Traffic Records System Inventory

A traffic records system consists of data about a State's roadway transportation network and the people and vehicles that use it. The six primary components of a State traffic records system are: Crash, Driver, Vehicle, Roadway, Citation/Adjudication, and Injury Surveillance. These components address driver demographics, licensure, behavior and sanctions; vehicle types, configurations, and usage; engineering, education, enforcement measures; crash-related medical issues and actions; and how they affect highway traffic safety.

Quality traffic records data exhibiting the six primary data quality attributes—timeliness, accuracy, completeness, uniformity, integration, and accessibility—is necessary to improve traffic safety and effectively manage the motor vehicle transportation network, at the Federal, State, and local levels. Such data enables problem identification, countermeasure development and application, and outcome evaluation. Continued application of data-driven, science-based management practices can decrease the frequency of traffic crashes and mitigate their substantial negative effects on individuals and society.

State traffic records systems are the culmination of the combined efforts of collectors, managers, and users of data. Collaboration and cooperation between these groups can improve data and ensure that the data is used in ways that provide the greatest benefit to traffic safety efforts. Thoughtful, comprehensive, and uniform data use and governance policies can improve service delivery, link business processes, maximize return on investments, and improve risk management.

A traffic records system inventory includes all traffic records data sources, system custodians, data elements and attributes, linkage variables, linkages useful to the State, and data access policies. The system documentation required in a traffic records system inventory permits the identification of common variables and provides an understanding of data quality that may affect linkage processes.

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

Data integration refers to the establishment of connections between the six major traffic records system components. The resulting integrated datasets enable users to conduct analyses and generate insights impossible to achieve if based solely on the contents of any singular data system.

Data governance is the formal management of the State's data assets. Governance includes a set of documented processes, policies, and procedures that are critically important to integrate traffic records data. These policies and procedures address and document data definitions, content, and management of key traffic records data sources within the State.

Responsibilities for data system contacts or data stewards depend on the applications as outlined in the Traffic Records Advisory. Procedures vary for each data steward, ensuring the tracking and release of information in their respective data system modules.

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Crash Data System	Kerry Ross			3-9
Citation Data System	Stacey Manware			10-18
Roadway Data System	Al Iallonardo			19-26
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Driver Data System	Cindy Zuerblis			48-56
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The crash system is the keystone of the State's traffic records system. The crash system not only holds the basic data critical to developing and deploying effective traffic safety countermeasures, it frequently also serves as the hub through which other systems are connected.

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

The crash system documents the characteristics of a crash and provides the who, what, when, where, how, and why. Ideally, crash data reflecting all levels of severity (including fatal, injury, and property damage only) is collected and used to support safety analysis.

Through linkages to other traffic records system components, the crash data system identifies the roadways, vehicles, and individuals (e.g., drivers, occupants, non-motorists) involved in a crash. Data and analytic tools are broadly available, so safety stakeholders can identify locations, roadway features, behaviors, driver characteristics, and vehicle characteristics that relate to crash risk.

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

The Connecticut crash system is consolidated into a database housed within the Connecticut Department of Transportation (CTDOT). Connecticut's law enforcement agencies report all fatal, injury, and property damage only (PDO) crashes over $1000 to the State electronically via a secure FTP site.

The State's law enforcement agencies can record crashes occurring in non-trafficway areas (e.g., parking lots, driveways), and these reports can be submitted to the crash system, although it is not required. The reports submitted through the secure FTP site are required to pass edit checks for accuracy, completeness, and location prior to being accepted by the repository. The State's data quality control clerks are provided with limited state-level correction authority to amend obvious errors in the database without returning the report to the originating officer. The clerks cannot modify the actual crash report, instead reports must be returned to the police agency for revision.

Connecticut DOT provides the data supplied to the crash repository to the Connecticut Transportation Safety Research Center and planning organizations for construction and engineering projects. This data allows research to be completed that will identify high crash locations and allow them to provide a cost-benefit analysis and appropriate countermeasures. The State allows local users access to crash data to prioritize law enforcement activity. The State's crash data is also used to generate information for Data-Driven Approaches to Crime and Traffic Safety (DDACTS) studies, including local heat maps and various reports of crash data including driver/vehicle/non-motorist demographics and driver behaviors.

Connecticut utilizes ANSI D.16 and D.20 in conjunction with MMUCC as primary sources for defining its crash system. Connecticut is 99.7% MMUCC V4-compliant. Connecticut also received the 2015 Association of Transportation Safety Information Professionals (ATSIP) Best Practices award for the development of their crash data processing system and the Crash Data Repository. The MMUCC 5th edition was released in 2017. Since the last MMUCC review, NHTSA has released MMUCC Mapping Guidelines to help states in evaluating their crash reporting with the MMUCC Guideline criteria.

Connecticut's crash data system and crash data repository contains crash data from 1995. The State's retention and archival storage of this data allows safety engineers and other users the long-term access to the crash data.

Connecticut has various opportunities for improvement or expansion of data linkages, interfaces, and integration amongst the State traffic records systems. As the traffic records systems data becomes more widely used, system interfaces and data integration will be crucial.

Overall, the Connecticut crash system is functioning well, with 100% electronic crash reporting and data accessibility for end-users. Data accessibility is vital for crash data users. By focusing engineering and law enforcement efforts on locations with the greatest crash risk, traffic fatalities and injuries can be reduced resulting in safer roadways.

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Questions - Description and Contents of the Crash Data System
Is statewide crash data consolidated into one database?
The State operates a single repository for crash data. All law enforcement agencies submit crash reports to a secure FTP site. These reports are required to pass edit checks for accuracy, completeness, and location prior to being accepted by the repository.
Is the statewide crash system's organizational custodian clearly defined?
The Statewide crash system's custodian is the Connecticut Department of Transportation (CTDOT).
Does the State have fatal crash reporting criteria?
The State has specific criteria that require the submission of fatal crashes to the statewide crash system. The criteria is specified by statute and administered by the Commissioner of Transportation.
Does the State have injury crash reporting criteria?
The State has five possible criteria to choose from on the crash report in order to indicate if an injury was observed from the crash. The State statute 14-108a requires investigations of motor vehicle crashes involving injury to be supplied within five days after completing the investigation.
Does the State have PDO crash reporting criteria?
The State requires that any PDO crash which results in at least $1000 in damages to be submitted to the crash data system.
Does the statewide crash system record crashes occurring in non-traffic way areas (e.g., parking lots, driveways)?
The State's law enforcement agencies can record crashes occurring in non-trafficway areas (e.g., parking lots, driveways) and these reports can be submitted to the crash data system, although it is not required.
Is data from the crash system used to identify crash risk factors?
The State's crash data collected from the repository is dissected and used to determine crash risk factors for specific intersections statewide.
Is data from the crash system used to guide engineering and construction projects?
The Crash Data Repository is available to the Connecticut Transportation Safety Research Center and planning organizations for construction and engineering projects. Projects are prioritized based on analysis of high crash locations identified in the Division of Traffic Engineering's - Suggested List of Study Survey Sites and cost-benefit analysis of appropriate countermeasures.
Is data from the crash system regularly used to prioritize law enforcement activity?
The State provides public access to data from the crash system to prioritize law enforcement activity. The State's crash data is used to generate data useful in Data-Driven Approaches to Crime and Traffic Safety (DDACTS) studies including local heat maps and various reports of crash data including driver/vehicle/non-motorist demographics and driver behaviors.
Is data from the crash system used to evaluate safety countermeasure programs?
The crash data system is used to assist the State in evaluating safety countermeasures.

Questions - Crash Reporting Guidelines and Standards
Is the MMUCC Guideline a primary source for identifying what crash data elements and attributes the State collects?
The State utilizes MMUCC as the primary source for identifying what crash data elements and attributes are collected by the State.
Are the ANSI D16 and ANSI D-20 used as sources for the definitions in the crash system data dictionary?
The State utilized ANSI D-16 and ANSI D-20 in conjunction with MMUCC as their sources for the definitions in the crash system data dictionary.
Questions - Data Dictionary for the Crash Data System
Does the data dictionary provide a definition for each data element and define that data element's allowable values?
Descriptions of data elements are provided in the Crash Data Guidelines.
Does the data dictionary document the system edit checks and validation rules?
The Validation Rules (Errors and Warnings) are present in the Crash Data Guidelines.
Is the data dictionary up to date and consistent with the field data collection, coding manual, crash report, and any training materials?
The State's manual was written in 2014 and has been updated periodically since.
Does the crash system data dictionary indicate the data elements populated through links to other traffic records system components?
The State can import data elements from sources such as NCIC and collect through links, although not all approved software providers offer this service.
Questions - Procedures and Process Flows for the Crash Data System
Do all law enforcement agencies collect crash data in the field?
All law enforcement agencies collect crash data electronically.
Do all law enforcement agencies collecting crash data electronically in the field also submit the data to the statewide crash system electronically?
All law enforcement agencies submit their crash data to the system electronically in XML format.
Do all law enforcement agencies collecting crash data electronically in the field apply validation rules consistent with those in the statewide crash system prior to submission?
All law enforcement agencies collecting crash data electronically apply validation rules that are consistent with those in the statewide crash system prior to submission. All approved software vendors are required to incorporate the State's edits and validations into their software.

Does the State maintain accurate and up-to-date documentation detailing the policies and procedures for key processes governing the collection, reporting, and posting of crash data – including the submission of fatal crash data to the State FARS unit and commercial vehicle crash data to SafetyNet?
The State does have accurate and up-to-date documentation detailing the policies and procedures for key processes governing the collection, reporting, and posting of crash data and has made available a crash data flow diagram that illustrates those partners that assist in the process.
Are the processes for managing errors and incomplete data documented?
The State has processes for tracking, managing errors, and documenting incomplete data. The State does this through internal reports, which also allows them to provide feedback and guidance to approved software vendors on what errors need fixed.
Do the document retention and archival storage policies meet the needs of safety engineers and other users with a legitimate need for long-term access to the crash data reports?
The State's crash data system contains crash data from 1995. The retention and archival storage of this data allows safety engineers and other users the long-term access to the crash data but not the reports themselves.
Questions - Crash Data System Interface with Other Traffic Records Components
Does the crash system interface with the driver system?
The crash system does not interface with the driver system.
Does the crash system interface with the vehicle system?
The crash system does not interface with the vehicle system. Local law enforcement and FARs analysts can manually access the vehicle system.
Does the crash system interface with the roadway system?
The State's crash system has merged three roadway elements with the roadway system. The State is in the process of merging an additional 40 elements in order to allow the State to do a more in-depth analysis of roadway and crash correlations.
Does the crash system interface with the citation and adjudication system?
The State's crash system does not interface with the citation and adjudication system. An MOU is currently being negotiated to set up a secure database and server to merge data from 2000 to present.
Does the crash system interface with the injury surveillance system?
The State's crash system does not interface with the injury surveillance system.
Questions - Data Quality Control Programs for the Crash System
Are there automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and is logically consistent among data elements?
The State has built in automated edit checks and validation rules; if the report submitted does not meet all the edit checks it is rejected and returned to the law enforcement agency for resolution.

Is limited State-level correction authority granted to quality control staff working with the statewide crash database to amend obvious errors and omissions without returning the report to the originating officer?
The State's data quality control clerks are provided with limited state-level correction authority to amend obvious errors and omissions. The clerks do not modify the actual report.
Are there formally documented processes for returning rejected crash reports to the originating officer and tracking resubmission of the report in place?
The State does have a formal process for returning rejected crash reports. If a report is rejected, an automated email is sent to the supervisor on record for that department from which the file was rejected. The email contains a notification as to the error and the report case ID.
Are there timeliness performance measures tailored to the needs of data managers and data users?
The State does track the timeliness performance measures regarding the crash report being received by the State and the processing time for each report.
Are there accuracy performance measures tailored to the needs of data managers and data users?
The State does have performance measures that compare the incoming data to the errors and warnings in the Crash Data Guidelines.
Are there completeness performance measures tailored to the needs of data managers and data users?
Reports cannot be submitted without being complete; however, if the need arose, the State could extract a report on the completeness of information in the report.
Are there uniformity performance measures tailored to the needs of data managers and data users?
The State is able to compare uniformity performance measures in some specific instances and tailors these reports to the needs of data managers and data users.
Are there integration performance measures tailored to the needs of data managers and data users?
The State indicated they do not have integration performance measures.
Are there accessibility performance measures tailored to the needs of data managers and data users?
The State indicated they count individual users, queries, and downloads as the method for measuring accessibility. They also conduct a count of users and queries from the Crash Data Repository and this report was supplied.
Has the State established numeric goals—performance metrics—for each performance measure?
The State does not have a set of established numeric goals—performance metrics—for each performance measure.
Is there performance reporting that provides specific timeliness, accuracy, and completeness feedback to each law enforcement agency?
The State has developed a “crash report card” which provides law enforcement agencies a report on how well they are doing on submitting crash reports electronically.

Is the detection of high frequency errors used to generate updates to training content and data collection manuals, update the validation rules, and prompt form revisions?
The State employs two Crash Data Liaisons (retired police officers) who review internal reports and produce new training content for law enforcement agencies across the State. The liaisons work with the law enforcement agencies on various issues and report back to the DOT as well as publish the resolution to the issues in a monthly newsletter.
Are quality control reviews comparing the narrative, diagram, and coded contents of the report considered part of the statewide crash database's data acceptance process?
The State utilizes a quality control process that analyzes the narrative, diagram, and data fields to improve the data quality.
Are independent sample-based audits periodically conducted for crash reports and related database contents?
The State has conducted limited independent audits of the crash database.
Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions?
The State conducts periodic comparative and trend analyses to identify unexplained differences in the data.
Is data quality feedback from key users regularly communicated to data collectors and data managers?
The State reports its data quality feedback to key users regularly in a newsletter that is sent to over 300 subscribers per month.
Are data quality management reports provided to the TRCC for regular review?
Data quality meetings are held as needed for review of data quality reporting.

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

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

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

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

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

Law enforcement officers, prosecutors, probation officers, parole officers, and judges benefit from having real-time access to individuals' driving and criminal histories to appropriately cite, charge, adjudicate, and impose penalties and sanctions. Ideally, all State and local courts

participate in and have access to an interfaced network of data systems that provides this degree of information access.

Custodial responsibility for the multiple components that comprise the State's citation and adjudication systems is divided among local and State agencies and may be shared between organizational custodians. The citation tracking systems, for example, are often maintained by law enforcement agencies, courts, and the licensing agency. Responsibility for coordinating, managing, and promoting such systems (e.g., for citation tracking, criminal justice information, case management, driver licensing and vehicle registration) resides at the State level. State agencies are best suited to the management of the law enforcement information network (e.g., criminal justice information agency), for coordinating and promoting court case management technology (e.g., administrative arm of the State's court system), and for assuring that convictions are forwarded on to the licensing agency and posted to the driver history (e.g., court records custodian and the licensing agency).

Connecticut has a unified court system and all court systems are interoperable. The system utilized by the Court is considered the statewide data system for citation and adjudication data. The Department of Motor Vehicles (DMV) only receives dispositions where an infraction must be entered on the driver or vehicle file. The central authority for distributing unique citation numbers is also a bureau under the Judicial Branch of the State.

A DUI tracking system is not present in Connecticut. There is no central repository for tracking a DUI citation from the time it is issued through to disposition. Without the ability to track citations for DUI offenses to this level, it makes it more difficult to determine problem areas not only in specific geographic areas for enforcement and education, but also within adjudicating DUI offenses. When a DUI tracking system is in place, metrics and measures can be monitored more efficiently. When implementing a DUI tracking system, the State should consider the appropriate location to have this type of a system. Although the Court is the State's data system, a DUI tracking system may not belong under the Court as the system should contain other information not under the purview of the Court. When considering a DUI tracking system, elements of MIDRIS, such as treatment tracking and sanctions imposed, should be included.

Standards are present within the State. The Courts are utilizing NIEM when any data is transferred as XML; however, it was unclear whether all data from the court is in XML. Functional requirements for traffic court case management and National Center for State Courts guidelines are followed within the State. Using standards as Connecticut has allows easier integration, interfacing, and sharing of data throughout other systems. Other personnel can also consume the data easily when standards are followed.

Although standards are being used in many of the citation and adjudication systems, there are few interfaces and linkages with different systems within the State. When looking at interfaces, other components such as crash files and roadway data assists with making better informed decisions. The decisions can be related to enforcement efforts or even roadway design. Using the adjudication data in conjunction with other traffic records systems also allows for analysis to better respond to trends and identify problem areas throughout the State.

Data dictionaries are not present for the citation and adjudication systems. Data dictionaries assist with knowing what data is available. Each traffic records system should have a data dictionary to not only include the specific fields that exist, but the elements that are linked to other systems and data types. The data dictionaries should be made available for key stakeholders within the State to promote the integration and linking of citation and adjudication data to other traffic safety systems. With data dictionaries, the State can identify duplication of efforts and begin to use the data collected more efficiently.

There are few performance measures reported within Connecticut. With performance measures in place, the State will be able to identify and mitigate degradation of system processes. Performance measures will help identify areas of improvement across multiple system interfaces. These measures are meant to assist in decision-making, resource allocation, and system performance. They are not meant to determine how fast data is received from other sources or evaluate outside agency performance, but to evaluate the internal processes of the specific system and how it may relate to other traffic records systems. Performance measures should not be mistaken for processes and workflow of the data within the system. Statutes in place or validation rules within the systems are not considered performance measures. Performance measures should be quantifiable with the ability to set a baseline and monitor changes within. This will not only assist with determining the system components that may need improvement, but also the improvements a system has made within the process. This will then assist in maintaining the highest standard possible for the systems which meet or exceed the performance measures that are monitored.

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Questions - Description and Contents of the Citation and Adjudication Data Systems
Is there a statewide system that provides real-time information on individuals' driving and criminal histories?
The State utilizes a system called Connecticut On-Line Law Enforcement Communications Teleprocessing (COLLECT), giving authorized users access to criminal and driving histories.
Do all law enforcement agencies, parole agencies, probation agencies, and courts within the State participate in and have access to a system providing real-time information on individuals driving and criminal histories?
COLLECT is available to law enforcement, parole, probation, and courts to gain real-time access to driving and criminal histories.
Is there a statewide authority that assigns unique citation numbers?
The Centralized Infractions Bureau is responsible for issuing citation numbers who fall under the authority of the Judicial Branch within the State.
Are all citation dispositions – both within and outside the Judicial Branch – tracked by the statewide data system?
The Court system is considered the statewide data system. All citations and dispositions are processed within one statewide court system. Dispositions of guilty are sent to the Department of Motor Vehicles (DMV) for inclusion on the driver file, but the statewide data system is considered to be with the Court.
Are final dispositions (up to and including the resolution of any appeals) posted to the driver data system?
The DMV receives dispositions where action can be taken based off the disposition. Any not guilty disposition is not forwarded to the DMV.
Are the courts' case management systems interoperable among all jurisdictions within the State (including local, municipal, and State)?
The Connecticut Judicial Branch has a unified court that uses one system for all courts within the State.
Is citation and adjudication data used for traffic safety analysis to identify problem locations, areas, problem drivers, and issues related to the issuance of citations, prosecution of offenders, and adjudication of cases by courts?
The utilization of collected data for targeted enforcement and other traffic safety analysis is left up to individual agencies. Although data is available, there is no evidence that citation data is used on a regular basis for traffic safety analysis.
Questions - Guidelines and Standards for the Citation and Adjudication Systems
Do the appropriate components of the citation and adjudication systems adhere to the National Crime Information Center data guidelines?
The COLLECT system used in the State follows NCIC guidelines.

Do the appropriate portions of the citation and adjudication systems adhere to the Uniform Crime Reporting Program guidelines?
Traffic data is not reported through UCR data. No part of the State system utilizes any UCR guidelines.
Do the appropriate portions of the citation and adjudication systems adhere to the National Incident-Based Reporting System guidelines?
NIBRS guidelines are not used within the citation or adjudication systems.
Do the appropriate portions of the citation and adjudication systems adhere to the National Law Enforcement Telecommunications System guidelines?
The COLLECT system utilized within the State meets NLETS guidelines.
Do the appropriate portions of the citation and adjudication systems adhere to the National Law Enforcement Information Network guidelines?
This specific guideline relates to a Michigan-based system. Other states will not utilize this standard.
Do the appropriate portions of the citation and adjudication systems adhere to the Functional Requirement Standards for Traffic Court Case Management?
Appropriate portions of the citation and adjudication systems adhere to the Functional Requirement Standards for Traffic Court Case Management.
Do the appropriate portions of the citation and adjudication systems adhere to the NIEM Justice domain guidelines?
Information in XML is NIEM-compliant, but there is no indication that all information is transmitted to and from the court in XML.
Does the State use the National Center for State Courts guidelines for court records?
National Center for State Courts guidelines are used within the court records system.
Does the State use the Global Justice Reference Architecture?
Global Justice Reference Architecture is not utilized within the State.
Does the State have an impaired driving data tracking system that meets the specifications of NHTSA's Model Impaired Driving Records Information System?
There is no impaired driving system within the State that meets MIDRIS standards.
Questions - Data Dictionaries for the Citation and Adjudication Systems
Does the citation system have a data dictionary?
There is no data dictionary available for the citation system.
Do the citation data dictionaries clearly define all data fields?
There is no data dictionary for the citation system.
Are the citation system data dictionaries up-to-date and consistent with the field data collection manual, training materials, coding manuals, and corresponding reports?
There is no citation system data dictionary.

Do the citation data dictionaries indicate the data fields that are populated through interface linkages with other traffic records system components?
There is no citation system data dictionary.
Do the courts' case management system data dictionaries provide a definition for each data field?
There is no case management data dictionary.
Do the courts' case management system data dictionaries clearly define all data fields?
There is no case management data dictionary.
Do the courts' case management system data dictionaries indicate the data fields populated through interface linkages with other traffic records system components?
There is no case management data dictionary.
Do the prosecutors' information systems have data dictionaries?
There is no case management data dictionary. There is no different system for the prosecutors within the State.
Questions - Procedures and Process Flows for the Citation and Adjudication Data Systems
Can the State track citations from point of issuance to posting on the driver file?
The State can track the citations from issuance to an agency through to final disposition. The documented flow diagram is incomplete because it only describes the electronic process.
Does the State measure compliance with the process outlined in the citation lifecycle flow chart?
The State indicated citation lifecycle process compliance measurements exist, but details were not available.
Is the State able to track DUI citations?
There is no flowchart that documents the process, although it was reported that DUI citations can be tracked.
Does the DUI tracking system include BAC and any drug testing results?
There is no indication that BAC or drug testing results are captured within a DUI tracking system.
Does the State have a system for tracking administrative driver penalties and sanctions?
There is a system to track administrative penalties, but there was no information available describing the protocols.
Does the State have a system for tracking traffic citations for juvenile offenders?
No information or flow chart was available regarding a State system that tracks traffic citations for juvenile offenders. It is noted offenders over the age of 16 are processed as an adult.
Does the State distinguish between the administrative handling of court payments in lieu of court appearances (mail-ins) and court appearances?
There is no flowchart or documentation showing a difference in court payments in lieu of court appearances and court appearances. It was reported that mail-in payments are considered convictions, but there is no information describing a difference in the process.

Does the State track deferral and dismissal of citations?
Dismissals are tracked in the statewide system housed within the judicial branch. Although the driver and vehicle files do not receive dismissal records, they are not considered the statewide system.
Are there State and/or local criteria for deferring or dismissing traffic citations and charges?
There are no specific criteria for dismissing or deferring citations within the State. Only the inability to prove a case is documented.
If the State purges its records, are the timing conditions and procedures documented?
Records are not purged in the State.
Are the security protocols governing data access, modification, and release officially documented?
Limited information regarding data storage and limited group access was available for the court system. Information regarding data access outside the court system was not available. Modification and release governance were not provided for any system.
Questions - Citation and Adjudication Systems Interface with Other Components
Is citation data linked with the driver system to collect driver information, to carry out administrative actions (e.g., suspension, revocation, cancellation, interlock) and determine the applicable charges?
Citation data is linked to the driver system at the DMV where administrative sanctions are imposed. This is performed electronically from the enforcement through to the court and ultimately the DMV when appropriate.
Is adjudication data linked with the driver system to collect certified driver records and administrative actions (e.g., suspension, revocation, cancellation, interlock) to determine the applicable charges and to post the dispositions to the driver file?
It was reported that adjudication data is linked to the driver record where administrative sanctions are imposed, but details were not available.
Is citation data linked with the vehicle file to collect vehicle information and carry out administrative actions (e.g., vehicle seizure, forfeiture, interlock)?
Data is made available to the DMV and law enforcement, but there is no information about a data linkage for administrative purposes with the vehicle file.
Is adjudication data linked with the vehicle file to collect vehicle information and carry out administrative actions (e.g., vehicle seizure, forfeiture, interlock mandates and supervision)?
It was reported that adjudication is linked with vehicle files, but the information provided details the driver file linkage.
Is citation data linked with the crash file to document violations and charges related to the crash?
The crash file is not linked to the citation data within the State.

Is adjudication data linked with the crash file to document violations and charges related to the crash?
The crash file is not linked with adjudication data within the State.
Questions - Quality Control Programs for the Citation and Adjudication Systems
Is there a set of established performance measures for the timeliness of the citation systems?
The number of days a citation takes to be populated in the central database from the time of issuance is measured by the State. The measure was quantified showing the reduction of the time it took to populate the database with electronic and paper citation data.
Is there a set of established performance measures for the accuracy of the citation systems?
The percentage error within critical elements within the citation entry is captured. The State has reports where the errors are identified.
Is there a set of established performance measures for the completeness of the citation systems?
There is no performance measure for completeness of the citation system.
Is there a set of established performance measures for the uniformity of the citation systems?
There is a performance measure to monitor the percentage of citations where the uniform violation codes are incorrect. Edits are in place to prevent the entry of such invalid codes within the electronic citation system. Edits in a system do not constitute a performance measure. This performance measure is measuring paper citations, but not electronic citations. The electronic citations are checked against the violation codes to prevent error at the officer level. No results or reports indicating the effectiveness of the performance measure or any quantifiable data for the performance measure were available for review.
Is there a set of established performance measures for the integration of the citation systems?
There is no performance measure for the integration of the citation systems.
Is there a set of established performance measures for the accessibility of the citation systems?
There is no performance measure for the accessibility of the citation systems.
Is there a set of established performance measures for the timeliness of the adjudication systems?
The State measures the number of days a citation takes to populate the central database from the time of issuance. The measure was quantified, and the State was able to show the reduction of the time to populate the database for both paper and electronic citations.
Is there a set of established performance measures for the accuracy of the adjudication systems?
The State determines the percentage error within critical elements within the citation entry. The State generates reports where the errors are identified.

Is there a set of established performance measures for the completeness of the adjudication systems?
There is no performance measure for the completeness of the adjudication system.
Is there a set of established performance measures for the integration of the adjudication systems?
There are no performance measures for the integration of the adjudication systems.
In States that have an agency responsible for issuing unique citation numbers, is information on intermediate dispositions (e.g., deferrals, dismissals) captured?
Dismissals are captured within the judicial system. There is no information available to show dismissals captured within the driver file.
Do the State's DUI tracking systems have additional quality control procedures to ensure the accuracy and timeliness of the data?
There is no DUI tracking system in the State.

The State's roadway data system comprises data collected by the State (State-maintained and locally owned roadways) as well as data from local sources such as county and municipal public works agencies and metropolitan planning organizations. The ideal statewide system incorporates sufficient information on all public roads to support valid, system-wide network screening and countermeasure development, deployment, and evaluation.

To focus on the collection of roadway inventory information for safety purposes, the FHWA developed the Model Inventory of Roadway Elements (MIRE) to provide an extensive listing of data elements dealing with road segments, intersections, interchanges, and traffic. MIRE's significant size led to the establishment of the Fundamental Data Elements (FDEs), a subset of key MIRE elements. A prerequisite for collecting and using MIRE and the FDEs, States must be able to uniformly locate the collected roadway and traffic data elements to a compatible location referencing system.

The Connecticut Department of Transportation (CTDOT) is the agency responsible for collecting and maintaining the roadway information system for the State. CTDOT maintains 4,466 miles of State-owned highways and ramps, representing roughly 21% of the 21,512 miles of road in Connecticut.

Roadway and traffic data elements have historically been maintained through a non-geospatial linear referencing system (LRS) known as the Roadway Information System (RIS). The new geospatial LRS effort has integrated the historical RIS data, as well as many newly developing data assets, through Bentley's EXOR product into the CTDOT-maintained Transportation Enterprise Database (TED). Through TED/EXOR, the CTDOT maintains data on all 21,512 miles of road. This system also enables linkages between road and traffic data, the bridge information system, the project document management system, and others. As the information is maintained by the CTDOT, all data, including locally submitted data, goes through a quality control process to insure the information is complete, accurate, and up-to-date before being integrated.

CTDOT maintains a data dictionary for all data elements within the RIS, including the MIRE Fundamental Data Elements (FDEs). All fully developed MIRE FDEs are documented and documentation is being developed for newly integrated FDE (e.g., intersections and interchanges) as well as assets not present in the historical system. Due to an ongoing transition to a geospatial LRS, CTDOT is developing and implementing plans to incorporate the MIRE FDEs and non-FDEs. A formal procedure to ensure the data dictionary is kept up-to-date is described in draft documentation and is an ongoing effort of the TED group as well as the Data Governance Council established in August 2017.

Crash data is not directly integrated within RIS except by using RIS route/road and mile points to assign crash location. Crash data within TED are located on the geospatial LRS primarily for visual analysis. However, road and traffic data are integrated with crash data outside the roadway data system and used to develop safety analysis and safety management tools including a crash visualization tree, a collision diagram tool, and updates to the network screening tool. Additionally, in partnership with the University of Connecticut (UCONN), CTDOT is developing web-based analysis tools that contain both crash and road data. This development transfers the roadway data to UCONN for integration with the crash data. These two systems are currently independent, but data exchange is possible and crash data is available within the TED environment.

The CTDOT is undergoing an extensive update to their enterprise data management system. A large portion of this update involves transitioning their legacy roadway data system from a non-geospatial LRS to a geospatial LRS. This provides CTDOT an unusual opportunity to incorporate and integrate all their data systems and build a system that will serve future data management and analysis needs. CTDOT has been leveraging this opportunity to be inclusive, identifying broad partner and customer needs, and establishing long-lasting partnerships.

As part of this update, the CTDOT has plans to build on their data entry quality control processes by establishing a spectrum of performance measures. This could include a formal process of assessing roadway data quality (timeliness, accuracy, completeness, uniformity, accessibility, and integration) by utilizing performance management information available in NHTSA's, "Model Performance Measures for State Traffic Records Systems". Additional information is also available in a follow-up document published by FHWA titled, "Performance Measures for Roadway Inventory Data".

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Questions - Description and Contents of the Roadway Data System
Are all public roadways within the State located using a compatible location referencing system?
The State has two compatible location referencing systems (LRS). The older of the two is a non-geospatial LRS utilizing route or road IDs. The newer system (EXOR) is a geospatial LRS. The two systems are adjusted so that the segment and mileposts match. Roughly 21% of these public roads are owned/maintained by the State.
Are the roadway and traffic data elements located using a compatible location referencing system (e.g., LRS, GIS)?
The State has compatible location referencing systems for both the roadway and traffic data elements. The systems support for adding new data and elements. The State has developed a new geospatial LRS that has been integrating the roadway and traffic data elements as well as expanding the available asset data through supplemental collection and integration.
Is there an enterprise roadway information system containing roadway and traffic data elements for all public roads?
The State has an enterprise roadway information system that contains data for roadway and traffic elements for all public roads. They have linkages for the roadway network features and assets; bridge/structures management; traffic signal database; projects; and other information.
Does the State have the ability to identify crash locations using a referencing system compatible with the one(s) used for roadways?
As of 2018, the State locates crashes using the new geospatial LRS locations and milepoint data which is compatible with the LRS for roadway and traffic data.
Is crash data incorporated into the enterprise roadway information system for safety analysis and management use?
The State has uploaded snapshots of the crash database into their enterprise roadway data system. This primarily enables visual analysis but is not used for safety analysis. However, safety analysis and management involving roadway data is managed via the crash enterprise system with the road data incorporated into safety analyses and safety analysis tools. The State is making progress towards a more integrated system and is working towards producing new tools to use for safety analysis which include a crash visualization tree and a collision diagram tool. This development involves transferring the roadway data to the University of Connecticut (UCONN) to be integrated with the crash data. UCONN access to TED enables this integration.
Questions - Applicable Guidelines for the Roadway Data System
Are all the MIRE Fundamental Data Elements collected for all public roads?
The State collects a substantial portion of the MIRE FDEs for all public roadways and has identified those that are collected in full, partial, and no compliance with MIRE. The State maintains information on which definitions they used, and which were slightly different than those of MIRE. The State developed a plan to comply with requirements which was included in the 2017 Traffic Records Strategic Plan and updated in the 2018 Traffic Records Strategic Plan. Intersections and interchanges were the State's major data deficiency and it is being addressed through a collaborative effort between CTDOT and UCONN.

Do all additional collected data elements for any public roads conform to the data elements included in MIRE?
The additional elements collected by the State do not necessarily conform to MIRE elements. However, the State has identified limitations and is in the on-going process of developing and implementing a plan for additional data element collection which includes a MIRE attribute category.
Questions - Data Dictionary for the Roadway Data System
Are all the MIRE Fundamental Data Elements for all public roads documented in the enterprise system's data dictionary?
The current road enterprise data system dictionary for the State contains documentation for many MIRE FDE elements, but not all. The State has completed MIRE FDE documentation for all segment related attribution and has draft documentation for intersection related FDE. Interchange related documentation is under development. Also, the State is developing a plan to collect additional MIRE elements and develop documentation within the data dictionary.
Are all additional (non-Fundamental Data Element) MIRE data elements for all public roads documented in the data dictionary?
The State documents additional MIRE elements in their Roadway Inventory System (RIS). Additionally, plans to develop additional collection and attribution techniques and data dictionaries for further non-MIRE FDEs are being developed and implemented.
Does roadway data imported from local or municipal sources comply with the data dictionary?
The State does not import data from locals directly; however, the State does receive information from locals and the data is entered in a manner consistent with the enterprise data system. The State has a vision related to future direct importation of local data, including utilizing a customized geospatial data update tool through a research or pilot FHWA project.
Is there guidance on how and when to update the data dictionary?
The State has indicated that there is guidance within the Roadway Inventory Section (RIS) on how and when to update the data dictionary and the RIS. The TED group has taken deliberate steps to more clearly identify the data dictionary update process for all roadway assets.
Questions - Procedures and Process Flows for the Roadway Data System
Are the steps for incorporating new elements into the roadway information system (e.g., a new MIRE element) documented to show the flow of information?
The State has developed an asset readiness form that outlines necessary considerations and documents potential information flow related to collection, use, and maintenance of an asset. Additionally, review and collaboration for new asset integration takes place weekly at TED.
Are the steps for updating roadway information documented to show the flow of information?
The State has a process for updating roadway information that is documented and identifies responsible parties. The process is undergoing changes with the deployment of new data collection applications. As that process develops, the steps are being evaluated and documented.

Are the steps for archiving and accessing historical roadway inventory documented?
The State documents the steps for archiving and accessing historical roadway inventory as part of the functionality of the new geospatial LRS. Modified or deleted data is provided an end date which sets the date for the activity. Annually the Roadway Information Systems (RIS) personnel create a snapshot of the database. They have the means to access the historical data by selecting the appropriate year's schema.
Are the procedures that local agencies (e.g., county, MPO, municipality) use to collect, manage, and submit roadway data to the statewide inventory documented?
The limited amount of data that local agencies are asked to collect have a defined process that is well documented. CTDOT is in the process of re-assessing these procedures and developing more in-depth data update processes for the local agencies.
Are local agency procedures for collecting and managing the roadway data compatible with the State's enterprise roadway inventory?
Most local roadway data is collected by State personnel; thus, the collection system is extremely similar to that for the State roadway data and compatibility is ensured. Any expansion of this process is planned to utilize CTDOT provided tools to ensure compatibility.
Are there guidelines for collection of data elements as they are described in the State roadway inventory data dictionary?
The State has a field collection manual with guidelines for collecting roadway elements for the non-geospatial LRS. An update to this manual is planned with the implementation of new data collection applications and processes.
Questions - Intrastate Roadway System Interface
Are the location coding methodologies for all State roadway information systems compatible?
The State has multiple coding methodologies but indicates that all are compatible and convertible. An on-going effort of the TED group is to normalize all location coding methodology and push for acceptance and utilization of a single LRS.
Are there interface linkages connecting the State's discrete roadway information systems?
The State has interface linkages through their enterprise database system that connect the various discrete roadway information systems, making them able to be queried through their Transportation Intelligence Gateway (TIG) and other data access applications.
Are the location coding methodologies for all regional and local roadway systems compatible?
The majority of information is collected and maintained by the Roadway Inventory Section and therefore the methodologies are compatible. However, individual asset data may have a particular coding methodology, but it is compatible with the State LRS. These methods included GPS coordinates which were snapped to a route and milepoint for storage.

Do roadway data systems maintained by regional and local custodians (e.g., MPOs, municipalities) interface with the State enterprise roadway information system?
The State maintains the local roadway system data within the State enterprise data system; thus, in that sense, an interface occurs naturally. However, other roadway systems that are collected and maintained by local and regional custodians do not interface with the State enterprise roadway data system. CTDOT is exploring access to those data systems at the COG level.
Does the State enterprise roadway information system allow MPOs and local transportation agencies on-demand access to the data?
The State provides on-demand access to some Roadway Information System data through several mechanisms. Published road network data and attribution is publicly available through the CTDOT Web Map and is also published to ArcGIS Online, both recent developments. Another is via the State Crash Data Repository (CDR) system.
Questions - Data Quality Control Programs for the Roadway Data System
Do Roadway system data managers regularly produce and analyze data quality reports?
The State has several mechanisms which produce quality reports for analysis, both annual and those run throughout the year. Possible expansion of this reporting is being assessed and developed.
Is the overall quality of information in the Roadway system dependent on a formal program of error/edit checking as data is entered into the statewide system?
The State has an extensive quality assessment and error/edit checking system with various levels of checks at data entry and later. This functionality is also being built into new data applications.
Are there procedures for prioritizing and addressing detected errors?
Detected errors are addressed and prioritized for the manual process based upon the development needs. Critical errors, those that would prevent further development, are addressed immediately while non-critical errors are a lower priority and are addressed through communication between the Department of Transportation (CTDOT) personnel and the software vendor's development team. Data errors are detected and prioritized based upon the needs of CTDOT and UCONN for safety analysis and asset management needs.
Are there procedures for sharing quality control information with data collectors through individual and agency-level feedback and training?
The State has several mechanisms for sharing quality control information with data collectors. However, training in how to use the LRS management software has reached only limited users. Quality control checks of internal and outside data sources are conducted, and spreadsheets are produced to identify gaps or obvious errors.
Is there a set of established performance measures for the timeliness of the State enterprise roadway information system?
The State acknowledges the lack of timeliness performance measures. However, the State indicates that performance measures will be developed with the full deployment of the new geospatial LRS. The information is being collected but is not yet available.

Is there a set of established performance measures for the timeliness of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)?
The State acknowledges the lack of timeliness performance measures and notes that the data to calculate performance measures exists but is not used for that purpose. However, the State indicates that performance measures will be developed with full deployment of the new geospatial LRS.
Is there a set of established performance measures for the accuracy of the State enterprise roadway information system?
The State acknowledges that though some accuracy performance measures exist, primarily related to the requirement of matching historical and geospatial LRS networks, more could be developed. However, the State indicates that performance measures will be developed with full deployment of the new geospatial LRS and its enhanced cross-asset querying/accuracy check capabilities.
Is there a set of established performance measures for the accuracy of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)?
The State acknowledges that, though limited accuracy performance measures exist related to acceptance of 0 errors through a manual audit check procedure, more could be developed. However, the State indicates that performance measures will be developed with full deployment of the new geospatial LRS and its enhanced querying/accuracy check capabilities.
Is there a set of established performance measures for the completeness of the State enterprise roadway information system?
The State has completeness performance measures related to the percentage of public road system geospatially located in the new LRS by comparison against the non-geospatial LRS. However, further performance measures will be developed with full deployment of the new geospatial LRS and the integration of additional state data assets into the LRS.
Is there a set of established performance measures for the completeness of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)?
The State has completeness performance measures related to the percentage of public road system geospatially located in the new LRS by comparison against the non-geospatial LRS. However, further performance measures will be developed with full deployment of the new geospatial LRS and additional assets.
Is there a set of established performance measures for the uniformity of the State enterprise roadway information system?
The State tracks MIRE FDE compliance as a measure of uniformity. The State included the percentage of State miles that have 31 of the 37 MIRE FDEs, the additional FDEs that are compliant, and the MIRE FDEs that are not collected. Additional performance measures related to uniformity are being considered.

Is there a set of established performance measures for the uniformity of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)?
The State tracks MIRE FDE compliance as a measure of uniformity for the local roadway data system as part of the inclusion into the State enterprise data system. Additional performance measures related to uniformity are being considered.
Is there a set of established performance measures for the accessibility of State enterprise roadway information systems?
The State acknowledges the lack of accessibility performance measures, although it has taken steps to develop accessibility metrics through solicitation of feedback from users.
Is there a set of established performance measures for the accessibility of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.)?
The State acknowledges the lack of accessibility performance measures, but it has taken steps to include COGs and municipalities in this effort and gathered feedback on data accessibility.
Is there a set of established performance measures for the integration of State enterprise roadway information systems and other critical data systems?
The State acknowledges the lack of integration performance measures. However, performance measures will be developed with full deployment of the new geospatial LRS. While a small subset of the roadway elements is integrated with the crash system, and CTDOT is tracking dataset integration into TED, no formal performance measures currently exist.
Is there a set of established performance measures for the integration of the roadway data maintained by regional and local custodians (municipalities, MPOs, etc.) and other critical data systems?
The State acknowledges the lack of integration performance measures. However, performance measures will be developed with full deployment of the new geospatial LRS. The State indicates that a small number of roadway elements are integrated with the crash system but offers no performance measures.

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

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

Ideally, the ISS tracks the frequency, severity, and nature of injuries sustained in motor vehicle crashes; enables the integration of injury data with the crash data; and makes this information available for analysis that supports research, prevention, problem identification, policy-level decision-making, and efficient resource allocation. Common sectors within the stakeholder community include traffic safety, health care, injury prevention, research, and the interested public.

The Connecticut (ISS) includes most of the basic components of an ideal system, including Emergency Medical Services (EMS), emergency department (ED) and hospital discharge (HD) databases, and a vital records (VR) system. The VR system is currently paper-based. Trauma registry (TR) data is collected by hospitals but has not been submitted to the State registry since 2011. Efforts are underway to restore the State trauma registry functionality and begin receiving data from local hospitals. The State does not utilize data from rehabilitation facilities or other data sources as part of the system.

For the most part, the component systems do not track the frequency, nature, and severity of traffic-related injuries, and have not used system data to plan or evaluate highway safety projects. The EMS, ED, and HD systems have a data dictionary, but none of the component systems have formal documentation regarding the collection, management, and maintenance of data.

None of the systems currently have a set of edit checks and/or validation rules for data entering the system, nor do they have documented procedures to track returned records through the correction and resubmission process.

Limited state-level correction authority to correct obvious errors without returning reports to the submitting entity is granted for the EMS, ED, and HD systems. The VR system documents

and reports to the submitting entity any changes that would affect the legal portion of death certificates.

None of the ISS systems have developed and implemented formal performance measures that enable them to track and quantify performance within their system. Performance measures include a baseline and goal over a period of time.

Quality control reporting varies among the six component systems. EMS has used high frequency errors to change training and reporting and compares data over time to identify gaps in submission. The ED and HD systems perform some data correction when preparing hospital data for distribution. Data quality feedback is occasionally received from key users of VR data. None of the component systems generate reports for the TRCC on a regular basis.

The State is on the brink of a substantial improvement in the ISS with the upgrade to the EMS system, the restoration of the State Trauma Registry, and the conversion of VR to an electronic data system.

All the State data systems have established procedures for making aggregate data available to outside parties. This creates advocacy for the development and improvement of the State's databases.

Each component system has a fairly complete data flow diagram that can provide the basis for developing documentation regarding how data is collected and managed.

Each component of the ISS should be provided the opportunity to regularly share data with the TRCC. The exposure of key stakeholders to reports from other data systems can identify potential collaborations.

The State should develop performance measures for all systems that will track and document system improvements. The Traffic Records Advisory is a good source of information on performance measures.

The State should review all current policies, processes, and procedures to develop formal documentation wherever possible. This can help to assure that procedures are followed consistently.

The restoration of the State Trauma Registry should be a top priority.

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Questions - Description and Contents of the Injury Surveillance System (ISS)

Does the injury surveillance system include emergency medical services (EMS) data?

Yes. The state has produced annual EMS data reports using the 2014, 2015 and 2016 data. The 2017 data was part of the transition to collection of EMS data in a new version of the National EMS structure (NEMSIS v3.4.0). To date, despite more than a year of weekly meetings, we are unable to easily access or query EMS data from 2017 onward.

EMS data report for 2016, located on the OEMS web site at: https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/ems/pdf/CEMSTARS/2016OEMSAnnualDataReportpublic.pdf?la=en

Used EMS and CDC data on age distribution of MVC records and age distribution of fatalities.

Does the injury surveillance system include emergency department (ED) data?

The injury surveillance system includes emergency department data. The State produced a report covering data from 2008-2013 that illustrates the use of ED data and other data related to crashes and other injuries.

Does the injury surveillance system include hospital discharge data?

The 'Injury in Connecticut' report uses vital statistics, emergency department, and hospital discharge data to describe the prevalence of injury in the State, its counties, and its municipalities. A number of data elements (including age, sex, race, and ethnicity) are used to describe injuries within the State.

Does the injury surveillance system include trauma registry data?

Yes. The State trauma registrars have begun submitting data from 2012 to 2018. The query application meant for individual trauma hospitals to graphically view their own data has still not been implemented. In 2018, OEMS regained access to the trauma registry.

As of September 2018, the OEMS epidemiologist was able to query trauma data using Trauma Report Writer and to bring the trauma registrar committee a sample of the kind of reports they had originally requested. Current training on a Report Writer that is part of the trauma system is ongoing.

The OEMS epidemiologist has been able to create some standard reports requested by the trauma registrars in 2017. The epidemiologist also created a report of record numbers by hospital and by year. From that it was clear that not all hospitals are submitting data to the state, though all of them are submitting to the National Trauma Data Bank. The report helped one hospital identify technical and hardware issues.
Does the injury surveillance system include rehabilitation data?
Rehabilitation data is generally provided by stand-alone facilities that provide continuing care for patients after their discharge from a trauma center or other acute care facility.
Does the injury surveillance system include vital records data?
Vital statistics data is included in the 'Injury in Connecticut' report, but it is not routinely used for injury surveillance.
Does the injury surveillance system include other data?
No information was provided on the availability of other data sources to support the injury prevention surveillance system.
Does the EMS system track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
The current version of the EMS data collection system does not adequately track detail about injuries sustained by persons involved in motor vehicle crashes. The state system is supposed to be able to collect records where cause of injury and mechanism of injury can allow calculation of frequency and nature of MV injuries. In the 2016 data report, MVTA and non-traffic accidents were characterized through the collection of data in the older NEMSIS v2.2.1 based collection system, in the context of ranked causes of injury separately for adults and children. In addition, MVC calls to EMS were examined by age distribution of records with and without documented toxicity indicators. In the 2015 EMS data report, MVTAs were included in the ranked causes of injury for adults and for children. The report documented how use of safety equipment was being entered in EMS records. Data from Connecticut EMS and the Centers for Disease Control showed the distribution of MVC accident calls and estimated fatality costs by age groups. The 2015 report also characterized MVC records by age and sex, and timing of accidents by age group. The report also included sections on Non-Traffic crashes, motorcycle crashes and pedestrian accidents to the extent that the data would allow. The NEMSIS v3.4.0 database and data dictionary allow better documentation of details regarding injuries sustained in motor vehicle crashes. OEMS has not been able to see the data collected since January 1, 2017. We cannot tell whether the guidelines are being followed or information about data and where data volume and quality problems exist. The Data Quality Improvement group has shared guidelines for entering information with all EMS agencies and ePCR software vendors for the new system. Some funding support from the DPH Injury Program to assist with the system upgrades, provided for the hiring of an IT consultant to manage this transition project at DPH.
Does the emergency department data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
The ED data system tracks motor vehicle crash injuries. The State has produced a report of age-adjusted crash rates per 100,000 population for recent years. The system tracks diagnosis and

discharge status, but a sample report categorizing the data by severity and diagnosis was not available for review.
Does the hospital discharge data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
Hospital discharge data is used to track the number of injury-related admissions in the State. While ICD-9 codes are available, they are not currently used to describe the nature and severity of the injuries sustained.
Does the trauma registry data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
The OEMS epidemiologist was able to produce a basic report about the distribution of severity scores by hospital but these were not based solely on motor vehicle crashes. The data in the trauma registry is not complete; one of the test reports could be to isolate motor vehicle crashes. There are apparent gaps between the submission and processing of data that we have alerted the vendor Digital Innovations to. OEMS has not seen trauma data in more than 5 years. In addition, the Report Writer tool supplied by Digital Innovations has proven to be very awkward to use. OEMS has repeatedly asked the vendor to make both EMS and Trauma data available as a csv file and to have control at the record level for data as in the old system.
Does the vital records data track the frequency, severity, and nature of injuries sustained in motor vehicle crashes in the State?
Vital records data is tracked through submission to the national database. The numbers of fatalities are tracked, but additional information about the nature and severity of injuries based on ICD-10 codes is not included.
Is the EMS data available for analysis and used to identify problems, evaluate programs, and allocate resources?
EMS data is not yet available for 2017 data forward. The current collaboration between OEMS, DPH-IT, BEST and Digital Innovation has not yet yielded satisfactory implementation of bringing 2017-2018 data into the new system monitoring process. *A large question of whether or not hosting the database at DPH/BEST is at the forefront of discussions.* In the 2014, 2015 and 2016 EMS data reports, identification of problems and evaluation of some data collection was certainly done. This also pointed up deficiencies in data collection in the OLD version 2.2.1 structure. The OEMS epidemiologist has met weekly with a data quality improvement group to identify major areas of deficiency in data collection and to provide guidelines in each area for collection and coding. This is not yet part of an automated check at the point of data entry, but the guidelines have been communicated to all EMS software vendors and all EMS agencies and are available on the OEMS website. Included at the website are parts of the state version of the data dictionary - https://portal.ct.gov/DPH/Emergency-Medical-Services/EMS/OEMS--CEMSTARS-Data
Is the emergency department data available for analysis and used to identify problems, evaluate programs, and allocate resources?
Emergency department data is used for analysis, but no specific highway safety projects utilizing the data were described.

Is the hospital discharge data available for analysis and used to identify problems, evaluate programs, and allocate resources?
The State did not describe or provide samples of the use of hospital discharge data for a highway safety project.
Is the trauma registry data available for analysis and used to identify problems, evaluate programs, and allocate resources?
Trauma registry data is not yet available; however, submission of data to the trauma registry has been re-started. For further detail, please refer to previous questions regarding the use of EMS and trauma registry data, to track the frequency, severity and nature of injuries sustained in motor vehicle crashes in the State.
Is the vital records data available for analysis and used to identify problems, evaluate programs, and allocate resources?
It was reported that the vital records data is available, but examples of a highway safety project that used the data were not available. The State Office of EMS reports that it does not have access to vital records data.
Questions - Applicable Guidelines for the Injury Surveillance System
Does the State have a NEMSIS-compliant statewide database?
Tentatively, yes. The current EMS database (electronic patient care record (ePCR)), is structured to comply with the NEMSIS v3.4.0 design and to implement business rules on incoming data. This does not mean complete state level validation. Each EMS software vendor must pass compliance tests with NEMSIS. The issue for local EMS agencies is to work with their software vendors to ensure that data collection complies with the NEMSIS business rules. The state level rules being developed and posted via meetings of the Data Quality Improvement team will ideally be translated to a state schematron of applied state rules. As of July 1, 2017, Connecticut accepted only NEMSIS v3.4.0 data. From January 1, 2017 through June 30, 2017, software vendors and local EMS providers were to test conversion to NEMSIS version 3.4.0 compliant ePCRs. Data submitted in version 2.2.1 was accepted through June 30, 2017. Digital Innovation was to convert v2.2.1 data to v3.4.0. Very few version 2.2.1 records were uploaded until June 30, when the system was overloaded. Since the crossover to the version 3.4.0 only data collector, OEMS has not been able to see its record-level data or obtain data for sharing with stakeholders. The previous system produced a csv file for import by OEMS. While the database vendor, Digital Innovation, Inc, has deflected all requests for this previously established capability, it currently advertises its ability to make "custom reports." Problem tracking at the state server showed an un-monitored system, memory issues, and an erasure of over 900,000 records when the working database was replaced with an EMPTY file and then backed up. This was also significant in that in NEMSIS 3.4.0, a "d" file containing EMS agency level demographics is joined to an "e" file, which contains the ePCR data. NEMSIS will not accept a data file which does not have both "d" and "e" parts. The ePCR data was recovered from another part of the Digital Innovation system; however, the agency demographics were wiped out. As DPH re-

collects the agency demographic files from each EMS provider in the State, they are joined to the ePCR files and sent to NEMSIS. NEMSIS is currently receiving a portion of the State's 2017 data.
Does the State's emergency department (ED) and hospital discharge data conform to the most recent uniform billing standard?
The ED and hospital data systems use UB-04, as detailed in the systems' data dictionary, coding reference, statutes, and regulations.
Does the State's trauma registry database adhere to the National Trauma Data Standards?
Yes. The state's trauma system currently collects data in Digital Innovation version 4.2. With the approval of a legislative change earlier this year, as of October 1, 2018, the State may now use a system to collect just the NTDB (National Trauma Data Bank) fields. Prior to this, Connecticut statute required State-specific fields, in addition to the NTDB fields. The migration of data to a new system and conversion of ICD9 to ICD10 will be part of the anticipated process. The National Trauma Database data dictionary, which is now the standard data dictionary for the State, can be located at https://www.facs.org/quality-programs/trauma/tqp/center-programs/ntdb/ntds/data-dictionary
Are Abbreviated Injury Scale (AIS) and Injury Severity Scores (ISS) derived from the State emergency department and hospital discharge data for motor vehicle crash patients?
The emergency department and hospital discharge data collect ICD-9 codes; however, they are not currently used to derive AIS or ISS scores.
Are Abbreviated Injury Scale (AIS) and Injury Severity Scores (ISS) derived from the State trauma registry for motor vehicle crash patients?
The state trauma registry system currently allows the reporting of Injury Severity Score statistics (see sample report). The OEMS is working on very basic Injury Severity Score reports by hospital, which are not yet specific to motor vehicle crashes and are based on incomplete data, in a system which is only partially functioning.
Does the State EMS database collect the Glasgow Coma Scale (GCS) data for motor vehicle crash patients?
The NEMSIS – compliant state database should allow capture of Glasgow Coma Score component data (GCS eye/verbal/motor/qualifier/total). The GCS data was not always completed; it may not have been appropriate for some records in the v2.2.1 system.
Does the State trauma registry collect the Glasgow Coma Scale (GCS) data for motor vehicle crash patients?
The GCS component scores are collected if possible, by both EMS and by the ED. The trauma registry standard elements include measures for processes of care such as highest GCS total, highest GCS motor and GCS assessment qualifiers of the highest GCS total. The state trauma registry system currently allows collection of the GCS Score; this should be able to be reported by Primary Mechansism of Injury.
Are there State privacy and confidentiality laws that supersede HIPAA?
The State's privacy laws appear to be in alignment with HIPAA. The statutes do not appear to pose a barrier to the sharing of data among State agencies for analysis and integration.

Questions - Data Dictionaries and Coding Manuals for the Injury Surveillance System
Does the EMS system have a formal data dictionary?
Yes. Connecticut has adopted NEMSIS version 3.4.0. As of July 1, 2017, EMS data could only be represented in that format for upload into the central site database. The revised data collection system complies with NEMSIS v3.4.0 data structures. Data collection/data dictionary guidelines for almost every data element category have been compiled by the data quality improvement group and are located on the OEMS website, along with additional guidance on the use of the new system. See V3 Update Documentation at: https://portal.ct.gov/DPH/Emergency-Medical-Services/EMS/OEMS--CEMSTARS-Data https://portal.ct.gov/DPH/Emergency-Medical-Services/EMS/EMS-Communications-and-Reference-Documents
Does the EMS system have formal documentation that provides a summary dataset—characteristics, values, limitations and exceptions, whether submitted or user created—and how it is collected, managed, and maintained?
The summary dataset is based on NEMSIS v3.4.0, data dictionary attached. More specific guidelines for CT EMS are at website cited in in the previous question. A user's manual for the system has not been set up; changes and uncertainties for the manual have been cited by Digital Innovation/BEST. A schematic drawing of the intended processes was shared, but, the processes have not been realized.
Does the emergency department dataset have a formal data dictionary?
The State ED data dictionary includes variable names and definitions as well as code lists for coded variables.
Does the emergency department dataset have formal documentation that provides a summary dataset—characteristics, values, limitations and exceptions, whether submitted or user created—and how it is collected, managed, and maintained?
Aside from the data dictionary, the ED dataset has no formal documentation that summarizes the dataset or how it is managed.
Does the hospital discharge dataset have a formal data dictionary?
A data dictionary providing a list of data elements and their associated attributes is maintained by the State for the hospital discharge database.
Does the hospital discharge dataset have formal documentation that provides a summary dataset—characteristics, values, limitations and exceptions, whether submitted or user created—and how it is collected, managed, and maintained?
Aside from the data dictionary, a more formal user's manual has not been developed for the hospital discharge database.
Does the trauma registry have a formal data dictionary?
Yes. With the passage of legislation, as of October 1, 2018, the Connecticut trauma data dictionary will be the National Trauma Data Bank (NTDB) data dictionary. Connecticut is no longer required to collect some additional elements as in previous years. https://www.facs.org New legislation permits each trauma registry to limit its data collection to data specified by the NTDB, instead of adding additional Connecticut-only fields. During a long wait period, trauma centers were expected to collect data using ICD10 instead of ICD9. The transition of data with the

old coding will involve conversion and migration to a new DI database. OEMS has already committed to funding this transition for the hospitals; asking DI and agency IT to provide a timeline for implementation.
Does the trauma registry dataset have formal documentation that provides a summary dataset—characteristics, values, limitations and exceptions, whether submitted or user created—and how it is collected, managed, and maintained?
Inclusion criteria are a part of data dictionary; edit checks are defined for NTDB fields. There is no state level manual specifying how data is to be collected and maintained. The revised trauma registry should be accompanied by a new data dictionary and a plan for providing regular updates.
Does the vital records system have a formal data dictionary?
The State did not provide a vital records data dictionary.
Does the vital records system have formal documentation that provides a summary dataset—characteristics, values, limitations and exceptions, whether submitted or user created—and how it is collected, managed, and maintained?
The State did not provide any vital records system documentation.
Questions - Processes and Procedures for the Injury Surveillance System
Is there a single entity that collects and compiles data from the local EMS agencies?
Yes. Digital Innovation database, which is now structured to be compliant with NEMSIS v3.4.0 business rules. Data are stored on the state servers at BEST.
Is there a single entity that collects and compiles data on emergency department visits from individual hospitals?
The Connecticut Hospital Association (CHA) collects and maintains the emergency department data for the State.
Is there a single entity that collects and compiles data on hospital discharges from individual hospitals?
The Connecticut Hospital Association collects and maintains the hospital discharge data for the State.
Is there a process flow diagram that outlines the EMS system's key data process flows, including inputs from other systems?
While a working system still does not exist (unable to obtain EMS system data), the plan is for the EMS database to move from an Oracle to an SQL server. Diagrams do exist that demonstrate proposed/potential data flows, once the system is operational.
Is there a flow diagram that outlines the emergency department data's key data process flows, including inputs from other systems?
The State has produced a diagram that outlines the responsibilities of various State offices and others once data has been received from hospitals. The diagram does not adequately cover the data process flow from the time of patient arrival to the time of submission to the State system.

Is there a process flow diagram that outlines the hospital discharge data's key data process flows, including inputs from other systems?
The State has produced a diagram that outlines the responsibilities of various State offices and others once data has been received from hospitals. The diagram does not adequately cover the data process flow from the time of patient arrival to the time of submission to the State system.
Is there a process flow diagram that outlines the trauma registry's key data process flows, including inputs from other systems?
From previous assessment: Digital Innovation, Inc. provided a series of process flow diagrams; and while they deal mainly with the internal structure of the data system, they cover the majority of the system processes. The process flow diagrams may or may not be adequate to explain when the trauma system is upgraded from version 4.2 to version 5. What needs to be included are timelines and steps for migrating the data collected in version 4.2 to a database that is going to be in version 5.
Are there separate procedures for paper and electronic filing of EMS patient care reports?
From the prior assessment: The State allows only electronic reporting, but the State did not describe the reporting procedures. Each EMS agency is to work with its software vendor to supply data electronically to the state collector system within one month after the response event. In March 2017, OEMS sent a memo to all vendors and EMS agencies to document the procedures for testing their version 3.4.0 files in a Staging environment, then going live in the Production environment. The Master Submission manual provides detailed procedures for submission in both Staging and Production. Posted on the OEMS web site, the memos and Master Submission Procedures manual was also sent individually to the software vendors. https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/ems/pdf/Communication_Statements/ https://portal.ct.gov/-/media/Departments-and-Agencies/DPH/dph/ems/pdf/CEMSTARS/
Are there procedures for collecting, editing, error-checking, and submitting emergency department and hospital discharge data to the statewide repository?
The Office of Health Care Access uses a vendor to initially collect, edit, and check the submitted data for errors. A flow diagram illustrating the primary processes was available.
Does the trauma registry have documented procedures for collecting, editing, error checking, and submitting data?
Status from previous assessment: The trauma registry is currently only maintained by the individual hospitals. Documents describing the collection, editing, and error-checking processes are under development in anticipation of resumption of data submission to the State. New data collection software is reportedly being downloaded, and revised documentation should accompany this application. Data submission by eight trauma hospitals was documented in October 2018 after initial testing by one hospital earlier in the year. The registrars are working with the Trauma Chair, Dr. Shea Gregg, on what they need (systems and updates and data migration) for the coming version 5

trauma registry; and are deciding which hospitals will be required reporters and which may join in if they have reporting resources.

OEMS has been informed by Digital Innovation, Inc. that it would be possible for trauma hospitals to start reporting their new (2019) data as of January 1, 2019; which will require several steps by DI, IT, BEST and all participants; OEMS expects/awaits a full=fledged timeline and action steps. Meanwhile, since legislation passed in May 2018 to allow the trauma registry to adhere to only the NTDB fields, the Connecticut trauma registry will be able to utilize the documentation already provided each year in their data dictionary for data entry and validation and edit checks.

Reference is made to the 2018 National Trauma Data Bank data dictionary available as a pdf file at https://www.facs.org and also to the 2019 version, which is seen only as a download at: https://www.facs.org/quality-programs/trauma/tqp/center-programs/ntdb/ntds/data-dictionary

Are there procedures for collecting, editing, error-checking, and submitting data to the statewide vital records repository?

The vital records system in Connecticut is currently paper-based. As such, there is no capability for inclusion of automated editing and error-checking. Information from paper certificates is entered manually into the data system. No information was available on how the data managers may identify or correct errors.

Are there documented procedures for returning data to the reporting EMS agencies for quality assurance and improvement (e.g., correction and resubmission)?

Digital Innovation, Inc. gave this response for documentation on 10/30/18: When files are submitted to the central site database, they go through two levels of validation: 1) Structure Validation (XSD) and 2) Logic Validation (schematron). If an error is encountered in either case the record is rejected, and a report is made available for the submitting agency or vendor. If the file does not contain any errors (warnings are allowed) the file will be processed into the central site.

All structure issues are considered errors. All logic issues which NEMSIS v3.4.0 tags as ERROR or CRITICAL are considered errors. Logic issues which NEMSIS tags as WARNING are not considered errors. NEMSIS compliant data base applies “business” rules to incoming data. However, they are not exhaustive and the state needs to translate a finished data dictionary into a state schematron so that additional rules can be applied through local EMS software at the point of data entry, if possible.

Are there documented procedures for returning data to the reporting emergency departments for quality assurance and improvement (e.g., correction and resubmission)?

No documented procedures are in place for returning data to the individual hospitals for correction. Historically, this has been done on an ad hoc basis.

Are there documented procedures for returning hospital discharge data to the reporting hospitals for quality assurance and improvement (e.g., correction and resubmission)?

The State has no documented procedures for returning hospital discharge data to submitters for correction and resubmission.

Are there documented procedures for returning trauma data to the reporting trauma center for quality assurance and improvement (e.g., correction and resubmission)?
Conclusions from previous assessment: No documented procedures are in place for returning data to the individual hospitals for correction. Historically, this has been done on an ad hoc basis.
Are there documented procedures for returning data to the reporting vital records agency for quality assurance and improvement (e.g., correction and resubmission)?
The electronic death reporting system will have procedures for returning data for correction and resubmission, but no procedures are currently in place.
Is aggregate EMS data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
Beginning with the 2017 data, the State has been unable to access its own record-level data from the Digital Innovation, Inc. database. OEMS has asked for resolution of this problem for more than a year. Through the Human Investigations Committee process, OEMS has made data prior to 2017 available to the UCONN Crash data researchers and to Yale University.
Is aggregate emergency department data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
Data is reportedly available to outside parties upon request, but no documentation of the process was available for review.
Is aggregate hospital discharge data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
Aggregate data is reportedly available to outside parties upon request, but no documentation of the process was available for review.
Is aggregate trauma registry data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
The current version 4.2 trauma data collector is accepting data from trauma registries. Not all expected submissions have been received. The trauma committee is reviewing which hospitals will be expected to report. As of 10/30/18, trauma registrars are still telling OEMS that they are working with their IT or with the software vendor before trying to submit data to the current registry. It is anticipated that the data entered as of January 1,2019 will be into an upgraded trauma database, V5 and will adhere to NTDB standards.
Is aggregate vital records data available to outside parties (e.g., universities, traffic safety professionals) for analytical purposes?
Aggregate statistics are reportedly available on the agency website, but no documentation of the process was available for review.
Questions - Data Interfaces within the Injury Surveillance System
Is there an interface among the EMS data and emergency department and hospital discharge data?
Currently, the State has no interface between EMS data and hospital data.

Is there an interface between the EMS data and the trauma registry data?
Currently, the state has no interface between EMS data and trauma registry data. As of 10/30/18, the plans are for the trauma registry to be upgraded to a new version. The registry may also be involved in a migration of the central site database from Oracle to SQL server; however the resolution of this migration remains very unclear.
Is there an interface between the vital statistics and hospital discharge data?
No interface currently exists between the vital statistics and hospital discharge databases.
Questions - Quality Control Programs for the Injury Surveillance System: *Emergency Medical Services Component*
Are there automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and is logically consistent among data elements?
As of 10/30/18, the quality assurance at the point of data submission to the central site database is as follows: When files are submitted, they go through two levels of validation: 1) Structure Validation (XSD) and 2) Logic Validation (Schematron). If errors are encountered in either case the record is rejected, and a report is made available for the submitting agency or vendor. If the file does not contain errors (warnings are allowed), the file will be processed into the central site. All structure issues are considered errors. All logic issues which NEMSIS tags as ERROR or CRITICAL are considered errors. Logic issues which NEMSIS tags as WARNING are not considered errors.
Is limited state-level correction authority granted to quality control staff working with the statewide EMS database in order to amend obvious errors and omissions without returning the report to the originating entity?
The only people who can correct their data are the people who submit the data. The State does NOT make corrections. The state does not have "quality control staff." NEMSIS v3.4.0 business rules return data if there are critical errors. OEMS makes no corrections of data that are processed, only points out the data issues as they are discovered. OEMS has provided data dictionary guidance on the web site for almost all sections of the electronic patient care report (ePCR), after review and approval by the quality improvement - data quality team (QIDC).
Are there formally documented processes for returning rejected EMS patient care reports to the collecting entity and tracking resubmission to the statewide EMS database?
As of 10/30/18, the quality assurance at the point of data submission to the central site database is as follows: When files are submitted, they go through two levels of validation: 1) Structure Validation (XSD) and 2) Logic Validation (schematron). If an error is encountered in either case the record is rejected, and a report is made available for the submitting agency or vendor. If the file does not contain any errors (warnings are allowed), the file will be processed into the central site.

All structure issues are considered errors. All logic issues which NEMSIS tags as ERROR or CRITICAL are considered errors. Logic issues which NEMSIS tags as WARNING are not considered errors. The State has no control over a "tracking" process for data that have been rejected by NEMSIS business rules.
Are there timeliness performance measures tailored to the needs of EMS system managers and data users?
Data is requested to be submitted within one month of the event. It was stated that this metric has shown improvement, but no details were provided. Calculating the percent of reports that are submitted within the specified time frame and defining the associated goal would help track the timeliness of EMS submissions moving forward. As of 10/30/18, OEMS is still unable to see EMS data or ascertain who is submitting, what the volume of data is by month, or any other data parameters.
Are there accuracy performance measures tailored to the needs of EMS system managers and data users?
No performance measures have been established for the accuracy of the EMS data. The NHTSA publication 'Model Performance Measures for Traffic Records Systems' provides examples of the types of measures that can be used to track the progress of the State's injury surveillance systems. As stated above, OEMS is unable to see EMS data for the previous couple years (2017 or 2018).
Are there completeness performance measures tailored to the needs of EMS system managers and data users?
The State has no completeness performance measures for EMS data. The only metrics on data submitted to the central site database are through the NEMSIS business rules schematron. OEMS is unable to see EMS data for the previous couple of years (2017 or 2018).
Are there uniformity performance measures tailored to the needs of EMS system managers and data users?
The only metrics on data submitted to the central site database are through the NEMSIS business rules schematron. The State receives a report from NEMSIS that contains information related to the completeness of several data elements. There did not appear to be metrics that address uniformity. Also, the completeness metrics could be used to develop performance measures with the establishment of goals for the data points. OEMS is unable to see EMS data for the previous couple of years (2017 or 2018).
Are there integration performance measures tailored to the needs of EMS system managers and data users?
The only metrics on data submitted to the central site database are through the NEMSIS business rules schematron. No performance measures have been developed to measure the integration of the EMS data with other traffic records components. OEMS is unable to see EMS data for the previous couple of years (2017 or 2018).

Are there accessibility performance measures tailored to the needs of EMS system managers and data users?
The only metrics on data submitted to the central site database are through the NEMSIS business rules schematron. No performance measures have been developed to measure the accessibility of the EMS data. OEMS is unable to see EMS data for the previous couple of years (2017 or 2018).
Has the State established numeric goals—performance metrics—for each EMS system performance measure?
Aside from the one-month requirement (recommendation) for data reporting, no other metrics have been identified. OEMS is unable to see EMS data for the previous couple of years (2017 or 2018).
Is there performance reporting for the EMS system that provides specific timeliness, accuracy, and completeness feedback to each submitting entity?
No performance reporting has been established to track the measures; and provide individual reports to the 185 EMS providers.
Are high frequency errors used to update EMS system training content, data collection manuals, and validation rules?
The State has used high frequency errors to provide training and other changes related to the reporting of naloxone administration by Basic Life Support (BLS) providers. The State has not used high frequency errors to update data collection manuals or validation rules. We do not have any v3.4.0 manuals except for DI's data submission manual. Validation rules are relevant only to the NEMSIS business rules schematron; DPH gets no report from NEMSIS on frequency of errors. The errors and corrections referred to in the context of opioid overdoses were made possible by the SAS code authored by the epidemiologist, not any system tools in the old database (non-existent). The new database lacks record access and no direct queries that might show error, because the tools do not work. Questions circulate over and over from DI to IT to BEST.
Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the EMS system?
Currently not possible without the ability to access the data. In the past, data quality issues were primarily identified when specific analyses were done. At best, this served as a 'work around' as quality control should be completed before the data is used for analysis.
Are periodic comparative and trend analyses used to identify unexplained differences in the EMS data across years and agencies?
The State compares data over time to identify gaps in submission. An example being a table of EMS record counts by agency and month, with submission gaps highlighted, that the State has previously generated. Presently, this is not yet possible with the new v3.4.0 based database.
Is data quality feedback from key users regularly communicated to EMS data collectors and data managers?
While the State is aware of issues with the current data system, no formal process is in place to provide feedback to the data collectors and managers.
Are EMS data quality management reports produced regularly and made available to the State TRCC?
Assessor's conclusions from previous assessment:

The State does not produce EMS data quality management reports. The new EMS data system will provide technical NEMSIS validation reports. It is unclear whether those reports may be used to compile EMS data quality management reports.

The State cannot see the data in the new central site database. Other technical problems exist regarding movement of records from intake to processing to database. OEMS is still discussing these problems with DI, DPH-IT and BEST, including moving the EMS database from an Oracle to an SQL server.

Questions - Quality Control Programs for the Injury Surveillance System: *Emergency Department and Hospital Discharge Components*

Are there automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and is logically consistent among data elements?

As of 10/30/18, the quality assurance at the point of data submission to the central site database is as follows: When files are submitted, they go through two levels of validation: 1) Structure Validation (XSD) and 2) Logic Validation (schematron). If an error is encountered in either case the record is rejected, and a report is made available for the submitting agency or vendor.

If the file does not contain any errors (warnings are allowed), the file will be processed into the central site. All structure issues are considered errors. All logic issues which NEMSIS tags as ERROR or CRITICAL are considered errors. Logic issues which NEMSIS tags as WARNING are not considered errors.

Is limited state-level correction authority granted to quality control staff working with the statewide emergency department and hospital discharge databases in order to amend obvious errors and omissions without returning the report to the originating entity?

State staff members perform some data correction when preparing hospital data for distribution. It is unclear whether the data is corrected within the State system or the corrections are only made to a copy of the data after it has been extracted from the State system.

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

Data quality issues have been addressed on a case-by-case basis. There is no formal policy in place.

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

The State has no timeliness performance measures for hospital data.

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

No performance measures have been developed to measure the accuracy of hospital data.

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

The State has no completeness performance measures for hospital data.

Are there uniformity performance measures tailored to the needs of emergency department and hospital discharge database managers and data users?
No performance measures have been developed to measure uniformity of the hospital data.
Are there integration performance measures tailored to the needs of emergency department and hospital discharge database managers and data users?
The State has no integration performance measures for hospital data.
Are there accessibility performance measures tailored to the needs of emergency department and hospital discharge database managers and data users?
No performance measures have been developed to measure the accessibility of the hospital data.
Has the State established numeric goals—performance metrics—for each emergency department and hospital discharge database performance measure?
No numeric goals have been established for the performance measures. NHTSA's model performance measure document would be a good resource.
Is there performance reporting for the emergency department and hospital discharge databases that provides specific timeliness, accuracy, and completeness feedback to each submitting entity?
No performance reports are provided to the submitting hospitals.
Are high frequency errors used to update emergency department and hospital discharge database training content, data collection manuals, and validation rules?
High frequency errors are not currently used to inform training or update data collection manuals.
Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the emergency department and hospital discharge databases?
The State maintains documentation of the quality control review process, but a sample quality control review report was not available for review.
Are periodic comparative and trend analyses used to identify unexplained differences in the emergency department and hospital discharge data across years and agencies?
Hospital data is analyzed over time to show trends and to identify data anomalies. Specifically, data comparisons are made between hospitals.
Is data quality feedback from key users regularly communicated to emergency department and hospital discharge data collectors and data managers?
Hospital data quality feedback has been received from users, but the State has no process for collecting user feedback regularly.
Are emergency department and hospital discharge data quality management reports produced regularly and made available to the State TRCC?
The State does not produce hospital data quality reports.

Questions - Quality Control Programs for the Injury Surveillance System: *Trauma Registry Component*
Are there automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and is logically consistent among data elements?
Edit checks and validation are included in the National Trauma Data Bank (NTDB). Currently, it is unknown to what extent these are utilized by the trauma hospitals.
Is limited state-level correction authority granted to quality control staff working with the statewide trauma registry in order to amend obvious errors and omissions without returning the report to the originating entity?
The State does not have limited authority to correct obvious errors in trauma registry data without returning the data to the submitter.
Are there formally documented processes for returning rejected data to the collecting entity and tracking resubmission to the statewide trauma registry?
Conclusions from previous assessment: Currently, there is no process to allow records to be returned. The State is in the process of upgrading the trauma registry system to allow hospitals to submit data to the State repository. Once this functionality is restored, the Department of Public Health (DPH) should investigate re-establishing this practice – maintaining an audit trail, then investigating it periodically.
Are there timeliness performance measures tailored to the needs of trauma registry managers and data users?
Historically, data was required to be submitted quarterly. Since data is not currently being submitted to the State, the timeliness cannot be tracked. Expectations should be discussed before setting up a performance measure; after the trauma committee decides which hospitals will be participating with the new v5 system in 2019.
Are there accuracy performance measures tailored to the needs of trauma registry managers and data users?
The American College of Surgeons has an established accuracy metric for the trauma centers; however, these numbers were not available for those facilities. Given the current transition of the trauma registry system, these data are not available on the State level.
Are there completeness performance measures tailored to the needs of trauma registry managers and data users?
If trauma registries follow NTDB guidelines, then performance measures should be linked to standards of the American College of Surgeons.
Are there uniformity performance measures tailored to the needs of trauma registry managers and data users?
If the trauma registries are going to follow NTDB guidelines, then the performance measures should be linked to standards of the American College of Surgeons.
Are there integration performance measures tailored to the needs of trauma registry managers and data users?
No measures have been established.

Are there accessibility performance measures tailored to the needs of trauma registry managers and data users?
Conclusions from previous assessment: The State trauma registry is currently inactive, so it is inaccessible to users. The State has discussed the development of reports and dashboards. The State has been talking with Digital Innovation, Inc. for over a year (began in mid-2017), about implementing query tools that would be useful at State and local levels.
Has the State established numeric goals—performance metrics—for each trauma registry performance measure?
No numeric goals have been established to support performance measures for the trauma registry system.
Is there performance reporting for the trauma registry that provides specific timeliness, accuracy, and completeness feedback to each submitting entity?
The trauma registry is currently inactive. The State has no performance reporting for the trauma registry data system; however, OEMS is seeking examples of “timeliness”, “accuracy”, and “completeness”, and an explanation of how those measures would be assessed, including the parties responsible for conducting such measurements.
Are high frequency errors used to update trauma registry training content, data collection manuals, and validation rules?
No; however, OEMS is seeking examples of “errors” in the trauma registry data.
Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the trauma registry?
No; however, OEMS is seeking examples of how an injury record would be reviewed for “completeness, accuracy, and uniformity”, including the parties responsible for conducting such reviews.
Are periodic comparative and trend analyses used to identify unexplained differences in the trauma registry data across years and agencies?
No; however, OEMS is seeking examples of “unexplained differences”, and whether they would be within institutions, or comparative across institutions.
Is data quality feedback from key users regularly communicated to trauma registry data collectors and data managers?
OEMS epidemiologist ran requested standard reports for the September 2018 meeting of the trauma registrars. The reports were based on incomplete reporting. Presently, Trauma hospitals are preparing to resume sending data to the State.
Are trauma registry data quality management reports produced regularly and made available to the State TRCC?
No; however, OEMS is seeking examples of data quality management reports that would be expected from a statewide trauma registry.

Questions - Quality Control Programs for the Injury Surveillance System: *Vital Records Component*
Are there automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and is logically consistent among data elements?
Simple validation checks are conducted to assure that the reported sex and cause of death are consistent, and that the reported place of residence components (town name and zip code) are aligned.
Is limited state-level correction authority granted to quality control staff working with vital records in order to amend obvious errors and omissions without returning the report to the originating entity?
Any changes that would affect the legal portion of the death certificate must be reported back to the local agency for confirmation. Coding changes for statistical reporting can be made independently.
Are there formally documented processes for returning rejected data to the collecting entity and tracking resubmission to vital records?
Due to the paper-based nature of the death certificate system, no such process is in place. Once the process becomes electronic, that functionality should be available.
Are there timeliness performance measures tailored to the needs of vital records managers and data users?
Timeliness measures and objectives are outlined by the National Center for Health Statistics (NCHS) to support submission of data to that system. No specific metrics have been identified. The NCHS standards should be used to establish baselines and goals that can be used to track the timeliness of vital record submissions.
Are there accuracy performance measures tailored to the needs of vital records managers and data users?
No performance measures for the accuracy of the vital records data have been established.
Are there completeness performance measures tailored to the needs of vital records managers and data users?
The completeness measures used reportedly conform to the NCHS requirements. Generally, the NCHS provides standards that should be met; these are not a substitute for performance measures which should establish baseline and goal metrics. Periodic measurements can then be taken to track the State's progress to that goal.
Are there uniformity performance measures tailored to the needs of vital records managers and data users?
No performance measures for the uniformity of the vital records data have been established.
Are there integration performance measures tailored to the needs of vital records managers and data users?
The State has no integration performance measures for vital records data.
Are there accessibility performance measures tailored to the needs of vital records managers and data users?
No performance measures for the accessibility of the vital records data have been established.

Has the State established numeric goals—performance metrics—for each vital records performance measure?
The State reported that there are specific goals for the completeness performance measures but did not provide the metrics for review.
Is there performance reporting for vital records that provides specific timeliness, accuracy, and completeness feedback to each submitting entity?
No specific performance reporting is provided to the submitting agencies other than providing a cross-check of the number of vital records events reported.
Are high frequency errors used to update vital records training content, data collection manuals, and validation rules?
Reporting errors, when noticed, are handled through personal discussion with the submitting agency. No formal documentation of the process is available.
Are quality control reviews conducted to ensure the completeness, accuracy, and uniformity of injury data in the vital records?
The State does not perform quality control reviews regarding injury data in the vital records system.
Are periodic comparative and trend analyses used to identify unexplained differences in the vital records data across years and agencies?
Trend analyses are reportedly conducted, but no examples were available for review.
Is data quality feedback from key users regularly communicated to vital records data collectors and data managers?
Data quality feedback is occasionally received from key users, but the State has no process for receiving vital records data system feedback on a regular basis.
Are vital records data quality management reports produced regularly and made available to the State TRCC?
Vital records data quality management reports are not made available to the TRCC.

The driver data system ensures that each person licensed to drive has one identity, one license to drive, and one record. Ideally, the driver system maintains information on all out-of-State or unlicensed drivers convicted of traffic violations within the State's boundaries. At a minimum, the driver system maintains driver identities, histories, and licensing information for all records in the system. While the structure of the driver system is typically oriented towards individual drivers, the system is also designed to support (in concert with other data systems) both aggregate and detailed analysis of driver behaviors as they relate to safety.

Connecticut's driver system has several noteworthy practices. Purges of data in the system are made according to State Archival policies. The State keeps an audit log of changes to driver records, including the identity of the employee who made the change, and provides employees with the policy and procedure manual in an electronic format. Additionally, conviction data is relayed electronically from the courts in a nightly batch for upload and posting to the driver history file. The driver file also contains information about driver improvement training, and novice driver training is available in a paper-based file. The State uses a combination of its own data dictionary, the AAMVA D.20 data dictionary, and depends on its driver license vendor to keep the system documentation up-to-date.

To ensure compliance with the Driver Privacy Protection Act, the State has developed Memoranda of Understanding with its data users and audits them regularly.

Connecticut DMV administers both internal and external fraud detection policies, procedures, and training. DMV's Document Integrity Unit (DIU) performs random audits on all DMV and partner issued licenses. DIU performs data and document checks on Branch Operations' staff using system data and scanned in documentation. DIU will document any discrepancies or deviations from agency policies and procedures and will forward to DMV Branch Operations for training purposes, if not severe. Additionally, it will forward to DMV's Investigations Unit for further review and action. DMV also has a series of operational procedures in place within the Branch Operations Division that requires multiple staff reviews of a credential being issued.

Additionally, **even a good system can benefit from best practices**. The system's data dictionary is minimal and the State appears to depend mostly on AAMVA's D.20 data dictionary. This effort does provide uniformity necessary to address exchange of information with other States, but does not always provide the breadth of information about the data in the system to in-State users and staff. A Connecticut-specific data dictionary would help to ensure that consistency and uniformity were practiced within the State and that any State-developed data edits and null values were included in the documentation

Development and review of data process flows would help to ensure that processing is as efficient as possible and is a valuable tool in initiating dialogue from those directly involved in

work processes about efficiency and the importance of the various aspects of data quality. Lean improvement and work flow mapping efforts can ensure streamline and efficiency standards. Development and consistent review of such process flows and work flow mapping can serve as continuous improvement processes and ensure that data processes are streamlined as much as possible.

Connecticut does not have a comprehensive data quality management program. Such a program focuses on collection and maintenance of the data, adequate data governance, and ensures that the State can easily discern where improvements are needed. While the State has goals related to its data, the actual qualities of the data in the systems do not appear to be measured with any consistency, nor is the level of data quality shared with members of the Traffic Records Coordinating Committee (TRCC).

Simple performance measures that are regularly monitored and reported help States to understand what types of situations result in degradation of data quality, and thereby, serve to prevent that from happening. The State's commercial driver license data is regularly audited and, while important, constitutes a small percentage of the entire data file. It would help the State to develop measures to see if the goals and mandates for data quality are being met.

Other important aspects of a data quality program include data quality feedback, not just to the information technology group, but to those who input or initiate the collection of data. One way to accomplish this is through random in-house audits conducted periodically and outside the normal auditing functions of the driver licensing staff. Measurement of data quality attributes and reporting those to the TRCC on a regular basis help to maintain effective data governance within the State and promote understanding of the type and potential uses of the various datasets within the traffic records system. The behavior aspects of drivers that are captured in the driver history are invaluable in development of countermeasures that may be used to improve traffic safety for all the citizens of the State of Connecticut.

Finally, linkages between systems also tend to promote quality. Linkage between the driver and crash systems, for example, would provide a great deal of information about what are the qualities of driver and driver behavior that are most often represented in crash involvement.

In all, the State driver data infrastructure is very good; reaching the next level could be the result of development of a data quality management program.

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Questions - Description and Contents of the Driver Data System

Does custodial responsibility for the driver system – including commercially-licensed drivers – reside in a single location?

Connecticut's driver data system, including commercially licensed drivers, resides in a single location. The Connecticut Department of Motor Vehicles (DMV) has centralized custodial responsibility for the driver systems. Those systems are hosted at the Connecticut Department of Administrative Services/Bureau of Enterprise Systems and Technology (DAS/BEST), the centralized IT agency.

Can the State's DUI system be linked electronically to the driver system?

The Connecticut DMV manages DUI administrative suspensions and posts DUI criminal convictions to the driver records. The data is sent from the courts in a nightly batch file and is recorded directly into the driver history system.

Does the driver system capture novice drivers' training histories, including provider names and types of education (classroom or behind-the-wheel)?

Novice driver information is not captured in the driver system. Currently that information is paper-based and is retrieved manually when needed.

Does the driver system capture drivers' traffic violation and/or driver improvement training histories, including provider names and types of education (classroom or behind-the-wheel)?

The Connecticut driver system captures history of driver improvement courses in the database; information is provided by approved vendors who transmit certification of class completion electronically to the DMV daily for inclusion on the driver history.

Does the driver system capture and retain the dates of original issuance for all permits, licensing, and endorsements (e.g., learner's permit, provisional license, commercial driver's license, motorcycle license)?

The Connecticut driver license system records original issuance date for permits, licenses, and endorsements. It also stores historical data for any DMV credential such as permit, non-driver identification, licenses, and endorsements.

Questions - Applicable Guidelines for the Driver Data System
Is driver information maintained in a manner that accommodates interaction with the National Driver Register's PDPS and the CDLIS?
There is documentation of CDLIS integration and AAMVA PDPS compliance, detailed in an integration manual.
Questions - Data Dictionary for the Driver Data System
Are the contents of the driver system documented with data definitions for each field?
Connecticut bases its data collection on the AAMVA D.20 Standard and maintains a data dictionary. However, there are cases where the data dictionary falls short of fully describing Connecticut's data. For example, the field OH-VIO-COURT-TYPE is included in the data dictionary and 3-character court types are denoted in the data dictionary. However, there are no further details available to differentiate what LEC versus TRI means within that field.
Are all valid field values—including null codes—documented in the data dictionary?
The data dictionary does not appropriately detail all fields and their values. For example, null fields are not denoted in the data dictionary and are possibly not supported by the driver system.
Are there edit checks and data collection guidelines for each data element?
The data dictionary, AAMVA D.20 manual, and a sample of additional data dictionary elements indicates field values and data descriptions but does not detail the edit checks within the Connecticut system.
Is there guidance on how and when to update the data dictionary?
Connecticut relies on their vendor Morpho Trust to update system documentation, as well as AAMVA's data dictionary D.20. Ideally, Connecticut would have processes in place that would trigger State-specific updates, such as field and edit check changes, or any necessary changes brought about through new legislation.
Questions - Procedures and Process Flows for the Driver Data System
Does the custodial agency maintain accurate and up to date documentation detailing the licensing, permitting, and endorsement issuance procedures (manual and electronic, where applicable)?
Driver licensing standard operating procedures demonstrate that the State has policies and procedures that are available to all staff. The procedures are available to staff electronically.
Does the custodial agency maintain accurate and up to date documentation detailing the reporting and recording of relevant citations and convictions (manual and electronic, where applicable)?
The State maintains documentation that covers the types of applicable citations and the screens in the mainframe terminal that are used, but do not adequately cover how the data flows into the system. The reviewed table has the statute, description, relevant ACD code, duration of suspension if applicable, and program requirements (IID, ORP, Safety Seat Class, Work Permit, etc.). The Connecticut system utilizes this information, created by the users for its business logic processing, for those citations electronically reported and attributed to the correct operator.

However, the documentation does not represent a process flow architecture that would assist someone who was not familiar with the system in understanding how the data flows throughout.
Does the custodial agency maintain accurate and up to date documentation detailing the reporting and recording of driver education and improvement course (manual and electronic, where applicable)?
Connecticut's process for recording and processing convictions and driver improvement courses are done manually on a daily basis.
Does the custodial agency maintain accurate and up to date documentation detailing the reporting and recording of other information that may result in a change of license status (manual and electronic, where applicable)?
The Connecticut DMV records all changes to a credential's status and supporting paperwork is scanned into the system as well.
Does the custodial agency maintain accurate and up to date documentation detailing any change in license status (e.g., sanctions, withdrawals, reinstatement, revocations, and restrictions)?
The State has an audit log of any changes to driver status on the driver history record--capturing the change, date and time, and identity of the person who made the change.
Is there a process flow diagram that outlines the driver data system's key data process flows, including inputs from other data systems?
The Connecticut DMV does not have a process flow diagram that outlines key process flows and inputs from other systems. Such diagrams, while time- and labor-intensive, also help the State to maintain a continuous improvement process by developing and periodically reviewing processes, to ensure that there are no inefficiencies in document processing. As time passes and technology changes, it is beneficial to review process flows in order to determine if improvements are possible. Review of process flows is also a great way to keep staff apprised of all processes, even those that are not commonly done.
Are the processes for error correction and error handling documented for: license, permit, and endorsement issuance; reporting and recording of relevant citations and convictions; reporting and recording of driver education and improvement courses; and reporting and recording of other information that may result in a change of license status?
Documentation that covers the processes for error correction and error handling in Connecticut is maintained by the State. While that information is mostly procedural, it does cover a set of use cases for license, permit, and endorsement documentation.
Are there processes and procedures for purging data from the driver system documented?
Although Connecticut does not purge data from its license files, it does follow the State DMV retention schedule and the related Statute.
In States that have the administrative authority to suspend licenses based on a DUI arrest independent of adjudication, are these processes documented?
Processes for handling of administrative sanctions for impaired driving are clearly documented.
Are there established processes to detect false identity licensure fraud?
It is clear that an identity theft procedure has been developed and examiners are trained to detect fraudulent documents, but these processes are based on manual intervention. While

manual detection is an important factor, automated, process-based detection is key to unearthing internal fraud issues. Ideally, programmatic measures would exist within the system to facilitate automated fraud detection measures.
Are there established processes to detect internal fraud by individual users or examiners?
Fraud detection is implemented at the branch level in Connecticut. The policies in place focus outwardly on applicant fraud and do not consider the potential for internal fraud. Ideally processes would be put in place in the future that also look inward at potential internal fraud issues. Additional procedures to prevent fraud are checks of data processing that occurs outside normal office hours, and hard-stops to prevent licensure without appropriate prerequisites, such as background checks for CDL hazmat endorsements. There are measures in place for internal branch-level auditing, but enterprise-wide measures should be implemented in the future.
Are there established processes to detect CDL fraud (including hazmat endorsements)?
Connecticut has outward facing CDL fraud detection processes that center around FMCSA and AAMVA training of its personnel and data sharing with neighboring States to prevent multi-state licensure by commercial drivers. They are also working to implement central issuance to further reduce fraud. It would be good though if Connecticut had an internally-facing fraud detection methodology whereby internal threats could be addressed. Central Issuance will provide Connecticut with a centralized method of fraud detection. The benefit of central issuance is that any investigative processes or checks can be finalized before the license is mailed, and it ensures that, at the least, the address on the license is a valid address.
Are there policies and procedures for maintaining appropriate system and information security?
The Connecticut DMV has taken steps to ensure that the privacy of its customers is protected. The Social Security Administration audit helps the State to ensure that handling of this sensitive information is appropriate. However, documentation related to these matters was not available for review.
Are there procedures in place to ensure that driver system custodians track access and release of driver information adequately?
Connecticut complies with the Driver Privacy Protection Act as well as entering into formal agreements with, and conducting audits of, its data users regarding release of driver records.
Questions - Driver System Interface with Other Components
Can the State's crash system be linked to the driver system electronically?
The Connecticut crash system is not linked with the DMV driver system. Back-end correlation of data takes place for analysis purposes, but no direct linkages exist between the systems.
Can the State's citation system be linked to the driver system electronically?
DMV court records and administrative actions at the State level are linked electronically. However, municipal citations from vendors are not received by that system and linked accordingly. No information about citations issued is provided to the DMV with the exception of those that immediately drive administration sanctions, such as DUI per se. If issuance of citations were reported to the DMV, the citation number (not the actual charge) could be placed on the driver history file to ensure that an appropriate disposition was later reported. Such links help to

provide audit capabilities for ensuring that all citations issued actually get to the courts and that the courts report on each. It also provides the State with a means of tracking levels of dismissals of charges, or charges that were never filed by prosecutors due to errors by the issuing officers or prosecutorial discretion. This type of processing could provide the State with the infrastructure for a citation tracking system, which would help the State to ascertain the effectiveness of its education and enforcement programs, as well as shed light on any concerns with jurisdictional bias in the State's courts.
Can the State's adjudication system be linked to the driver system electronically?
The Connecticut driver and adjudication systems are linked electronically for posting and reporting of convictions and administrative actions.
Is there an interface link between the driver system and: the Problem Driver Pointer System, the Commercial Driver Licensing System, the Social Security Online Verification system, and the Systematic Alien Verification for Entitlement system?
Prior to license issuance, Connecticut is required by law to check applicants against the Problem Driver Pointer System, the Commercial Driver Licensing System, the Social Security Online Verification system, and the Systematic Alien Verification for Entitlement system.
Does the custodial agency have the capability to grant authorized law enforcement personnel access to information in the driver system?
The Connecticut DMV provides its data to law enforcement via the Connecticut On-Line Law Enforcement Communications Teleprocessing (COLLECT) system. It is unclear how the COLLECT system functions and what the protocols are for granting authorized law enforcement personnel access to information in the driver system.
Does the custodial agency have the capability to grant authorized court personnel access to information in the driver system?
Access to driver data is provided to courts, prosecutors, and public defenders through Memoranda of Understanding with the DMV.
Does the custodial agency have the capability to grant authorized personnel from other States access to information in the driver system?
The National Law Enforcement Telecommunication System (NLETS) is the means by which other law enforcement agencies and other States access Connecticut driver history data. Additionally, some Connecticut data is housed in PDPS and CDLIS as required to be reported. Connecticut has Memoranda of Understanding with some federal entities for data access as well.
Questions - Data Quality Control Programs for the Driver System
Is there a formal, comprehensive data quality management program for the driver system?
Connecticut does not have a formal, comprehensive data quality management program for the driver system. Connecticut utilizes external tools/resources to improve data quality, but they do not have a formalized management plan in regard to data quality.

Are there automated edit checks and validation rules to ensure entered data falls within a range of acceptable values and is logically consistent among data elements?
Connecticut has data validation and edit checks on some of the data fields within the driver system. A more comprehensive set of documentation is recommended though for the future.
Are there timeliness performance measures tailored to the needs of data managers and data users?
The State is bound by certain time limits for processing changes and applying convictions to records. Such mandates are helpful but are not measures. If a mandate is 10 days, it is still helpful to have a measure that reports whether the actual performance is 10 days, or if the State manages to exceed the mandate by processing in an average of three days, or perhaps misses the mark and has an average of 12 days. Mandates are excellent metrics for measures, but the actual measurements still need to be calculated. Such calculations are helpful to determine if staff is improving or to serve as a warning when performance is incrementally degrading. Ideally, timeliness performance measures would be in place for all system verticals to ensure uniform productivity and accountability.
Are there accuracy performance measures tailored to the needs of data managers and data users?
While the DMV is audited for accuracy by several entities, the true test of system accuracy should be systemwide and calculated regularly. Accuracy measures can include: The percentage of driver records that have no errors in critical data elements, such as "date of birth," or the percentage of records on the State driver file with Social Security Numbers (SSN) successfully verified using Social Security Online Verification (SSOLV) or other means. The NHTSA publication "Model Performance Measures for State Traffic Records Systems" is the source of these examples.
Are there completeness performance measures tailored to the needs of data managers and data users?
The State has a set of requirements that would serve as the basis for a performance measure for completeness. The measure itself would need to be taken on a regular basis. The measure of completeness could be number of files with no critical elements missing and /or number of elements which contain "unknown" when unknown is not an appropriate response.
Are there uniformity performance measures tailored to the needs of data managers and data users?
It is agreed that uniformity is based on the standardization required by our national systems. However, this is not a measure. The measure would be number of national guidelines with which the driver data file complies. This is a measure which would be easy to establish and maintain.
Are there integration performance measures tailored to the needs of data managers and data users?
Integration measures generally indicate the number of traffic record component systems with which the driver file is linked or integrated -- such as Crash, Citation, Adjudication, Vehicle, Injury Surveillance, etc. The State has some integration and links between systems, which are easily measured and noted in a performance measure and metrics.

Are there accessibility performance measures tailored to the needs of data managers and data users?
Accessibility measures are limited for the driver data, which is protected by the Driver Privacy Protection Act. However, there are many authorized uses and users. An easy measure of accessibility is the number of requests for aggregate driver data that are fulfilled by the DMV. It's a simple measure to establish and maintain, in that the time frame for delivery of the requested data could be used as a goal and any rise in the number of requests could provide support for the need for additional resources when those numbers are significant.
Has the state established numeric goals—performance metrics—for each performance measure?
No metrics have been established for performance measures related to driver data.
Is the detection of high frequency errors used to generate updates to training content and data collection manuals, update the validation rules, and prompt form revisions?
The State would benefit by developing a procedure for addressing these errors, including ensuring that all reported errors are recorded and addressed. Certain types of errors might require changes to training, others to forms, or to the IT system or the procedure manual. The State should have a documented means of determining when errors must be addressed in some way due to their frequency.
Are independent sample-based audits conducted periodically for the driver reports and related database contents for that record?
Specific types of driver data are audited on a regular basis by any number of entities, which can be helpful to the DMV management. In this instance, independent audits are not meant as 3rd-party audits, but random audits outside the normal DMV procedures. Additionally, such audits should address all driver types. An example might be a monthly or semi-annual selection of 100 random drivers whose records are audited for errors or omissions.
Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions?
Trend analyses, particularly of driver data, help those in the State who perform problem ID to understand the changing demographics of the driving population, as relates to age, training, types of endorsements, license status changes, etc. They can also occasionally point out internal fraud if a certain office or examiner tends to have an unusual number of a single type of transaction.
Is data quality feedback from key users regularly communicated to data collectors and data managers?
While it is clear that errors are reported to IT, errors can be initiated in many ways and feedback should be provided to those who would benefit from the reporting, particularly, those inputting the incorrect data into the system. Ideally, processes and procedures would be in place that provide data quality feedback mechanisms for all aspects of motor vehicle data.
Are data quality management reports provided to the TRCC for regular review?
Connecticut does not provide driver system data quality management reports to the TRCC for regular review. The driver data should be monitored, and performance recorded. When this information is reported at the TRCC, it can generate projects that may be undertaken with grant funding and discussions with groups who depend on driver data for program management, such as impaired driving, occupant protection, etc.

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

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

Connecticut's vehicle registration and titling data is maintained in a separate system from its driver data. The strong points of this system include the use of software to validate the vehicle identification numbers, real-time processing, use of NMVTIS (National Motor Vehicle Title Information System) in real-time, and querying the NMVTIS system prior to issuing a Connecticut title. The vehicle system uses NMVTIS brand codes and the State participates in the PRISM (Performance and Registration Information Systems Management) system at the gold level. Additionally, the State has developed process flows for most of its vehicle-related processing. These are all best practices and deserve recognition.

The State's data dictionary for the system is a combination of the NMVTIS information, AAMVA D.20 data elements, and State-specific data elements. These aspects of the data dictionary should be combined into a Connecticut vehicle data dictionary that is limited to the State's data and definitions and contains its data edits and validation rules. It is commendable that the State uses NMVTIS and AAMVA documentation, as that provides for uniformity, but data users and collectors benefit more from a concise listing of the State's data elements and definitions.

There are some areas in which the State can improve its data, processes, and documentation to further improve an already good system. While the State has developed an error-handling process, it is not contained in the process flows; an error-handling process flow would help to ensure that this information is reviewed and updated as needed. Stolen vehicle flags are not added to the registration system upon reporting by law enforcement, with State reliance on NMVTIS in lieu of flagging. However, State-level registration system flags would improve the timeliness of such reporting and could help to ensure that, upon recovery, such vehicles could be immediately cleared on the State system. In the same light, brand history from NMVTIS can be carried forward on to Connecticut titles, but such brands that are listed on out-of-state titles are not necessarily copied onto the Connecticut title. Changing this procedure would help to ensure that brands are not inadvertently washed from titles when moving from State to State.

One concern about uniformity within the State is the fact that personal information is not collected in the same format on the vehicle file as it is on the driver file. The discrepancies are due to the fact that the files are of varying ages and one has greater capacity than the other. It would behoove the State to review the current conventions for collecting and recording names and attempt to make those consistent.

Finally, a comprehensive data quality management program should be initiated for the vehicle data. The State has made efforts to improve its data quality and assumes that those practices and technology have made data quality better. However, the only way to ensure that data quality is and remains improved is to develop specific measures and to take and record those measurements on a regular basis. It is an often-faulty assumption that all errors are prevented by data edits. That is not the case and auditing for errors that might have bypassed the edits is a good way to develop additional edits if needed and to ascertain where training or procedures might need to be updated.

Random audits of the data, independent of customary State processes, help to find and fix problems. A small number of files, randomly selected and reviewed on a regular basis can help to determine what types of transactions are most likely to result in errors, to develop regular audit procedures for most-risky transaction types, and to provide feedback to data collectors and data entry staff to improve accuracy. Performance measures regularly monitored and reported to the TRCC will aid in maintaining the quality of the data and data system that Connecticut has developed.

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Questions - Description and Contents of the Vehicle Data System
Does custodial responsibility of the identification and ownership of vehicles registered in the State – including vehicle make, model, year of manufacture, body type, and adverse vehicle history (title brands) – reside in a single location?
Custodial responsibility for the registration and titling of motor vehicles in the State of Connecticut resides with the Department of Motor Vehicles (DMV).
Does the State or its agents validate every VIN with a verification software application?
Connecticut's DMV verifies Vehicle Identification Numbers (VIN) with CVINA software using the registration data system. CVINA is integrated into the workflow of the Connecticut Integrated Vehicle and Licensing System (CIVLS) software and validates that VIN information as it is entered.
Are vehicle registration documents barcoded—using at a minimum the 2D standard—to allow for rapid, accurate collection of vehicle information by law enforcement officers in the field using barcode readers or scanners?
Neither the registration nor the title documents have 2D (PDF417) barcodes. Instead, they have linear 1D code 128 barcodes that contain limited information. 2D barcodes can contain much more data than traditional UPC style 1D barcodes. Connecticut should pursue more advanced barcode symbology like PDF417, matrix, etc.
Questions - Applicable Guidelines for the Vehicle Data System
Does the vehicle system provide title information data to the National Motor Vehicle Title Information System at least daily?
Connecticut provides title information to NMVTIS daily in real time, as part of registration transaction processing.
Does the vehicle system query the National Motor Vehicle Title Information System (NMVTIS) before issuing new titles?
NMVTIS is queried through the CIVLS system prior to title issuance in the State.
Does the State incorporate brand information on the vehicle record that are recommended by AAMVA and/or received through NMVTIS, whether or not the brand description matches the State's brand descriptions?
Connecticut uses brand codes that are consistent with NMVTIS.
Does the State participate in the Performance and Registration Information Systems Management (PRISM) program?
Connecticut participates in the PRISM system at the gold level.
Questions - Vehicle System Data Dictionary
Does the vehicle system have a documented definition for each data field?
Connecticut's vehicle data system has a data dictionary with definitions available for each data field/element.

Does the vehicle system include edit check and data collection guidelines that correspond to the data definitions?
The documentation provided, a data dictionary, NMVTIS manual, and an AAMVA D20 manual, did not contain information about the Connecticut system related to edit checks.
Are the collection, reporting, and posting procedures for registration, title, and title brand information formally documented?
State Statutes and the NMVTIS manual are used to determine when to use which title brands. No information related to the procedure for applying title brands, nor a copy of the actual brands that are applied in Connecticut, was available for review.
Questions - Procedures and Process Flows for the Vehicle Data System
Is there a process flow diagram describing the vehicle data system?
Although a process flow exists for the vehicle data system, it was not available for review.
Does the vehicle system flag or identify vehicles reported as stolen to law enforcement authorities?
Connecticut DMV staff can identify stolen vehicle marker plates and pass that information to law enforcement. Ideally, flagging of stolen vehicles would be integrated into the system in the future. The Connecticut system does check NMVTIS for stolen vehicle status at the time of vehicle purchase and that result can be added to the title application via a DE 133 discretionary edit. However, the Connecticut registration system does not include stolen vehicle flags.
If the vehicle system does flag or identify vehicles reported as stolen to law enforcement authorities, are these flags removed when a stolen vehicle has been recovered or junked?
The CIVLS vehicle system does not flag or identify vehicles reported as stolen to law enforcement authorities. Since the flags are not within the vehicle system, they cannot be automatically removed. Ideally, this would be a future enhancement to the system. CIVLS has the ability to flag a title via a discretionary edit, but no information was available that shows how a stolen vehicle flag might exist and then be removed from the registration system. There is a THEFT REPORT that can be viewed in CIVLS (by variable date range) that indicates all of the "hits" received from NMVTIS.
Does the State record and maintain the title brand history (previously applied to vehicles by other States)?
Connecticut does not maintain title brand history from previous States of record but has the capacity to carry forward brands listed on NMVTIS to the Connecticut title. When a physical title from another State is transferred in and that State does not fully participate in NMVTIS, the title brand has to be entered manually into CIVLS if the brand is indicated on the title presented at time of registration.
Are the steps from initial event (titling, registration) to final entry into the statewide vehicle system documented in a process flow diagram?
Flow charts for registration and titling are very good and provide a clear view of the title and registration processes.

Is the process flow diagram or narrative annotated to show the time required to complete each step?
Process flows have been developed, but they do not show the amount of time to complete each step. The State notes that this addition is underway. Such information is helpful in efforts to streamline or improve processes and can indicate improvements made due to such technological or process changes.
Does the process flow diagram or narrative show alternative data flows and timelines?
Connecticut has flowcharts that show alternative data flows. Timelines are not currently included, but should be a focus of future enhancements.
Does the process flow diagram or narrative include processes for error correction and error handling?
Process flows have not been developed for error handling and correction in the Connecticut vehicle data system. The State reports that such diagrams are under development.
Does the process flow diagram or narrative explain the timing, conditions, and procedures for purging records from the vehicle system?
Connecticut follows the retention periods listed in the General Statutes, and provided a list of retention periods for various data and documents. It would be beneficial to develop procedures by which retention and purging are conducted, such as manual/scheduled tasks, or exemptions.
Questions - Vehicle Data System Interface with Other Components
Are the driver and vehicle files unified in one system?
Driver and vehicle files are stored in separate systems, with vehicle records stored on the newer of the two systems, CIVLS, and driver records in legacy system housed at the Connecticut Administrative Technology Center (CATER).
If the driver and vehicle files are separate, is personal information entered into the vehicle system using the same conventions used in the driver system?
Personal information is entered into the driver and vehicle systems using different conventions, due to the restrictions of smaller fields in the older driver files. This lack of consistency makes integration of the two files more difficult and makes it difficult for law enforcement officers to find potential vehicle information on suspects. To the extent possible, effective data governance would include methodologies to consistently capture customer names throughout State files to prevent fraud and duplicate records, as well.
Can vehicle system data be used to verify and validate the vehicle information during initial creation of a citation or crash report?
Law enforcement has access to the vehicle file and can use that information to verify and validate information provided during crash reporting and citation issuance. Law enforcement has a programmatic interface to the CIVLS system and utilizes that interface for data import into citation and crash reports.

When discrepancies are identified during data entry in the crash data system, are vehicle records flagged for possible updating?
The crash repository is the responsibility of the Connecticut Department of Transportation, and data from that file is not used to update the vehicle file if there are discrepancies. This is a missed opportunity for data quality improvements in Connecticut.
Are VIN, title number, and license plate number the key variables used to retrieve vehicle records?
Vehicle records can be retrieved by the VIN, title number, or plate number.
Questions - Data Quality Control Programs for the Vehicle Data System
Is the vehicle system data processed in real-time?
Vehicle data is processed in real-time in the CIVLS system.
Are there automated edit checks and validation rules to ensure that entered data falls within a range of acceptable values and is logically consistent among data elements?
The State uses CVINA software to verify Vehicle Identification number (VIN), model, make, year, and other data found in the VIN. No other edit checks embedded in the vehicle data system software were noted, so it is unknown what back-end or extended processes may exist to assist the data validation and enforce the policies. CIVLS is a customer-based system that attempts to make consistent the customer and lien holder information.
Is limited state-level correction authority granted to quality control staff working with the statewide vehicle system to amend obvious errors and omissions?
Quality control staff members in the vehicle section have the authority to make corrections of obvious errors or omissions, based on system security matrix and employee protocol, apparently based on policies and procedures.
Are there timeliness performance measures tailored to the needs of data managers and data users?
There are no timeliness performance measures for the vehicle system, which functions in real-time. The system developer, though, does have service level agreements related to timeliness. Apparently, there are manual triggering mechanisms to denote when those agreements have been violated, so that would be a good place to start with a timeliness measure, since it is important to management and it appears to be monitored regularly. Additionally, automated Control Reports have been developed for the Branch Operations, Vehicle and Business Regulations, and Driver Services Divisions that are now used by DMV management.
Are there accuracy performance measures tailored to the needs of data managers and data users?
CVINA and NMVTIS are used to increase accuracy of vehicle data. However, it is rare that any software catches every error in a data system, and the mere use of those tools does not correlate to a measured level of performance. A good performance measure would be: Number of fatal errors or critical errors found in vehicle data. This type of measure is helpful in ensuring that the software is doing its job.

Are there completeness performance measures tailored to the needs of data managers and data users?
Completeness performance measures have not yet been established; however, the CIVLS software requires that specific data elements are entered for a transaction to be processed. Generally, for a vehicle data system, a completeness measure would be percentage of vehicle files with no missing critical data elements or no missing data elements, or: the percentage of unknowns or blanks in critical data elements for which unknown is not an acceptable value. Monitoring any of these helps to keep a finger on the pulse of the health of the vehicle data system.
Are there uniformity performance measures tailored to the needs of data managers and data users?
Obviously, CVINA and NMVTIS are tools that help to create uniformity in vehicle data. However, those aspects of data still need to be measured, as does the performance of these tools, particularly in light of any errors found, and in tracking non-standard VINs. The State does have uniformity tools in place to help data quality, but no defined metrics are in place to examine the performance of those tools.
Are there integration performance measures tailored to the needs of data managers and data users?
Integration performance measures for the CIVLS system should be developed, since none currently exist. If a transition in maintenance is underway, it is a good time to determine how to measure the system's performance and to capture baseline data for later comparison.
Are there accessibility performance measures tailored to the needs of data managers and data users?
Connecticut has no vehicle data accessibility measures. Possible measures may relate to requests for vehicle data, perhaps in the aggregate, by authorized users and the number of those requests that were able to be completed within three or five days, or some other measurement chosen by the State. These measures become more important as the number of requests for data grows to the point that the State has a difficult time fulfilling them and needs to seek new resources. However, it is also important from a data standpoint to track the number of entities or individuals who have access to the vehicle data file. These might be relatively easy counts and can be monitored at regular intervals. The Connecticut DMV, through the Office of Policy and Management, has started to work on “Open Data.” This will give various agencies and organizations the ability to use data available from DMV on an as needed basis. The work on this has just begun, as of October 2018.
Has the State established numeric goals—performance metrics—for each performance measure?
Since there are no formal performance measures for the vehicle system, it is a good time for the State to develop both the measures and some goals for those measures (metrics). Consistent measurement can be an excellent warning system for minor degradation in the data system performance that can be addressed quickly and without major effort if it is known immediately that problems are developing.

Is the detection of high frequency errors used to generate updates to training content and data collection manuals, update the validation rules, and prompt form revisions?
While it appears that tracking of errors, particularly high-frequency errors is taking place, it would be best to have a procedure for addressing them when they are noted and even for determining which errors are high-frequency. Data users are generally an excellent source of error reporting, as well. Review of errors that are not due to IT efforts, such as unclear instructions on forms, or lack or improper training of staff, are now tracked and reported by unit and employee to eliminate any future type of errors.
Are independent sample-based audits conducted periodically for vehicle reports and related database contents for that record?
PRISM and SAFER reports tend to be limited to certain records and types of data. Thus, it is also helpful, on a regular basis, to pick a small random sample of vehicle records to audit in-house. This effort can help to determine which types of transactions are more likely to result in errors and will provide ways to detect and prevent those common errors, or to develop edit checks within the software to guard against such errors.
Are periodic comparative and trend analyses used to identify unexplained differences in the data across years and jurisdictions?
No current trend analyses are conducted, but they could be undertaken as a result of the new system. Trend analyses are a good way to find data discrepancies, particularly within specific counties or agencies. Trend analyses also help determine the types of vehicles registered within the State and can be compared to crash involvement to discern if there is over-representation of any type of vehicle in crashes in Connecticut, such as certain types of motorcycles or commercial vehicles, for example. The vehicle file can provide a great deal of information to the "Problem ID" for the State, in terms of its traffic safety initiatives. The Connecticut DMV, through the Office of Policy and Management, has started to work on “Open Data.” This will give various agencies and organizations the ability to use data available from DMV on an as needed basis. The work on this has just begun, as of October 2018.
Is data quality feedback from key users regularly communicated to data collectors and data managers?
The State has a means of tracking errors and providing that information to data managers to be addressed. End-user feedback is acquired through the TrackIT system and that feedback is communicated to data collectors through appropriate IT channels.
Are data quality management reports provided to the TRCC for regular review?
Performance measures and their metrics should be provided to the TRCC. Sharing of such information in the TRCC can help to coordinate on shared concerns, provide helpful information about data availability and use, and encourage data-sharing. States spend a great deal of money on data collection and should encourage use of the available data to improve highway safety, prevent fraud, and reduce costs to all citizens. Data quality discussions are a great way to inform the State's TRCC of the data that is collected, the collection methods and technologies used, and any anomalies that users might find in the data. These discussions also provide a platform for healthy competition between data owners and collectors in the various component systems to have the best system possible. However, the ability to process these types of reports may be possible given the State’s new “Open Data” initiative.