



CVSA and FMCSA

SSDQ Performance Measures: Crash and Inspection Record Completeness Inspection VIN Accuracy

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CVSA Spring Workshop



Office of Research and Information Technology

Introduction

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Agenda

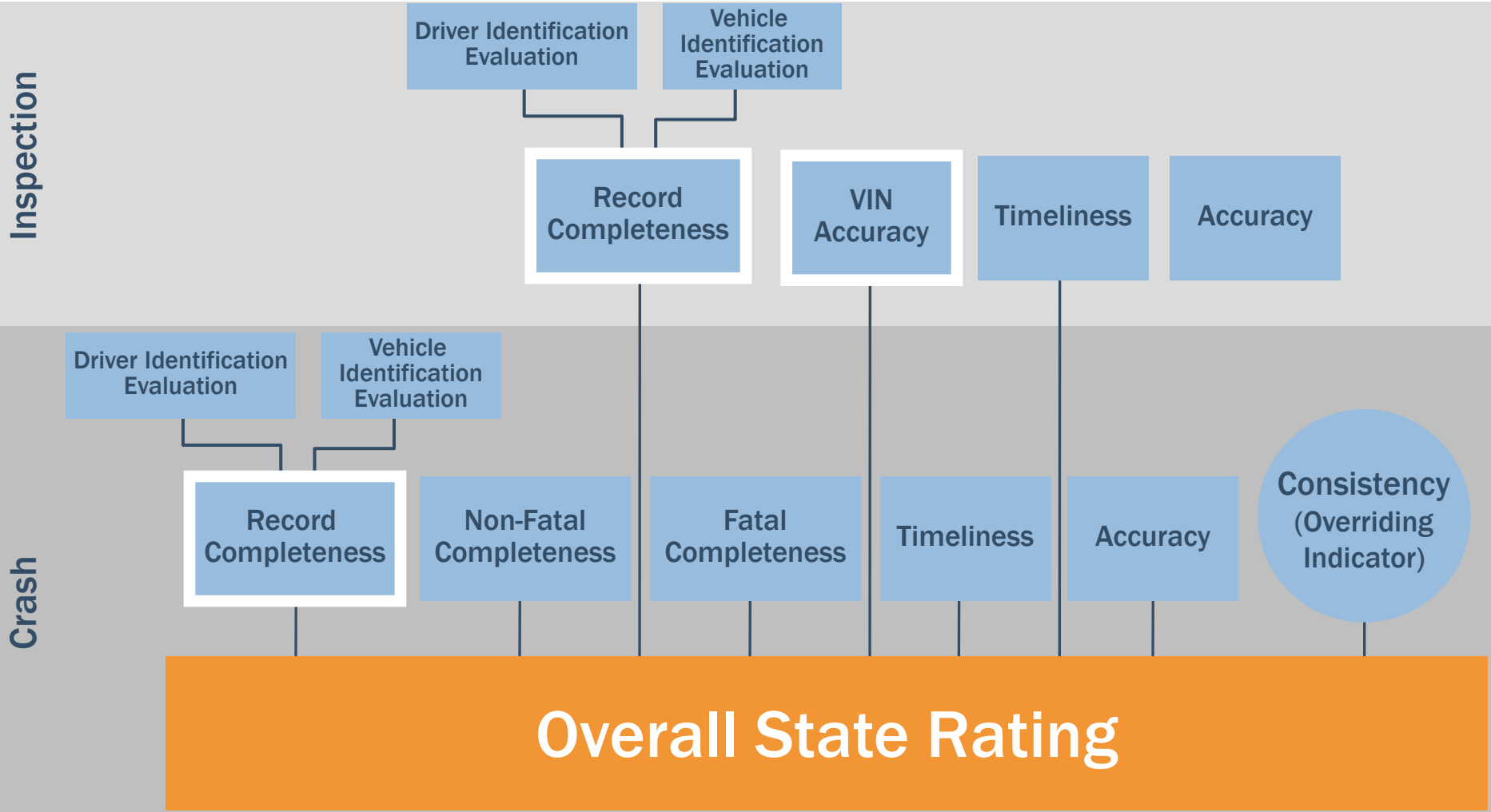
- Overview of Record Completeness and VIN Accuracy Measures
- Why Record Completeness and Accuracy Matter
- Training Objectives and Expected Outcomes
- How State Ratings Are Determined
- How to Interpret Data Quality Reports
- When and How to Improve Data Quality
- Resources



Record Completeness and Inspection VIN Accuracy Measures

- **Crash Record Completeness:** the percentage of fatal and non-fatal crash records, which contain complete driver and vehicle information over a 12-month period
- **Inspection Record Completeness:** the percentage of inspection records, which contain complete driver and vehicle information over a 12-month period
- **Inspection VIN Accuracy:** the percentage of inspection records, which contain complete and accurate VIN over a 12-month period

State Safety Data Quality (SSDQ) Measures





Why Record Completeness and Accuracy Matter

- Driver information associated with the driver's safety record
 - Pre-Employment Screening Program (PSP)
 - Driver Information Resource (DIR)
 - Driver Safety Measurement System (DSMS)
- Vehicle information used in the New Applicant Screening (NAS) tool

Training Objectives

- Explain the Crash and Inspection Record Completeness and Inspection VIN Accuracy performance measures
- Show how data collection and processing errors can affect Record Completeness ratings
- Emphasize the importance of reviewing blank or incomplete fields in crash and inspection records and demonstrate how to correct them
- Identify FMCSA resources for improving data quality

Expected Outcomes

- Understand Record Completeness and VIN Accuracy performance measure methodologies
- Interpret Record Completeness and VIN Accuracy rating results
- Interpret Record Completeness and VIN Accuracy for State Data Analysis Reports (SDAR)
- Identify potential sources of collection and reporting issues
- Use Driver Information Resource (DIR) and VIN Decoder Tool to research and complete blank data fields

How State Ratings Are Determined



Methodology for Crash Record Completeness

Driver Identification Fields

- Driver's License Number
- Driver's Date of Birth
- Driver's First Name
- Driver's Last Name
- License Class

Vehicle Identification Fields

- Vehicle Identification Number
- License Plate Number
- Vehicle Configuration
- Cargo Body Type
- Gross Vehicle Weight Rating



Methodology for Inspection Record Completeness

Driver Identification Fields

- Driver's First Name
- Driver's Last Name
- Driver's Date of Birth
- Driver's License Number

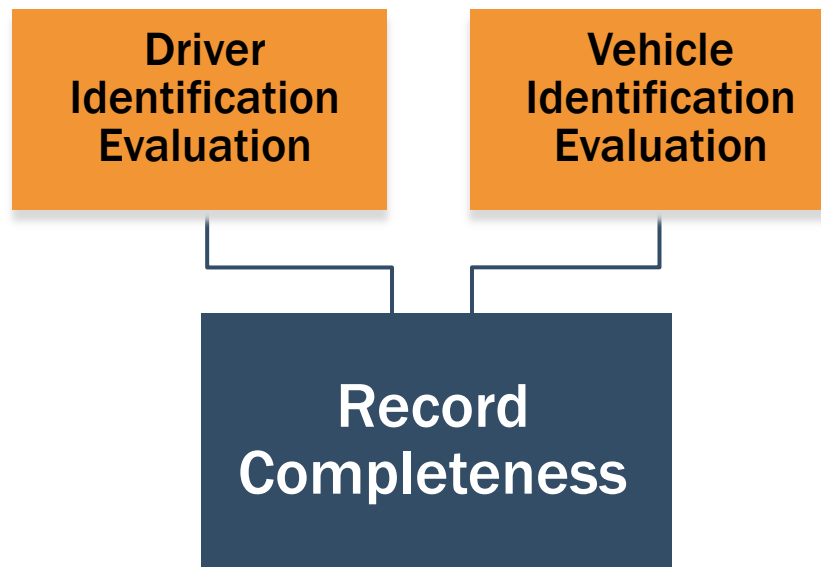
Vehicle Identification Fields

- License Plate Number
- Gross Vehicle Weight Rating



Methodology for Completeness

- Record Completeness measures evaluate all crash records and inspection records
- Determine ratings based on Record Completeness of driver and vehicle data reported to FMCSA
 - Driver and vehicle data evaluated separately and then results averaged together
 - Record considered incomplete if any information is missing





Methodology (cont.)

Inspection VIN Accuracy

- Inspection VIN Accuracy measure evaluates all Level 1-6 roadside inspection records
- Determines rating based on completeness and accuracy of the VIN on the first vehicle unit; all trailing units are excluded
 - Checksum digit used to determine if the VIN is accurate

Evaluation Period = Event Date Range

12 Months of MCMIS Data

- Based on event date, not upload date
- “Rolling” 12-month period
- Excludes the most recent 3 months



Record Completeness and VIN Accuracy Ratings






Ratings for Record Completeness Measures

Record Completeness ratings calculated every month and results posted on the A&I Data Quality Website

Rating = Average of:

- Percent of evaluated records with complete **driver** information
- Percent of evaluated records with complete **vehicle** information




Rating		Criteria
Good		Percentage of complete driver and vehicle info is $\geq 85\%$
Fair		Percentage of complete driver and vehicle info is 70 - 84%
Poor		Percentage of complete driver and vehicle info is $< 70\%$



VIN Accuracy Ratings

Inspection VIN Accuracy ratings calculated each month and results posted on the A&I Data Quality Website

$$\frac{\text{Number of records with valid VIN}}{\text{Number of evaluated records}} = \text{Percent of records with valid VIN}$$

Rating		Criteria
Good		Percentage of complete & accurate VIN is $\geq 85\%$
Fair		Percentage of complete & accurate VIN is 70 - 84%
Poor		Percentage of complete & accurate VIN is $< 70\%$



How to Use Data Quality Reports

Three types of reports:

- 1 *Rating Results*
- 2 *State Data Analysis Reports*
- 3 *Custom Reports*

What you can do with them:



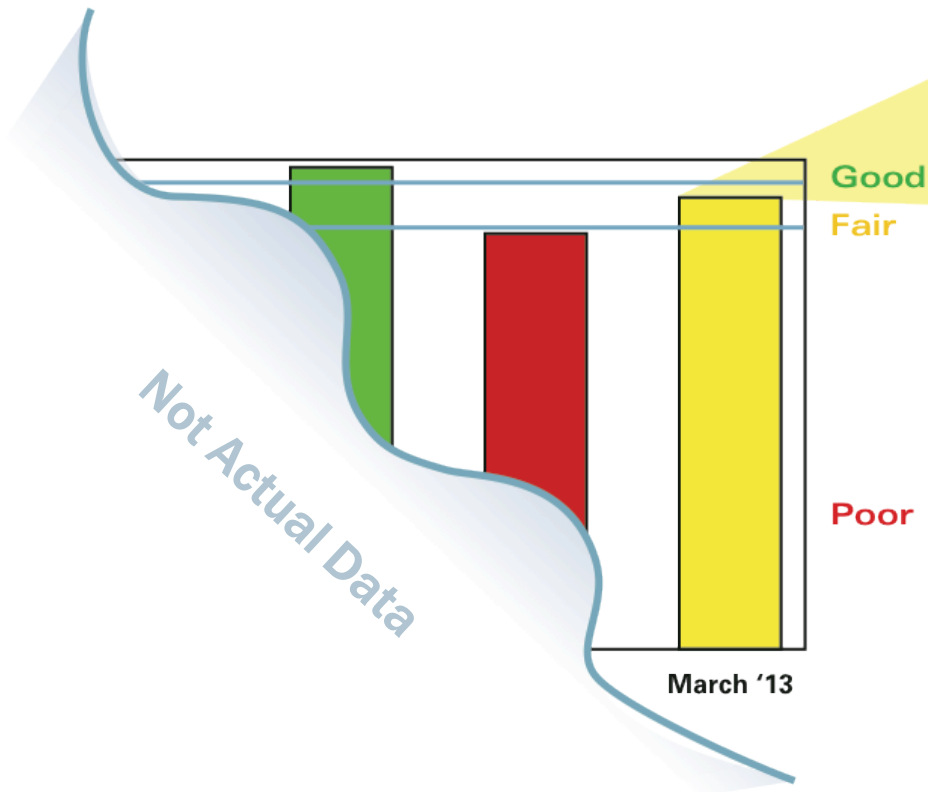
Spot trends in reporting

Identify problems with data collection

Review/correct specific records



Monthly Rating Results



**Event Date Range is
1/1/2012 - 12/31/2012**

12 Months of MCMIS data

**MCMIS snapshot
was taken March 22, 2013**

Crash Record Completeness Results

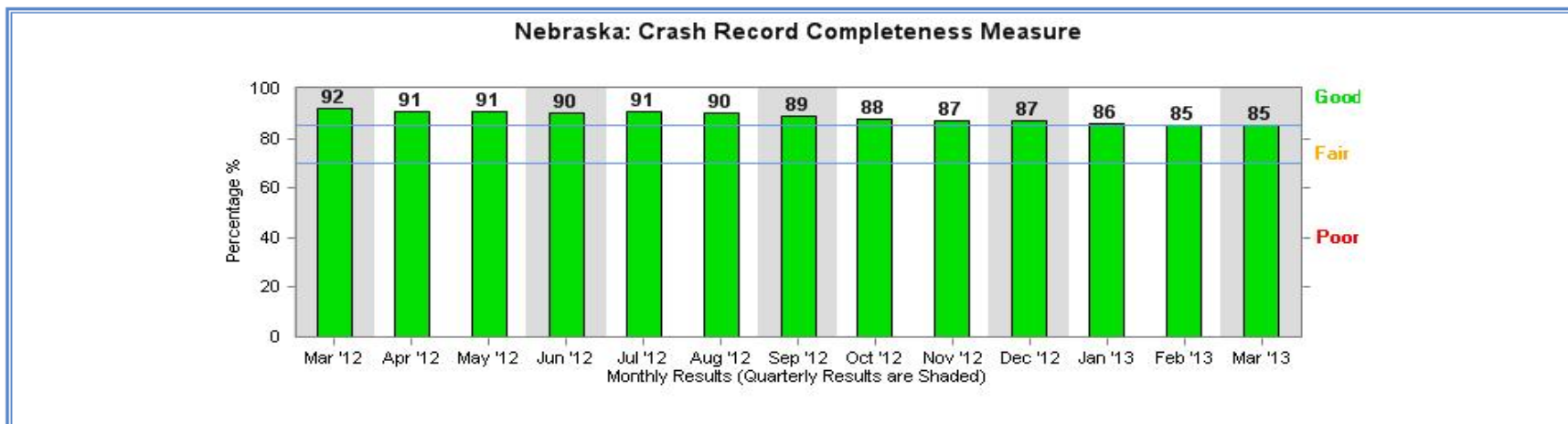


Table 1: Nebraska: Crash Record Completeness Measure [Download Data](#)

Monthly Results	MCMIS Run Date	Event Date Range	Rating	Driver Identification Completeness Evaluation	Vehicle Identification Completeness Evaluation	Crash Record Completeness
Mar '13	3/22/2013	1/1/2012 - 12/31/2012	●	80%	90%	85%
Feb '13	2/22/2013	12/1/2011 - 11/30/2012	●	81%	88%	85%

How to Interpret

- Report displays the last 13 ratings
- Each rating based on the percentage of completed driver and vehicle fields
- Compares current and previous results to identify trends

When to Act

- Unusual or significant change in the percent of complete records
- Slow decline in rating
- Even when the rating is Good

Inspection Record Completeness Results

- Room for improvement, even for Good ratings
- Most States have a Good rating, but...
 - Even a Good rating of 90% may point to collection issues
 - Gross Vehicle Weight Rating (GVWR) collected at lower rate than Vehicle License Number

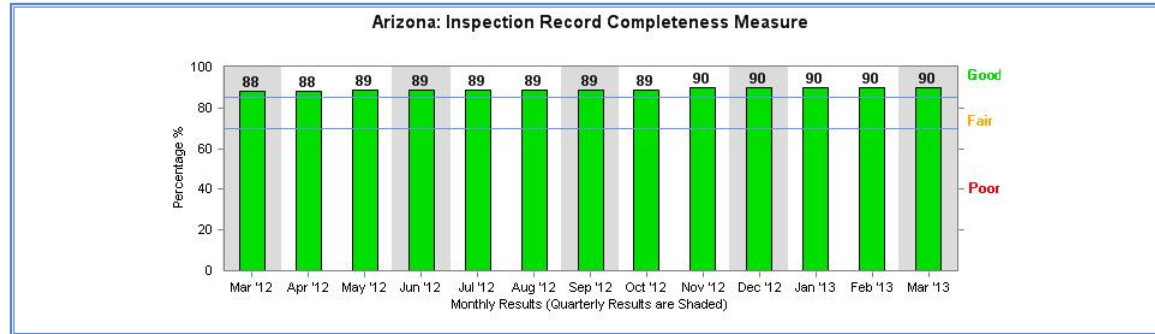


Table 1: Arizona: Inspection Record Completeness Measure [Download Data](#)

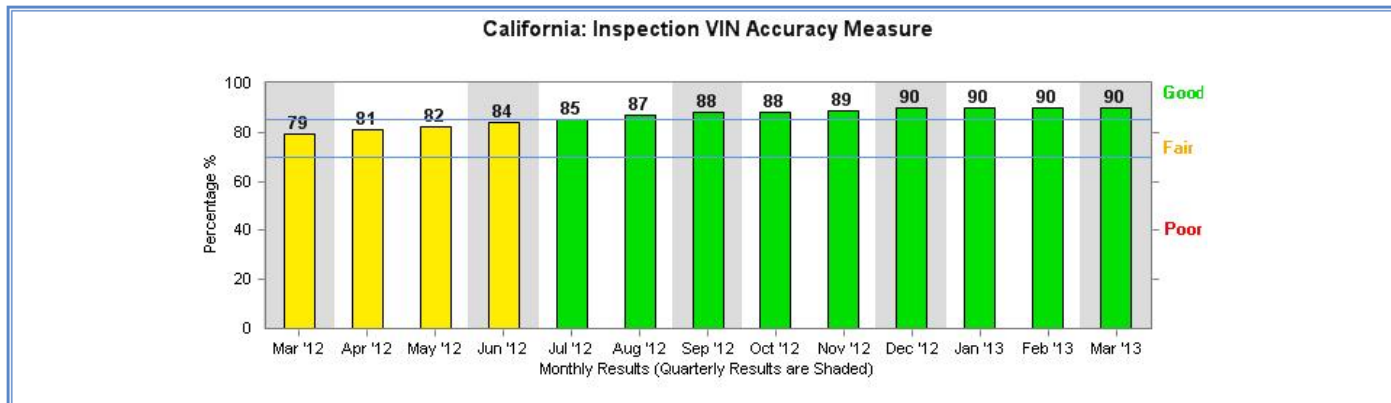
Monthly Results	MCMIS Run Date	Event Date Range	Rating	Driver Identification Completeness Evaluation	Vehicle Identification Completeness Evaluation	Inspection Record Completeness
Mar '13	3/22/2013	1/1/2012 - 12/31/2012	●	100%	80%	90%
Feb '13	2/22/2013	12/1/2011 - 11/30/2012	●	100%	80%	90%

Table 2: Driver Identification Completeness

Monthly Results	MCMIS Run Date	Crash Records Evaluated	Records with Complete Driver Information		# Records with Driver Information			
			# Records	% Records	Last Name	First Name	Date of Birth	License Number
Mar '13	3/22/2013	77,865	77,639	100%	77,765	77,860	77,808	77,749
						77,880	77,821	77,760
						77,900	77,936	77,881

# Records with Vehicle Information	
Vehicle License #	GVWR
135,777	109,837

Inspection VIN Accuracy



California: Inspection VIN Accuracy Report [Download Data](#)

Monthly Results	MCMIS Run Date	Event Date Range	Rating	# Vehicle Units Evaluated (1st unit only)	Invalid VIN		Valid VIN	
					# Records	% Records	# Records	% Records
Mar '13	3/22/2013	1/1/2012 - 12/31/2012	●	550,521	54,708	10%	495,813	90%
Feb '13	2/22/2013	12/1/2011 - 11/30/2012	●	556,094	55,900	10%	500,194	90%
Jan '13	1/25/2013	11/1/2011 - 10/31/2012	●	564,079	57,827	10%	506,252	90%
Dec '12	12/14/2012	10/1/2011 - 9/30/2012	●	563,769	58,910	10%	504,859	90%

How to Interpret

- Report displays the last 13 ratings in a bar chart and a table
- Each rating based on VIN completeness and accuracy
- Checksum digit used to check accuracy

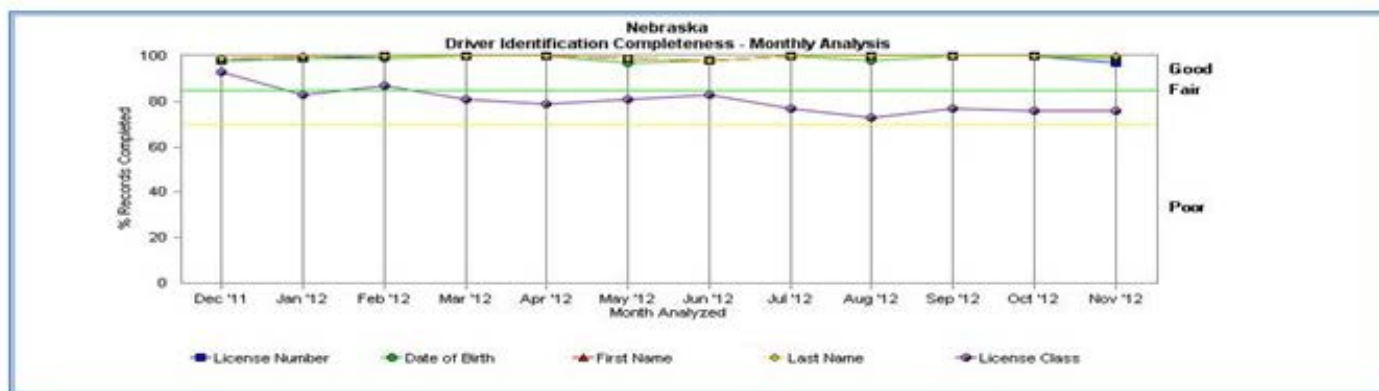
When to Act

- Unusual or significant change in percent of records with inaccurate VINs
- Slow decline in rating
- Even when the rating is Good

How to Interpret Data Quality Reports

State Data Analysis Reports (SDAR)

Crash Record Completeness – Monthly Analysis



Event Date Range Analyzed (1 Month)	Crash Records Evaluated	License #		Date of Birth		First Name		Last Name		License Class	
		# Records	% Records	# Records	% Records	# Records	% Records	# Records	% Records	# Records	% Records
11/1/2012 - 11/30/2012	68	66	97%	67	99%	68	100%	68	100%	52	76%
10/1/2012 - 10/31/2012	84	84	100%	84	100%	84	100%	84	100%	64	76%
9/1/2012 - 9/30/2012	92	92	100%	92	100%	92	100%	92	100%	71	77%
8/1/2012 - 8/31/2012	92	92	100%	90	98%	92	100%	92	100%	67	73%

How to Interpret

- Details of evaluation period
- Completeness of fields by month of event
- Trends in completeness

When to Act

- A downward trend for any of the fields
- A sudden drop in percentage

SDAR (cont.)

Inspection VIN Accuracy – Records Reported by Inspector ID

California: Inspection VIN Accuracy - Records by Inspector ID						Download Data
Inspector ID #	# Vehicle Units Evaluated (1 st unit only)	Invalid VIN		Valid VIN		
		# Records	% Records	# Records	% Records	
State Total	556,094	55,900	10%	500,194	90%	
Insp #'s hidden from view	2	0	0%	2	100%	
	52	6	12%	46	88%	
	1	0	0%	1	100%	
	2	0	0%	2	100%	
	221	16	7%	205	93%	
	20	4	20%	16	80%	
	363	16	4%	347	96%	
	1	0	0%	1	100%	
	292	76	26%	216	74%	
	17	0	0%	17	100%	

How to Interpret

- Sort by:
 - Inspector ID
 - Number or percent of inspection records with invalid and valid VINs
 - Total number of vehicle units evaluated



When to Act

- Inspectors (single or groups) with high numbers/percent of invalid VINs
- Widespread distribution of records of invalid VINs



Custom Reports

Explore specific data quality issues:

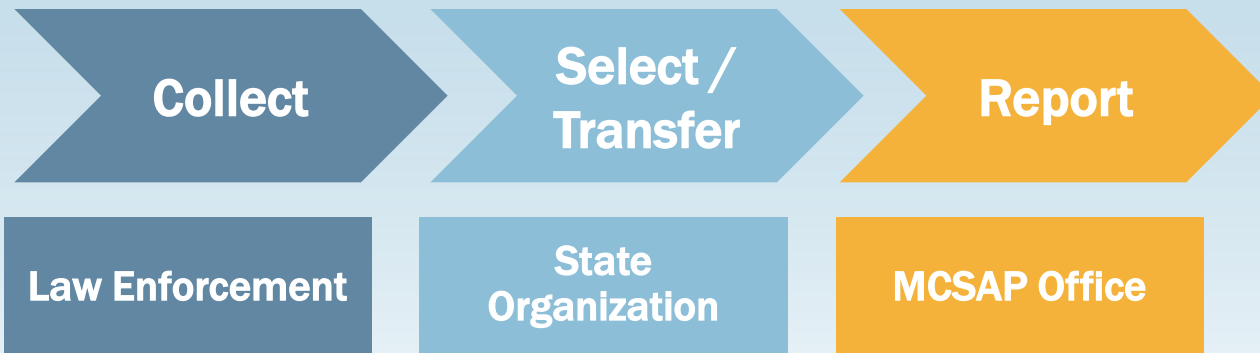
- Identify inspections collected with Aspen or another method
- Sort by month of inspection to highlight related trends
- Evaluate fields in crash and inspection records that compare current and past time periods

When and How to Improve Data Quality

Data Collection and Reporting Process

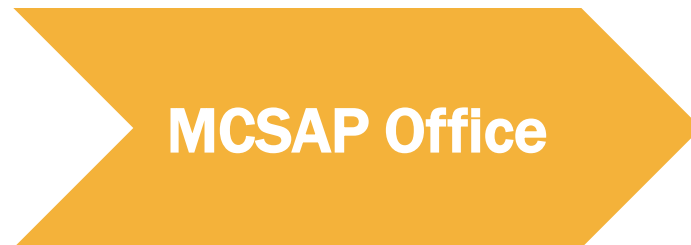
Key to improving Crash and Inspection Record Completeness:
Apply FMCSA reporting requirements throughout the reporting
process

FMCSA Requires Complete Driver and Vehicle Information





Report to Federal Systems



- Motor Carrier Safety Assistance Program (MCSAP) Office responsible for uploading complete and accurate safety data to Federal systems
- Includes completing empty fields in crash and inspection records



How to Complete Empty Fields

- Research and complete blank driver or vehicle fields
- Research using FMCSA and State systems
 - Driver Information Resource (DIR)
 - VIN Decoder Tool

Resources

U.S. Department of Transportation
Federal Motor Carrier Safety Administration
Analysis & Information Online

HOME | SMS | CARRIER/DRIVER SAFETY | DATA QUALITY | CRASH STATS | SAFETY PROGRAMS | MCSAP | ANALYSIS & REPORTS

About DIR
[How Do I Correct My Data? \(DataQs\)](#)
[Introduction and User Lessons](#)
[Disclaimer](#)

Search by Driver:

- Last Name ↑
Narrow Search By: First Name ↑
- Enter Driver License # ↑

For Last Name or Driver License #,
Narrow Search By: Driver License State

Or Search by Carrier:

- U.S. DOT #
- Carrier Name ↑
Narrow Search By: State

Generate Report:

- Report Type: Select a Report
- Driver License State: Select a State

[Clear Search Criteria](#)

↑ Tip: Use * (an asterisk) for a wildcard search.
[Tips on Searching](#)

Driver Information Resource

Updated Results: February 22, 2013

The Driver Information Resource (DIR) provides a web based lookup capability that allows FMCSA and State enforcement personnel to search, via a secure password, a driver's crash and inspection history by driver name or commercial driver license number. A driver's crash and/or violation data will be displayed if the driver had an inspection within 3 years or a crash within 5 years. All crash and inspection events that meet these criteria will be included and associated with both the driver and motor carrier for whom they were operating. The system will also allow users to search by U.S. DOT number or carrier name to obtain a list of all drivers affiliated with the specified carrier that had an inspection within 3 years or a crash within 5 years.

The information provided in Driver Information Resource is based on the Motor Carrier Management Information System (MCMIS) inspection, crash and census data and is updated **monthly**. Potential future enhancements include the addition of other FMCSA and State data sources.

Please provide comments or suggestions on Driver Information Resource by selecting [Feedback](#) from the main menu.

Introduction and User Lessons
This presentation provides an introduction to Driver Information Resource (DIR) with information on the data sources, accessing DIR, and using DIR to search by Driver or Carrier to view Driver safety performance and compliance history.

[PPT Download](#)
[TXT Download](#)

Data Source: Driver Information Resource results are based on the February 22, 2013 MCMIS data snapshot.

VIN Decoder Tool

Supporting the Federal Motor Carrier Safety Administration (FMCSA) in crash data collection for the SAFETYNET Crash Module



CMV ID® 3.0
A web-based VIN decoder for Commercial Motor Vehicles

ENTER VIN:

SUBMIT

No Pictures
 Configurations Only
 With Cargo Body

The VIN should be 17 characters to validate

WMI			GVWR, Style					CD	YR	Plant, Serial #						
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17

NEW! [Find WMI by Maker](#)

♦ Trucks, Pickups, Vans, SUVs ♦ Buses ♦ Single Unit Trucks ♦ Tractors ♦ Trailers ♦ North American Border Cross Vehicles ♦

Processing Messages: None

	VEHICLE INFORMATION		SAFETYNET CRASH DATA
VIN		Config1	
WMI		Config2	
MAKER		Config3	
MODEL		Config4	
AXLES		Config5	
TYPE		Config6	
GVWR		GVWR	

VEHICLE CONFIGURATIONS AND CARGO BODY TYPE CODES for SAFETYNET CRASH DATA

Resources

- DIR
 - <https://ai.fmcsa.dot.gov/DriverActivity/DriverHome.asp>
- VIN Decoder Tool
 - http://www.nisrinc.com/cm_v_id/

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Training Recap

I am now able to:

- ✓ Understand Record Completeness and VIN Accuracy performance measure methodologies
- ✓ Interpret Record Completeness and VIN Accuracy rating results
- ✓ Interpret Record Completeness and VIN Accuracy SDAR
- ✓ Identify potential sources of collection and reporting issues
- ✓ Use DIR and VIN Decoder Tool to research and complete blank data fields
- ✓ Identify FMCSA resources for improving data quality