exact number of elements and try to add the ones that are missing.

Please describe the issues with AADT collection for the two missing elements here.

Completeness Metric—Percent of traffic data based on actual counts no more than 3 years old (currently estimated to be 95%). The exact percent can be obtained.

Please describe the reasons why it is not 100% here.

Completeness Metric 2: Percent of public roadways listed in the inventory. This is close to 100 percent and would not be worth computing.

Integration metric: Number of years for which CRASH and roadway data have been linked. KSP would have the answer to this. Ed Harding would know.

Accessibility Metric 1: Number of users (by database or item or records.)

Cabinet-related data is accessible to the public on the planning website. So, presumably anyone can access it.

We have a query page but there is room for improvement with the website called Datamart. The roadway data is not on it yet. So the roadway data may not be accessible

Please find out the current accessibility of the roadway data or what is being planned to make it accessible.

Accessibility Metric 2: Number of users able to perform independent inquires. Access is supposed to be open to anyone. We could count web hits to find out how many have used it.

Accessibility 3: Number of individuals or organizations on distribution list for standardized reports. This is not known but it can be found out.

Accessibility Metric 4: Number of web hits, downloads, or service requests. The number of web hits can be identified for a given period of time.