

FHWA Roadway Safety Data Program

State Roadway Safety Data Capability Assessment Questionnaire

State

Date

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GLOSSARY

AASHTOWare SafetyAnalyst™	A set of software tools which utilizes SPFs for screening roadway locations and contains over 100 SPFs for various roadway segment types. <i>SafetyAnalyst</i> includes modules for identifying locations for potential safety improvement (network screening), diagnosis and countermeasure selection, economic appraisal and priority ranking, and evaluation of implemented improvements.
Accessibility	A measure of how easy it is for legitimate users to retrieve and manipulate data in a system, in particular, by those entities that are not the data system owner.
Accuracy	How close do the data match the correctness for each internal and external roadway inventory element. The external accuracy of roadway inventory data can only be verified with direct observation – survey, photo or video log, aerial photos, etc. Internal accuracy concerns whether legitimate data values are present and can be monitored through computerized checks.
Application Developers	IT personnel who design and write code for software.
ARNOLD	All Roads Network of Linear Referenced Data (ARNOLD) is the FHWA sponsored effort to encourage States to develop enterprise-wide linear referencing system for all public roads.
Automated enforcement device	An electronic citation issuance device related to speed, red-light running or other enforcement.
Basemap	In a GIS, the overlay of locations onto spatial coordinates to represent the physical environment, including roadways.
Before-after study	The evaluation of implemented safety treatments, accomplished by comparing expected frequency or severity of crashes before and after implementation. There are several different types of before-after studies. These studies often develop crash modification factors for a particular treatment or group of treatments. Also known as BA studies.
Business Rule	A formally stated constraint governing the characteristic or behavior of an object or the relationship between objects (entities) used to control the complexity of the activities of an enterprise. Example: the standard width of an Interstate lane is 12 feet.
Business Users	Application software users from among stakeholder agencies.
Centralized IT	An organizational structure in which IT is a separate State agency from the DOT, but may have an IT group within the DOT. As opposed to an IT department within DOT with no Statewide central authority over all State government IT programs.
Collision diagram	A two-dimensional plan view representation of the crashes that have occurred at a site within a time period. It simplifies the visualization of crash patterns. Clusters of crashes by collision type may become evident on the diagram that were otherwise overlooked.

Completeness	How much of the all public road inventory that can be potentially be collected and stored are actually in the final electronic data file.
Computerized internal checks	For coded elements (e.g., pavement type, shoulder type), the entered value would be compared to legitimate codes and flagged and corrected if not legitimate. Reasonable ranges might include lane width between 8 and 13 feet or AADT for two-lane rural roads that are non-zero and less than some reasonable maximum value. "Agreement with related variables" might mean a shoulder width of zero when a curb is present.
Condition diagram	Similar to a collision diagram, but instead of crash information, it provides detailed site characteristics and information on the surrounding land uses.
Count Program	Traffic counting programs may be described by type of count requested and the nature of the counting hardware used. For example: <p style="margin-left: 40px;">Short counts are typically of a few days' duration and may be collected using temporary installation of a movable counter device and sensors.</p> <p style="margin-left: 40px;">Permanent counts are typically year-round and involve installation of sensors in the roadbed (or overhead for video-based sensors) connected to a digital counting station.</p>
Critical rate	A method in which the observed crash rate at each site is compared to a calculated critical crash rate that is unique to each site.
Cross-functional Teams	Any multi-agency/multi-business area group brought together in an advisory capacity. In safety data governance, the cross-functional teams may serve as the data governance group/board.
Data Administrators	Personnel in charge of the data system and who oversee its operation.
Data Business Plan	A plan that lists tasks and activities within each task and is aimed at improving data completeness, timeliness, accuracy, uniformity, integration, and accessibility. It will cover data collection and planned data uses.
Data Custodians	Individuals responsible for the technical support of the data applications, which may include activities such as data loading, maintaining data dictionaries, data models, and back-up and recovery procedures for databases.
Data Governance Board or Council	A high-level data governance structure in the organization that typically includes senior managers. Responsibilities may include identifying priorities for data governance policies, projects, or system enhancements, and the authorization, implementation and enforcement of data governance policies and standards.
Data Governance Plan	The accountability for the management of an organization's data

	assets to achieve its business purposes and compliance with any relevant legislation, regulation and business practice.
Data Owners	People or groups with decision making authority for initiating or discontinuing the data program and who determine the content of what data is collected.
Data Quality Performance Measures and Metrics	Defined measurements made to assess the quality of data (e.g., time between roadway modification and modification of roadway inventory data in the official inventory file). For safety data (including inventory data), one or more measurements are defined for each of six data-quality criteria – accuracy, timeliness, completeness, uniformity, accessibility and integration. Performance metrics are the goals associated with each data quality performance measure.
Data Quality Standards	The operational definitions established through data governance processes that describe how the data are to be collected, the QA/QC processes for managing data quality, and, ultimately, the numeric targets to be achieved in completeness, timeliness, accuracy, uniformity, integration, and accessibility.
Data Stewards	People who are accountable for the quality, value and appropriate use of the data.
Data Stewardship	The formal, specifically assigned and entrusted accountability for business (as opposed to information technology) responsibilities ensuring effective control and use of data and information assets.
Database architecture	The design of data structures within a system and the relationships among the various data tables.
Decentralized DOT	An organizational structure in which the State DOT headquarters provides policies, tools, and oversight while Districts play a large role in developing, designing, and constructing projects.
Diagnosis	The identification of factors that may contribute to a crash.
Dynamic Segmentation	A method of defining roadway sections based on a change in features, attributes, or events to trigger the start of a new segment.
EMS	Emergency Medical Services. In this study, EMS refers to the data source consisting of run reports from ambulance services.
Enterprise, enterprise-wide	Term used to describe data systems that span the full range of a department's areas of responsibility. A single, comprehensive and all-encompassing system.
Equivalent property damage only (EPDO) average crash frequency with EB adjustments	Rather than looking at crash severities separately, this measure combines all crashes using a weighted average. Specifically, it converts all crashes to property damage only crashes, so an injury crash represents X PDO crashes and a fatal crash represents Y PDO crashes. These multipliers X and Y are typically calculated based on accepted crash costs by crash severity
Estimated AADT	A data source listing the estimated annual average daily traffic on local roads and rural minor collector roads and intersections as defined in the roadway inventory.

Excess expected average crash frequency with EB adjustments	The observed average crash frequency and the predicted crash frequency from a safety performance function are weighted together using the Empirical Bayes method to calculate an expected average crash frequency. The resulting expected average crash frequency is compared to the predicted average crash frequency from a SPF. The difference between the EB adjusted average crash frequency and the predicted average crash frequency from an SPF is the excess expected average crash frequency.
Excess predicted average crash frequency	Method in which sites are ranked according to the difference between the observed crash frequency and the predicted crash frequency based on a safety performance function.
Expected crashes	An estimate of long range average number of crashes per year for a particular type of roadway or intersection.
Federal-aid Highways/System	All public roads other than rural minor collectors, rural local roads, urban local roads (functional class).
GIS	Geographic Information System is an electronic mapping system using spatial coordinates (latitude/longitude) to associate data with specific locations on a base map.
HSIP	Highway Safety Improvement Program – a core Federal-aid program aimed at achieving a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance.
HSP	Highway Safety Plan – a document submitted by States each fiscal year which describes the strategies and projects the State plans to implement and the resources from all sources it plans to use to achieve its highway safety performance targets. The HSP is coordinated with the State strategic highway safety plan as defined in 23 U.S.C. 148(a)
In-patient billing	A statewide data source that provides information on all patients admitted to the hospital. The billing information includes causes of injury (e.g., motor vehicle crashes), types and severity of injuries, treatments, and charges.
Integration	Integration is the ability to merge data from multiple different systems and/or different agencies into a single analytic resource.
Interactive Highway Safety Design Manual	The IHSDM - HSM Predictive Method 2016 Release includes six evaluation modules: Crash Prediction, Policy Review, Design Consistency, Traffic Analysis, Driver/Vehicle and Intersection Review. To the extent possible, the Crash Prediction Module (CPM) faithfully implements Part C (Predictive Method) of AASHTO's 1st Edition Highway Safety Manual for evaluating rural 2-lane highways, rural multilane highways, and urban/suburban arterials, as well as HSM 2014 Supplement materials on freeway segments and freeway ramps/interchanges.

Level of service of safety	The ranking of sites according to their predicted and expected crash frequency for the entire population, where the degree of deviation is then labeled into four level of service classes.
Local and regional jurisdictions	Local (county and municipal) governments/agencies as well as entities such as Metropolitan Planning Organizations and Regional Planning Organizations that coordinate efforts among these agencies and entities.
L RTP	Long Range Transportation Plan
Metadata	A set of data that describes and gives information about other data.
Method of moments	Method in which a site's observed accident frequency is adjusted based on the variance in the crash data and average crash counts for the site's reference population.
MIRE	Model Inventory of Roadway Elements - Guideline to help agencies improve their roadway and traffic inventories
MPA	Metropolitan Planning Area – the area in which the metropolitan transportation planning process is carried out. The MPA is made up of the census-defined Urbanized Area (UZA), plus the contiguous area expected to become urbanized within the next 20 to 25 years.
MPO	Metropolitan Planning Organization –Federal transportation laws and regulations require the establishment of an MPO in every urbanized area of the U.S. with a population over 50,000. MPOs are responsible for meeting the federal metropolitan planning regulations for transportation.
Network screening	Process by which State or local agencies identify sites with “safety issues”. This is an initial cut at identifying sites with potential for treatment. Further studies are necessary (diagnosis) to determine specific issues and appropriate treatments.
Non-public roadways	Roads that aren't functionally classified, i.e. private roads, military installations, and national park service roads.
Performance Measure	An expression based on a metric, used to establish targets and to assess progress towards achieving the established target
Performance Metric	A quantifiable indicator of performance or condition
Performance Target	A quantifiable level of performance or condition, as a value for a measure, to be achieved within a specified period.
Performance threshold	A numerical value that is used to establish a threshold of expected number of crashes (i.e. safety performance) for sites under consideration.
Predicted crashes	The estimate of long-term average crash frequency which is forecast to occur at a site using a predictive model or safety performance function suitable to the roadway type under consideration.
Publicly-owned non-State-maintained roadways	Includes county and local/municipality roads that are not maintained by the State.

RDIP	Roadway Data Improvement Program (RDIP) offers expert review and recommendations on a State's roadway data management and data quality.
Regression-to-the-mean	When a period with a comparatively high crash frequency is observed, it is statistically probably that a lower crash frequency will be observed in the following period. This tendency is known as regression-to-the-mean.
Relational Database	A modern database structure characterized by defined data tables related to each other by keys in a hierarchical manner that avoids duplicating data elements. Examples of relational database software environments in Transportation include Oracle and SQL.
Relative severity index	An average crash cost calculated based on the crash types and severities at each site and then compared to an average crash cost for sites with similar characteristics to identify those sites that have a higher than average crash cost. The crash costs can include direct crash costs accounting for economic costs of the crashes only; or account for both direct and indirect costs.
Roadway inventory types	In this document, primary inventory types surveyed include (1) roadway segments (e.g., number of lanes, shoulder width, AADT), intersections (e.g., type, traffic control, crossing street AADT), interchanges (e.g., type of interchange, lighting), ramps (e.g., ramp AADT, length, type), curves (e.g., length, degree of curve) and grades (e.g., percent grade, up or downgrade). Supplemental information is also collected on roadside object inventories, sign inventories, speed data inventories and safety improvement inventories.
Roadway Segment	A portion of roadway as defined in the State's roadway inventory system. The method of defining when new segments start varies among States and sometimes within a State depending on the roadway type under consideration. Usually segments are defined to be homogenous with respect to key features such as pavement width, number of lanes, median type, AADT, etc.
Rolling Average	A method for smoothing time series data by averaging data points for a fixed number of consecutive terms. Each data point of the series is sequentially included in the averaging, while the oldest data point in the span of the average is removed.
RPO/RPC/RPA	Regional Planning Organization/Regional Planning Commission/Regional Planning Agency
Safety performance functions	An equation used to estimate or predict the average crash frequency per year at a location as a function of traffic volume and in some cases roadway or intersection characteristics (e.g. number of lanes, traffic control, or median type).
Scenario Analysis	A technique used to compare different transportation investment options based on their predicted impacts on transportation system performance.

Service Level Agreements	Interagency agreements for developing data elements at a specified quality.
SHSO	State Highway Safety Office - lead coordinator for traffic safety programs in each State, led by the Governor's designated Highway Safety Representative.
Site address	Roadway system screening to identify sites for potential treatment requires multiple years of crash data. Changes to the roadway system (e.g., lengthening of a curve; realignment of a roadway section, opening a new intersection thus creating two segments and one new intersection) can change the "site address" (route/milepost) for modified and downstream locations before and after the change.
State-maintained roadway	Any roadway segment, regardless of ownership, that is maintained by the State DOT.
State-system	The roadway network under the control ("owned by") the State DOT. The remainder of the public mileage in a State (i.e., "non-State public roads") is predominately owned by local governments (e.g., county or municipal) or the federal government (e.g., national park roads).
STIP	State Transportation Improvement Program or MPO Transportation Improvement Program
Supplemental Databases	In this data capability assessment, supplemental data refers to information related to safety that is beyond the typical inventory files maintained by a State DOT. The list includes estimated AADT, roadside fixed objects, signs, speed data, automated enforcement devices, safety-related land use, bridges/structures, railroad grade crossings, safety improvements and others.
Temporal trends	Time-related factors that influence reported crashes and can change throughout a given study period, including crash reporting thresholds, weather conditions, etc.
TIP	Transportation Improvement Program is a capital improvement program developed cooperatively by local and state transportation entities.
Trauma care	A data source usually stored in a Trauma Registry reporting care provided by designated trauma centers. The data source typically includes information on cause of injury (including motor vehicle crashes), the extent of injuries, and the treatments provided. Linking data from crashes and trauma registries can be used to improve the accuracy of data on crash injuries, medical outcomes, and the economic cost of motor vehicle crashes.
UZA	Urbanized Area - One type of urban areas that the Census Bureau identifies with 50,000 or more people.
VMT	Vehicle Miles of Travel - The product of traffic volume and the length of the road segment(s) within a defined scope of interest during the period of interest.

AREA 1: DATA COLLECTION/TECHNICAL STANDARDS

- **Background Questions**
- **Element 1A: Completeness**
- **Element 1B: Timeliness**
- **Element 1C: Accuracy**
- **Element 1D: Uniformity**

AREA 1: DATA COLLECTION/TECHNICAL STANDARDS

Background Questions

Road Inventory Data

1. How is the State roadway basemap constructed? (select one)
 - a. GIS system with linear referencing where the inventory elements/attributes for each ft. (or each x ft.) of road are stored spatially and can be linked to the GIS base roadway network.
 - b. GIS system with dynamic segmentation, in which elements and attributes are consistent within a dynamically defined segment. Segments are not determined by a standardized length (dynamic segmentation may be based on changing attributes, or segments defined by presence of intersections, for example).
 - c. Other (please describe).

2. Does the State have an ARNOLD-compliant LRS/network? (select one)
 - a. Yes
 - b. No (please explain)

3. How is the inventory data stored (e.g., in GIS tables on Oracle server)?

4. What roadways are covered in the basemap? (Check all that apply)
 - a. State-owned (percent):
 - b. State-maintained (percent):
 - c. Non-State public (local, tribal, federal) (percent):
 - d. Non-public (percent):

5. Do you have defined quantitative data quality performance measures and metrics (goals) for the set of roadway inventory data elements you collect? (Check all that apply.) If so, could you please provide any documentation on what they are, how they are measured, and how they are tracked.
- Completeness.
 - Timeliness.
 - Accuracy.
 - Uniformity
 - Accessibility.
 - Integration.
 - Other metric, please describe:

Descriptions of these terms are available in the NHTSA Performance Measures White Paper, <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/811441>

Up-to-date data quality performance measures are available in the NHTSA Traffic Records Assessment Advisory, <https://www.transportation.gov/government/traffic-records/nhtsa-traffic-records-program-assessment-advisory>

6. Does the State take an approach where all business units can use and integrate into one LRS/Map? (Select one)
- Yes
 - No
7. Are there any Service Level Agreements (SLAs) (i.e., interagency formal agreements or memoranda of understanding assigning responsibilities) in place for maintaining the basemap that include components for completeness, timeliness, accuracy, uniformity, accessibility, and integration? (Select one)
- Yes
 - No

Other Data for Safety Performance Management

General

8. Which of the following statements best describes the status of your agency's efforts to identify and address gaps in data needed for safety performance management? (Select one)
- Gaps in meeting safety performance data requirements are not yet well understood (1)
 - Safety data gaps have been identified and work is underway to identify actions required to fill these gaps (2)
 - There is an established plan for filling safety data gaps but implementation has not yet begun (3)

Area 1 Data Collection – Background Questions

- d. There is an established plan, and several data improvement initiatives underway to fill safety data gaps (4)
 - e. There is an established plan, essential safety data gaps have been filled, and there is a continuous improvement process to sustain and improve data quality (5)
9. *Which of the following practices do you employ to manage quality of your crash data: (Check all that apply)*
- a. Designated data steward with accountability for crash data quality
 - b. Documented data performance metrics
 - c. Regular reporting of data quality metrics for crash data owners/stewards
 - d. Regular reporting of data quality metrics as part of metadata available to data users
 - e. Consistent data collection guidance
 - f. Training and communication on data quality for law enforcement
 - g. Defined business rules for checking validity of each data element
 - h. Validation of crash locations
 - i. Automated edit checks built into the crash data system

Element 1A: Completeness

Road Inventory Data

1. What percent of your state's public road mileage is State owned or maintained?
 - a. State-owned (HPMS item 6 = 1): _____
 - b. State maintained (HPMS item 68 = 1): _____

2. What percent of your state's public road system has roadway inventory data that are maintained electronically?
 - a. State-owned (percent): _____
 - b. State-maintained (percent): _____
 - c. Non-State public (local, tribal, federal) (percent): _____
 - d. Non-public (percent): _____

3. How does the State collect data on local roads? (Check all that apply)
 - a. State collects data.
 - b. Local city/town/village/tribe collects data and provides to State.
 - c. MPO/RPO collects data and provides to State.
 - d. Other (please describe).

NOTE: If more than one answer applies in question 3, please describe the circumstances when each of the employed data collection methods is used.

4. Please describe any data sharing agreements and/or practices you have with local, tribal, federal, and other agencies that maintain roads in the State.

5. What percentage of the MIRE elements are in the State road inventory file, what percent of public roadways are they collected on, and what elements are planned for future collection?

Worksheet can be found in Appendix B. Additional information on MIRE can be found at <http://safety.fhwa.dot.gov/rsdp/mire.aspx>.

MIRE Elements (# of elements)	Is this collected? (Y/N)	Percent of Elements		Percent of Roadways Collected On		Planned Future Collection	
		State %	Local/ Federal %	State (All = 100%, Most > 50%, Some < 50%, None = 0%)	Local/Federal/ Tribal (All = 100%, Most > 50%, Some < 50%, None = 0%)	State (Y/N)	Local/ Federal (Y/N)
I. Roadway Segment (109) - Page 92 Appendix B							
II. At-Grade Intersection/Junctions (18) - Page 98 Appendix B							
III. Intersection Leg (Each Approach) (40) - Page 99 Appendix B							
IV. Interchange/Ramp (25) - Page 102 Appendix B							
V. Horizontal Curve (8) - Page 104 Appendix B							
VI. Vertical Grade (5) - Page 104 Appendix B							

6. What supplemental datasets are included in your roadway inventory system? If collected, please briefly describe how the data are being collected and maintained?

NOTE: For this assessment, it is recognized that States may differ in what they collect in each of these systems. A description of the contents of each of the systems is not required. If there is any doubt if a particular system meets the sense of this assessment, the State may provide a data element list to show the contents of each of the supplemental datasets. Alternatively, the State and/or the assessors can make brief notes describing a system’s contents if the State desires.

Data collection techniques/technologies may include: As-built plans (AB), Field survey (FS), Instrumented vehicle (IV), Aerial Photos (AP), and Other, please describe (O, description).

State-Owned Roadway Network

Supplemental Data	Collected State (All = 100%, Most > 50%, Some < 50%, None = 0%)	How is it Collected	How is it linked to other location-based data?	How is it Stored
Access management				
Automated enforcement devices				
Curve inventories				
Grade inventories				
Guard rails				
ITS Devices				
Lighting				
National Bridge Inventory				

Supplemental Data	Collected State (All = 100%, Most > 50%, Some < 50%, None = 0%)	How is it Collected	How is it linked to other location-based data?	How is it Stored
Pedestrian (i.e. counts, sidewalks, trails, injuries)				
Bicycle (i.e. counts, sidewalks, trails, injuries)				
Pavement condition (IRI)				
Pavement markings				
FRA Highway-Rail Crossing Inventory				
Fixed Object on Side of Roadway				
Safety improvements (planned/programmed? Completed/work history? HSIP annual report requirements?)				
Signs				
Speed (please describe in notes)				
Other (please describe).				

Locally-owned roadway network

Supplemental Data	Collected Local/Federal/Tribal (All = 100%, Most > 50%, Some < 50%, None = 0%)	How is it Collected	How is it linked to other location-based data:	How is it Stored
Access management				
Automated enforcement devices				
Curve inventories				
Grade inventories				
Guard rails				
ITS Devices				
Lighting				
National Bridge Inventory				
Pedestrian (i.e. counts, sidewalks, trails, injuries)				
Bicycle (i.e. counts, sidewalks, trails, injuries)				
Pavement condition (IRI)				

Pavement markings				
FRA Highway-Rail Crossing Inventory				
Fixed Object on Side of Roadway				
Safety improvements (planned/programmed? Completed/work history? HSIP annual report requirements?)				
Signs				
Speed Limits/ Speed Zones				
Other (please describe).				

7. How would the State prioritize in rank-order *improving* the collection of the following items for safety purposes. If resources/grants (cost, labor, etc.) were available to assist with a larger data collection effort where would the State want to spend those resources? (rank the items with 1 as top priority; ties are acceptable). NOTE: items for which the State feels it already has adequate data to support its programs and decision making would receive a lower priority in this ranking because they would not need improvement. Low priority should also be given to those items for which there is no interest by the State in improving or expanding data collection. Highest priority should be given to those items that need improving and the State sees a clear need for better data.
- a. Roadway segments.
 - o Cross-section.
 - o Roadside.
 - b. Traffic counts.
 - c. Curves.
 - d. Grades.
 - e. Intersections.
 - f. Interchanges.
 - g. Ramps.
 - h. Access management.
 - i. Automated enforcement devices.
 - j. ITS devices.
 - k. Lighting.
 - l. Pedestrian.
 - m. Bicycle.
 - n. Pavement condition.
 - o. Fixed objects on Side of Roadway.
 - p. Safety improvements.
 - q. Signs.
 - r. Speed Limits/Speed Zones.
 - s. Other (please describe).
8. What is the status of the State’s efforts to fulfill the requirement of providing a MIRE FDE dataset beyond providing a plan in the July 1, 2017 Traffic Records Strategic Plan?

Other Data for Safety Performance Management

Crash Data

9. Which calendar years of fatal and serious injury crash data do you currently have available for reporting and analysis? (Source: HSIP Report)
- a. From Calendar Year: _____
 - b. To Calendar Year: _____

10. Which word below best characterizes the availability of serious injury data for State maintained public roads? (Select one)
- a. Good – complete data for 90% or more of the state-maintained system
 - b. Fair – complete data for 70% or more of the state-maintained system
 - c. Poor – complete data for less than 70% of the state-maintained system

If you answered Fair or Poor to the above, which of the following factors contribute to the lack of complete data: (Check all that apply.)

- a. Poor/incomplete road network data that enables crashes to be located
 - b. Poor/incomplete crash data attributes
 - c. Under-reporting of crashes
 - d. Other, please specify:
11. Which word below best characterizes the availability of serious injury data for non-state maintained public roads? (Select one)
- a. Good – complete data for 90% or more of the non-state-maintained system
 - b. Fair – complete data for 70% or more of the non-state-maintained system
 - c. Poor – complete data for less than 70% of the non-state-maintained system

Boundary Data

12. Does your agency maintain spatial data on current approved Metropolitan Planning Area (MPA) and Urbanized Area (UZA) boundaries? (Select one)
- a. No
 - b. Yes
13. Does your agency maintain historical spatial data on the MPA and UZA boundaries that were effect in past calendar years? (Select one)
- a. No – we just have current boundary information
 - b. Yes – we have data sets for boundaries in effect for prior years (please specify how far back your boundary data goes): _____
 - c. Not applicable –boundaries haven’t changed

VMT Data

14. Are your state’s MPOs currently able to produce a VMT estimate for all public roads in their MPA? (Select one)
- a. None of our MPOs can do this
 - b. All of our MPOs can do this
 - c. Some of our MPOs can do this (Which MPOs cannot currently do this?)

Element 1B: Timeliness

Road Inventory Data

- Using the descriptions I-VI below the table, what type of procedure(s) do you have to update each of your state-owned inventory data types? What is the time lapse between the “open to traffic” dates of a new roadway or roadway modification and when the revised data are included in each inventory file? (Complete all that apply.)

Inventory Type	Update Procedure	Typical Time Lapse
Roadway Segment		
Traffic volume (MIRE FDE)		
Intersection		
Interchange		
Ramp		
Curve		
Grade		
Supplemental Data		
Other (please describe)		

Example procedures might include the following:

- Ad hoc procedure – no standardized procedure, but changes to the file are made when they come to the attention of the file maintainer.
- Annual (or less often) survey of entire or part of the roadway system (e.g., the roadway system is re-inventoried over a five-year period).
- On-going “as roadway is modified” process where descriptions or “as-built” plans are submitted to the file maintainer each time a change is made to the roadway or a new roadway segment is opened to traffic. The data for the affected section or location are then updated.
- Updates vary by data type.
- Other (please describe).

Example time lapses might include the following:

- There is no systematic updating process, thus the time varies greatly.
- More than one year.
- 6 – 12 months.
- 1-5 months.
- 1 month or less.

2. What are the constraints to updating data elements in a timely manner in terms of (a) collecting and/or (b) entering them in the databases (e.g., funding, staff, technology)?
3. Are there plans to improve the timeliness for adding new data elements to the roadway files? If so, please describe these plans.
4. Are there plans to regularly update the all public roads database that continue to meet the ARNOLD requirements? If so, please describe these plans.
5. Does project completion trigger a change in the corresponding data in the system where applicable?
6. Do you indicate the following items in your inventory files, and if so, how? (Check all that apply)
 - a. Whether an inventory element/item/file was updated. How: _____
 - b. Which element/characteristic of that item was updated. How: _____
 - c. The date when that updating took place. How: _____
7. Does the State track the date of the physical change(s) to roadway locations in a database? (Select one)
 - a. Yes
 - b. No
8. Is information about the change history available in existing query tools and reports? If yes, are these reports available to external users? (Select one)
 - a. No.
 - b. Yes, Internal users (DOT/other State agencies).
 - c. Yes, Internal users and External users (local DOTs/MPOs).

Other Data Supporting Safety Performance Management

9. What is the average number of reporting days for fatal and serious injury crashes in your agency? (Average number of reporting days is defined as the number of days between when the crash occurred – as noted on the crash form, and when the crash information is entered into the electronic crash database.) (Select one)
- a. Less than 30 days
 - b. 30 – 89 days
 - c. 90-179 days
 - d. 180 days or more
10. What percentage of local jurisdictions in your State can provide crash reports for fatal and serious injury crashes within 3 months of crash occurrence? (Select one)
- a. Over 90 percent
 - b. 70 – 90 percent
 - c. Less than 70 percent
11. If the average elapsed time from fatal or serious injury crash is 1 month or greater, is your agency planning any initiatives to improve timeliness of crash data reporting? Please describe these plans and the target improvement that you hope to achieve:

Element 1C: Accuracy

Road Inventory Data

1. Do you have a systematic process where all or some part of your inventory data are re-measured or otherwise verified in the field (e.g., from surveys, video logs, aerial photos, etc.)? If so, please describe it. (If the answer differs for different roadway inventory types, please answer for each type.)

2. For the data that you already maintain (this may apply only to State-maintained roadways if that is what the State's database content has now), and based on past accuracy verifications, indicate which groups of data elements can be considered accurate for 90% of the records; if no accuracy has been verified, indicate it by NA?

Roadway inventory elements (approximate percent): _____
Traffic inventory elements (approximate percent): _____
Curve inventory elements (if present) (approximate percent): _____
Grade inventory elements (if present) (approximate percent): _____
Intersection inventory elements (if present) (approximate percent): _____
Interchange inventory elements (if present) (approximate percent): _____
Ramp inventory elements (if present) (approximate percent): _____
Other – please describe (approximate percent): _____

3. Do you have and continually use a series of computerized internal checks (beyond data type edits) to verify that data values are legitimate codes or in reasonable ranges and agree with values for related data variables (i.e., checks for logical agreement among data elements)?

If yes, please provide data from accuracy measurements (i.e. pass/fail ratios).

If possible, please provide a copy of the edit check definitions if that is not possible, please describe the extent of the accuracy checks by telling us what percentage of roadway data elements are subjected to these validation and logical agreement checks.

Other Data Supporting Safety Performance Management

4. Do you monitor crash data accuracy using formally defined performance measurements? (Select one)
- a. Yes
 - b. No
- If yes, please provide crash data accuracy reports.

5. Do you perform validity and consistency checks in the crash data capture and data entry processes? (This includes electronic data collection as well as paper-based processes) (Select one)
- a. Yes
 - b. No

6. Do you provide feedback to reporting agencies regarding the accuracy of the crash reports they submit? (Select one)
- a. Yes
 - b. No
- If yes, please state how often.

Element 1D: Uniformity

Road Inventory Data

1. For all types of existing inventory data on *State-system* roadways (e.g., roadway segments, intersections, curves, etc.), are element definitions and coding consistent across all highway divisions/regions? If not, describe what differences exist.
2. For State-system and local roadways *in the statewide* roadway inventory system, are data element definitions consistent for all roadway locations (i.e., does the database documentation have the same data definitions for use in all locales or are there different definitions used in the database for local versus state-maintained roadways? If not, describe the differences for each data type roadways (e.g., roadway segments, intersections, curves, etc.) included.
3. For any locally-maintained roadway inventory databases, do the local systems all adopt the same data element definitions as the State? If not, please describe the differences.
4. If your inventory data system contains multiple years of data, what procedures are in place to ensure that coding for each variable (or critical variables) is consistent across years? (if no procedures exist, answer “none”).
5. How are deliberate changes in data definitions (e.g. to meet new requirements) accommodated while balancing consistency across years? Are timestamps provided? Is documentation provided to users to inform them of the changes?
6. What is the specific system (e.g. Roads and Highways) used to ensure that the same “site address” (e.g., route milepost) in the crash location and roadway inventory file describes the same “site” across multiple years?

Other Data Supporting Safety Performance Management

7. Do you provide feedback to reporting agencies regarding the uniformity of the crash reports they submit? (Select one)
 - a. Yes
 - b. No

8. How would you characterize the consistency of *coding* Serious Injury Data across jurisdictions? (Select one)
 - a. Good – consistent definitions and coding for 90% or more of the jurisdictions
 - b. Fair – consistent definitions and coding for 70% or more of the jurisdictions
 - c. Poor – consistent definitions and coding for less than 70% of the jurisdictions

9. Do your current criteria (as documented in your manuals/data dictionary) for identifying a serious injury match with the definition of a “Suspected Serious Injury” in the MMUCC 4th Edition? (Source: HSIP Report) (Select one)
 - a. Yes
 - b. No

10. Which of the following actions have you taken to ensure consistency with the MMUCC 4th edition definition of “Suspected Serious Injury”? (Check all that apply)
 - a. Included the verbatim definition from MMUCC in the Police Crash Report Form
 - b. Included the verbatim definition from MMUCC in the State Crash Report User Manual
 - c. Included the verbatim definition from MMUCC in the State Crash Database Data Dictionary
 - d. Made certain that the attributes of Suspected Serious Injury A¹ are reportable and not included in other coded values of injury status.

11. Do you anticipate compliance with the MMUCC 4th edition definition of Suspected Serious Injury by April 15th, 2019? SI Data – Timeliness (Select one)
 - a. We are already in compliance
 - b. We are not yet in compliance but anticipate that we will be by April 15th, 2019

¹ Severe laceration resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood; Broken or distorted extremity (arm or leg); Crush injuries; Suspected skull, chest or abdominal injury other than bruises or minor lacerations; Significant burns (second and third degree burns over 10% or more of the body); Unconsciousness when taken from the crash scene; Paralysis

- c. We do not anticipate being in compliance by April 15th, 2019 – our current estimated date for compliance is: _____
12. Which of the following ways do you plan to implement serious injury designation in your crash database? SI Data-Uniformity (Select one)
- a. We include (or plan to include) an Injury Status data element that utilizes the full set of codes specified in MMUCC version 4
 - b. We include (or plan to include) a data element that indicates only the “A-Suspected Serious Injury” coding (as opposed to the full set of Injury Status data codes in MMUCC version 4)
 - c. Other (Describe): _____
13. Does your State crash database allow you to identify injuries involving pedestrians or pedalcyclists as defined in ANSI D16.1-2007? (Select one)
- a. Yes
 - b. No: If no, please explain what is needed to achieve consistency with ANSI D16.1-2007 (e.g. convert existing data, change data collection practices, etc.)
14. Have available MPA VMT estimates been verified to (1) make use of data reported in HPMS, (2) be consistent with the state’s HPMS data for the MPO’s UZA(s) and (if applicable) National Ambient Air Quality Standards (NAAQS) areas? MPO VMT Data – Uniformity (Select one)²
- a. None of the MPA VMT estimates have been verified to meet these criteria
 - b. All of the MPA VMT estimates have been verified to meet these criteria
 - c. Some of the MPA VMT estimates have been verified to meet these criteria
15. Are available MPA VMT estimates based on an “a documented statistically valid procedure based on monitored traffic” – as described in the Traffic Monitoring Guide³ and other available guidance for air quality conformity analysis and HPMS? MPO VMT Data – Uniformity (Select one)
- a. None of the MPA VMT estimates have been verified to meet this criterion
 - b. All of the MPA VMT estimates have been verified to meet this criterion
 - c. Some of the MPA VMT estimates have been verified to meet this criterion

² See information at: https://www.fhwa.dot.gov/planning/processes/tools/technical_guidance/index.cfm.

³ <https://www.fhwa.dot.gov/policyinformation/tmguide/>

AREA 2: DATA ANALYSIS TOOLS AND USES

- **Background Questions**
- **Element 2A: Network Screening (Data)**
- **Element 2A: Network Screening (Method)**
- **Element 2A: Network Screening (Coverage)**
- **Element 2B: Diagnosis**
- **Element 2C: Countermeasure Selection**
- **Element 2D: Evaluation**
- **Element 2E: Accessibility**

AREA 2: DATA ANALYSIS

Background Questions

1. For which of the following roadways are crash data available for analysis? (Check all that apply)
 - a. All State-maintained roadways.
 - b. All publicly-owned non-State-maintained roadways (includes county and local/municipality roads).
 - c. A portion of State-maintained roadways.
 - d. A portion of owned by local government agencies.
 - e. A portion of roadways on federal lands
 - f. A portion of roadways on Tribal lands

2. Does the State have a formal road safety management process? (Select one)
 - a. No.
 - b. Yes. Provide documentation:

3. How often does the State conduct a network screening? (Select one)
 - a. Never.
 - b. Periodically (please specify).
 - c. Annually.

Area 2 Data Analysis – Background Questions

4. Please indicate in the table below what data analysis tools and resources you are using for network screening, countermeasure selection, and evaluation? (Check all that apply)

Data Analysis Tools	DATA ANALYSIS PROCEDURES		
	Network Screening	Countermeasure Selection	Evaluation
Agile Assets Safety Analyst			
Highway Safety Manual			
AASHTOWare Safety Analyst			
Interactive Highway Safety Design Model*			
CMF Clearinghouse			
FHWA Systemic Safety Project Selection Tool			
HPMS/ARNOLD			
Numetric			
usRAP			
Other (please specify)			

5. Please indicate in the table below which roadway characteristics are available for mainline road segments, and for which roadway types they are available.

**Indicate if the statistics are available for all, most, some or none of the roadway types in the columns*

DATA TYPE	ROADWAY TYPE	
	State (All, Most, Some, None) ⁴	Local/Federal/Tribal (All, Most, Some, None)
Number of lanes per direction		
Location of access points (e.g., drives)		
Median type		
Median width		
Posted speed		
Area type (e.g., urban, suburban, rural)		
Adjacent land use		
Curvature (e.g., curve/tangent, degree of curve)		
Grade		
Traffic volume (MIRE FDE)		
ITS Devices		

⁴ In some States, the dividing line for different treatment of locations is not based on ownership / jurisdiction but on whether the location is Federal Aid eligible or not. If that is the case for your State, please make a note that the answers in the table correspond to FA-eligible versus non-FA-eligible. This note may apply to questions 5-9, or a subset thereof.

6. Please indicate in the table below which roadway statistics are available for **intersections**, and for which roadway types they are available.

**Indicate if the intersections statistics are available for all, most, some or none of the roadway types in the columns*

DATA TYPE	ROADWAY TYPE	
	State (All, Most, Some, None)	Local/Federal/Tribal (All, Most, Some, None)
Traffic control (e.g., signalized, two-way stop control, yield, etc.)		
Number of approaches (e.g., 3-legged or 4-legged)		
Cross-section by approach (e.g., number of through/turn lanes)		
Functional classification		
Area type		
Traffic volume (MIRE FDE)		
Turning movement counts		
Posted speed		
Location of access points (e.g., drives)		
Adjacent land use		
Median presence		
Observed crash rates		
Average crash rates		

7. Please indicate in the table below which roadway statistics are available for **ramp and ramp terminals**, and for which roadway types they are available.

**Indicate if the ramp and ramp terminal statistics are available for all, most, some or none of the roadway types in the columns*

DATA TYPE	ROADWAY TYPE	
	State (All, Most, Some, None)	Local/Federal/Tribal (All, Most, Some, None)
Interchange type (e.g., diamond, cloverleaf, etc.)		
Traffic control at ramp terminal (e.g., signalized, two-way stop control, yield, etc.)		
Cross-section		
Functional classification		
Area type		
Adjacent land use		
Posted speed		
Traffic volume		
Curvature		
Grade		

8. Please indicate in the table below which roadway statistics are available for **at-grade rail crossings**, and for which roadway types they are available.

**Indicate if the at-grade rail crossing statistics are available for all, most, some or none of the roadway types in the columns.*

DATA TYPE	ROADWAY TYPE	
	State (All, Most, Some, None)	Local/Federal/Tribal (All, Most, Some, None)
Type of crossing (e.g., active or passive)		
Number of roadway lanes		
Number of tracks		
Functional classification of roadway		
Area type		
Adjacent land use		
Traffic volume on roadway		
Number of trains per day		
Roadway curvature		
Roadway grade		

Element 2A: Network Screening (Data)

1. Which of the following data are available on all public roads tied to individual road segments or intersections for network screening? (Check all that apply)
 - a. Crash data.
 - b. Roadway inventory data.
 - c. Traffic data (motor vehicle, pedestrian, bicycle, trucks, etc.).
 - d. Citation data.
 - e. Hospital records (injury outcome) data.
 - f. Other (please specify) - vehicle registrations, driver license, CMVs. _____
 - g. ITS Data
 - h. Programmed projects

2. Which of the following best describes the network screening process? (Select one)
 - a. A list of locations in order by crash frequency or rate using traffic volume. Road segments are considered as one large group. No differentiation by roadway type.
 - b. A list of locations in order by crash frequency or rate using traffic volume. Road segments are ranked within specific types or functional classifications (e.g., interstates, major arterials) so that each segment is compared only to similar roadway locations.
 - c. A list of locations is developed within specified groups of road locations that have similar classification and roadway attributes. For each grouping, a critical rate is calculated using a safety performance function specific to that class or type of roadway location and the network is screened for locations where crashes exceed the critical value..
 - d. Other. Describe:

3. Which stakeholders provide input during the network screening process? (Check all that apply)
 - a. District maintenance.
 - b. District planner.
 - c. District engineer.
 - d. MPO staff
 - e. RPO staff
 - f. Local staff
 - g. Law enforcement
 - h. Public officials
 - i. Governor's Highway Safety office
 - j. General Public
 - k. Other (please specify
 - l. None

Element 2A: Network Screening (Method)

4. Which of the following “networks” can be incorporated into a statewide query by linking crash data and having sufficient data on site characteristics to compare to other sites statewide?
(Check all that apply)
 - a. Mainline road segments.
 - b. Roadway classification (Please specify if based on functional class, facility type, or other classification scheme)
 - c. Corridors.
 - d. Intersections - Signalized.
 - e. Intersections - Unsignalized.
 - f. Ramps.
 - g. Ramp terminals.
 - h. At-grade rail crossings.
 - i. Curves
 - j. Grades
 - k. Other (Please specify)

5. Are you able to generate performance metrics for peer groups for comparison (e.g., average crash rates for certain intersection types)? (Select one)
 - a. No.
 - b. Yes. Please explain.

6. Which of the following performance measures are used in the network screening process?
(Check all that apply)
- a. Average observed crash frequency.
 - b. Crash rate.
 - c. Equivalent property damage only (EPDO) average crash frequency.
 - d. Relative severity index.
 - e. Critical rate.
 - f. Excess predicted average crash frequency using method of moments.
 - g. Level of service of safety.
 - h. Excess predicted average crash frequency using safety performance functions (EB adjustments).
 - i. Probability of specific crash types exceeding threshold proportion.
 - j. Excess proportions of specific crash types (using statistical methods in HSM).
 - k. Expected average crash frequency with empirical Bayes adjustments.
 - l. Equivalent property damage only (EPDO) average crash frequency with empirical Bayes adjustments.
 - m. Excess expected average crash frequency with empirical Bayes adjustments.
 - n. Other

Descriptions of these terms are available in the AASHTO Highway Safety Manual, Part 2, Chapter 4 as well as on page 60 (2-20) of the FHWA HSIP Manual,
<http://safety.fhwa.dot.gov/hsip/resources/fhwasa09029/fhwasa09029.pdf>.

Element 2A: Network Screening (Coverage)

7. Considering the performance measures selected in the previous question, what percentage of roadways does your network screening analysis have the ability to cover? Please complete the table below for each roadway type.

Roadway	Covered (All, Most, Some, None)
State-maintained	
Publicly-owned non-State-maintained ¹	

¹ Includes county, federal, Tribal, and local municipality roads.

8. How extensively is your State using analytical tools for network screening? This is not limited to advanced tools such as AASHTOWare Safety Analyst but may also include any analytical tools that conduct screening, including any developed by the State. (Select one)
- Not using it at all.
 - Using it partially for some State-owned roadways.
 - Using it for all State roads
 - Using it for all State and non-State local roads.

Element 2B: Diagnosis

- Please indicate below which crash statistics can be generated for a specific site or corridor and for which roadway types they are available by filling “all” (every location), “some”, or “none” (not available for any location) in each box.

DATA TYPE	ROADWAY TYPE	
	State-maintained roadways	Publicly-owned non-State-maintained roadways
Crash type		
Crash severity		
Time of crash		
Day of crash		
Date of crash		
Road condition (dry, wet, etc.)		
Lighting condition (light, dark-lit, etc.)		
Weather condition (clear, rain, snow)		
Contributing factors		
Driver impairment		
Driver age		
Pedestrian impairment		
Pedestrian age		
Bicyclist impairment		
Bicyclist age		
Motorcyclist impairment		
Motorcyclist age		
Unique location identifier		
Object hit		
Direction of travel		
Specific location of crash (e.g., within an intersection, on east approach, off the right roadside, etc.)		

2. Does the State have the ability to automatically generate a collision diagram? (Select one)
 - a. No.
 - b. Yes.

3. Does the State have the ability to automatically generate a condition diagram? (Select one)
 - a. No.
 - b. Yes.

4. Is your State using analytical tools for diagnosis? (Select one; if yes, please describe)
 - a. No.
 - b. Yes, partially for some State-owned roadways.
 - c. Yes, for all State roads
 - d. Yes, for all State and non-State local roads.

5. Is a test of proportions used for overrepresented crashes (e.g., comparing an agency's proportion of serious crashes to the statewide proportion)? (Select one)
 - a. No.
 - b. Yes.

Element 2C: Countermeasure Selection

There are no further questions under this section. Relevant information for this section can be obtained from responses to questions in the “Background” section.

Element 2D: Evaluation

1. Does the State maintain a central database of records for roadway safety improvement projects implemented on State roads with locations, dates, and what improvements were implemented? (Select one)
 - a. No.
 - b. Yes, but only for specific site improvements (i.e., spot intersections or specific segments of road)
 - c. Yes, for most specific site improvements and for some systemic (broad scale) improvements
 - d. Yes, for any road safety improvement

2. What types of information are available for completed safety improvement projects? (Check all that apply)
 - a. Project location.
 - b. Construction dates.
 - c. Countermeasure type and details.
 - d. Project cost.
 - e. Crash data.
 - f. Funding source and amount.
 - g. Relation to SHSP emphasis areas and safety programs.
 - h. Information from pre-construction safety performance analyses.
 - i. Photos.

3. How long is the information kept and what form (single database, spreadsheet, paper records, etc.) is the information in?
 - a. Retention period: _____
 - b. Form:

4. Does the State have the ability to link crash data to the safety improvement project site(s) of interest? If so, how many years of historical crash data are available? (Select one)
 - a. No.
 - b. Yes. Number of years available: _____

5. Does the State have the ability to link annual traffic data (ADT or AADT) to the safety improvement project site(s) of interest? If so, how many years of reliable historical traffic volume data are available? (Select one)
 - a. No.
 - b. Yes. Number of years available: _____

6. Are crash data and annual traffic data (ADT or AADT) available for the same set of years? (Select one)
 - a. No.
 - b. Yes.

7. Does the State have the ability to define specific reference or comparison groups (e.g., rural, four-legged, signalized intersections) with associated traffic volume and crash data to be used as non-treatment sites such as an inventory of all other similar sites in the State that did not receive the safety treatment? (Select one)
 - a. No.
 - b. Yes, but it is a manual process to identify attributes or characteristics of each location.
 - c. Yes, and it is automated. Explain:

8. Does the State have the ability to identify non-treatment sites for any/all portions of the network? (Select one)
 - a. No.
 - b. Yes. Specify which portions:

9. Does the State have a method of knowing which sites have had a project within a specific timeframe? (Select one)
 - a. No.
 - b. Yes. Specify:

10. Does the State have the ability to summarize crash/performance statistics based on various criteria defining the comparison site? (Select one)
 - a. No.
 - b. Yes. Specify:

11. What tools and analytic methods does the State use for before-after study (e.g., EB method)?

12. Is the information described in the questions within this element 2D being used to impact decision making? (Select one)
 - a. No.
 - b. Yes, Specify:

Element 2E: Accessibility

Road Inventory Data Accessibility

1. What is the internal process for obtaining roadway inventory data? (Select one)
 - a. Self-service access internal to the agency
 - b. Self-service access external to the agency
 - c. Available on request – formal process in place
 - d. Available on request – no formal process established

2. What is the external process for obtaining roadway inventory data? (Select one)
 - a. Partners (MPOs, other State agencies, etc.)
 - b. Legal/lawyers
 - c. Legislative
 - d. Public

3. Does the State have visualization tools (e.g., internal GIS tool or public GIS portal) for geospatial roadway inventory data? (Select one)
 - a. No.
 - b. Yes.

4. Which of the following safety partners have (or may be allowed with agency approval) direct access (i.e., via internal computer network or internet) to inventory data? (Check all that apply)
 - a. Top-level decision-makers.
 - b. All divisions within DOT.
 - c. Specific divisions within DOT (please specify). _____
 - d. All safety partners outside of DOT, excluding the public.
 - e. Some safety partners outside of DOT, excluding the public (please specify). _____
 - f. Public.

Are there different levels of access to inventory data for these safety partners?

5. For those *not checked in Question 4* (i.e., those that do not have direct access), which of the following safety partners can request and receive access to or information from the State roadway inventory database? (Check all that apply)
- a. Top-level decision-makers.
 - b. All divisions within DOT.
 - c. Specific divisions within DOT (please specify). _____
 - d. All safety partners outside of DOT, excluding the public.
 - e. Some safety partners outside of DOT, excluding the public (please specify). _____
 - f. Public.

Are there different levels of access to inventory data for these safety partners?

6. Does the State have a defined timeline for filling data requests? If so, which of the following best describes the State's policy for filling data requests? (Select one)
- a. No.
 - b. Yes, varies; not managed.
 - c. Yes, policy in place and loosely followed.
 - d. Yes, policy actively managed.
 - e. Yes, real-time response; part of the organization.
 - f. Yes, real-time response with advanced visualization tools and feedback sought.
7. Does the State measure users' satisfaction with data accessibility (e-mail, online satisfaction survey, etc.)? (Select one)
- a. No.
 - b. Yes.
8. Is all necessary documentation available to facilitate data access (e.g., data dictionaries and information about data quality processes)? (Select one)
- a. No.
 - b. Yes. Specify:
9. Has a communication plan (informal or formal) been established to make internal and external partners aware of what data DOT is collecting and what additional data and services DOT would be able to provide as data efforts expand? (Select one)
- a. No.
 - b. Yes.

Other Safety Performance Data Accessibility

10. Do you make available subsets of crash data for particular MPAs? (Select one)
 - a. Yes, to internal agency users of our data systems
 - b. Yes, to both internal agency users and our MPO partners
 - c. We have the capability to produce this data on request but have not yet done so
 - d. We do not currently have the capability to produce this data

AREA 3: DATA MANAGEMENT AND GOVERNANCE

- **Background Questions**
- **Element 3A: Roles and Responsibilities**
- **Element 3B: Policies**
- **Element 3C: Processes**

AREA 3: DATA MANAGEMENT AND GOVERNANCE

Background Questions

1. Which of the following systems operate under a system using relational database management or LRS? (Check all that apply)

	Relational Database Management	LRS
Roadway Inventory Data.		
Traffic Data.		
Crash Data.		
Citation / Adjudication Data.		
Injury Data.		
Driver Data.		
Vehicle Data.		
ITS Data.		

2. Which of the following systems are currently being upgraded or are planned to be created or upgraded in the next two years to a system using relational database management or LRS? (Check all that apply.)

	Relational Database Management	LRS
Roadway Inventory Data.		
Traffic Data.		
Crash Data.		
Citation / Adjudication Data.		
Injury Data.		
Driver Data.		
Vehicle Data.		
ITS Data.		

3. For coordinating data needs among internal agencies, which of the following numbers best describes your efforts: (Select one)

1	<p><i>Agency-Wide:</i> Most data collection efforts in the agency are independent—there has been little or no effort to coordinate across business units. The agency does not have information about the extent of data duplication.</p> <p><i>Program Specific:</i> There have been no efforts to coordinate data collection or management activities with other business units.</p>
2	<p><i>Agency-Wide:</i> The agency has assessed the extent to which there is duplication across data sets within the agency. Opportunities for coordinating data collection and management across business units (e.g., safety and asset management) are periodically discussed, but limited progress has been made.</p> <p><i>Program Specific:</i> Opportunities for coordinating data collection and/or management activities with other business units have been discussed, but no action has been taken.</p>
3	<p><i>Agency-Wide:</i> The agency has implemented a data collection effort involving coordination of more than one business unit (e.g., use of video imagery from pavement data collection to extract data on other assets). The agency has defined metrics to track improvements in data collection and storage efficiency.</p> <p><i>Program Specific:</i> A specific opportunity for coordinated data collection has been identified and is being pursued.</p>
4	<p><i>Agency-Wide:</i> Agency business data owners are encouraged and incentivized to share their data with a broader audience within the agency (where appropriate). Agency business data owners are encouraged and incentivized to plan new data collection initiatives in partnerships with other business units where information needs of multiple units can be simultaneously addressed. The agency monitors progress of efforts to reduce data duplication.</p> <p><i>Program Specific:</i> Data collection is routinely coordinated with one or more other business units.</p>

Area 3 Data Management - Background Questions

5	<p><i>Agency-Wide:</i></p> <p>The agency periodically reviews its data collection programs to identify opportunities to leverage new technologies and externally available data sources.</p> <p>The agency regularly seeks opportunities to minimize or reduce redundancy in data collection, storage, and processing.</p> <p><i>Program Specific:</i></p> <p>New internal agency partnerships on data collection and management are actively sought to achieve economies of scale and make best use of limited staff and budget.</p>
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Reference: NCHRP 814, Element 4 Data Collaboration

4. For coordination of safety data needs among external agencies who share an interest in or need for common sets of data, which of the following numbers best describes your efforts: (Select one)

1	<p><i>Agency-Wide:</i> Individual business units obtain and use publicly available data from external entities as needs and opportunities arise. The agency has acquired single "point-in-time" data sets from external entities.</p> <p><i>Program Specific:</i> Publicly available data from external entities is obtained and used as needs and opportunities arise.</p>
2	<p><i>Agency-Wide:</i> The agency is exploring partnerships with other public- and private-sector organizations to share data on an ongoing basis.</p> <p><i>Program Specific:</i> Partnerships with other public- and private-sector organizations are being explored to share data on an ongoing basis.</p>
3	<p><i>Agency-Wide:</i> The agency has data-sharing agreements with external entities. The agency provides "self-serve" access to data sets of value to external users.</p> <p><i>Program Specific:</i> Data-sharing agreements are in place with external entities. "Self-serve" access is provided to data sets of value to external users.</p>
4	<p><i>Agency-Wide:</i> The agency has sustained partnerships with external entities involving regular update cycles.</p> <p><i>Program Specific:</i> Data-sharing agreements with external entities have been sustained over time (2+ years) and through multiple data update cycles.</p>
5	<p><i>Agency-Wide:</i> The agency routinely seeks new opportunities for data partnerships with external entities. They have designated staff liaison responsibilities for managing the external partnerships.</p> <p><i>Program Specific:</i> New opportunities for data partnerships with external entities are actively sought. Staff liaison responsibilities for managing these external partnerships have been designated.</p>

Reference: NCHRP 814, Element 4 Data Collaboration

Area 3 Data Management - Background Questions

5. Please describe the effectiveness of the process to coordinate safety data needs among agencies. What improvements (if any) do you think are needed?

Element 3A: Roles and Responsibilities

1. Check-off which of the following Roles and Responsibilities matrix in your data management organizational framework are placed at 1) State DOT or 2) Multi-agency group: (Select one for each column)

Describe State DOT program(s) assessed in this question:

Describe Multi-agency group(s) assessed in this question:

		State DOT	Multi-agency group
1	<p><i>Agency-Wide and Program Specific:</i> Accountability for the quality, value, and appropriate use of data has not been clearly established.</p>		
2	<p><i>Agency-Wide:</i> One or more individuals have been identified to lead agency-wide data governance activities. A business lead or point person has been designated for each major data set or application but the responsibilities of the role have not been spelled out.</p> <p><i>Program Specific:</i> A business lead or point person has been designated for each major data set or application but the responsibilities of their role have not been spelled out.</p>		
3	<p><i>Agency-Wide:</i> An agency-wide data governance body has been established with representation from IT and business functions and has defined its charter. Objectives and performance metrics for data governance and stewardship have been defined and documented. Role(s) have been designated to identify points of accountability for data quality, value, and appropriate use—for priority data programs or data subject categories. Decision-making authority has been defined for collection/acquisition of new data, discontinuation of current data collection, and significant changes to the content of existing data. Capabilities and skills for data management are included in staff position descriptions, agency recruiting, and staff development efforts.</p> <p><i>Program Specific:</i> Role(s) have been designated to identify points of accountability for data quality, value, and appropriate use—for priority data programs or data</p>		

	<p>subject categories.</p> <p>Decision-making authority has been defined for collection/acquisition of new data, discontinuation of current data collection, and significant changes to the content of existing data.</p> <p>Capabilities and skills for data management are included in staff position descriptions, agency recruiting, and staff development efforts.</p>		
<p>4</p>	<p><i>Agency-Wide:</i></p> <p>An agency-wide data governance body is active and achieving results recognized as valuable.</p> <p>The agency is successfully identifying and resolving situations where individual business unit interests are in conflict with agency-wide interests related to data collection and management</p> <p>Staff with responsibility for data stewardship and management have sufficient time and training to carry out these responsibilities.</p> <p>Staff with responsibility for data stewardship and management play an active role in defining data improvements and periodically produce reports of progress to their managers.</p> <p><i>Program Specific:</i></p> <p>Staff with responsibility for data stewardship and management have sufficient time and training to carry out these responsibilities.</p> <p>Staff with responsibility for data stewardship and management play an active role in defining data improvements and periodically produce reports of progress to their managers.</p>		
<p>5</p>	<p><i>Agency-Wide:</i></p> <p>A charter for agency-wide data governance body is reviewed periodically and updated based on experience.</p> <p>Stewardship roles are periodically reviewed and refined to reflect new or changing data requirements and implementation of new data systems.</p> <p>Staff with responsibility for data stewardship and management are coordinating with their peers in the agency and with external data partners to deliver best value for resources invested.</p> <p>Data management-related metrics are routinely considered in employee performance reviews.</p> <p><i>Program Specific:</i></p> <p>Stewardship roles are periodically reviewed and refined to reflect new or changing data requirements and implementation of new data systems.</p> <p>Staff with responsibility for data stewardship and management are coordinating with their peers in the agency and with external data partners</p>		

	to deliver best value for resources invested. Data management-related metrics are routinely considered in employee performance reviews.		
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Reference: NCHRP 814, Element 1 Data Strategy and Governance

Executive Level Management

- 2. Is there awareness at the executive level at all agencies of the need for an institutional arrangement or organizational structure to support data governance? (Select one)
 - a. No.
 - b. Yes. Describe:

- 3. Does the data governance body include safety-related data representatives? (Select one)
 - a. No data governance body exists
 - b. No, the data governance body does not include safety-related data representatives.
 - c. Yes, includes some safety-related data representatives.
 - d. Yes, includes most safety-related data representatives.
 - e. Yes, includes all safety-related data representatives (roadway inventory, crash, traffic, injury / CODES, citation, driver).

- 4. Is there a data committee within the DOT that would report to (or coordinate with) the data governance board on safety data? (Select one)
 - a. No, there is no data governance board governing safety data.
 - b. No, there is no DOT-specific group that coordinates with the data governance board.
 - c. Yes, includes some safety-related data representatives (refers to roadway OR traffic OR crash data).
 - d. Yes, includes most safety-related data representatives (refers to roadway AND traffic AND crash data).
 - e. Yes, includes all safety-related data representatives (Refers to answer “c” plus other data).
 - f. N/A, governance board is within the DOT.

- 5. Does the State TRCC serve as the data governance committee? (Select one)
 - a. No.
 - b. Yes.

Traffic Records Coordinating Committee

6. What is the role/responsibility of the TRCC in the State with respect to roadway inventory, traffic volume, and crash data? What is its role/responsibility with respect to other safety data sources? In other words, is the TRCC responsible for the data sets as a committee or does the TRCC defer to specific agencies to manage the data sets?
7. How often does the TRCC meet?
8. Which data subjects are represented on the executive leadership level (if any) and the working level of the TRCC? (Check all that apply)
 - a. Roadway Inventory Data.
 - b. Traffic Data.
 - c. Crash Data.
 - d. Citation / Adjudication Data.
 - e. Injury Data.
 - f. Driver Data.
 - g. Vehicle Data.
 - h. GIS Data.
 - i. Other (please specify)

Safety Data Improvement

9. Have action (or implementation) plans been developed from the Strategic Plan for Traffic Records or any other efforts such as the Crash Data Improvement Program, Roadway Data Improvement Program, NCHRP 814? Please describe.
10. Within any of the safety-data plans, is there a clear strategic vision articulated as an organizing principle for all public roads safety data projects/programs covering crash, roadway, and traffic data? (Select one)
 - a. No.
 - b. Yes, includes some safety-related data (refers to roadway OR traffic OR crash data).
 - c. Yes, includes most safety-related data (refers to roadway AND traffic AND crash data).
 - d. Yes, includes all safety-related data (Refers to answer “c” plus other data).

If yes, please specify the plan (or plans) and provide the relevant vision statement(s)
11. Is there a formal program established to evaluate data sets and identify which data elements are critical for safety analysis? (Select one)

- a. No.
- b. Yes, describe:

12. Is there a formal program to evaluate data systems and applications for inclusion in the safety data program? (Select one)

- a. No.
- b. Yes, describe:

Who is Active in Data Management?

13. Data ownership/stewardship within our organization is assigned by: (Check all that apply)

- a. An enterprise data steward or individual who assigns all responsibilities across our organization
- b. A data management committee that assigns responsibilities across the organization
- c. Individuals within the organization that have responsibility for stewardship as part of their everyday work who then inform the managers of the decisions and policies that have been put in place
- d. Management or a committee who make a final decision as to what policies are put in place after individuals within the organization make recommendations
- e. Other (please specify)

14. How active are data stewards in the State DOT related to safety data management? (Select one)

- a. Continuously seeking improvement.
- b. Independently active with little coordination.
- c. Some limited activity.
- d. Not active.

15. How active are the majority of data stewards at agencies outside of the State DOT related to safety data management? (Select one)

- a. Continuously seeking improvement.
- b. Independently active with little coordination.
- c. Some limited activity.
- d. Not active.

16. Are GIS, IT, and/or business intelligence personnel included in the data governance working groups to address data integration and spatial data components? (Select one)

- a. No.
- b. Yes. Specify:

17. Does the DOT share standards with local agencies to facilitate data integration from local agencies into DOT systems? (Select one)

- a. No.
- b. Yes.

Element 3B: Policies

1. Is there a program or process at the State level to improve the management of safety data?
Which number below best describes your program or process. (Select one)

1	No formal policies and procedures have been defined.
2	Executive leadership has endorsed basic data principles.
3	The scope of data governance has been established. Data classifications have been defined based on importance or need for cross business unit integration. A limited set of data management policies have been adopted for priority data categories. There is a documented procedure and decision-making process for requesting and evaluating new data collection or acquisition requests.
4	A comprehensive set of data management policies has been adopted based on collaboration, including IT, business units, and records management. Processes are in place to monitor and enforce compliance with policies. There is a documented and implemented procedure for requesting and evaluating new data collection or acquisition requests (i.e., the documented procedure is routinely followed).
5	Policies are regularly reviewed and updated based on factors such as awareness/reach, effectiveness, and cost burden

NCHRP 814: Element 1 Data Strategy and Governance 1.3

2. What is the current commitment and strategic planning initiative to maximize value of data to meet agency goals? Choose a number that best describes this commitment. (Select one)

1	<i>State-wide:</i> Data collection and management is performed by individual business units with little or no direction or coordination. Data improvements are not systematically or regularly identified—they are implemented reactively or opportunistically. <i>Program Specific:</i> Data improvements are not systematically or regularly identified—they are implemented on a reactive or opportunistic basis.
2	<i>State-wide:</i> Efforts to implement data governance or assess data needs are being discussed or planned. Data improvement needs are identified and communicated to management informally and efficiently. <i>Program Specific:</i> Data improvement needs are identified and communicated to management informally

<p>3</p>	<p><i>State-wide:</i> Executive leadership has communicated the expectation that business units and IT functions should collaborate on identifying and implementing data improvements of benefit. Data business plans or equivalent planning tools have been prepared to identify short and longer term data collection and management strategies that align with business objectives. Data improvement needs have been systematically reviewed, assessed, and documented.</p> <p><i>Program Specific:</i> Data business plans or equivalent planning tools have been prepared to identify short and longer term data collection and management strategies that align with business objectives. Data improvement needs have been systematically reviewed, assessed and documented.</p>
<p>4</p>	<p><i>State-wide:</i> Leadership regularly communicates and demonstrates active support for data improvements that will lead to improved effectiveness and efficiency. Leadership actively works to facilitate collaboration across business units on data improvements and maintain strong partnerships between IT and business unit managers. Data business plans or equivalent planning tools are regularly updated. A regular process of data needs assessment is in place and is used to drive budgeting decisions.</p> <p><i>Program Specific:</i> Data business plans or equivalent planning tools are regularly updated. A regular process of data needs assessment is in place and is used to drive budgeting decisions.</p>
<p>5</p>	<p>Data governance and planning activities are continually refined to focus on key risks and opportunities and eliminate activities without demonstrated payoff. Data governance and planning activities have a high probability of continuing through changes in executive leadership.</p>

3. Is there a data catalog with data definitions, standards, policies, and procedures for the collection and use of data available electronically in the organization and is it accessible to users? (Select one)
 - a. No.
 - b. Yes. Describe for which data types:

4. Has a data business plan or equivalent formal plan been developed to guide management of strategic safety data programs? (Select one)
 - a. No.
 - b. Yes.

5. Are safety data stakeholders consulted when the annual data collection plan is being updated? (Select one)
 - a. No.
 - b. Yes.
 - c. N/A: no such plan exists.

6. Is there coordination between the data governance group, data stewards, and other stakeholders, as needed? (Select one)
 - a. No.
 - b. Yes.

7. Ownership/stewardship within our organization is tied to the data based on the type of data that is being managed? (Select one)
 - a. No.
 - b. Yes.

8. Where one is designated, the data steward (or data owner) has control over: (check all that apply)
 - a. Master Data
 - b. Transactional Data
 - c. Reference Data
 - d. Metadata
 - e. Historical data
 - f. Temporal data
 - g. Other (please specify)

Element 3C: Processes

1. Which data systems have one or more standard business rules? (Check all that apply)
 - a. Roadway Inventory Data.
 - b. Traffic Data.
 - c. Crash Data.
 - d. Citation / Adjudication Data.
 - e. Injury Data.
 - f. Driver Data.
 - g. Vehicle Data.
 - h. Other (please specify). _____

2. Which of the following types of data have one or more coded business rules that can be automatically applied to check data quality, restrict data access, and perform consistent calculations and transformations? (Check all that apply)
 - a. Roadway Inventory Data.
 - b. Traffic Data.
 - c. Crash Data.
 - d. Citation / Adjudication Data.
 - e. Injury Data.
 - f. Driver Data.
 - g. Vehicle Data.
 - h. ITS Data.
 - i. Other (please specify). _____

3. Which standards, documentation, and communication protocols are applied to the roadway inventory data? (Check all that apply)
 - a. Data Definitions.
 - b. Data file structures or database schemas.
 - c. Formats used for data exchange.
 - d. Frequency of publication of data updates.
 - e. Processes to secure the transmission of confidential data and information.

4. Which number best describes your maintenance cycle for the process and access of roadway data? (Select one)

Describe	<p>program(s) assessed in this question: Updating cycles have been established but have not been documented.</p>
3	<p><i>Agency-Wide and Program Specific:</i> Updating cycles have been documented. Business rules have been defined for how key data entities are added, updated, and deleted.</p>
4	<p><i>Agency-Wide and Program Specific:</i> Updating cycles are being consistently followed. Business rules for data updating are embedded in and enforced by applications (where applicable).</p>
5	<p><i>Agency-Wide and Program Specific:</i> Data updating methods are periodically reviewed to identify opportunities for improved efficiencies.</p>

NCHRP 814 Element 2: Data Life Cycle Management 2.1

5. Which number in the list below best describes guidelines and procedures for protecting data assets? (Select one)

Describe program(s) assessed in this question:

1	<p><i>Agency-Wide:</i> There may be important data sets managed using desktop applications within individual business units, but these have not been systematically identified. Each business unit is responsible for ensuring that its data sets are backed up and periodically archived to enable future retrieval and use.</p> <p><i>Program Specific:</i> Backups of data sets are made ad hoc.</p>
2	<p><i>Agency-Wide:</i> Several of the agency's important data sets are managed using desktop applications (e.g., spreadsheets) but plans are in process to bring these into enterprise databases. Data owners receive informal (unwritten) guidance regarding frequency and storage locations for backups and archive copies.</p> <p><i>Program Specific:</i> Backups of data sets are made regularly, but there are no written procedures on backup frequency or storage locations. Archive copies of data sets exist, but there are no written procedures on how to create these and how to retrieve them.</p>
3	<p><i>Agency-Wide:</i> Several of the agency's important data sets are managed using desktop applications (e.g., spreadsheets) but plans are in process to bring these into enterprise databases. Data owners receive informal (unwritten) guidance regarding frequency and storage locations for backups and archive copies.</p> <p><i>Program Specific:</i> Backups of data sets are made regularly, but there are no written procedures on backup frequency or storage locations. Archive copies of data sets exist, but there are no written procedures on how to create these and how to retrieve them.</p>
4	<p><i>Agency-Wide:</i> All of the agency's important data sets are managed within enterprise databases (e.g., Oracle, SQL Server) and regular backups are made. Backup procedures are consistently followed. Archiving procedures are consistently followed. Backup procedures have been fully tested. Archiving procedures have been fully tested.</p>

	<p><i>Program Specific:</i> Backup procedures are consistently followed. Archiving procedures are consistently followed. Backup procedures have been fully tested. Archiving procedures have been fully tested.</p>
5	<p><i>Agency-Wide and Program Specific:</i> Data managers and stewards periodically review existing data backup and archiving procedures and update them as appropriate to reflect user feedback or changing needs.</p>

NCHRP 814 Element 2: Data Life Cycle Management 2.4

6. Which number in the list below best describes management of geospatial data? (Select one)

1	<p>The agency does not provide enterprise-wide planning and support for management and integration of geospatial data. Management of geospatial data is not integrated with other agency data management and IT functions.</p>
2	<p>The agency has designated responsibilities for enterprise-wide planning and support for managing geospatial data. The agency manages a collection of spatial data sets and makes them available for internal use.</p>
3	<p>The agency has written policies and standards defining how geospatial data is to be collected, stored, managed, shared, and integrated with non-spatial data attributes. The agency considers spatial data in their IT strategic plan (or equivalent) that identifies investment needs and priorities for hardware, software, and data. The agency has identified data entities that should have standard location referencing.</p>
4	<p>The agency has a well-understood and functioning process for collecting, adding, and updating geospatial data sets. The agency has a standard approach to assigning spatial location to key data entities (e.g., construction projects and assets.) Training and support is provided to ensure adherence to adopted policies and standards for geospatial data collection and management and to build skills in spatial data analysis.</p>
5	<p>Spatial data collection, management, and visualization requirements are fully integrated within the agency's IT and data management planning and operational functions. The agency periodically reevaluates and updates its approach to geospatial data management to reflect changes in technology, data availability and cost, and user requirements.</p>

NCHRP 814 Element 2: Data Architecture and Integration 3.2

7. Describe procedures and policies in place to manage sensitive data:
8. Does the agency use any software tools to calculate safety performance measures and compare to safety performance metrics/targets? (Select one)
 - a. No.
 - b. Yes.
9. Do both internal (agency) and external safety stakeholder share access to the same safety performance data and displays (maps, etc.)? (Select one)
 - a. No
 - b. Yes
10. Which of the following tools is the agency most interested in developing (or expanding) to improve safety data management and analysis? Please do not check existing tools that are satisfactory as is. (Check all that apply)
 - a. Enterprise Geospatially Enabled data warehouse.
 - b. Business intelligence (including GIS).
 - c. Data repositories.
 - d. Data dictionaries
 - e. Data cleansing / Data standardization.
 - f. None of the above.
11. What role does the Information Technology (IT) staff/department play in selecting or improving the various tools for safety data management and analysis? (Select one)
 - a. IT has no role in selection or improvement.
 - b. IT has an advisory role only.
 - c. IT has a significant role, but the business units make the selections and fund the purchases/contracts.
 - d. IT has the primary decision-making role
12. Which of the following do you find challenging to manage and track change? (check all that apply)
 - a. Data security
 - b. Data models
 - c. Data definitions
 - d. Data structures
 - e. Data transfers
 - f. The structure of metadata repositories
 - g. Type of metadata included in a metadata repository
 - h. Stewardship responsibilities

i. None of the above

AREA 4: INTEGRATION

- **Element 4A: Integration**
- **Element 4B: Expandability**
- **Element 4C: Spatial Data Integration**

AREA 4: INTEGRATION

Element 4A: Integration

1. Which best describes your State's ability to support an analysis associating roadway attributes (geometrics) with crash frequency? (Select one)
 - a. We are constrained by timeliness of crash data availability
 - b. We are constrained by the availability of roadway data characteristics
 - c. We can map roadway characteristics and crashes in separate layers or as events using GIS, LRS, or other methodology.
 - d. We could easily produce an analysis for State-maintained roads only.
 - e. We could easily produce an analysis for all public roads.

2. Which best describes your State's ability to support analysis linking crash types to roadway features (e.g., identifying locations with a propensity for rollovers, run-off-road crashes, or other) and then analyzing the network for similar locations based on similarity of roadway attributes? (Select one)
 - a. We have not considered this type of analysis.
 - b. We are not interested in this type of analysis.
 - c. We are interested in this type of analysis but are unable to conduct it at this time due to a lack of data.
 - d. We formerly conducted this kind of analysis but decided not to continue.
 - e. We are in the process of developing this capability.
 - f. We have a system in place and regularly conduct this type of analysis.

3. Which best describes your State's ability to support an analysis of the consequences of crashes from a health perspective, incorporating information on roadway locations, types of roadways/attributes, and medical treatments (EMS, trauma care, in-patient billing, etc.)? (Select one)
 - a. We have not considered this type of analysis.
 - b. We are not interested in this type of analysis.
 - c. We are interested in this type of analysis but are unable to conduct it at this time due to a lack of data.
 - d. We were a CODES State and formerly conducted this kind of analysis but we no longer have CODES or similar analytic capabilities.
 - e. We are in the process of developing this capability.
 - f. We have a system in place (including CODES or CODES-like systems) and regularly conduct this analysis.

4. Which best describes your State's ability to support analysis linking the safety-related enforcement activities (citations/arrests) and crashes with roadway features/attributes or locations by type? (Select one)
 - a. We have not considered this type of analysis.
 - b. We are not interested in this type of analysis.
 - c. We are interested in this type of analysis but are unable to conduct it at this time due to a lack of data.
 - d. We formerly conducted this kind of analysis but decided not to continue.
 - e. We are in the process of developing this capability.
 - f. We have a system in place and regularly conduct this analysis.
 - g. We are interested in this type of analysis but are unable to conduct it at this time due to confidentiality issues

5. Which best describes your State's ability to support analysis linking driver characteristics and safety/conviction history with roadway features/attributes or locations by type? (Select one)
Please explain:
 - a. We have not considered this type of analysis.
 - b. We are not interested in this type of analysis.
 - c. We are interested in this type of analysis but are unable to conduct it at this time due to a lack of data.
 - d. We formerly conducted this kind of analysis but decided not to continue.
 - e. We are in the process of developing this capability.
 - f. We have a system in place and regularly conduct this analysis.

6. Are there efforts to establish relationships with local agencies to determine what data are currently in existence? (Select one)
 - a. Yes
 - b. No

Element 4B: Expandability

1. Which best describes your State's current level of roadway data integration? (Select one)
 - a. We have “stovepipe”/ “silo” systems with no integration.
 - b. Our systems are running on multiple platforms and difficult to integrate.
 - c. Some of our systems share a common platform and are integrated.
 - d. Most of our systems share a common platform and are integrated.
 - e. We have a fully integrated statewide enterprise system for highway safety analysis for all public roads.

2. Which best describes your State's interactions with local or regional jurisdictions in the State with respect to roadway inventory data? (Select one)
 - a. We have little interaction with other jurisdictions other than some planning with MPOs.
 - b. We send data to jurisdictions who ask us for it.
 - c. If we need data on local roadways, we gather it ourselves instead of relying on another jurisdiction to use our data collection protocols.
 - d. We provide our roadway-related data about a jurisdiction to that jurisdiction when their data change.
 - e. When streets are added or the city limits changes, a city will send us an update to use for our roadway-related databases.
 - f. All transportation agencies in the State use the same software for roadway inventory management and trade data on a regular basis.

3. What would it take to add a new data element (e.g., a new roadway inventory attribute not previously included in the database) across State and local roadway data systems?

4. Which best describes your State's ability to modify the data structure of statewide databases maintained by the DOT? (Select one)
 - a. We have little or no capability for modification.
 - b. We can only expand a limited number of our databases, or only in limited ways.
 - c. We can expand some of the databases, but many would be problematic.
 - d. We can expand most databases, but some would be a problem.
 - e. We can expand easily.

5. We have business rules as to how to request and implement changes. (Select one)
 - a. Yes
 - b. No

6. Which best describes your State's current ability to conduct spatial analysis? (Select one)
 - a. We do not have GIS mapping capabilities for safety analysis.
 - b. Our capabilities are limited to visualization of only one or two data layers at a time, with no analytic capabilities.
 - c. Our GIS is primarily a visualization tool allowing us to display multiple layers of data on a single map.
 - d. Our GIS is very powerful supporting multiple types of statistical analysis of spatial data and the safety management data analysis processes we use.

7. Which best describes your State's ability to conduct spatial analysis one year from now? (Select one)
 - a. We will not have GIS mapping capabilities for safety analysis.
 - b. Our capabilities will be limited to visualization of only one or two data layers at a time, with no analytic capabilities.
 - c. Our GIS will primarily be a visualization tool allowing us to display multiple layers of data on a single map.
 - d. Our GIS will be very powerful supporting multiple types of statistical analysis of spatial data.

8. Which describes your data systems' abilities to support state-of-the-art analyses as described in the *Highway Safety Manual* and using tools listed here (https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/ddsa_resources/)? (Select one)
 - a. We haven't evaluated our ability to support analyses at that level.
 - b. Our data systems are not at the level needed to support those analyses.
 - c. Some of our data systems would easily support state-of-the-art analysis, but many would not. Specify:
 - d. Most of our systems would support that level of analysis, but some would not. Specify:
 - e. Our systems are in good shape to support state-of-the-art analysis.

Element 4C: Spatial Data Integration

Road Inventory Data Linkages in Support of Data Integration

1. How are locations coded for *State-maintained and local roadways* in the roadway inventory? (Select one)
 - a. We use street names only for all roads.
 - b. We have a linear referencing system for State-owned roadways only.
 - c. We have linear referencing (which includes GIS capability) for State-owned roadways only.
 - d. We have linear referencing for all public roadways.
 - e. We have linear referencing and GIS mapping for all public roadways.
 - f. Other, Explain:

2. What percentage of *all* crash report locations are assigned a valid location code (after all automated and manual processes) that is identical to the location code used in the roadway inventory file? (Select one)
 - a. 0-20%.
 - b. 21-40%.
 - c. 41-60%.
 - d. 61-80%.
 - e. 81-100%.

3. What percentage of crash location codes are assigned automatically? (Select one)
 - a. 0-20%.
 - b. 21-40%.
 - c. 41-60%.
 - d. 61-80%.
 - e. 81-100%.

4. What percentage of automatically assigned codes require manual location adjustment due to errors? (Select one)
 - a. 0-20%.
 - b. 21-40%.
 - c. 41-60%.
 - d. 61-80%.
 - e. 81-100%.

5. Has a formal data collection plan for data elements, which includes prioritization of data elements required for enhanced safety analysis been developed? (Select one)

Note: these data elements may include: Sign inventory, Signal inventory, Lighting, Guardrail, Speed limit, Driveway density

- a. Yes
- b. No

Other Safety Performance Data Linkages

6. Are you able to produce extracts of crash data for a particular MPA or UZW as of a specific year in the past? (Select one)

- a. Yes
- b. No
- c. Partially (please explain:)

AREA 5: SAFETY PERFORMANCE MANAGEMENT

- **Element 5A: Performance-Based Planning and Programming**
- **Element 5B: Interagency Coordination**

AREA 5: SAFETY PERFORMANCE MANAGEMENT

Element 5A: Performance Based Planning and Programming

1. Which of the following best describes your agency’s current capability for establishing evidence-based, data driven safety performance targets? (Select one):
 - a. An approach to establishing evidence-based safety performance targets is currently under development.
 - b. We have developed an approach involving review of baseline and trend data, examination of external factors that may influence future target achievement, and feasibility analysis – but have not yet applied this approach.
 - c. We have applied our evidence-based approach to establish targets and have gained internal agency approval for these targets. We have reviewed our targets against actual performance achieved and can evaluate factors contributing to target achievement (or lack thereof.)
 - d. Our evidence-based approach has been successfully applied for multiple cycles of target setting and is periodically reviewed and refined to reflect influencing factors and risks.

2. Which of the following analysis capabilities do you currently have or plan to develop in support of performance target setting (check all that apply):

	Current Capability	Under Development	Planned Future Development
a. Capability to <i>graph trends</i> in 5 year rolling averages for the five national safety performance measures (number of fatalities, fatality rate, number of serious injuries, serious injury rate, number of non-motorized fatalities and serious injuries)			
b. Capability to <i>analyze trends</i> to diagnose causal factors behind the trends			
c. Capability to access and review pertinent data on external factors likely to impact future safety performance, including but not limited to: socioeconomic data (population, demographics, jobs, etc.), VMT, revenues.			

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	Current Capability	Under Development	Planned Future Development
d. Capability to predict the impact of planned and programmed HSIP projects on future safety performance.			
e. Capability to predict the impact of planned and all programmed STIP and/or TIP projects (other than those in the HSIP) on future safety performance.			
f. Basic scenario analysis capability – ability to estimate future safety performance for different sets of projects			
g. Advanced scenario analysis capability – ability to estimate future safety performance for different sets of projects and program elements + varying assumptions about external factors			
h. Other (Describe):			

3. Which of the following practices do you currently employ or plan to implement to strengthen performance-based planning and programming decisions? (Check all that apply)

	Current Practice	Implementation in Progress	Planned Future Practice
a. Use estimates of projected impacts on safety performance measures to prioritize/select HSIP projects			
b. Use estimates of projected impacts on safety performance measures to prioritize/select HSIP elements			

Area 5 Safety Performance Management – Planning and Programming

	Current Practice	Implementation in Progress	Planned Future Practice
c. Use estimates of projected impacts on safety performance measures to prioritize/select STIP and/or TIP projects			
d. Use scenario analysis to set targets and allocate available funds across different program areas based on estimated impacts of varying investment levels on safety performance			
e. Use results of Before/After analysis to improve future projections of safety performance impacts for candidate projects			
f. Involve safety stakeholders representing the 4E's (education, enforcement, engineering and emergency response) in evaluation of the LRTP and STIP and/or TIP			
g. Other (Describe):			

Element 5B: Coordination

1. How far along is your State on implementing a coordinated approach for safety performance measure target setting and reporting? (Select one)
 - a. The need for coordination across agencies with respect to target setting and reporting is not yet well understood; discussions on coordination have not yet been initiated.
 - b. Discussions among partner agencies on coordination of targets and reporting are underway.
 - c. Basic decisions have been made about whether MPOs will set separate targets, and whether there will be separate targets for urban versus rural areas. There is understanding among partner agencies on what type of coordination is needed, and what coordination processes will be followed for target setting and reporting, but no formal agreements are in place.
 - d. Processes for coordinated target setting and performance reporting have been formally documented and agreed-to.
 - e. Processes for coordinated target setting and performance reporting have been refined or improved based on initial experience.

2. In what ways do you plan to coordinate on collection, management and reporting of safety performance data? (check all that apply)

	Current Practice	Implementation in Progress	Planned Future Practice
a. State DOT and SHSO share a single source database for all required data elements for HSIP and HSP			
b. State DOT and SHSO use the same consultant or data analysts for production of reports for HSIP and HSP			
c. State DOT provides access to data system and reports that MPOs can use to produce reports			
d. State DOT provides data export to MPOs for use in producing reports			
e. Other (Describe):			

FOLLOW-UP QUESTIONS

1. Do you agree that the level assigned to your State is consistent with your *ability*?
2. The CMM defines five capability maturity levels as follows:

(1) Initial / Ad hoc: The organization does not possess a stable implementation environment and the safety data collection, management (entering/coding, processing, and evaluating) and maintenance process is 'ad hoc' with no interconnection within the organization. Interoperability and expandability are not planned.

(2) Repeatable: Activities are based on the results of previous projects and the demands of the current one. Decisions are considered during individual projects.

(3) Defined: The process is documented throughout the organization rather than on a per-project basis. Projects are carried out under guidance of the organization's standards and are tied to an adopted strategy.

(4) Managed: Projects are started and supervised by process management. Through performance management, processes are predictable and the organization can develop rules and conditions regarding the quality of the products and processes.

(5) Optimizing: The whole organization is focusing on the continuous improvement. The organization possesses the means to detect weaknesses and to strengthen areas of concern proactively.

To what level would you assign your State (overall and for each Area) if the questions represented your *actual practices* rather than *desired practice*?

- a. Overall:
- b. Roadway Data Collection/Technical Standards:
- c. Data Analysis Tools and Uses:
- d. Data Management and Governance:
- e. Data Integration and Expandability:

3. What level would you like to be at overall and for each area?
 - a. Overall:
 - b. Roadway Data Collection/Technical Standards:
 - c. Data Analysis Tools and Uses:
 - d. Data Management and Governance:
 - e. Data Integration and Expandability:

4. What are the non-financial challenges/barriers preventing you from reaching that level?

5. What kinds of assistance (webinar, in-person training, web links, etc.) should FHWA be providing to stakeholders to assist with the collection, use, and expansion of roadway safety data and data capabilities? (Check all that apply)
 - a. Assistance for Collection of Data (Specify):
 - b. Assistance for Use of Data (Specify):
 - c. Assistance for Expansion of Data (Specify):

6. What kinds of problems are you having with policies or processes at the State or Federal level that make it difficult to collect, use or expand roadway safety data and data capabilities? (Check all that apply)
 - a. Problems with Collection of Data (Specify):
 - b. Problems with Use of Data (Specify):
 - c. Problems with Expansion of Data (Specify):

7. What non-financial resources such as tools, guidance, training etc., would be beneficial to you to collect, use, or expand roadway safety data and data capabilities? (Check all that apply)
 - a. Resources for Collection of Data (Specify):
 - b. Resources for Use of Data (Specify):
 - c. Resources for Expansion of Data (Specify):

8. Is there anything else you would like to share with FHWA, or the highway safety community that you think would be beneficial to improving the collection, usage, or expansion of roadway safety data and data capabilities?

APPENDIX A: FOR IT PROFESSIONAL

Appendix A is an extended list of questions of Area 3, which focuses on questions related to IT professionals.

Area 3: Data Management and Governance

Element 3A: Roles and Responsibilities

1. Are communities of interest (both internal working groups and external stakeholders) defined and active? (Select one)
 - a. No.
 - b. Yes. Specify:

2. Are business users active in data strategies and delivery? (Select one)
 - a. No.
 - b. Yes. Specify:

3. Does a data quality group work directly with safety data stewards, application developers, and database administrators to address quality issues and/or concerns? (Select one)
 - a. No.
 - b. Yes. Specify:

4. Do data stewards work directly with cross-functional teams to enact data quality standards? (Select one)
 - a. No.
 - b. Yes. Specify:

5. Are data stewards identified so that all organizational staff know who they are? (Select one)
 - a. No.
 - b. Yes.

6. Are data quality and data integration tools standardized across the organization? (Select one)

- a. No.
 - b. Yes.
7. Do all aspects of the organization use standard business rules created and maintained by designated data stewards? (Select one)
- a. No.
 - b. Yes.

Element 3B: Policies

1. Are there any rules or processes built for data governance? (Select one)
 - a. No.
 - b. Yes.

2. Is there a Data Business Plan to support the data management of the following databases?
(Check all that apply)
 - a. Roadway Inventory Data.
 - b. Traffic Data.
 - c. Crash Data.
 - d. Citation / Adjudication Data.
 - e. Injury Data.
 - f. Driver Data.
 - g. Vehicle Data.
 - h. Provide a link to your data business plan:

3. Are new initiatives only approved after careful consideration of how the initiatives will affect the existing data infrastructure? (Select one)
 - a. No.
 - b. Yes. Specify:

4. If yes to 3, is there a formal business process to request a change to the Data Business Plan?
(Select one)
 - a. No.
 - b. Yes. Please specify:

5. Are policies in place to ensure that data remains consistent, accurate, and reliable throughout the enterprise? (Select one)
 - a. No.
 - b. Yes. Specify:

6. Have data management goals shifted from problem correction to prevention? (Select one)

- a. No.
 - b. Early Progress
 - c. Significant Progress
 - d. Complete
7. Are real-time preventive data quality rules and processes in place? (Select one)
- a. No.
 - b. Early Progress.
 - c. Significant Progress.
 - d. Complete.
8. Do data quality metrics provide insight into areas needing improvement? (Select one)
- a. No.
 - b. Yes. Specify:
9. Has the State DOT developed and published a Data Governance manual or handbook that identifies the roles and responsibilities of staff in the State DOT to support data governance operations? (Select one)
- a. No.
 - b. Yes. Specify (and provide link to a copy):
10. Has the State IT department developed and published a Data Governance manual or handbook that identifies the roles and responsibilities of staff to support data governance operations? (Select one)
- a. No.
 - b. Yes. Specify (and provide link to a copy):
11. Are most data management processes short-range and focused on recently discovered problems? (Select one)
- a. No.
 - b. Yes.
12. What planned long-range processes for data governance are being pursued?

Element 3C: Processes

1. Are data continuously inspected? (Select one)
 - a. No.
 - b. Yes.
2. If yes, are deviations from standards are resolved immediately? (Select one)
 - a. No.
 - b. Yes.
3. What are some of the data checks (i.e. manual procedures, electronic files)?
4. Are there other business rules that dictate formal data governance framework? (Select one)
 - a. No.
 - b. Yes. Please specify:
5. Does ongoing data monitoring help the data stewards maintain data integrity? (Select one)
 - a. No.
 - b. Yes.
6. Do the data models capture the business meaning and technical details of all corporate data elements? (Select one)
 - a. No.
 - b. Yes. Please specify:
7. Are data definitions, business rules, and data quality standards available to authorized users of the data? (Select one)
 - a. No.
 - b. Yes.

APPENDIX B: MIRE ELEMENT WORKSHEET

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
I. Roadway Segment				
1. County Name				
2. County Code				
3. Highway District				
4. Type of Governmental Ownership ^{FDE}				
5. Specific Governmental Ownership				
6. City/Local Jurisdiction Name				
7. City/Local Jurisdiction Urban Code				
8. Route Number ^{FDE}				
9. Route/Street Name ^{FDE}				
10. Begin Point Segment Descriptor ^{FDE}				
11. End point Segment Descriptor ^{FDE}				
12. Segment Identifier ^{FDE}				
13. Segment Length ^{FDE}				
14. Route Signing				
15. Route Signing Qualifier				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
16. Coinciding Route Indicator				
17. Coinciding Route – Minor Route Information				
18. Direction of Inventory ^{FDE}				
19. Functional Class ^{FDE}				
20. Rural/Urban Designation ^{FDE}				
21. Federal Aid ^{FDE}				
22. Route Type ^{FDE}				
23. Access Control ^{FDE}				
24. Surface Type ^{FDE}				
25. Total Paved Surface Width				
26. Surface Friction				
27. Surface Friction Date				
28. International Roughness Index (IRI)				
29. Pavement Roughness Date				
30. Pavement Condition (Present Serviceability Rating)				
31. Pavement Condition (PSR) Date				
32. Number of Through Lanes ^{FDE}				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
33. Outside Through Lane Width				
34. Inside Through Lane Width				
35. Cross Slope				
36. Auxiliary Lane Presence/Type				
37. Auxiliary Lane Length				
38. HOV Lane Presence/Type				
39. HOV Lanes				
40. Reversible Lanes				
41. Presence/Type of Bicycle Facility				
42. Width of Bicycle Facility				
43. Number of Peak Period Through Lanes				
44. Right Shoulder Type				
45. Right Shoulder Total Width				
46. Right Paved Shoulder Width				
47. Right Shoulder Rumble Strip Presence/Type				
48. Left Shoulder Type				
49. Left Shoulder Total Width				
50. Left Paved Shoulder Width				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
51. Left Shoulder Rumble Strip Presence/Type				
52. Sidewalk Presence				
53. Curb Presence				
54. Curb Type				
55. Median Type ^{FDE}				
56. Median Width				
57. Median Barrier Presence/Type				
58. Median (Inner) Paved Shoulder Width				
59. Median Shoulder Rumble Strip Presence/Type				
60. Median Sideslope				
61. Median Sideslope Width				
62. Median Crossover/Left Turn Lane Type				
63. Roadside Clearzone Width				
64. Right Sideslope				
65. Right Sideslope Width				
66. Left Sideslope				
67. Left Sideslope Width				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
68. Roadside Rating				
69. Tapered Edge				
70. Major Commercial Driveway Count				
71. Minor Commercial Driveway Count				
72. Major Residential Driveway Count				
73. Minor Residential Driveway Count				
74. Major Industrial/Institutional Driveway Count				
75. Minor Industrial/Institutional Driveway Count				
76. Other Driveway Count				
77. Terrain Type				
78. Number of Signalized Intersections in Segment				
79. Number of Stop-Controlled Intersections in Segment				
80. Number of Uncontrolled/Other Intersections in Segment				
81. Annual Average Daily Traffic (AADT) FDE				
82. AADT Year ^{FDE}				
83. AADT Annual Escalation Percentage				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
84. Percent Single Unit Trucks or Single Truck AADT				
85. Percent Combination Trucks or Combination Truck AADT				
86. Percentage Trucks or Truck AADT				
87. Total Daily Two-Way Pedestrian Count/Exposure				
88. Bicycle Count/Exposure				
89. Motorcycle Count or Percentage				
90. Hourly Traffic Volumes (or Peak and Off peak AADT)				
91. K-Factor				
92. Directional Factor				
93. One/Two-Way Operations ^{FDE}				
94. Speed Limit				
95. Truck Speed Limit				
96. Nighttime Speed Limit				
97. 85th Percentile Speed				
98. Mean Speed				
99. School Zone Indicator				
100. On-Street Parking Presence				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
101. On-Street Parking Type				
102. Roadway Lighting				
103. Toll Charged				
104. Toll Type				
105. Edgeline Presence/Width				
106. Centerline Presence/Width				
107. Centerline Rumble Strip Presence/Type				
108. Passing Zone Percentage				
109. Bridge Numbers for Bridges in Segment				
II. At-Grade Intersection/Junctions				
110. Unique Junction Identifier ^{FDE}				
111. Type of Intersection/Junction				
112. Location Identifier for Road 1 Crossing Point ^{FDE}				
113. Location Identifier for Road 2 Crossing Point ^{FDE}				
114. Location Identifier for Additional Road Crossing Points				
115. Intersection/Junction Number of Legs				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
116. Intersection/Junction Geometry ^{FDE}				
117. School Zone Indicator				
118. Railroad Crossing Number				
119. Intersecting Angle				
120. Intersection/Junction Offset Distance				
121. Intersection/Junction Traffic Control ^{FDE}				
122. Signalization Presence/Type				
123. Intersection/Junction Lighting				
124. Circular Intersection - Number of Circulatory Lanes				
125. Circular Intersection - Circulatory Lane Width				
126. Circular Intersection - Inscribed Diameter				
127. Circular Intersection - Bicycle Facility				
III. Intersection Leg (Each Approach)				
128. Intersection Identifier for this Approach				
129. Unique Approach Identifier ^{FDE}				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
130. Approach AADT				
131. Approach AADT Year				
132. Approach Mode				
133. Approach Directional Flow				
134. Number of Approach Through Lanes				
135. Left Turn Lane Type				
136. Number of Exclusive Left Turn Lanes				
137. Amount of Left turn Lane Offset				
138. Right Turn Channelization				
139. Traffic Control of Exclusive Right Turn Lanes				
140. Number of Exclusive Right Turn Lanes				
141. Length of Exclusive Left Turn Lanes				
142. Length of Exclusive Right Turn Lanes				
143. Median Type at Intersection				
144. Approach Traffic Control				
145. Approach Left Turn Protection				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
146. Signal Progression				
147. Crosswalk Presence/Type				
148. Pedestrian Signalization Type				
149. Pedestrian Signal Presence/Type				
150. Crossing Pedestrian Count/Exposure				
151. Left/Right Turn Prohibitions				
152. Right Turn-On-Red Prohibitions				
153. Left Turn Counts/Percent				
154. Year of Left Turn Counts/Percent				
155. Right Turn Counts/Percent				
156. Year of Right Turn Counts/Percent				
157. Transverse Rumble Strip Presence				
158. Circular Intersection - Entry Width				
159. Circular Intersection - Number of Entry Lanes				
160. Circular Intersection - Presence/Type of Exclusive Right Turn Lane				
161. Circular Intersection - Entry Radius				
162. Circular Intersection - Exit Width				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
163. Circular Intersection - Number of Exit Lanes				
164. Circular Intersection - Exit Radius				
165. Circular Intersection - Pedestrian Facility				
166. Circular Intersection - Crosswalk Location				
167. Circular Intersection - Island Width				
IV. Interchange/Ramp				
168. Unique Interchange Identifier ^{FDE}				
169. Location Identifier for Road 1 Crossing Point				
170. Location Identifier for Road 2 Crossing Point				
171. Location Identifier for Additional Road Crossing Points				
172. Interchange Type ^{FDE}				
173. Interchange Lighting				
174. Interchange Entering Volume				
175. Interchange Identifier for this Ramp				
176. Unique Ramp Identifier				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
177. Ramp Length ^{FDE}				
178. Ramp Acceleration Lane Length				
179. Ramp Deceleration Lane Length				
180. Ramp Number of Lanes				
181. Ramp AADT ^{FDE}				
182. Year of Ramp AADT ^{FDE}				
183. Ramp Metering				
184. Ramp Advisory Speed Limit				
185. Roadway Type at Beginning Ramp Terminal ^{FDE}				
186. Roadway Feature at Beginning Ramp Terminal				
187. Location Identifier for Roadway at Beginning Ramp Terminal ^{FDE}				
188. Location of Beginning Ramp Terminal Relative to Mainline Flow				
189. Roadway Type at Ending Ramp Terminal ^{FDE}				
190. Roadway Feature at Ending Ramp Terminal				
191. Location Identifier for Roadway at Ending Ramp Terminal ^{FDE}				
192. Location of Ending Ramp Terminal				

MIRE Element	Collected		Indicate the Inventory/Database it is stored in	Comments
	State %	Local %		
Relative to Mainline Flow				
V. Horizontal Curve				
193. Curve Identifiers				
194. Curve Feature Type				
195. Horizontal Curve Degree or Radius				
196. Horizontal Curve Length				
197. Curve Superelevation				
198. Horizontal Transition/Spiral Curve Presence				
199. Horizontal Curve Intersection/Deflection Angle				
200. Horizontal Curve Direction				
VI. Vertical Grade				
201. Grade Identifiers and Linkage Elements				
202. Vertical Alignment Feature Type				
203. Percent of Gradient				
204. Grade Length				
205. Vertical Curve Length				

APPENDIX C: MIRE FDE LOOKUP

MIRE FDEs for non-local (based on functional classification) paved roads.

MIRE Name (MIRE Number)⁽⁴⁾	
Roadway Segment	Intersection
Segment Identifier (12)	Unique Junction Identifier (120)
Route Number (8)*	Location Identifier for Road 1 Crossing Point (122)
Route/street Name (9)*	Location Identifier for Road 2 Crossing Point (123)
Federal Aid/ Route Type (21)*	Intersection/Junction Geometry (126)
Rural/Urban Designation (20)*	Intersection/Junction Traffic Control (131)
Surface Type (23)*	AADT (79) [for Each Intersecting Road]
Begin Point Segment Descriptor (10)*	AADT Year (80) [for Each Intersecting Road]
End Point Segment Descriptor (11)*	Unique Approach Identifier (139)
Segment Length (13)*	
Direction of Inventory (18)	Interchange/Ramp
Functional Class (19)*	Unique Interchange Identifier (178)
Median Type (54)	Location Identifier for Roadway at Beginning Ramp Terminal (197)
Access Control (22)*	Location Identifier for Roadway at Ending Ramp Terminal (201)
One/Two-Way Operations (91)*	Ramp Length (187)
Number of Through Lanes (31)*	Roadway Type at Beginning Ramp Terminal (195)
Average Annual Daily Traffic (79)*	Roadway Type at Ending Ramp Terminal (199)
AADT Year (80)*	Interchange Type (182)
Type of Governmental Ownership (4)*	Ramp AADT (191)*
	Year of Ramp AADT (192)*
	Functional Class (19)*
	Type of Governmental Ownership (4)*

MIRE FDEs for local paved roads.

MIRE Name (MIRE Number)⁽⁴⁾
Roadway Segment
Segment Identifier (12)
Functional Class (19)*
Surface Type (23)*
Type of Governmental Ownership (4)*
Number of Through Lanes (31)*
Average Annual Daily Traffic (79)*
Begin Point Segment Descriptor (10)*
End Point Segment Descriptor (11)*
Rural/Urban Designation (20)*

MIRE FDEs for unpaved roads.

MIRE Name (MIRE Number)⁽⁴⁾
Roadway Segment
Segment Identifier (12)
Functional Class (19)*
Type of Governmental Ownership (4)*
Begin Point Segment Descriptor (10)*
End Point Segment Descriptor (11)*